



## **FF15**

(example; exact model may vary)

*This instruction handbook is for the daily users of the equipment.*

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## 1 Introduction

### 1.1 FF15

FF15 is a small-scale vial/bottle handling system.


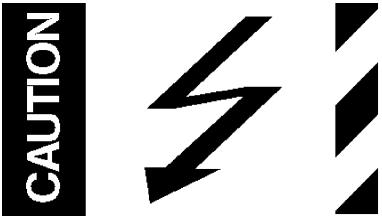
A round table moves the bottles from the inlet area to the bottle sluice, from which each bottle is moved further on by a bottle pusher. Filling is performed automatically when a bottle is present below the filling nozzle. After filling, the bottle is pushed towards the outlet tray.

FF15 is delivered without the external filler; in order to perform the filling, a filler must be connected. (See further information in section 2.5)

### 1.2 Abbreviations in this manual

App.	Approximately
e.g.	As example
B.P.	Bottle Pusher
BpH	Bottles per hour
Hz	Hertz
IH	Instruction Handbook
L/min	Litres per minute
Max.	Maximum
mA	milli Ampere
msec	milli seconds
PE	Protective Earth (electrical units safety measure)
SOP	Standard Operating Procedure
VAC	Volt Alternating Current
VDC	Volts Direct Current
WMF	Watson-Marlow Flexicon a/s

### 1.3 Symbols on the machine

Warning against touching	Warning against high voltage
	

### **1.4 Caution and employee safety**

This manual should be read before using the FF15.

It is strongly advised that

- Any kind of maintenance or cleaning of the machine not is carried out while power is connected
- Unauthorised / non-trained personnel should not maintain the electrical parts
- The machine is placed in such a way that it is not exposed to high humidity, high temperatures or other abnormal operating environment.

### **1.5 Essential training before daily use**

Read the section with *Daily Use*, thoroughly before using the machine.

Protective equipment and protective devices are installed:

- If fingers are placed in front of the sensor, the bottle pusher will move automatically, but if the bottle pusher meets too much resistance it will return to start position
- Always respect the warning symbols on the machine.

Cleaning must be performed as described in this IH.

### **1.6 References**

N/A

### **1.7 Dismantling and disposal**

Prior to dismantling, it must be observed that all services are disconnected, and connections to other equipment are removed.

WM-Flexicon machines may not be disposed using normal refuse collection. The machines must be collected and disposed separately as they contain electrical components such as batteries, electrolyte capacitors, liquid crystal displays and printed circuit boards. Further information is available on [www.wmflexicon.dk](http://www.wmflexicon.dk).

\* (WEEE) DS/EN 50419



## 2 General information

### 2.1 Unpacking and inspection

Please check that all ordered items have been received and that no items are damaged during transport. In case of any defects or omissions, please contact WMF or your supplier immediately.

Note: FF15 is delivered with a commutation cable to be used with WM-Flexicon pumps, only.

### 2.2 Receiving and storing the FF15

Before unpacking or storing of the FF15 it should be checked if the crate is damaged. In case of long-term storage of the FF15 before installation, the machine must be stored in the crate, and placed in a dry room. The crate is not water resistant.

### 2.3 Mounting of inlet and outlet trays

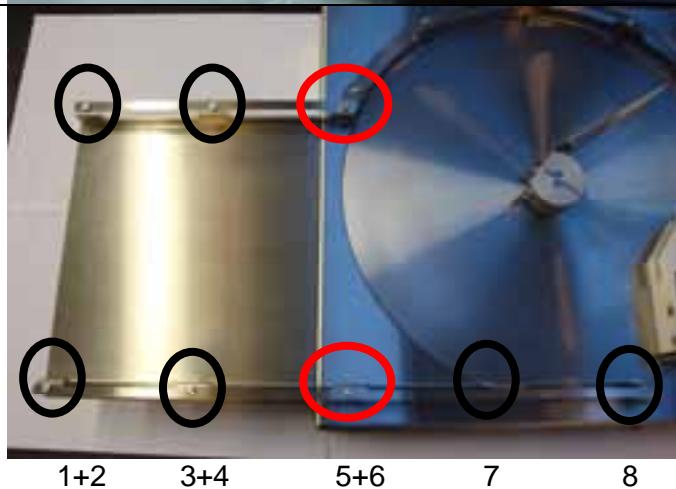
If the inlet tray or outlet tray have been removed during shipping they must be mounted as shown below. Use the supplied bolts and fasten them as shown below.

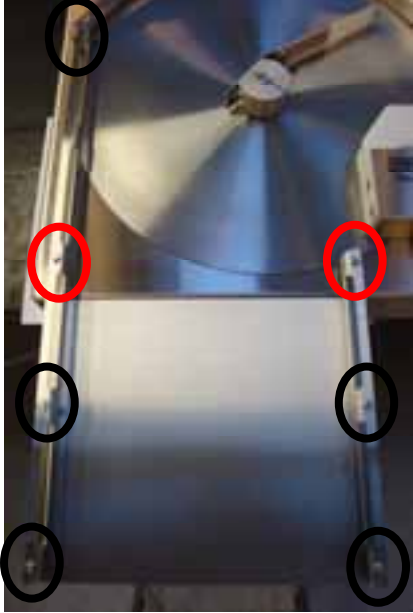
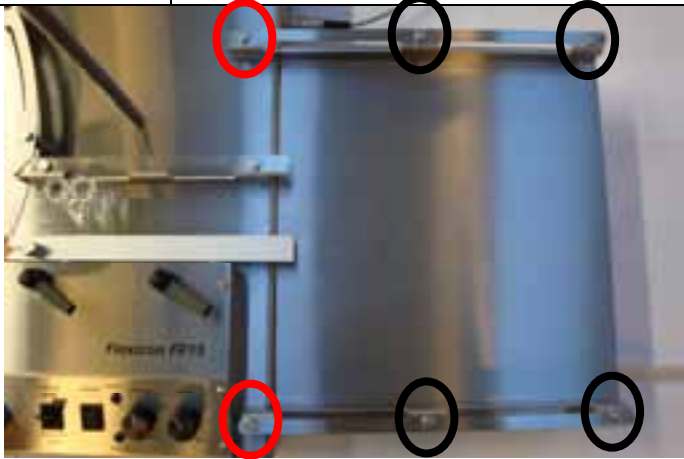
Please note that Inlet tray is optional; bottles can be placed directly on the round table.

**All trays** must be fastened underneath before the bottle rails are mounted on the top.



On the **Inlet tray with I-shape**: The 2 bottle rails are fastened with the 8 bolts. Fasten the bolts/rails in the order shown on the picture: The bolts marked with the red circles must be fastened one after another. Lift the tray slightly upwards while tensioning the bolts; in order to make the level of the tray = the level of the base plate.



<p>On the <b>Inlet tray with L-shape</b>: The two bottle rails are fastened with the 7 bolts.</p> <p>Fasten the bolts/rails in the order shown on the picture: The bolts marked with the red circles must be fastened one after another. Lift the tray slightly upwards while tensioning the bolts; in order to make the level of the tray = the level of the base plate.</p>	<p>7</p> <p>5+6</p> <p>3+4</p> <p>1+2</p>	
<p>The <b>Outlet tray</b>:</p> <p>The two bottle rails are fastened with the 6 bolts.</p> <p>Fasten the bolts/rails in the order shown on the picture: The bolts marked with the red circles must be fastened one after another. Lift the tray slightly upwards while tensioning the bolts; in order to make the level of the tray = the level of the base plate.</p>		 <p>5+6</p> <p>3+4</p> <p>1+2</p>

## 2.4 *Mounting of filling stand*

If the filling stand has been removed during shipping it is mounted as shown on the picture.



Fasten the bolt underneath the base plate.



The filling stand must be stable and immovable



Mount the nozzle holder on the stand

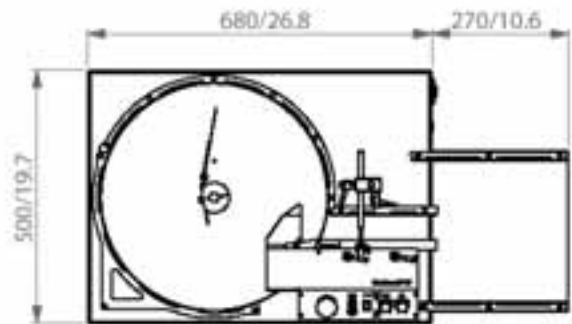
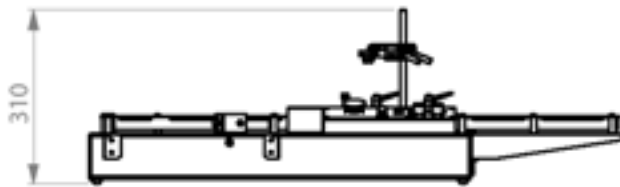
## 2.5 Technical specifications

### 2.5.1 Dimensions

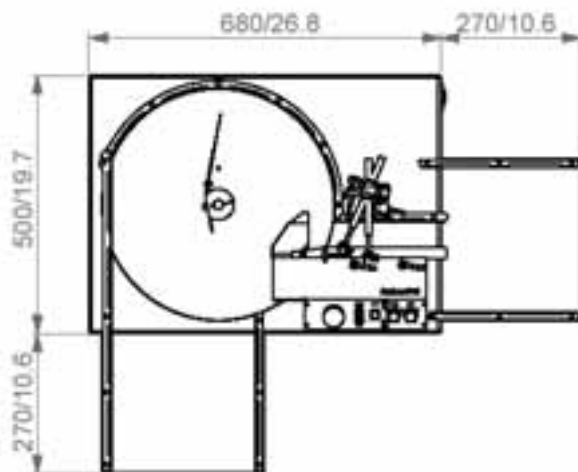
Length: 950 mm

Width: 500 mm ( I – shape )  
770 mm ( L – shape )

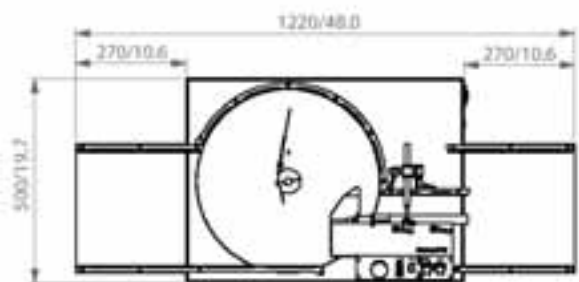
Height: max. 310 mm (incl. Feet)



Dimensions without inlet tray  
( mm / inches )



Dimensions with inlet tray / L-shape  
( mm / inches )



Dimensions with inlet tray / I – shape  
( mm / inches )



## 2.5.2 Buttons / Control panel



### EMERGENCY SWITCH

Emergency switch for compressed air.  
Note: When the E-switch is pushed the round table is not stopped.



power	Indicator; lights when power is on.
sensor	Bottle sensor indicator. Lights when a bottle is present in front of the sensor.
manual mode automatic mode	Manual mode = Each bottle is moved through the filling area manually. See "release" Automatic mode = Each bottle is moved through the system automatically
release	Is used together with manual mode, only When release is pressed the B.P. will move once and push the bottle one step further in the bottle sluice.
off delay	Potentiometer for adjusting the delay between each filling 0,5 = minimum time (~ fast process of bottles), 10 = maximum time (~ slow process) E.g. if filling volume is small a high "off delay" value can be an advantage
speed	Potentiometer for setting the speed of the round table. 0,5 = slow 10 = fast

### 2.5.3 Services

All electrical systems are placed underneath the base plate.

Power supply:	110/230 VAC, 50/60Hz Earthed by the main power switch
Consumption:	50 W
Compressed air:	6 bar, clean and dry air
Consumption:	25 L/min at 2000 BpH

Note:

Only authorised personnel can gain access to the installations.

The main power cable must be removed completely from power supply before the installations are touched.

### 2.5.4 Bottles, caps and trays

#### Bottle sizes

Diameter	From Ø12 mm to Ø48 mm.
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#### Tray size inlet / outlet

	Inlet	Outlet
Length / width	270 mm / 278 mm	270 mm / 278 mm
Height of rail	30 mm	30 mm

### 2.5.5 Ingress protection

Ingress protection	IP31
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### 2.5.6 Weight

Weight:	app. 30 kg
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### 2.5.7 Materials of construction

- AISI304 stainless steel
- Anodised aluminium
- Polyacetal

### **2.5.8 Optional fillers and capping machines**

A peristaltic filler or gear filler *must* be connected to FF15.

Optional WMF fillers when filling are:

- PF6 Peristaltic filler
- MC12/PD12 peristaltic filler
- 520 Di peristaltic filler
- DF32 Positive displacement filler
- GF30 gear filler

A capping machine *can* be used in connection with FF15

Optional WMF capping machines are:

- FC10 or FC32 screw caps
- FS10 or FS32 crimp caps

### 3 Installation

#### 3.1 Connections

FF15 must be placed on a stable and horizontal bedplate.

The mains cable (1) is connected to a single-phase power supply with earth.

The filler is connected to (2)  
See section 2.5.8



Compressed air is connected to (1) by use of the supplied quick release clutch.

All exhaust air is collected and exhausted through the exhaust filter (2)

(3) is adjustment of bottle pusher speed – see section 4.2.5



## 4 Daily Use

### 4.1 Starting-up and running

Installation section must be carried out before this chapter can be performed.

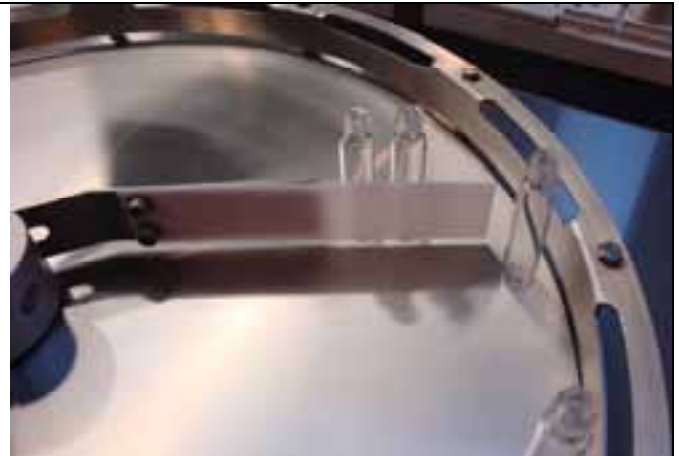
When the main switch is pressed, an initial procedure starts and secure that the machine is ready for production. The POWER ON will turn on when the machine is ready.

### 4.2 Adjustments

Before starting up and running, the machine must be set up to the correct bottle size.

#### 4.2.1 Adjusting the round table inner bottle rail

Adjust the inner bottle rail by loosening the bolts and move the rail in or out; depending on bottle size. The bottles should be stopped by the rail in such a way that only one bottle at a time can pass the space between the inner and outer rail.



#### 4.2.2 Adjusting the inlet sluice

The inlet sluice and the outlet sluice are adjusted at the same time – see section 4.2.3

#### 4.2.3 Adjusting the outlet sluice



Place the bottle in the middle of the outlet sluice.



Loosen the two handles, move the sluice rail close to the bottle. The rail must not be too close to the bottle; leave less than 1 mm on each side of the bottle.



#### 4.2.4 Adjusting the inlet sensor

Adjust the inlet sensor by use of the small finger screw. The sensor head must point at the middle of the incoming bottle, when it is situated in the corner of the sluice.



#### 4.2.5 Adjusting the bottle pusher



The throttle valve on the side of the FF15 is used when the speed of the bottle pusher is adjusted.

Clockwise = slower

Counter clockwise = faster

Note: If the valve is turned fully the B.P. is unable to move.



The speed of the bottle pusher must not be too fast; this might cause bottles to be pushed over.

#### 4.2.6 Speed adjustment

See section 2.5.2

If the speed of the round table is set to fast the bottles might be pushed over and if the speed is too low the feeding of bottles may be less than the capacity of the filling.

Speed should be adjusted during filling in order to find the correct level.

This is also applicable with the adjustment / use of the "off delay" speed

#### 4.2.7 Adjustment of the filling stand

Adjust the filling stand and the filling nozzle over the center of the bottle – over the second bottle in the outlet sluice.

The nozzle tip should only be a few millimetres away from the bottle top to avoid squirt of product.



second bottle in outlet sluice



#### 4.3 Production START and STOP

FF15 is ready for production start when:

- bottles are placed on the round table/inlet tray
- the sluice is set up to the exact bottle size
- inlet sensor is adjusted
- the filling stand / nozzle are adjusted
- the external filler is connected and ready
- the “off delay” speed is set, if necessary\*
- control panel is set on “automatic mode”
- and the FF15 Power signal is ON

Set the speed of the round table; this will make the table move.

When a bottle is detected in the corner of the inlet sluice the bottle pusher will move it one step and filling will begin.

\*The time/pause between 2 fillings can be adjusted on the “off delay”.  
If filling volume is small a high “off delay” value can be an advantage

Stopping during production can be done by turning the round table speed button to 0 or by changing to manual mode.

#### 4.4 Stepping bottles

Pressing the release button will perform one push of the bottle pusher causing all bottles in the outlet sluice to move one bottle size forward, without filling.

Release is only available if the manual mode is selected.



### 4.5 Removing bottles from outlet / collection tray

When the outlet tray is full the operator can choose to stop the machine and empty the tray or to empty the tray when production is ongoing and the tray is not packed.

## 5 Malfunctioning

### 5.1 Function errors / Trouble shooting

FF15 is a relatively simple machine to operate and normally errors will be due to incorrect adjustment of certain functions.

In the table below, the most common faults are described and what causes it.

Description of fault	Possible cause
The bottles tip over when pushed into the round table	<ul style="list-style-type: none"> <li>- The inlet tray must be adjusted See section 2.3</li> <li>- The bottle disc must be adjusted See section 7.1.2</li> </ul>
The bottles do not "hit" the inlet sluice, and stay on the round table	<ul style="list-style-type: none"> <li>- The inner bottle rail must be adjusted See section 4.2.1</li> </ul>
The filling is not performed directly into the present bottle	<ul style="list-style-type: none"> <li>- Adjust the filling stand See section 4.2.7</li> <li>- Adjust the outlet sluice See section 4.2.3</li> </ul>
Filling is not performed at all	<ul style="list-style-type: none"> <li>- Control that the cable is connected.</li> <li>- Consult the manual of the filler</li> </ul>
The bottles tip over in the outlet sluice	<ul style="list-style-type: none"> <li>- Adjust the outlet sluice See section 4.2.3</li> <li>- Adjust the speed of the bottle pusher See section 4.2.5</li> </ul>
The bottle pusher does not push the bottle into the outlet sluice	<ul style="list-style-type: none"> <li>- Control that compressed air is connected</li> <li>- Adjust the inlet sensor See section 4.2.4</li> <li>- Maschine is in "manual mode" See section 2.5.2</li> </ul>
The bottles tip over when pushed into the outlet tray	<ul style="list-style-type: none"> <li>- The inlet tray must be adjusted See section 2.3</li> </ul>
The round table does not run steady	<ul style="list-style-type: none"> <li>- The toothed belt needs tension See section 7.1.1</li> </ul>



## 6 Cleaning

### 6.1 Cleaning Frequency

As FF15 is not in direct contact with the dispensed product, daily cleaning might not be necessary. Cleaning might be determined by local SOP's and cleaning validations; but must never be with detergents more potent than the ones below.

### 6.2 Preparations for cleaning

Before cleaning the machine:

- Turn off the power
- Remove the filling nozzle and the filling tubes

### 6.3 Cleaning Guidance

Correct cleaning of the FF15 is carried out by washing it off with water or detergents, using a lint-free firmly wrung cloth or lint-free paper towel; subsequently the machine is wiped off with a dry cloth.

### 6.4 Detergents or cleaning agents

Normal cleaning agents such as tepid/medium hot water, ethyl alcohol (ethanol) 70% and may be used all over the machine.

The FF15 consists of stainless steel and anodized aluminium, and can be cleaned in several ways:

Cleaning of parts made of:	May be autoclaved	Can be cleaned with ethyl alcohol 70%	Can be cleaned with water and afterwards wiped off with dry a cloth
Stainless steel	X	X	X
Anodized aluminium	X	X	X
Polyacetal (POM)		X	X
Nylon (Compressed Air tubes)			X
Optical sensors*		X	X*

*\*Optical Sensors can be cleaned with alcohol, but over time this can cause a milky surface. Either avoid cleaning the sensor optics with solvents or be sure to wipe them immediately afterwards with a soft dry cloth.*

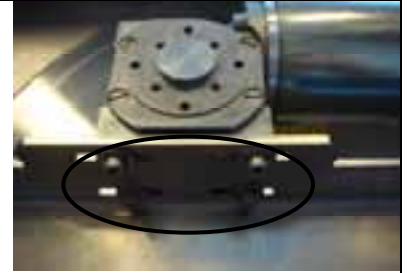
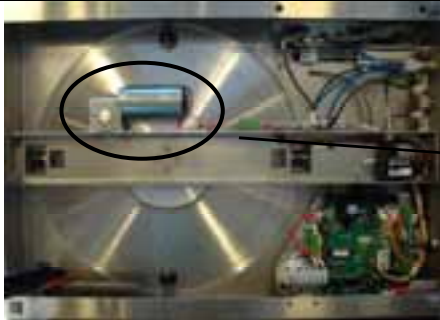
*Recommendation: Keep a log on the cleaning in order to keep a sense of perspective.*

## 7 Maintenance & service

### 7.1 Maintenance

#### 7.1.1 Tension of toothed belt

If the toothed belt is slipping it needs to be tightened.



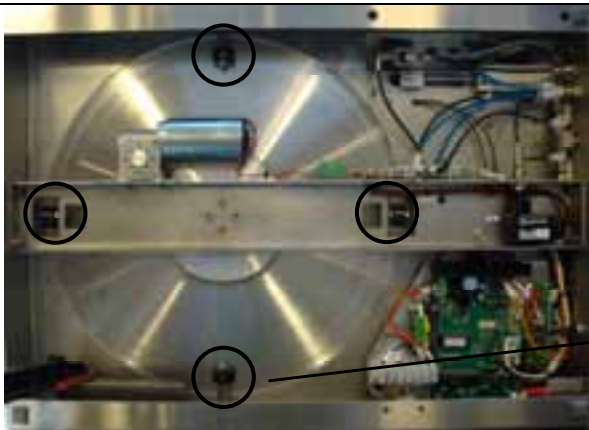
Turn of power, remove all connections to other equipment and tip the FF15 to gain access to the toothed belt.

Loosen the 4 bolts underneath and move the motor to the left until the belt is tense again.\*

\*Note- The toothed belt must not be stretched by use of tools while tension is done.

#### 7.1.2 Alignment of bottle disc (round table)

If the bottle disc has become out of alignment with the inlet tray and the inlet sluice, the bottles will not glide easily. The bottle disc can be aligned from underneath the FF15 via the 4 conically shaped plastic rollers.



Turn of power, remove all connections to other equipment and tip the FF15 to gain access to the plastic rollers.

Loosen the small bolt on the outside of the FF15 and adjust on the hexagon pole inside.

**Do not** loosen the bolt on top of the roller.

When the bottle disc is aligned all the loosened bolts must be tightened again.

### **7.1.3 Alignment of trays**

If the inlet tray or the outlet tray have become out of alignment the bottles will not glide easily. The trays can be aligned as described in the installation section, see section 4.2.2 and 4.2.3.

## **7.2 Service**

Should service be needed, please contact W-M Flexicon or your local supplier.

### **7.3 *Methods and frequency of inspections for safety functions***

Safety functions should be tested once a year:

- Emergency switch  
When pressed the compressed air is switched off

Keep a log and read the previous log recordings to present an overview of the machines state. After testing the safety functions the results must be recorded in the log.

## 8 Declaration of conformity

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

Declare on our sole responsibility that the product:

FF15, model no. 62-160-000

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

DS EN/ISO 12100	Safety of machinery - Basic concepts, general principles of design
DS/EN 60204	Safety of machinery – Electrical equipment of machines

According to the provisions in the Directives:

2006/42/EC	On the approximation of the laws of the Member States relating to machinery
2006/95/EC	On the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits
2004/108/EC	On the approximation of the laws of the Member States relating to electromagnetic compatibility

Signature:



January 2010

Ringsted, Denmark

Jørn Jeppesen, Development Manager