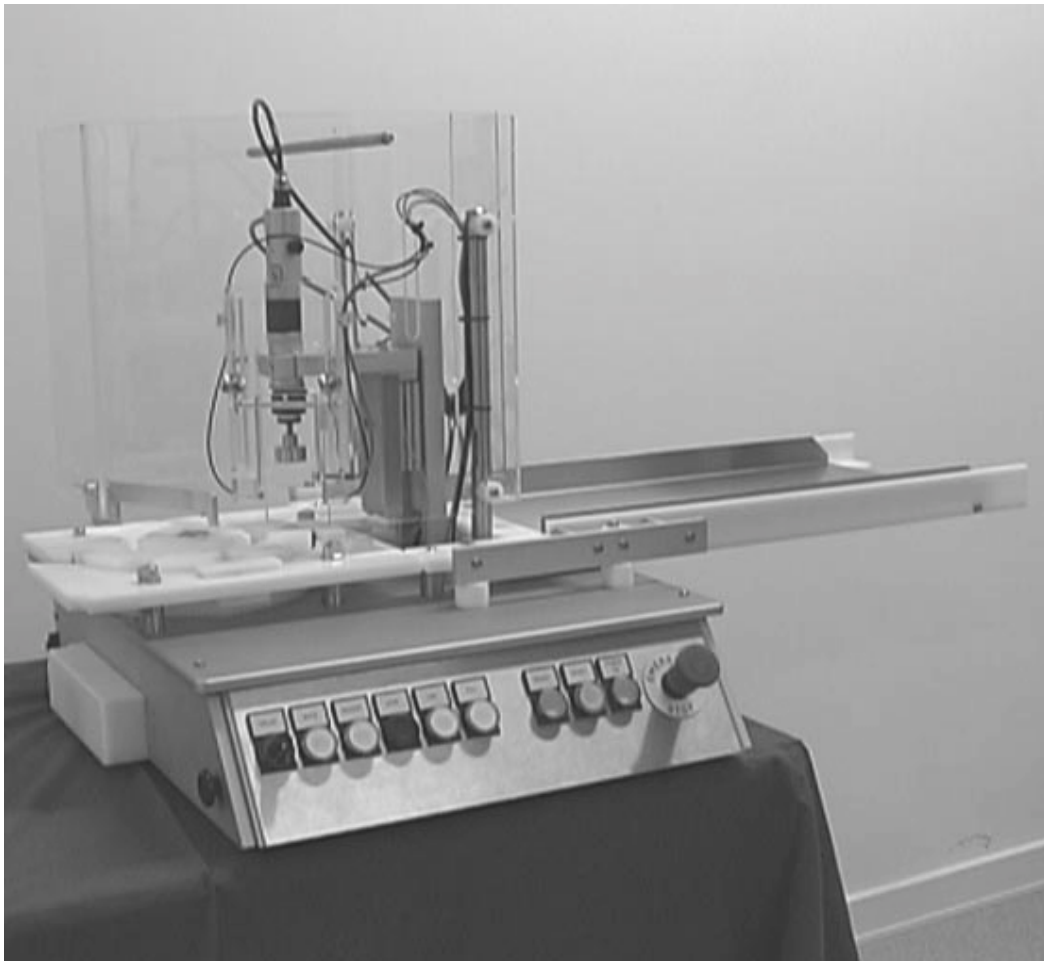


# **Flexicon**<sup>®</sup>

## ***Filling and Capping System***

### ***FF30 S***



## **Operators Manual**

### ***FF30-S Screw Capping Module***

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**DECLARATION OF CONFORMITY.**

We Flexicon A/S  
Frejasvej 2-6  
DK-4100 Ringsted

declare on our sole responsibility that the product:

**FF30-S – Screw capping module**


to which this declaration relates is in conformity with the following standard(s):

EN 292: Safety of Machinery: Basic Concepts,  
General Principles of design.

according to the provisions in the Directives:

98/37/EEC, 91/368/EEC and 93/44/EEC: Machine-directive.  
73/023: Low Voltage-directive.

EMC 2004/18/EEC

 <b>Flexicon a-s</b> Denmark <sup>®</sup>	
Model	<b>FF30 S</b>
Serial No.	yyww xxxx
Supply	230V/50Hz/120W
Year	yyyy

CE

**Ringsted 2006**

**Mads Ulric Jensen**  
Signature.

**CAUTION.**

This manual should be read before using the FF30-S.

**Explanations to the pictograms:**

Warning against touching/Warning against opening:



Warning against high voltage:



The mains switch is used for emergency stopping.

The FF30-S should only be used in accordance with this manual: for applying and tightening screw caps onto bottles.

The FF30-S must be placed on a stable bed plate and in such a way, that it is not exposed to great humidity, high temperatures or other abnormal operating-environments.  
It is not to be used in explosion hazardous environments.

It is prohibited to maintain or clean the FF30-S, when it is connected to the power supply.

It is prohibited for unauthorised personnel to open the cover of the electrical parts of the FF30-S.

Always remember that the FF30-S must be earthed by way of the switch.

## 1 GENERAL INFORMATION

### 1.1 Use

The filling and capping system FF30 is a small modular bottle handling system, which - combined with a Flexicon filler – automatically fills and semi-automatically applies caps to bottles with a diameter ranging from 12 to 52 mm.

FF30 is designed to meet the demands of a very flexible small batch production of filling liquids, oil or cream in bottles, or jars.

The design of the FF30 complies with the requirements of the pharmaceutical, bio technical and cosmetic industries.

The compact design of FF30 allows placement in a Laminar Air Flow (LAF) bench, or in a ventilated cabinet, thus giving a sterile filling machine, or a filling machine where the operator is protected from hazardous fumes.

This manual contains all information necessary for the installation and daily operation of the system and so the FF30 manual should be read before using the system.

### 1.2 Unpacking and inspection

Please check that all ordered items have been received and that no items were damaged during transport.

In case of any defects or omissions, please contact Flexicon A/S or your local supplier immediately.

When ordering spare parts or accessories for the FF30, please state the serial number.

The serial number is stamped on the label on the rear panel on each module of the FF30.

**ALWAYS REMEMBER that this machine must be earthed.**

### 1.3 The modules.

The filling and capping system FF30 consists of following individual modules:

FF30-F in-feed rotary table, with optional infeed from either front or side.

FF30-S screw-capping module.

Additionally a collecting device is included in the system:

FF30-T collecting tray.

FF30-L tray loading.

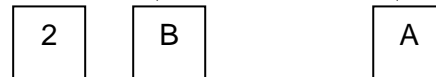
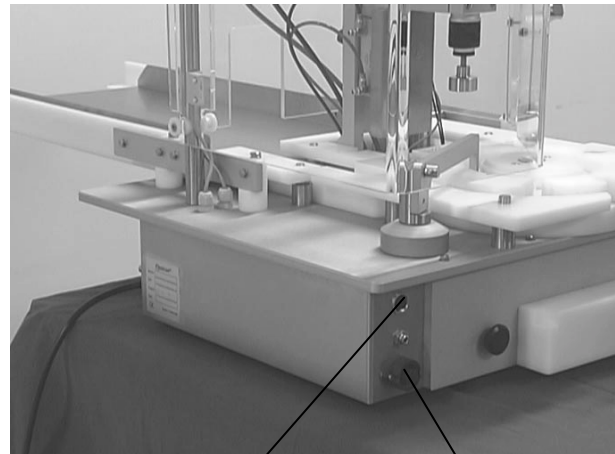
## 2 INSTALLATION.

### 2.1 Placing the machine.

The FF30-S should always be placed on a stable and horizontal support (table or likewise), that is levelled to a proper working height for the operator.

The FF30-S should be placed so, that it is not exposed to great humidity, high temperatures or other abnormal operation environments. It is not to be used in explosion hazardous environments.

### 2.2 Electrical connections.

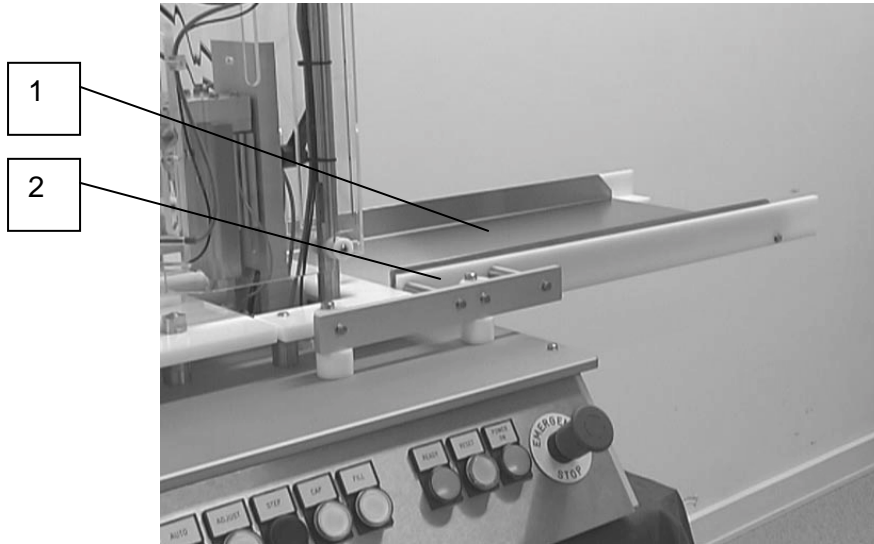


- 1 The mains cable is connected to a single-phase power supply socket with earth.  
The supply voltage must correspond to the voltage indicated on the machine label.
- A The power socket supplies power for the FF30 module that delivers bottles to the FF30-S screw capping module.
- 2 The communication cable is connected to the socket (B) on FF30-S and to the corresponding socket on the bottle feeding FF30 module .
- C If a foot switch or other external device is to provide the start signal for the FF30-S, it should be connected to this socket

### 2.3 Pneumatic connections.

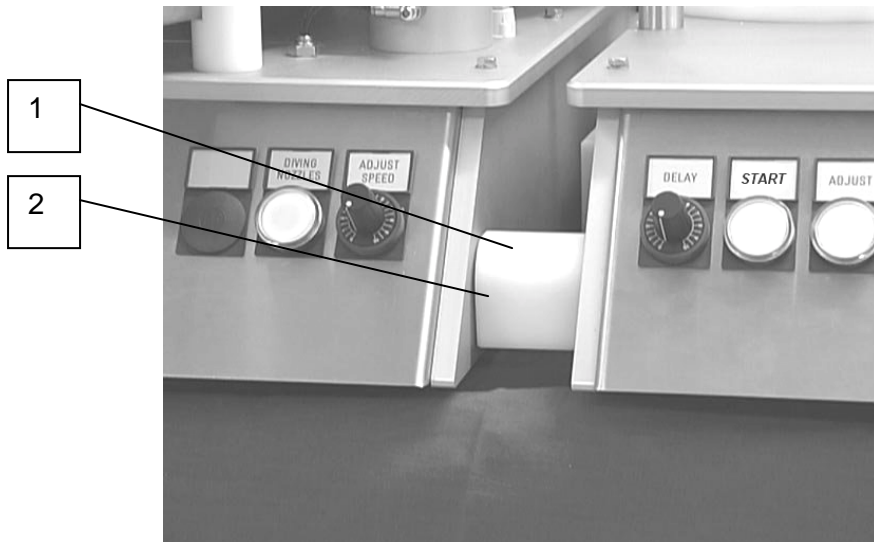
- 3 The FF30-S screw capping module is connected to a supply of compressed air by use of the supplied quick release clutch through this nipple.  
Clean and dry compressed air should be supplied at 6 – 8 bar, at a capacity of min. 100 l/min.
- D All exhaust air is collected and exhausted through the exhaust filter (D). If a tube connector or the like replaces the filter, the machine exhaust can be connected to a building extraction system. Be careful not to build up air pressure in the exhaust line by using too narrow tubes.

### 2.4 Fitting the collecting tray.



The collecting tray (or tray loading device) (1) is fitted to FF30-S screw capping module by the supplied screws (2) (4 pcs. M6x65).

### 2.5 Connection and alignment to the feeding FF30 module:



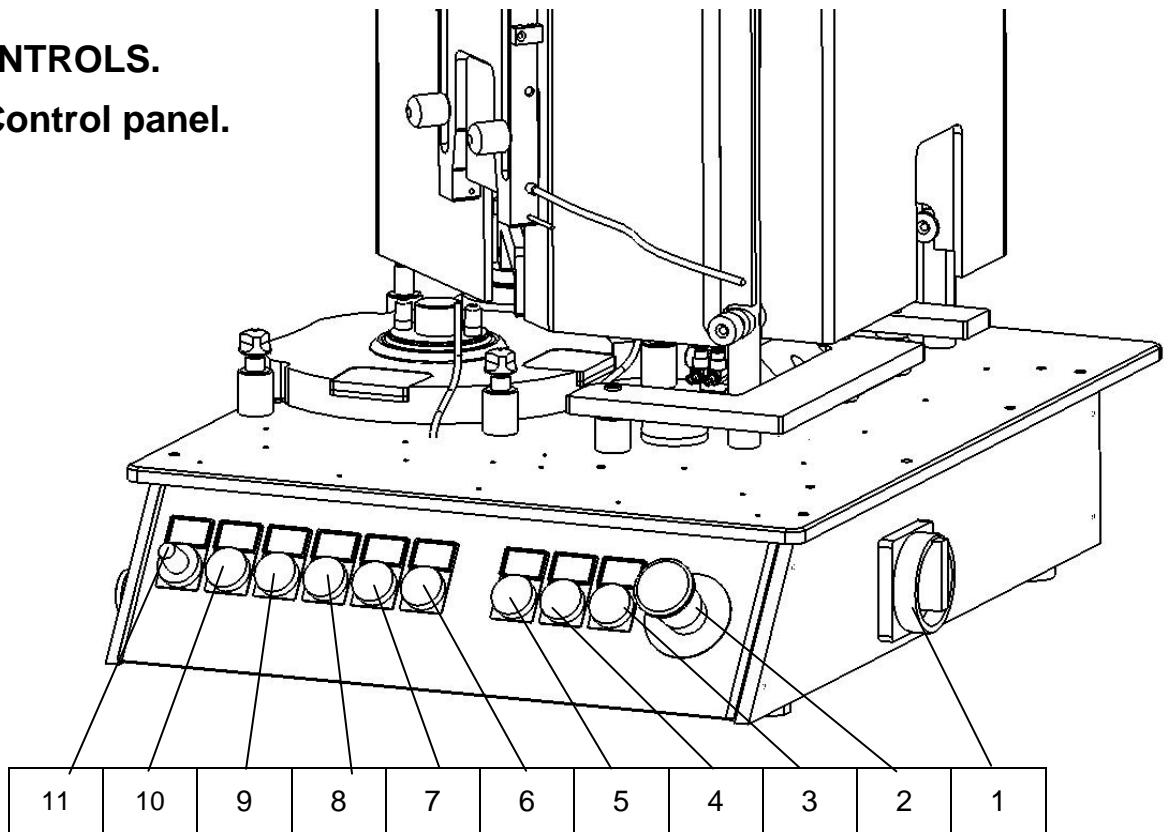
The FF30-S is connected to the feeding module by fitting the couplings (1) to the locks (2). This connection aligns the modules horizontally.

By use of the supplied tool the front feet of the modules can be adjusted. The feet should be adjusted so that the bottle support of the FF30-S is 0 mm to 0.5 mm beneath the corresponding level of the FF30-F bottle feeding module.

The feet should also be adjusted so that the FF30-S is horizontal and is supported by all 4 feet.

### 3 CONTROLS.

#### 3.1 Control panel.



<b>1 ON/OFF</b>	Main switch for the entire FF30 system.
<b>2 EMERGENCY</b>	Emergency switch for the entire FF30 system.
<b>3 POWER ON</b>	Green indicator lamp for main power switch.
<b>4 ALARM / RESET</b>	Push-button for cancelling errors, that has stopped the FF30 system. The button flashes with a yellow light for error message.
<b>5 READY</b>	Green indicator lamp for READY status.
<b>6 FILL</b>	Main switch for the entire FF30 system.
<b>7 CAP</b>	Push-button for activating screw capping. White indicator lamp for screw capping active.
<b>8 STEP</b>	Push-button for a single index of star wheel.
<b>9 ADJUST</b>	Push-button for adjustment mode. White indicator lamp for ADJUST active.
<b>10 START</b>	Push-button for starting and stopping production. Production is active when the white indicator lamp is ON. Only the functions activated on the control panel will be performed. Functions can be switched ON and OFF during production without having to stop and restart production.
<b>11 DELAY</b>	Potentiometer with OFF switch for setting of minimum time limit between 2 indexes. If potentiometer is OFF every indexing cycle is triggered by an external signal.



## 4 PREPARATION FOR PRODUCTION

### 4.1 Recognition of bottle format parts.

A set of bottle format parts consists of a bottle star wheel and 2 bottle guides. All individual parts are marked with a number.

The parts in a set of bottle format parts for a specific bottle are marked with the same number.

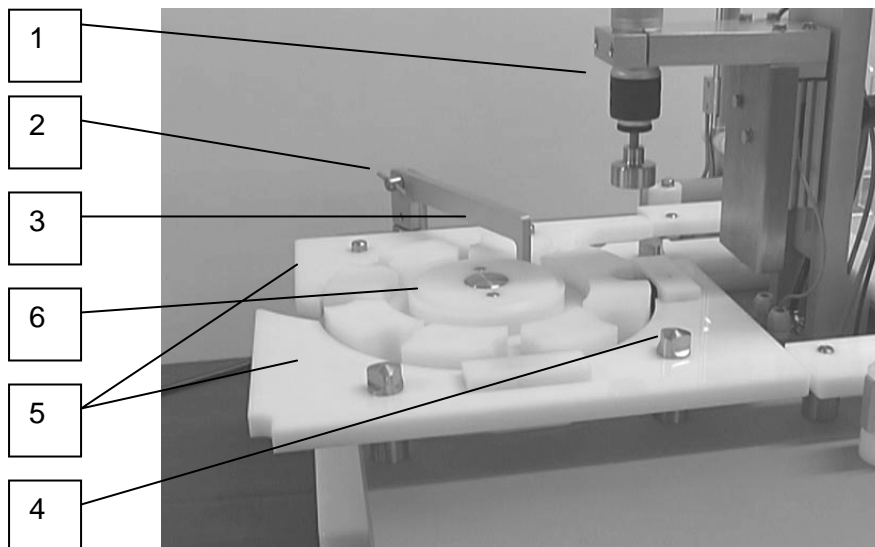
This number does not have any reference to the appearance of the bottle.

Please refer to the description in the appendix of this manual.

The format parts are individual for each customer/bottle. Please refer to the spare parts number stated in the appendix of this manual, when contacting Flexicon A/S or your local distributor.

### 4.2 Change of bottle format parts.

The bottle format parts cannot be changed while guarding is closed.



Elevate the capping machine (1) if necessary.

Remove the finger screw (2) and the ejector arm (3).

Remove 3 finger screws (4) holding the bottle guide towards the front of the machine.

Remove the bottle guides (5) and the bottle star wheel (6).

The machine is now ready for placing another set of bottle format parts.

### 4.3 Recognition of screw cap format parts.

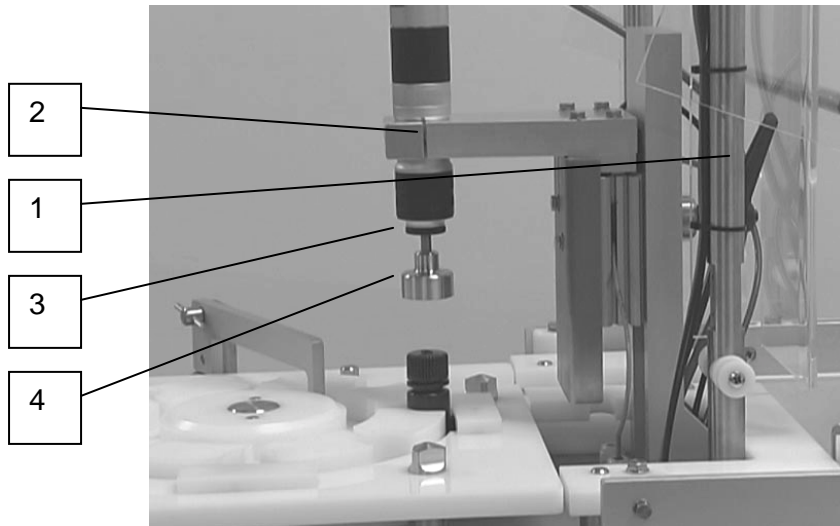
Screw cap format parts consists of a single capping head. All capping heads are marked with a number. The number does not have any reference to the appearance of the screw cap.

Please refer to the description in the appendix of this manual.

The capping heads are individual for each customer/screw cap. Please refer to the spare parts number stated in the appendix of this manual, when contacting Flexicon A/S or your local distributor.

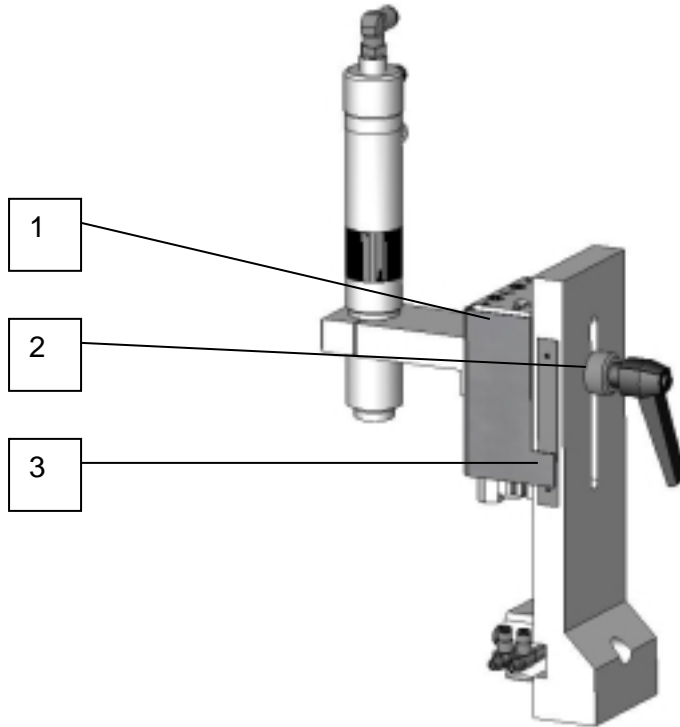
#### 4.4 Change of capping head.

The capping head cannot be changed while guarding is closed.  
Compressed air must be connected while changing the capping head, so that the air motor is elevated to the upper position.



Loosen the finger screw (1), move the air motor (2) to the upper position and fasten the finger screw.  
At the same time pull down the spring-loaded release sleeve (3), and the capping head (4).  
The capping head will come off the quick change chuck.  
To mount another capping head, press the head up in the quick change chuck.

#### 4.5 Adjusting the height of the capping head.



The height of the capping set can be set by the use of the scale on the side of the stand holding the screw capper.

Make sure that compressed air is connected and the machine is ON, so that the air cylinder (1) is up. Now loosen the finger screw (2) and set the height of the screw capper according to the chosen format parts for both bottle and cap. For height setting value please refer to the description in the appendix of this manual.

The value is read at the lower edge of the pointer (3)

If new format parts have been added after reception of the FF30-S, the following procedure for initial adjustment of the height of the capping head can be used.

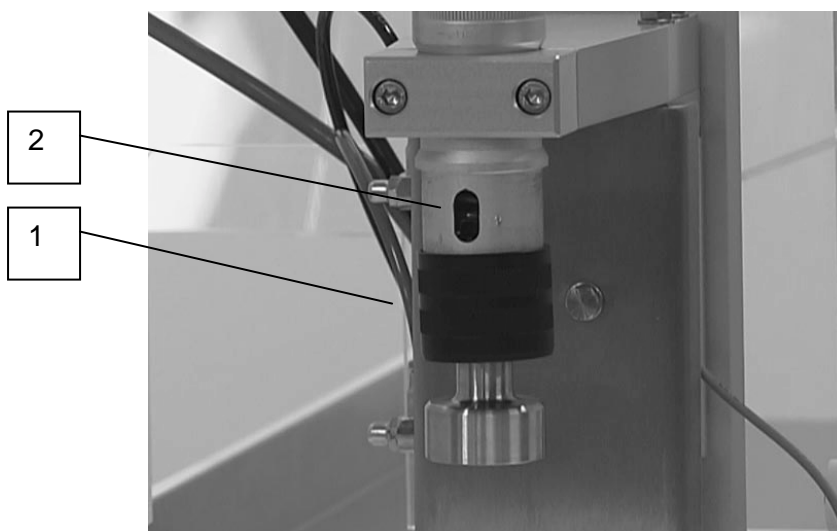


Place a bottle with fully screwed cap (1) in the capping station. Close the guarding and press RESET. Now press ADJUST, and the capping head will come down towards the bottle. While the machine is in adjust-mode, is it possible to open the rear guarding without having an alarm from the safety

switch. Loosen the finger screw (2) and lower the air motor until the capping head (3) is resting on the top of the screw cap. Fasten the finger screw.

Now press ADJUST again, and the capping head will go to top position. Loosen the finger screw (2) again, and lower the air motor 3 – 5 mm, before tightening the finger screw.

### 4.6 Adjusting the capping torque.

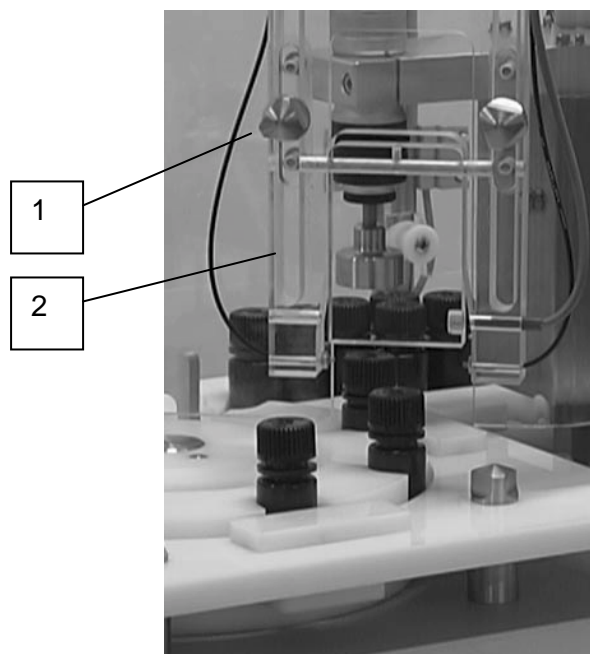


Pull the clutch casing sleeve (1) down, and turn the capping head until the hole in the adjustment lock plate is visible through the slot (2). Insert a Phillips Screwdriver and adjust torque by turning.

Increase capping torque by turning clockwise.

Decrease the torque by turning counter clockwise.

### 4.7 Adjusting the height of the cap sensor.



Loosen the finger screws (1), and lift up the gate (2). Place a bottle with a loosely screwed cap in the slot where the bottle enters the guarding. Close the guarding and lower the gate until the distance between the cap and the small gate is 2 – 4mm. The optical sensor will now detect the cap as it passes.

## **5 OPERATION.**

### **5.1 Starting the machine.**

Switching ON the main switch, starts an initial procedure which secures that the machine is ready for production. The POWER control lamp will go ON, and – if no errors are detected – the READY control lamp will go on as well. The FF30-S is now ready to commence production.

In case of error detection during initial procedure the ERROR lamp will flash.

Please refer to the TROUBLE SHOOTING chapter of this manual to eliminate the error.

### **5.2 Stepping bottles through the FF30-S.**

By pressing the STEP button you can perform a single ejection followed by an indexing of the star wheel. Please note that the star wheel indexes whether a bottle is present at the inlet station or not. If a filling is desired, this must be activated manually from the filler control. If the CAP function is ON and a screw cap is applied to the bottle the FF30-S will carry out the capping cycle.

By using the STEP function the star wheel can be emptied before automatic production commences or to empty the star wheel at the end of a batch.

### **5.3 Production START and STOP.**

When FF30-S has been prepared for production and the READY control lamp is ON, production is started by pressing START.

Note that filling and capping stations must be activated before pressing START.

When a bottle is detected in the inlet station the star wheel will index, and the workstations activated on the control panel will carry out working cycles.

The pause between 2 indexing cycles can be adjusted on the DELAY potentiometer.

If a workstation has a longer cycle time than the setting of the DELAY potentiometer, the indexing will be halted until all workstations has finished the cycle.

The start of each indexing can also be activated by a footswitch connected.

In this case START must be switched off, and the delay function is not active.

Automatic production mode is terminated by pressing the START button again.

FF30-S will finish initiated working cycles before it stops and the START control lamp goes OFF.

### **5.4 Manual placing of screw caps.**

Screw caps are to be applied to the bottles in the station following the filling station.

It is advisable to pre-screw the cap on the bottle neck to prevent the cap from falling off during indexing.

### **5.5 Removing bottles from collection device.**

When the collection tray is full, the operator must stop the machine while emptying the tray.

## 6 MALFUNCTIONING IN PRODUCTION.

### 6.1 Function errors.

The FF30-S is equipped with control functions, which will stop the machine in the event of malfunctioning.

The drive system for the star wheel is fitted with sensors, which detect if the star wheel cannot finish the index cycle within the time limits.

The drive system for the ejector arm is fitted with sensors, which detect if the ejector arm cannot finish the ejection cycle within the time limits.

The capping station is equipped with sensors, which detect if the elevation cylinder reaches the upper position within the time limits.

The protection guards are equipped with interlock switches, which detect if the guards leave their correct positions.

The gate for entering the capping station is equipped with an interlock switch, which detects that the gate is in correct position.

If a malfunction is detected, the yellow RESET control lamp will begin to flash and the machine will stop.

Flashing of a function button indicates, that an error has occurred at this station.

**If the FF30-S screw capping module malfunctions during production, is it important to stop the system while correcting the fault.**

### 6.2 Errors in manual placing of cap.

The cap sensor is only active when **CAP** has been selected from the control panel.

Once a cap has been detected by the cap sensor, alarm will be given at each following missing cap.

The missing cap alarm, will make the machine stop, and the RESET button will flash to indicate an alarm. The READY Lamp and the CAP button will flash simultaneously to show that the error is related to the capping station. Automatic production can be continued by placing a cap on the bottle at the cap-sensor and pressing the RESET button.

## **7 PROTECTION SYSTEMS.**

### **7.1 Electrical shielding.**

All electrical systems are placed in the base cabinet.  
Tools must be used to gain access to the installations.

#### **IMPORTANT NOTICE:**

The main power cable for the FF30-S must be removed completely from power outlet socket, before the base cabinet is opened.

### **7.2 Mechanical guarding.**

The operator is protected from hazardous movements of the capping station and the ejector arm. The guards are equipped with interlock switches that prevents the machine from running while the guards are open.

Opening of the guarding while the machine is running will make the machine stop **WHEN THE CURRENT CYCLE HAS ENDED.**

For further safety of the operator, the opening in the guarding is fitted with a interlocked gate. If the gate is pushed away from the vertical position, the current cycle is terminated immediately.

### 8 TROUBLE SHOOTING.

Fault No	Description of fault and possible causes.
<b>1</b>	<b>The POWER and READY control lamps do not go ON when power is connected.</b>
a:	The emergency button is activated.
<b>2</b>	<b>The READY control lamp does not go ON.</b>
a:	The prior FF30 module is not ready.
b:	Compressed air is not connected.
c:	The elevation cylinder for the air motor is blocked, and cannot reach the upper position.
d:	The star wheel is not in "home" position
e:	The ejector arm is not in "home" position.
f:	The guarding is not closed.
	<b>NOTE!</b> All the above faults will be highlighted by the RESET control lamp.
<b>3</b>	<b>The star wheel does not index.</b>
a:	The bottle inlet sensor on the prior FF30 module does not see the bottle in the inlet station.
b:	A workstation has not finished the cycle (this will be highlighted by the RESET control lamp).
<b>4</b>	<b>The capping station does not work.</b>
a:	The slide gate has been placed too high, so the optical sensor does not see the cap.
b:	The CAP button is not ON.
<b>5</b>	<b>An alarm signal cannot be reset after above causes has been checked.</b>
a:	Both drive system for star wheel and ejector arm are not in "home" position.

#### Correction of fault no. 5.

In order to synchronise the star wheel and the ejector arm, please follow these instructions.

Dismount the ejector arm from the machine.

Close the guarding and press and hold down STEP button. The star wheel will now index slowly until "home" position is reached.

Please note that the motor will continue to run for a short period after the star wheel has stopped.

It is necessary to hold down the STEP button until the motor has stopped.

Press RESET button. The drive system for the ejector arm will now go to "home" position.

The READY control lamp goes ON.

Mount the ejector arm. The machine is now ready to commence production.



## 9 CLEANING AND MAINTENANCE.

### 9.1 Daily cleaning.

The FF30-S screw capping module should be cleaned on a daily basis, or at every planned production shutdown.

#### **Preparations for cleaning.**

Prior to cleaning the machine, should all filled and empty bottles as well as screw caps be removed from the system, and the filling tube and filling nozzle should be dismantled.

In order to access the upper face of the cabinet, should the bottle format parts be dismantled before cleaning.

#### **IMPORTANT NOTICE:**

During cleaning must the main switch on the FF30 system be disconnected!

#### **Cleaning method.**

Correct cleaning of the FF30-S screw capping module is carried out by washing it off with a firmly wrung cloth or paper towel, and subsequently the machine is wiped.

NOTE: The FF30-S may not be cleaned by pouring or splashing liquids onto the machine.

#### **Cleaning agents.**

Normal cleaning agents like water, alcohol or isopropanol may be used on all parts of the machine. For evaluation of other cleaning agents suitability, please note that following materials are used in the manufacture of the FF30-S:

- Stainless steel AISI 304.
- Anodised aluminium.
- Plastics - POM (polyacetal) and PMMA (acrylic).
- Compressed air hoses – PUR (polyurethane).

### 9.2 Maintenance.

FF30-S screw capping module does not require any special daily maintenance, such as lubrication or likewise.

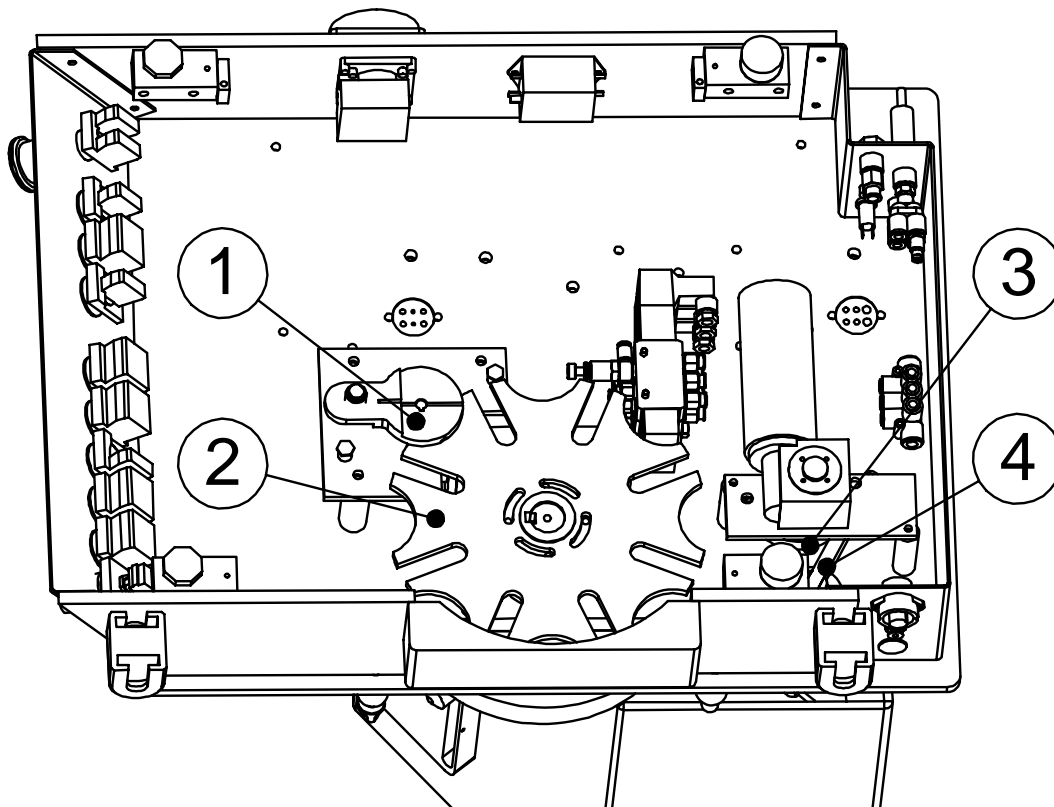
Dependant on the running time of the FF30-S a regular lubrication of drive systems for star wheel and ejector arm is required.

#### IMPORTANT NOTICE:

Maintenance of drive systems includes accessing the base cabinet. This maintenance should therefore be carried out by technical staff.

During maintenance the main cable and all other connections on the FF30 system must be disconnected!

Place the FF30-S on the left side, and open the bottom plate.



The contact faces between the cogwheel (1) and the Geneva wheel (2) should be lightly lubricated with a suitable grease such as Dow Corning MOLYKOTE grease BR2 Plus.

The contact faces between the eccentric hub (3) and the ejector arm (4) should be lightly lubricated with a suitable grease such as Dow Corning MOLYKOTE grease PG75.

### 9.3 Service.

The FF30-S screw capping module should be serviced on a regular basis by the technical staff of Flexicon or your local Flexicon distributor.

Please contact your local distributor or Flexicon.

## 10 TECHNICAL SPECIFICATIONS.

### **Bottle dimensions:**

Bottle diameter between Ø12 and Ø52 mm.  
Screw cap diameters up to 50mm; screw cap height up to 40mm.  
Bottle height (incl. loosely screwed cap) max 125mm.

### **Dimensions:**

See enclosed layout drawing FF30-S-L-01 and FF30-S-L-01.  
Weight app. 40 kg.

### **Electrical specifications:**

Mains: 115/230 VAC earthed, 50/60 Hz.  
Fuses: All fuses are Ø5 x 20mm cartridge types.  
Consumption: Max 150W.

### **Pneumatic specifications:**

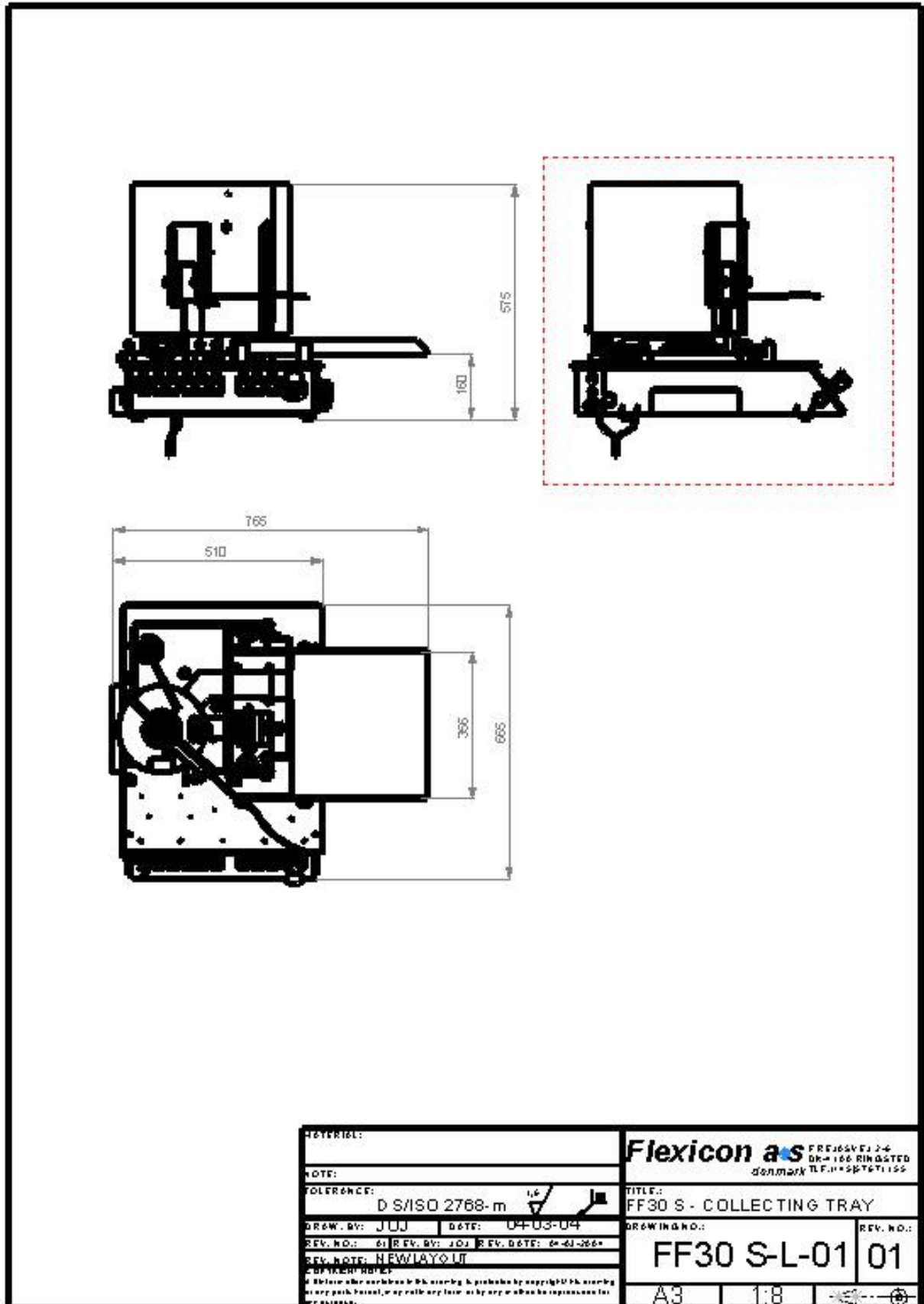
Supply: Clean and dry air at 6 bar.  
Consumption: 75 l/min free air by 1000 fills/hour.  
Exhaust: All compressed air is collected and exhausted through a single outlet.

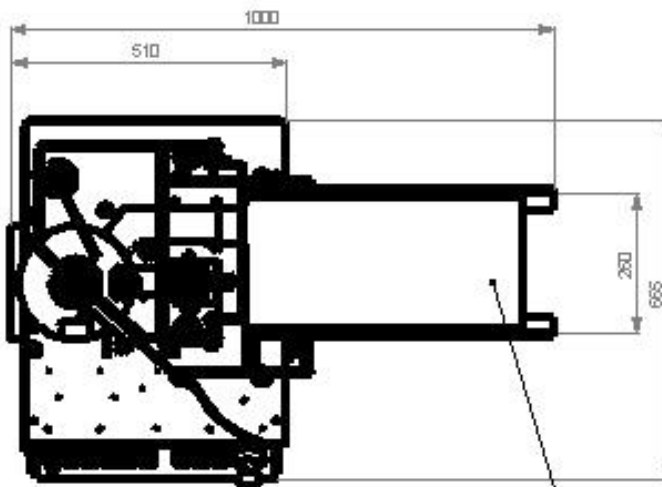
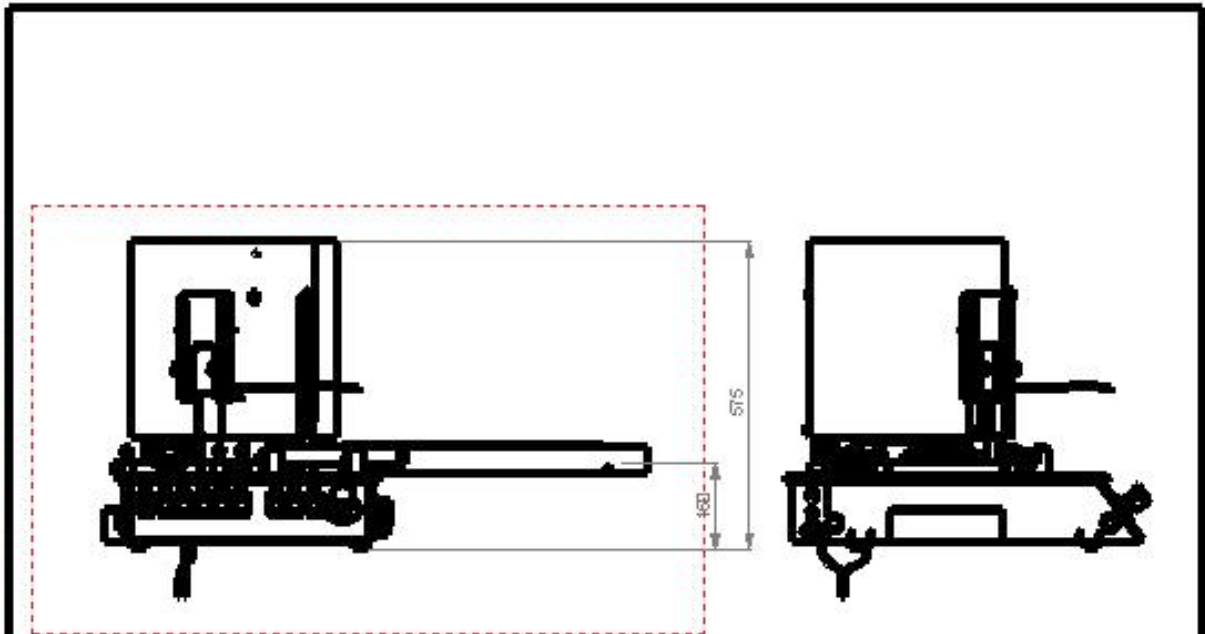
### **Interface:**

5 pin round DIN socket for external start.  
8 pin round DIN socket for interface to prior FF30 module.

### **Software:**

Flexicon software for FF30-S screw capping module.





Width will be design according to the dimensions on the clients tray.  
 Dimensions for tray:  
 Max internal width = 300mm  
 Max wall thickness sides = 4mm  
 Max wall thickness bottom = 1.5mm  
 Max length = 400mm  
 Max weight (incl filled bottles) = 5kgs

MATERIAL:		<b>Flexicon a/s</b> FREJESVEJ 2-4 DK-166 RINGSTED denmark TEL: +45 46767115	
NOTE:		TITLE:	
TOLERANCE: D S/ISO 2768-m		FF30 S - TRAY LOAD	
DRAW. BY: JUJ	DATE: 04-03-04	DRAWING NO.:	REV. NO.:
REV. NO.: 01	REV. BY: JUJ	REV. DATE: 04-03-06	FF30 S-L02 01
REV. NOTE: NEW LAYOUT		A3 1:8	
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