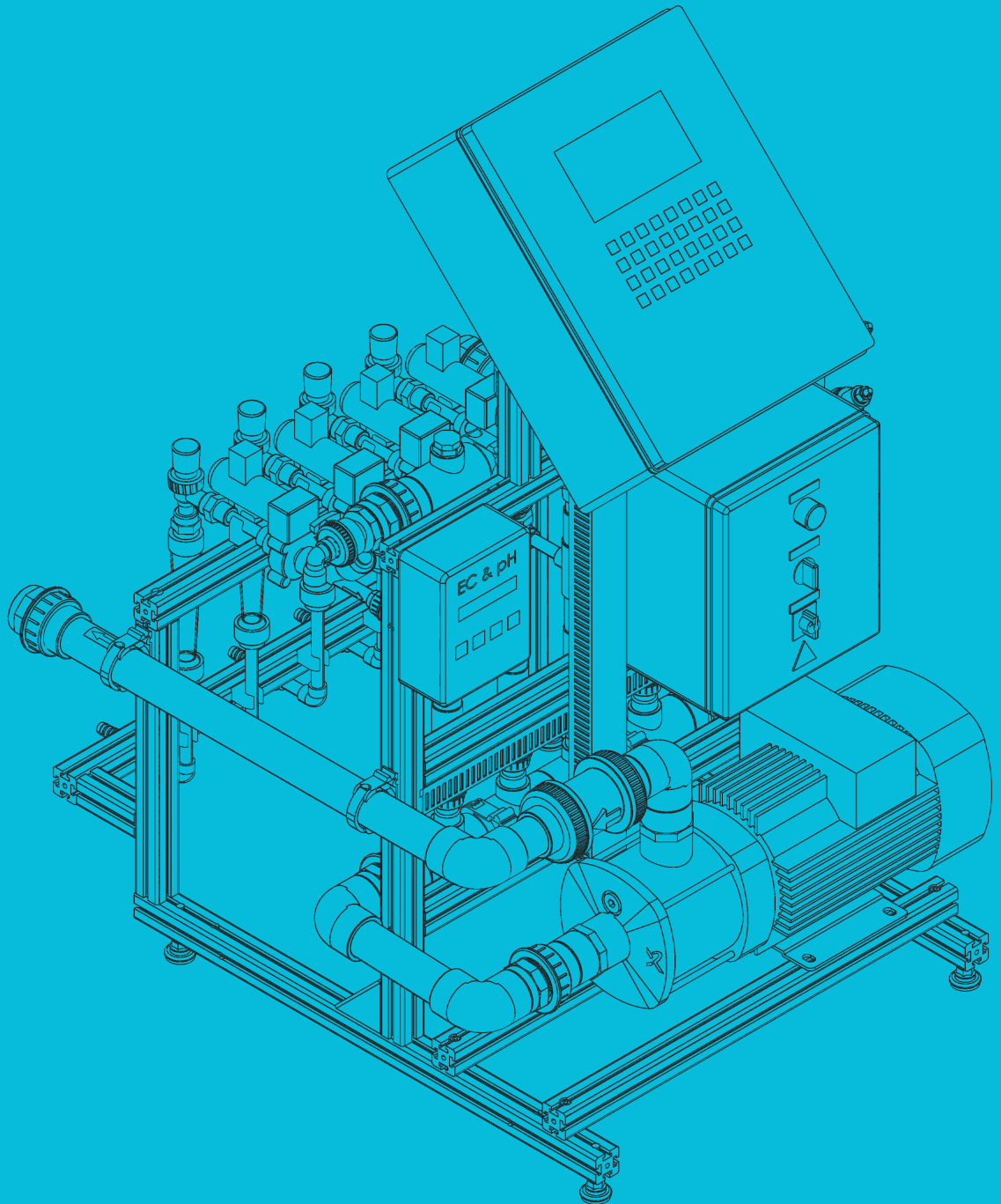



FERTIKIT 3G SPLIT (SP) NPT

USER MANUAL





COPYRIGHT 2015, NETAFIM ©

NO PARTS OF THIS PUBLICATION MAY BE REPRODUCED, STORED IN AN AUTOMATED DATA FILE OR MADE PUBLIC IN ANY FORM OR BY ANY MEANS, WHETHER ELECTRONIC, MECHANICAL, BY PHOTOCOPYING, RECORDING OR IN ANY OTHER MANNER WITHOUT PRIOR WRITTEN PERMISSION OF THE PUBLISHER

ALTHOUGH NETAFIM TAKES THE GREATEST POSSIBLE CARE IN DESIGNING AND PRODUCING BOTH ITS PRODUCTS AND THE ASSOCIATED DOCUMENTATION, THEY MAY STILL INCLUDE FAULTS. NETAFIM WILL NOT ACCEPT RESPONSIBILITY FOR DAMAGE RESULTING FROM THE USE OF NETAFIM'S PRODUCTS OR THE USE OF THIS MANUAL. NETAFIM RESERVES THE RIGHT TO MAKE CHANGES AND IMPROVEMENTS TO ITS PRODUCTS AND/OR ASSOCIATED DOCUMENTATION WITHOUT PRIOR NOTICE

TABLE OF CONTENTS

Symbols	5
Introduction	
Safety Instructions	6
When Using Acid/Chemicals	7
Description	
Introduction	8
Advantages	8
Specifications	8
Basic Functions	9
Operating Principle	9
Service	9
Add-ons	9
SP	10
Typical Setup.....	11
Dimensions	13
Weights	13
Operation & Maintenance	
Maintenance	14
Winterization	15
Troubleshooting	
Symptoms for More Than One Single Dosing Channel	16
Symptoms for a Single Dosing Channel	17
Symptoms While Idle	19
Switchboard Warning	19
Calibration	
Calculation of Dosing Channels Opening Percentage	20
Simulation with 2 Gallon Bucket of Water	20
Calibration of FertiKit While Irrigating	22
Warranty	24
FertiKit Parts	
SP	25



SYMBOLS

The symbols used in this manual refer to the following:



WARNING

The following text contains instructions aimed at preventing bodily injury or direct damage to the crops, the FERTIKIT and/or the infrastructure.



CAUTION

The following text contains instructions aimed at preventing unwanted system operation, installation or conditions that, if not followed, might void the warranty.



ATTENTION

The following text contains instructions aimed at enhancing the efficiency of usage of the instructions in the manual.



NOTE

The following text contains instructions aimed at emphasizing certain aspect of the operation of the system or installation.



EXAMPLE

The following text provides an example to clarify the operation of the settings, method of operation or installation.

The values used in the examples are hypothetical. Do not apply these values to your own situation.



ELECTRICAL HAZARD

The following text contains instructions aimed at preventing bodily injury or direct damage to the FERTIKIT and/or the infrastructure in the presence of electricity.



ACID HAZARD

The following text contains instructions aimed at preventing bodily injury or direct damage to the crops, the FERTIKIT and/or the infrastructure in the presence of acid.



SAFETY FOOTWEAR

The following text contains instructions aimed at preventing foot injury.



TIP

The following text provides clarification, tips or useful information.



PROTECTIVE EQUIPMENT

The following text contains instructions aimed at preventing damage to health or bodily injury in the presence of fertilizers, acid or other chemicals.

INTRODUCTION

Safety Instructions

- All safety regulations must be applied.
- Ensure that the installation is carried out in a manner that prevents leaks from the FERTIKIT, the fertilizer/acid tanks and lines, the peripherals and the accessories, contaminating the environment, soil or ambient area.
- Electrical installation must be performed by an authorized electrician only.
- The electrical installation must comply with the local safety standards and regulations.
- Protection provided by the equipment can be impaired if the equipment is used in a manner other than that specified by the manufacturer.



WARNING

In agricultural environment - always wear protective footwear.



WARNING

When handling fertilizers, acid and other chemicals, always use protective equipment, gloves and goggles.



WARNING

Measures must be taken to prevent fertilizer infiltration of the water source.



CAUTION

When opening or closing any manual valve, always do it gradually, to prevent damage to the system by water hammer.



NOTE

The maximum sound level produced by the equipment does not exceed 70dB.

INTRODUCTION

When Using Acid/Chemicals



ACID HAZARD

When using acid/chemicals - always observe the manufacturer's safety instructions.



WARNING

When handling fertilizers, acid or other chemicals, always use protective equipment, gloves and goggles.



ATTENTION

When dosing acid, use a dosing channel fitted with the appropriate components according to the type and concentration of the acid used*:

Type of dosing channel	Diaphragm and O-rings	For pH correction			For maintenance of drippers		
		Nitric (HNO ₃)	Phosphoric (H ₃ PO ₄)	Sulfuric (H ₂ SO ₄)	Hydrochloric (HCl)	Hydrogen peroxide (H ₂ O ₂)	Chlorine (as hypochlorite)
For diluted acid	EPDM	<3%	<85%	<30%	<10%	<30%	<1%
For concentrated acid	Viton	<40%	<85%	<90%	<33%	<50%	<10%

% is by weight at 70°F

* The table indicates the resistance of the dosing channel components to acid, and is not a recommendation to use the acids mentioned.



WARNING

Exceeding the above acid concentrations will damage the dosing channels.



WARNING

Substances such as chemicals for pest/disease control might be corrosive and damage the FERTIKIT. When using any substance other than fertilizers or acids not exceeding the concentrations in the table above, always observe the manufacturer's instructions for corrosivity. In case of any doubt, consult your Netafim representative.

DESCRIPTION

Introduction

The FERTIKIT 3G is a fully configurable, highly cost-effective solution for precise Nutrigation™. The FERTIKIT 3G maximizes the usage of available water flow rates and pressures on the main irrigation line ensuring the highest efficiency with minimum investment. The FERTIKIT 3G can operate under various modes and accommodate a variety of dosing channels, dosing boosters, controllers, peripherals and accessories to meet a vast range of applications and infrastructure constraints.

Advantages

- A modular Nutrigation™ system for soil or substrate applications with minimum investment
- Efficient usage of water, fertilizers and energy
- Unrivaled range of irrigation water capacities
- Designed for any application where quantitative or proportional Nutrigation™ is required
- Highly profitable price/performance ratio
- Venturi operating principle - no moving parts
- Fits easily into any existing irrigation system
- Precise Nutrigation™ based on high-accuracy dosing channels
- Quick action dosing valves
- Available with up to 4 fertilizer/acid dosing channels
- Nutrigation™ recipes can be changed quickly and efficiently
- Can be operated manually or fully computerized
- NMC and other controllers can be assembled on the FERTIKIT for advanced Nutrigation™ control
- A wide variety of accessories and peripherals can be integrated into the FERTIKIT to enhance its functions
- High-quality components and PVC pipe work
- Aluminum, corrosion-resistant frame with adjustable legs
- Easy to install and to maintain
- Made by Netafim

Specifications

Capacity Range

The FERTIKIT ensures a satisfactory mixture in an extremely vast range of flow capacities. It will accommodate a large range of applications.

Fertilizer Dosing Capacity

The FERTIKIT 3G SP's basic platform accommodates up to 4 dosing channels of various types:

- 13 GPH
- 35 GPH
- 95 GPH

* For applications requiring more than 4 dosing channels - consult Netafim.

Mainline Pressure Range

Typical main line pressure ranges and conditions, by mode:

SP - For applications where the main line pressure is between 15 and 60 psi and sufficient for irrigation with no excess.

DESCRIPTION

Basic Functions

The FERTIKIT supports the following Nutrigation™ functions:

- Fully controlled dosing and mixing of fertilizers/acid with source water into a homogenous nutrient solution.
- EC/pH correction of the nutrient solution.
- Water pre-treatment

Operating Principle

The FERTIKIT doses the various fertilizers and acid into a homogeneous solution and injects it into the irrigation water main line. The suction of the fertilizers and acid in the dosing channels is based on the Venturi principle. The FERTIKIT booster pump creates the pressure differential to drive the dosing channels.

Service

Servicing the FERTIKIT 3G is a prompt and simple process. The dealer keeps a small quantity of interchangeable components on hand, for replacement on site within a few minutes.

Add-ons

The FERTIKIT functionality can be extended by means of the many add-ons offering a wide variety of useful functions. All the add-ons are easy to connect to the FERTIKIT - here are a few examples:

Fertilizer Meter

Enables continuous reading of fertilizer dosing. Useful in applications where EC/pH control is not performed.

Stock Selection

Enables the dosing of multiple fertilizers through a single dosing channel (in cases they where simultaneous dosing is not required).

Available in a wide variety of configurations, from a single dosing channel with 2 fertilizers to as many dosing channels and fertilizers as required.

For further information on the FERTIKIT add-ons, consult Netafim.

DESCRIPTION

SP

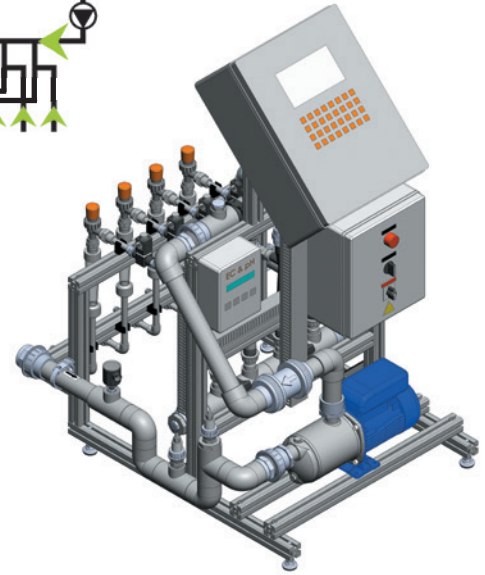
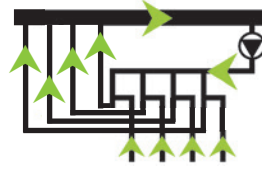
For applications where the main line pressure is between 15 and 60 psi and is sufficient for irrigation with no excess.

The pressure differential required to generate fertilizer suction via the Venturis is produced by a boost pump integrated in the Fertikit.

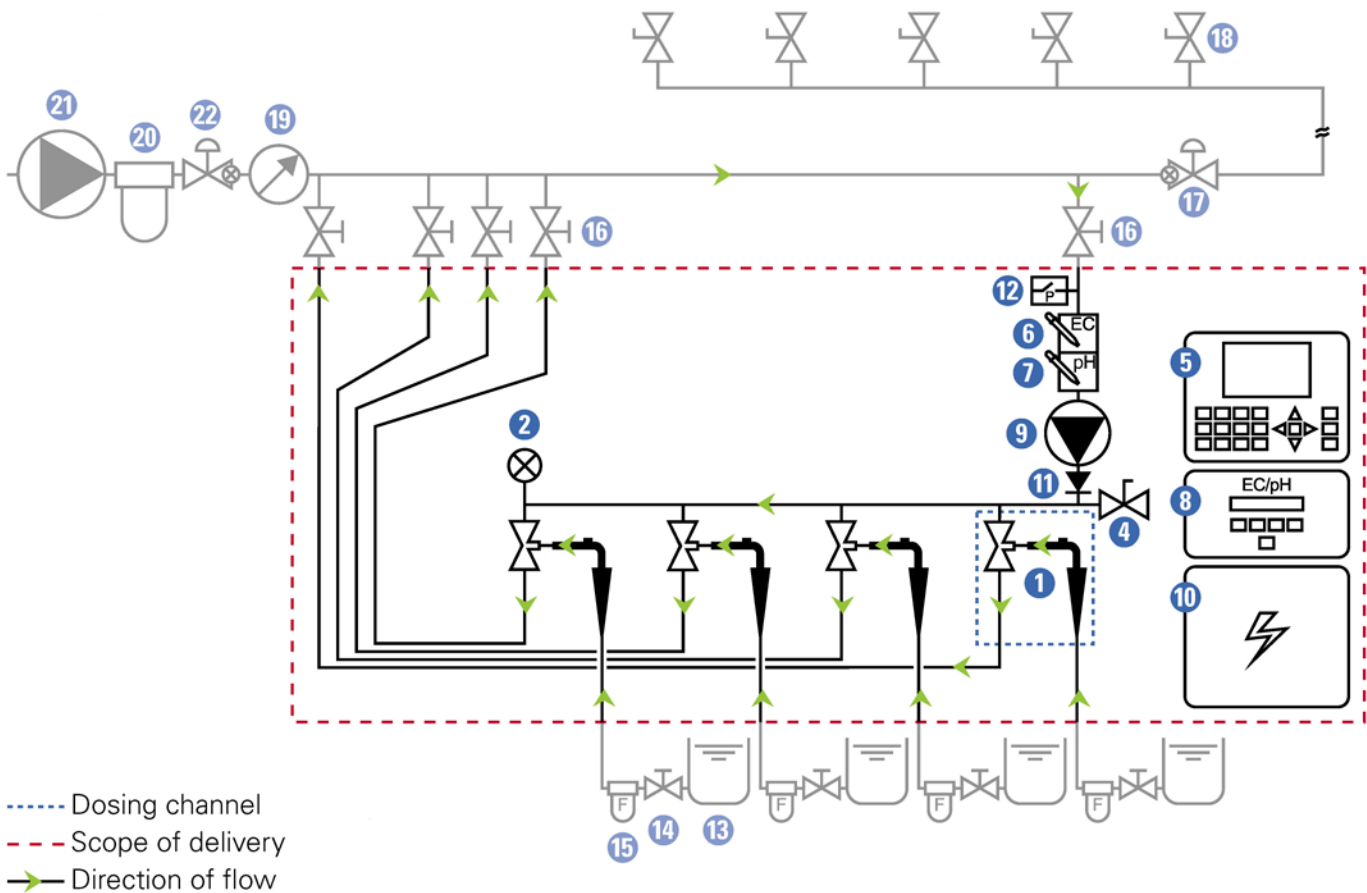
This mode of operation, where the system pump is installed upstream from the Venturis, permits the use of a smaller pump, reducing the investment required and saving energy.

Total fertilizer/acid suction capacity - up to 380 GPH.

Accommodates a wide variety of dosing channels for fertilizer and concentrated/diluted acid: Up to 4 dosing channels, from 13 GPH each, up to 40 GPH each. Available in 13 GPH, 35 GPH, and 95 GPH each.

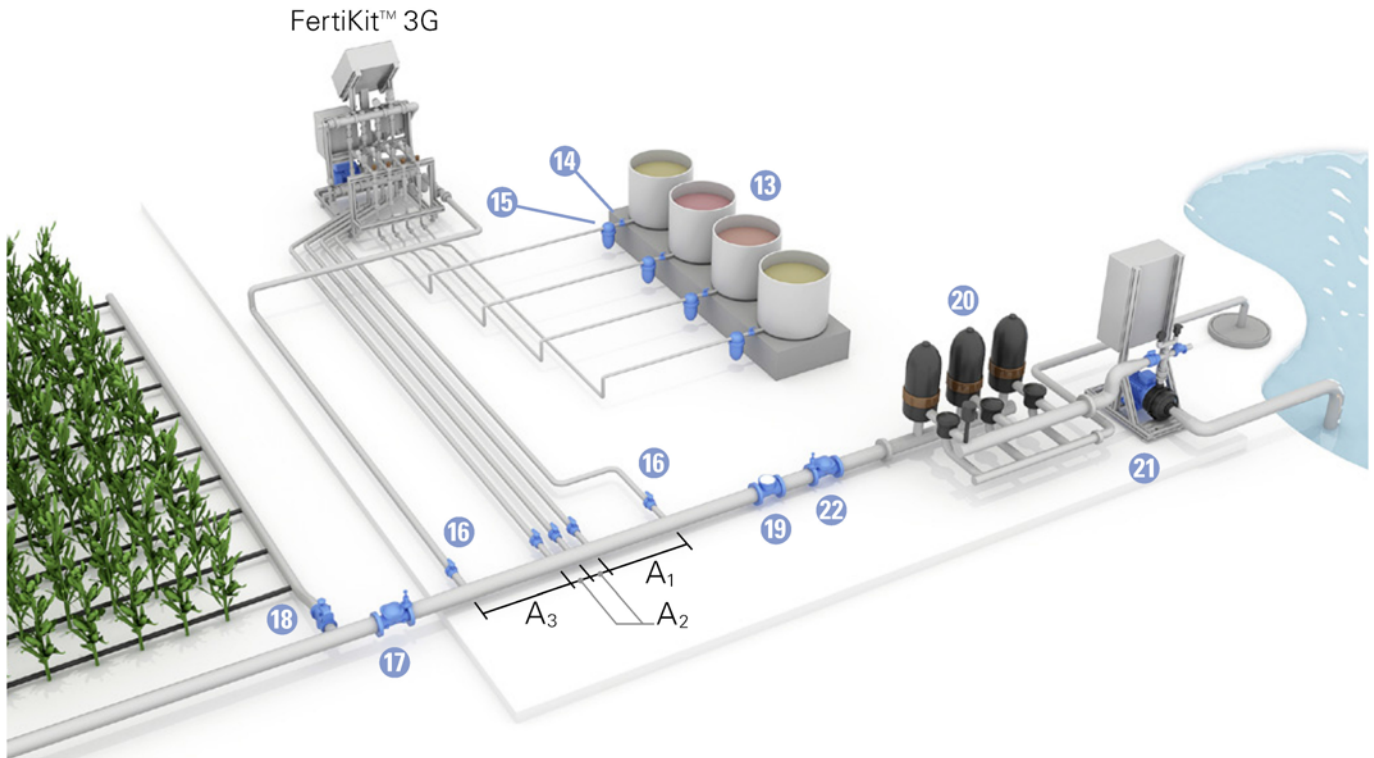


Schematic Diagram



DESCRIPTION

Typical Setup



Minimum required distances between the inlet and the fertilizer/acid outlets on the main line

Description		Required proportions
A ₁	Distance between acid outlet and fertilizer outlet on the main line	Minimum 2.5 feet (75 cm)
A ₂	Distances between fertilizer outlets on the main line	Minimum 1.0 feet (30 cm)
A ₃	Distance between fertilizer outlet and FertiKit™ inlet on the main line	Minimum 3.0 feet (90 cm)

Main parts of the SP mode and infrastructure

The list below presents the main parts of the FertiKit™ SP mode and the infrastructure parts required for its operation as depicted in the Schematic diagram and the Typical setup drawing above.

- | | | |
|---------------------------------|-------------------------------|---|
| 1 Dosing channel + Venturi | 10 Dosing booster switchbox | 17 Main line pressure reducing valve (PRV) |
| 2 Upper manifold pressure gauge | 11 Check valve | 18 Irrigation valve |
| 4 Sampling outlet | 12 Pressure switch | 19 Water meter |
| 5 Controller | 13 Fertilizer/acid stock tank | 20 Main line filter |
| 6 EC sensor | 14 Manual valve (fertilizer) | 21 Main line pump |
| 7 pH sensor | 15 Fertilizer/acid filter | 22 Main line pressure sustaining valve (PSNO) |
| 8 EC/pH transducer | 16 Manual valve (isolation) | |
| 9 Dosing booster | | |

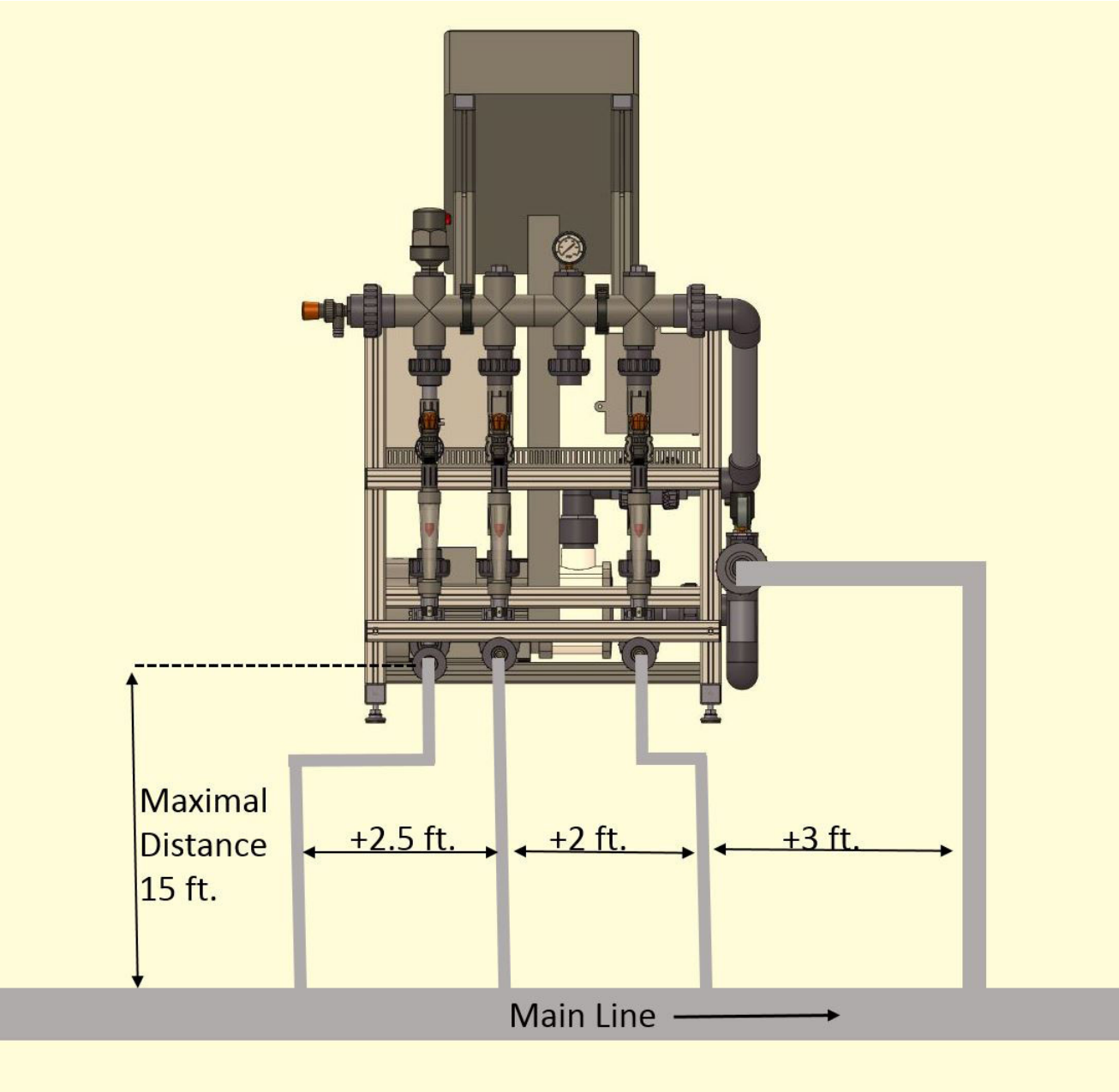
Color code: ● Supplied (part of the FertiKit™), ● Not supplied (part of infrastructure).

DESCRIPTION

Typical Setup

Required Proportions

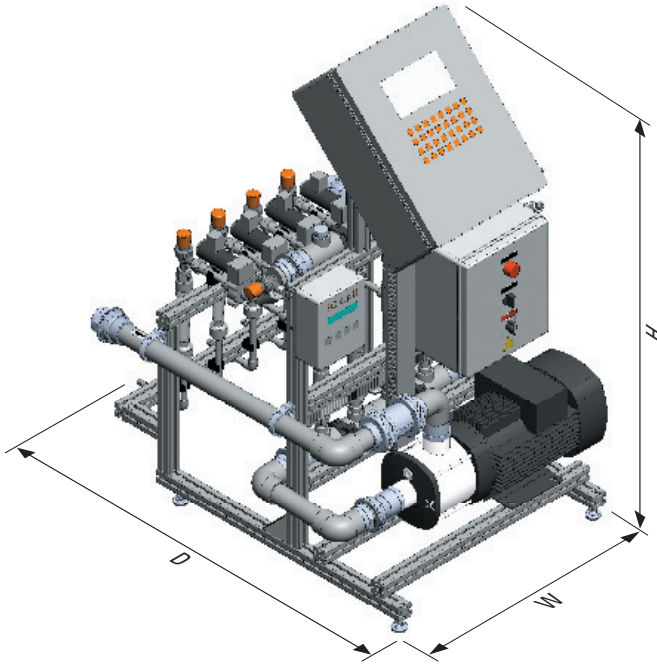
For optimal operation of the FERTIKIT, piping must be installed while maintaining the following proportions.



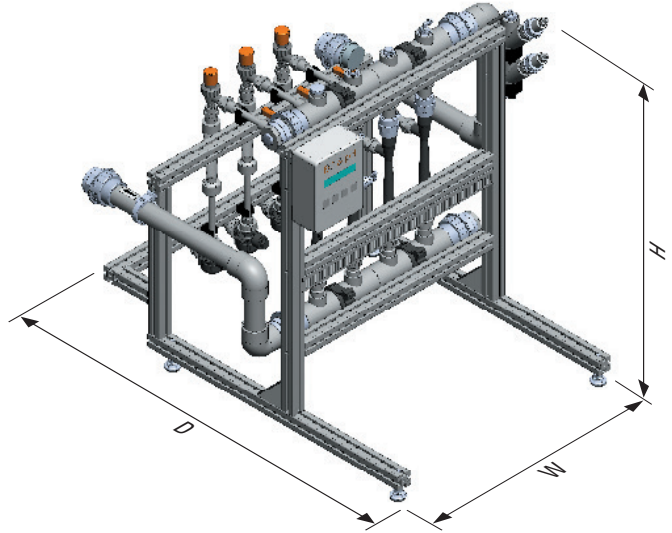
DESCRIPTION

Dimensions

With Controller



Without Controller



Configuration	FERTIKIT external dimensions (W/D/H*)	Package dimensions (W/D/H**)
Without controller	33/40.5/36"	39.5/45.5/39.5"
With controller	33/40.5/53"	39.5/45.5/63.5"

*The height varies by ± 0.5 " according to the adjustment of the legs.

**The package height includes the pallet height of 4".

Weights

With dosing booster

Mode	Controller	4HM9		CM5		CM15	
		Net weight	Packed weight	Net weight	Packed weight	Net weight	Packed weight
SP	Without	110 lbs.	165 lbs.	139 lbs.	194 lbs.	198 lbs.	254 lbs.
	With	132 lbs.	194 lbs.	161 lbs.	223 lbs.	220 lbs.	282 lbs.

OPERATION & MAINTENANCE

Maintenance



CAUTION

When opening or closing any manual valve, always do it gradually, to prevent damage to the system by water hammer.

To prevent failures and extend the life cycle of the FERTIKIT, the user must carry out regular maintenance.

- Keep the FERTIKIT dosing unit and its immediate environment clean and dry.



CAUTION

Before calibrating the EC and pH sensors, gradually close the isolation valves and open the sampling valve until the pressure in the system is released.

- The FERTIKIT dosing unit and the supply water and irrigation system must be inspected regularly.

Regular Inspection

Description	How often	Instructions
Rinsing of fertilizer filters*	Once a day	
Rinsing of supply water filters*	Once a day	
Water and fertilizer leak inspection	Once a week	Visual inspection
Calibration of the pH sensor	Every 2-4 weeks	See the EC/pH Transducer Manual
Calibration of the EC sensor	Every 4 weeks	

* Manual filters only.

Check the FERTIKIT Hydraulic Conditions Every 4 Weeks

Consult the main line flow meter and pressure gauge, the upper manifold and lower manifold pressure gauges and the visual flow meters of the dosing channels, fill in the data on the FERTIKIT Hydraulic Conditions Checklist provided by the installer and make sure that all the hydraulic conditions match the reference data.

When verifying the flow rate for each dosing channel, make sure the cursors on all the visual flow meters are adjusted.



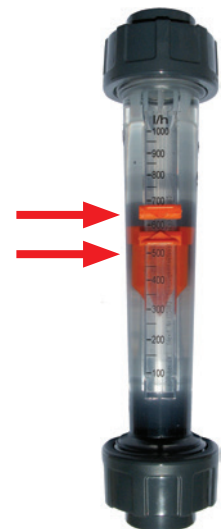
NOTE

The visual flow meter's scale is calibrated by the manufacturer for measurement of the flow rate of water (H₂O). Certain inaccuracies may be observed when the flow rate of liquids with different densities, such as fertilizers and acids, is measured.



ATTENTION

Once a month, read the measured flow rates of the dosing channels and compare them with the flow rates defined in the controller, to check whether any changes have occurred.



Winterization



CAUTION

When opening or closing any manual valve, always do it gradually, to prevent damage to the system by water hammer.

In areas susceptible to freezing temperatures, if the system is not required for irrigation during the winter (mainly in open field applications) perform the following procedure to avoid damage caused by freezing when the FERTIKIT is idle for the winter period:

At the beginning of winter:

- Gradually close the isolation valves and open the sampling valve until the pressure in the system is released.
- Remove EC and pH sensors and store the pH sensor immersed in KCL solution (supplied with the sensor) or in calibration buffer 4 at temperature 64 - 77°F. The pH sensor must never be dry (see EC/pH Transducer Manual).
- Empty the FERTIKIT of water.

At the end of winter:

- Reinstall the EC and pH sensors and calibrate them (see EC/pH Transducer Manual).
- Gradually open the isolation valves until the pressure in the system is restored.

TROUBLESHOOTING

This section is a systematic guide to the actions to be taken in the case of a malfunction of the FERTIKIT.



ATTENTION

Before proceeding to troubleshoot any malfunction, make sure that:

- The controller settings regarding the dosing channels are correct and match the dosing channels of the FERTIKIT (see the Controller Manual).
- The controller settings regarding the field valves are correct (see the Controller Manual).

Perform the actions in their order of appearance until the malfunction is fixed.

If you identify faulty parts - consult your Netafim representative.



CAUTION

Only qualified electricians are permitted to perform electrical installations and repairs!



CAUTION

If isolation valves have been installed on the system, ensure that they are in closed position before troubleshooting any hydraulic malfunction.



ATTENTION

If fertilizers from a different manufacturer have been recently in use and changes in EC and pH are recorded, perform calibration of the system before assuming a malfunction of the FERTIKIT (see Calibration on page 19).

Symptoms For More Than One Single Dosing Channel

If one or more of the following symptoms occur regarding more than one single dosing channel, perform the actions listed below:

Controller Warnings

- Low EC
- High pH
- Low fertilizer/acid flow rate

Visual Flow Meter Reading

- Low fertilizer/acid flow rate

Action

- 1) For controller warnings only - check and calibrate the EC and pH sensors (see the EC/pH Transducer Manual).
- 2) Have a qualified electrician check that electricity is being supplied to the FERTIKIT and that all the electrical components are properly connected (see the Switchboard Manual).
- 3) Check that the hydraulic conditions comply with the reference data in the FERTIKIT Hydraulic Conditions Checklist.

If **NO**, restore the original hydraulic conditions according to the reference data in the FERTIKIT Hydraulic Conditions Checklist.

If **YES** or if the malfunction is still not fixed after restoring the original hydraulic conditions, in SP model - have a qualified electrician check the dosing booster:

Does it function? Does it rotate in the correct direction?

If not - the electrician should swap between phases L1 and L3 (see the Dosing Booster Manual). This only applies to Phase 3 booster pumps.

TROUBLESHOOTING

- 4) Check for an air pocket in the dosing booster impeller chamber (see the Dosing Booster Manual):
Open the FERTIKIT sampling valve until a stable flow, free of air-bubbles, is obtained.
- 5) If the original hydraulic conditions are still not restored - loosen the dosing booster's bleeding screw and wait until a stable flow, free of air-bubbles, is obtained, then retighten the bleeding screw (see the Dosing Booster Manual).
- 6) Check the dosing booster's impeller chamber for clogging:
If it is clogged - it should be dismantled and thoroughly cleaned (see the Dosing Booster Manual).

If after implementing all the above steps the malfunction is still not fixed - consult your local Netafim Dealer.

Symptoms For a Single Dosing Channel

If one or more of the following symptoms occur regarding a single dosing channel, perform the actions listed below:

Controller Warnings

- Low EC
- High pH
- Low fertilizer/acid flow rate

Visual Flow Meter Reading

- Low fertilizer/acid flow rate

Action

- 1) Check that there is fertilizer/acid solution in the stock tank **A**.
- 2) Check that the stock tank manual valve **B** is in the OPEN position.
- 3) Check that the fertilizer/acid filter **C** is clean - If not, it should be dismantled and thoroughly cleaned.
- 4) Check the fertilizer/acid line **D** (from the stock tank to the dosing channel) for leaks and breaches and make sure all the connectors are tightened.
- 5) Make sure the dosing channel's needle valve **E** is open according to the reference data in the FERTIKIT Hydraulic Conditions Checklist.
- 6) Visually check the needle valve **E** for chemical damage (internal deformation). If internal deformation is present, replace the needle valve.
- 7) Visually check the needle valve **E** for clogging. If clogging is present - thoroughly clean the needle valve.
- 8) Check that the dosing valve **F** is functioning:

With the controller in MANUAL mode, set the dosing valve **F** to ON (see the Controller Manual).

The LED on the dosing valve should be lit.

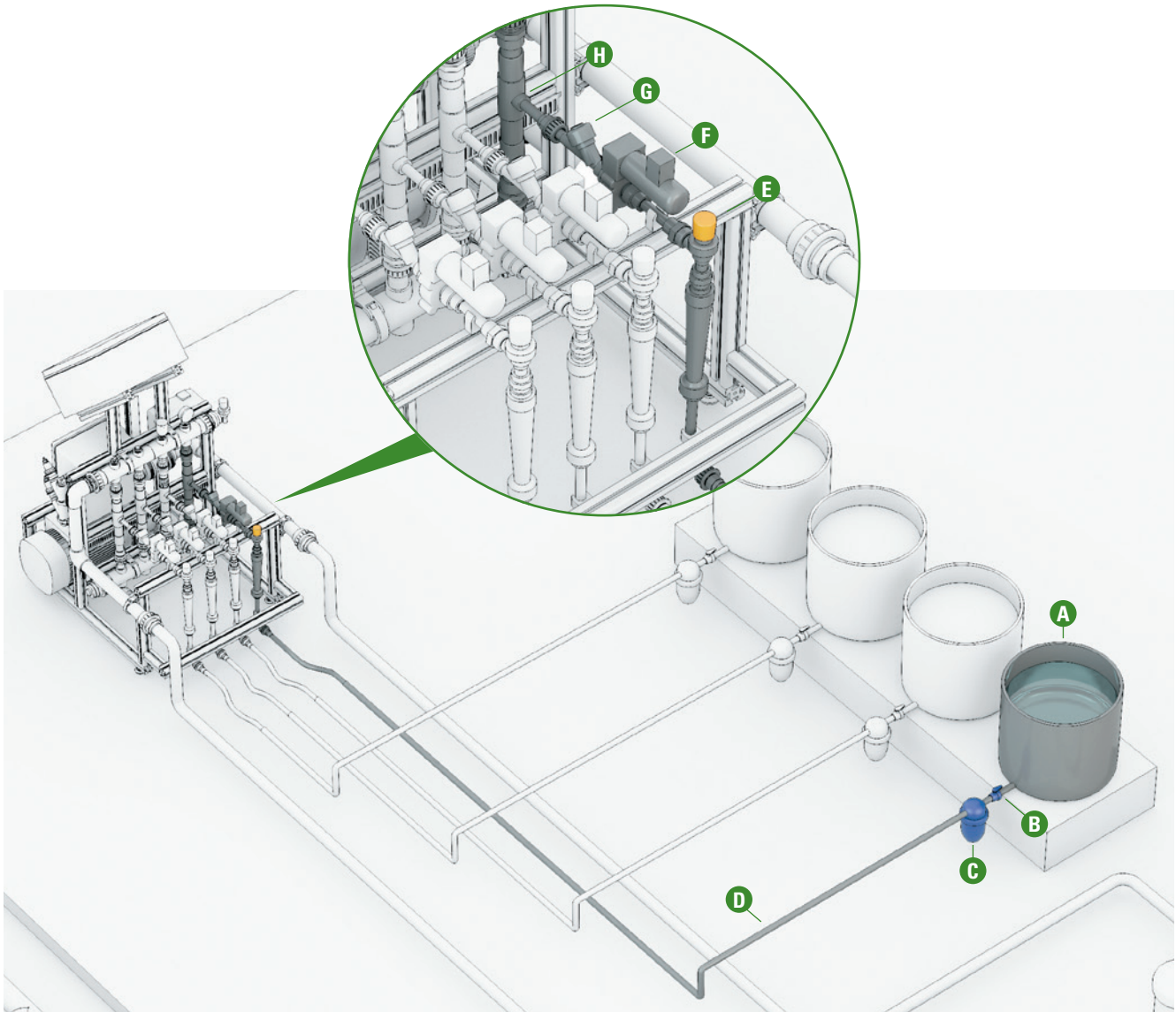
- If it is not - have a qualified electrician check the dosing valve's cable for electrical continuity.

- If the cable is in working order - check the controller (see the Controller Manual).

- If the controller and the cable are in working order - toggle the dosing valve **F** to OFF and again to ON in the controller (see the Controller Manual). A 'Click' should be heard from the dosing valve with each toggle - If a 'Click' is not heard, replace the dosing valve (consult your Netafim Dealer).

- If a 'Click' is heard and the dosing valve **F** still does not open - disconnect the dosing valve from the dosing channel and with the dosing valve set to ON in the controller (see the Controller Manual), check for clogging by injecting water at low pressure through the dosing valve.

TROUBLESHOOTING



- If there is clogging - thoroughly clean the dosing valve **F** with running water.

- If there is no clogging and the dosing valve **F** still does not open - replace it (consult your Netafim Dealer).

- 9) Visually check the non-return valve **G** for any internal deformation or damage to its flat ring gasket. If present - replace the non-return valve (consult your Netafim Dealer).
- 10) Check the non-return valve **G** for clogging by injecting water at low pressure through it (make sure to respect the direction of flow). If there is clogging - thoroughly clean the non-return valve **G** with running water.
- 11) Disconnect the Venturi **H** from the manifolds and from the dosing channel and check it for clogging, visually and by injecting water at low pressure through it. If there is clogging - thoroughly clean the Venturi **H** with running water.
- 12) Visually check the Venturi **H** for chemical damage (internal deformation). If internal deformation is present - replace the Venturi (consult your Netafim Dealer).

If after implementing all the above steps the malfunction is still not fixed - consult your Netafim Dealer.

TROUBLESHOOTING

Symptoms While Idle

If the following symptoms occur while the FERTIKIT is idle, perform the actions listed below:

Controller Warnings

- High EC
- Low pH
- While idle - uncontrolled fertilizer/acid flow rate or a fertilizer/acid leak or breach

Action



NOTE

The fertilizer dosing channels have a dosing valve (model: Fip S12), make sure the dosing valve selector is in the CLOSED position.

Check if the dosing valves leak when closed:

- 1) Close all the manual valves **B** for fertilizers and acid.
- 2) Make sure the level of the solution in all the the stock tanks is higher than the dosing valves.
- 3) With the controller in MANUAL mode, set all the dosing valves to OFF (see the Controller Manual).
- 4) Disconnect one of the the dosing valves from the non-return valve (downstream from the dosing valve).
- 5) Open the fertilizer manual valve **B**.
If a leak from the dosing valve is visible - disconnect the dosing valve from the dosing channel.
- 6) With the controller in MANUAL mode, set the dosing valve to ON (see the Controller Manual).
- 7) Thoroughly clean the dosing valve with running water.
- 8) Repeat steps 4-7 for each fertilizer and acid dosing channel.
- 9) After completing the procedure, open all the manual valves **B** for fertilizers and acid.
- 10) If the malfunction is still not fixed - replace the dosing valve.

If after implementing all the above steps the malfunction is still not fixed - consult your Netafim Dealer.



Switchboard Warning

If the following symptom occurs during operation, perform the actions listed below:

Switchboard Warning Light

- The switchboard warning light is on (when the dosing booster is either ON or OFF).

Action

- 1) Check if the pressure on the main line is low compared with the reference data on the FERTIKIT Hydraulic Conditions Checklist: If YES, restore the original main line pressure.
- 2) Check if the overload protection breaker is ON (see the Switchboard Manual). Toggle it OFF and ON again. If the switchboard warning light is still on or the overload protection breaker trips (turns to OFF) again, have a qualified electrician check if the dosing booster is in working order (see the Dosing Booster Manual) and check if there are irregularities in the electricity voltage supplied to the FERTIKIT.

If after implementing all the above steps the malfunction is still not fixed - consult your Netafim Dealer.

CALIBRATION

The process of calibrating the FERTIKIT is carried out in three stages:

1. Calculation of Dosing Channels Opening Percentage

To finely calibrate the FERTIKIT in order to achieve homogeneous and stable dosing, perform the following calculation for each dosing channel (fertilizers and acid) to determine the amount of suction reduction needed to attain the required fertilizer/acid flow rate.

DEFINITION

$$\text{Dosing ratio} = \frac{\text{The quantity of fertilizer/acid (l)}}{1 \text{ m}^3 \text{ irrigation water}}$$

US units

Flow rate of the largest irrigation shift GPM

X

Dosing ratio of a single fertilizer/acid US gal/1000 US gal

X 0.06 =

Result: a single fertilizer/acid flow rate GPH

X 1.25 =

Result: target Rotameter reading GPH

EXAMPLE

GPM

X

US gal/1000 US gal

X 0.06 =

GPH

X 1.25 =

GPH

DEFINITION

$$\text{Dosing ratio} = \frac{\text{The quantity of fertilizer/acid (US gal)}}{1 \text{ THG (1000 US gal) irrigation water}}$$



NOTE

The visual flow meter's scale is calibrated by the manufacturer for measurement of the flow rate of water (H₂O). Certain inaccuracies may be observed when the flow rate of liquids with different densities, such as fertilizers and acids, is measured.

2. Simulation Test with a 2 Gallon Bucket of Water

Instruments Needed

- Good-quality portable EC and pH sensors, finely calibrated
- Calibration solutions for EC and pH
- Bucket with a scale for up to 2 gallons
- Measuring tube or syringe with a scale for up to 1 ounce
- Clean (preferably distilled) water for cleaning sensors during calibration
- Blotting paper for cleaning and drying

The client prepares the fertilizer solutions and the acid solution (if required) in the stock tanks according to the recipe advised by the agronomist/consultant.



ATTENTION

Ensure the fertilizers and acid solutions in the stock tanks have been thoroughly agitated before starting the simulation.

CALIBRATION

Note the required dosing ratio of each fertilizer solution and the dosing ratio of the acid solution (if used).

Fill a bucket with 2 gallons of the client's supply water (without fertilizer or acid).

Measure the EC and the pH levels of the water in the bucket using calibrated portable sensors.

EXAMPLE

	EC	pH
Supply water (without fertilizer or acid)	0.3	7.8

Using a measuring tube or a syringe, take a dose from each fertilizer solution and from the acid solution (if used) according to the proportions determined by the dosing ratio (see example below) and **mix thoroughly** with the water in the bucket.

EXAMPLE

US units

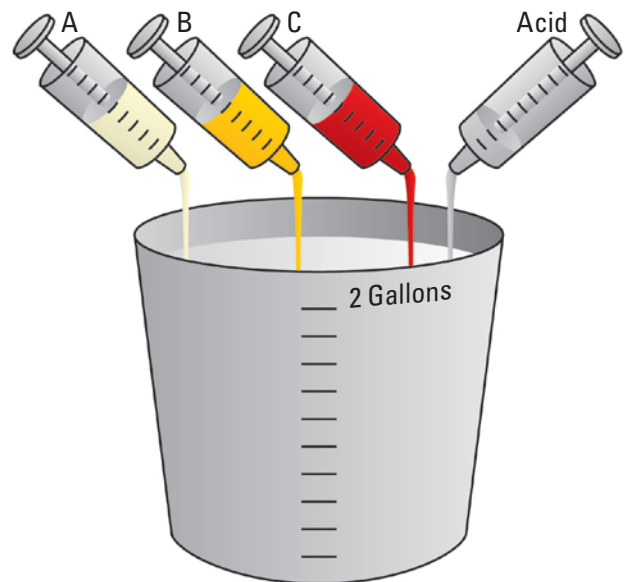
For a fertilizers dosing ratio of 1.5 US gal/THG each and an acid dosing ratio of 1.1 US gal/THG the quantities for 2 US gallons of water in the Bucket-simulation-test will be 0.38 oz* of each fertilizer solution and 0.28 oz** of the acid solution

DEFINITIONS

1 US gal = 128 oz

$$* \frac{1.5 \times 2}{1000} = 0.003 \text{ US gal} = 0.384 \text{ oz}$$

$$** \frac{1.1 \times 2}{1000} = 0.0022 \text{ US gal} = 0.28 \text{ oz}$$



Measure the EC and the pH levels of the mixture in the bucket using calibrated portable sensors.

Compare the measured EC and pH values to the target values set by the agronomist/consultant.

EXAMPLE

	EC	pH
After adding the fertilizers and acid	1.6	5.5
Target values	1.8	5.8
Deviation from target value	11%	5%



With the controller set to operate according to EC/pH values - if the EC and pH values measured in the bucket are within a range of $\pm 30\%$ deviation from the target values, the system will be able to correct them automatically.

If the values are out of the $\pm 30\%$ range, check the data and consult the agronomist/consultant.

CALIBRATION

3. Calibration of the FERTIKIT While Irrigating



WARNING

Extreme EC or pH values may damage the crop.

Perform the following procedure only after completing stage 2 above (Simulation test with a 2 gallon bucket of water) with satisfactory results.



NOTE

The following steps explain the operations to be performed, regardless of the type of controller used. For the operation of your controller's interface, consult the Controller Manual.

However, since the NMC Pro controller is widely used - its interface screens for the execution of each step are noted.



NOTE

Before the calibration, confirm that the EC and the pH sensors of the FERTIKIT have been calibrated according to the instructions in the EC/pH Installation Manual.

Define the dosing configuration, while the EC and pH controls are in the OFF position (**NMC Pro - screen 7.7**).

In the EC and pH alarm definitions, set the EC and pH alarm to the OFF position (deactivated) (**NMC Pro - screen 3.6**).

Enter the data for the irrigation valves, and the dosing ratio for each dosing channel (**NMC Pro - screens 1.1-1.2-1.3**).

Run the program (**NMC Pro - screen 2.2**).

Allow a few minutes for the pipes to fill up and the flow rate to stabilize.

Reduce the suction of the dosing channels by adjusting the manual needle valve of each dosing channel until the "target visual flow meter reading" calculated in stage 1 (page 23) is attained.



NOTE

The visual flow meter's scale is calibrated by the manufacturer for measurement of the flow rate of water (H₂O). Certain inaccuracies may be observed when the flow rate of liquids with different densities, such as fertilizers and acids, is measured.

Check the appropriate controller screen for the measured EC and pH values (**NMC Pro - hot screen 4**).

If the desired values have been reached, check opening percentages of the dosing valves.

The EC and pH target values should be attained with the dosing valves opened to 50% - 80% of their capacity.

If the EC and pH target values are attained with the dosing valves opened less than 50%, reduce the dosing channel suction rate, until the EC and pH target values are reached.



NOTE

Every change in the flow rate of the needle valve must be updated afterwards in the controller (**NMC Pro - screen 7.6**).

CALIBRATION

If the EC and pH target values cannot be attained, and the dosing valves are opened more than 85%, measures should be taken to increase the dosing ratio - if feasible, slightly increase the concentration of the fertilizer solution and/or reduce the water flow rate to the field during irrigation.

If not - consult the agronomist/consultant.

In a field where the flow rate changes significantly from one irrigation shift to the next, try to be at a minimum of 50% dosing valve opening for the low flow rate shift, and a maximum of 80% for the high flow rate shift.

When the calibration process is completed, return to the EC and pH control screen in the controller, define the deviation in EC and pH values for the channels and switch the EC and pH control to ON

(NMC Pro - screen 7.7-7.6).

In the EC and pH alarm definitions, define the EC and pH deviation from the target values that, if attained, will trigger the alarm and set the EC and pH alarm to the ON position (activated) **(NMC Pro - screen 3.5-3.6).**



NOTE

EC and pH values must not exceed a $\pm 30\%$ deviation from the target values.



ATTENTION

Once a month, read the measured flow rates of the dosing channels and compare them with the flow rates defined in the controller, in order to check whether changes have occurred

(NMC Pro - screen 7.6).

After completing the calibration process, fill out the FERTIKIT Hydraulic Conditions Checklist in three copies. Make sure to fill out all the boxes of the reference row. Keep one copy as reference for future calibration of the FERTIKIT and send one copy to your Netafim Dealer.

WARRANTY

Netafim warrants all the components of the FERTIKIT to be free of defects in material and workmanship for 1 (one) year from the date of installation, provided the installation has been reported to Netafim within 30 days of installation.

If the installation was not reported or was reported later than 30 days from the date of installation, Netafim will warrant the FERTIKIT for a period of 18 months from the date of production, according to its serial number.

If a defect is discovered during the applicable warranty period, Netafim will repair or replace, at its discretion, the product or the defective part.

The above does not apply to EC and pH sensors, since they are wearable. Netafim will warrant these items to be free of defects in material and workmanship for 3 months from the date of installation, provided the installation has been reported to Netafim within 30 days, or 6 months from date of production if installation was not reported or was reported later than 30 days from the date of installation.



CAUTION

When not installed, the pH sensor must be immersed in KCL solution (supplied with the sensor) or in calibration buffer 4 at temperature 64-77°F, protected from freezing and not be exposed to pressure greater than 87 psi.

Damage due to these causes is not covered by warranty.

This warranty does not extend to repairs, adjustments or replacements of a FERTIKIT or part that results from misuse, negligence, alteration, force majeure, lightning, power surge, improper installation or improper maintenance.

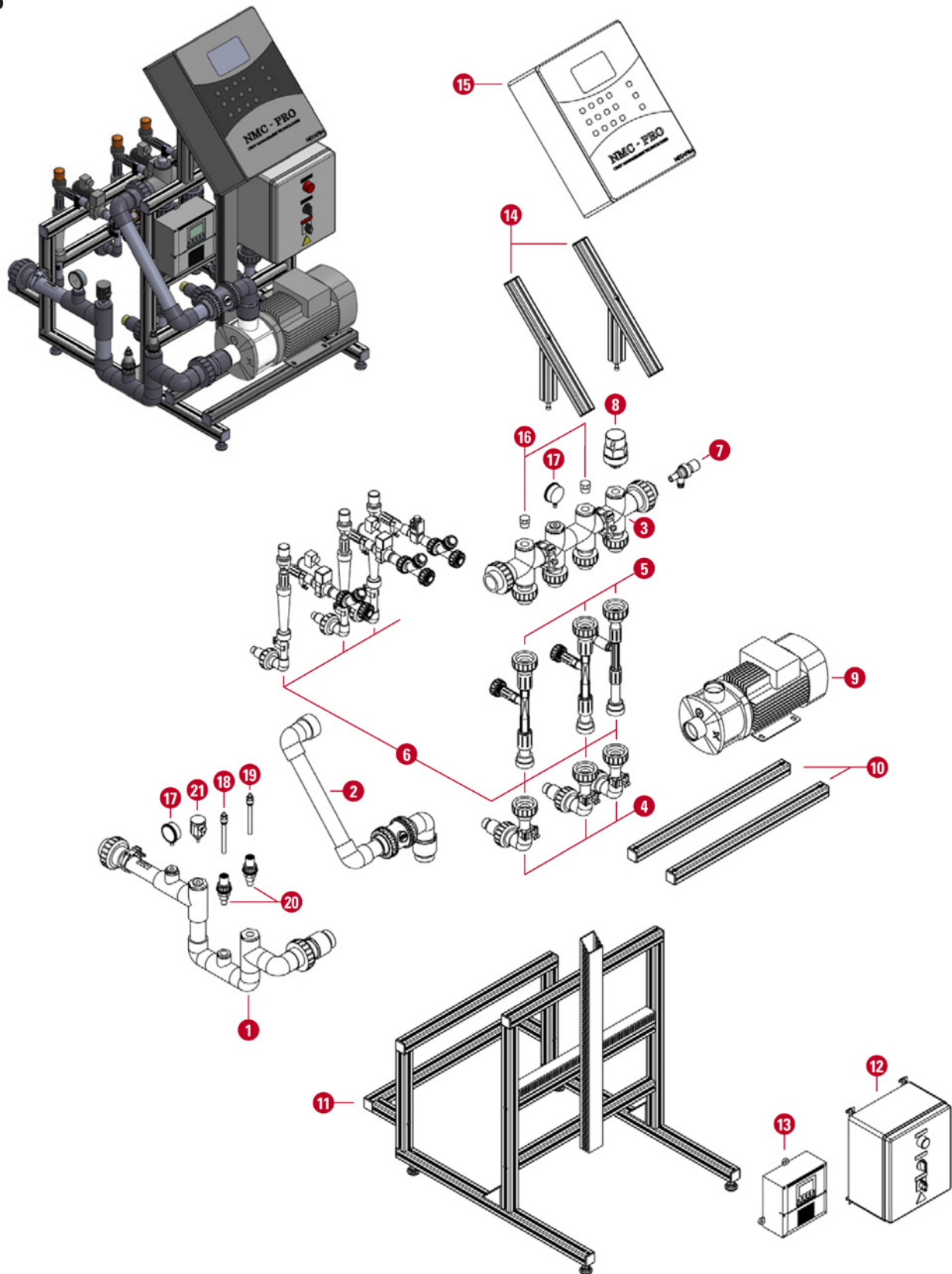
If a defect arises in your Netafim product during the warranty period, contact your Netafim supplier.

Limited Warranty

This warranty is subject to the conditions in Netafim's official warranty statement.
(For the full text of Netafim's official warranty statement, please contact Netafim).

FERTIKIT PARTS

SP



FERTIKIT PARTS

FertiKit SP Parts

Part	Description	Notes	Item Number
1	Inlet to CM15-2 60Hz SCH80		33241-009030
	Inlet to MTX5-3 60Hz SCH80		33241-009040
2	Outlet from CM15-2 60Hz SCH80		33241-009050
	Outlet from MTX5-3 60Hz SCH80		33241-009060
3	Upper manifold SCH80		33241-009080
4	Outlet from Venturi		33241-009070
5	Venturi PP M100GPH SCH80		33241-009090
	Venturi PP N40GPH SCH80		33241-009100
	Venduri PVDF M13GPH SCH80		33241-009110
6	Complete Acid Dosing Channel 13 GPH Viton		33241-009210
	Complete Dosing Channel 35 GPH EPDM		33241-009200
	Complete Dosing Channel 95 GPH EPDM		33241-009220
	Dosing Channel Vertical part 1.3-13 GPH SCH80	For Acid	33241-009120
	Dosing Channel Vertical part 10-100 GPH SCH80	For Fertilizer	33241-009130
	Dosing Channel Vertical part 4-40 GPH SCH80	For Fertilizer	33241-009140
	Dosing Channel Horizontal part VITON Bacc. SCH80	For Acid	33241-009010
	Dosing Channel Horizontal part EPDM S.12 SCH80	For Fertilizer	33241-009020
7	Sampling Valve RPRV 1/2" FPM for flow up to 105 GPH		76400-011375
8	Air Valve - plastic grey 3/4" (DG-010) NPT		70561-003730
9	CM15-2 Pump - 3 Phase		77800-002996
	Matrix 5-3 Pump - Single Phase		77800-023250
10	Set - Aluminum frame for dosing booster		45000-008759
11	Basic Frame	Not available as spare part	-
12	Switchboard for CM15-2		33220-001450
	Switchboard for Matrix 5-3		33220-001300
13	EC/pH Transducer		74360-007700
14	Set - Aluminum frame for NMC Pro Controller		45000-008757
15	NMC Pro Controller		74340-013943
16	PVC Threaded Plug 3/4" M		77400-027100
17	Pressure Gauge - 250 GLZ 10 bar 1/4" BSP		77540-003400
18	pH Sensor, Jumo - 12mm, plastic, bared wires		45000-006701
19	EC Sensor, Jumo - 12mm, temperat comp, PT100		45000-006705
20	Set - EC/pH Adapter		33140-008500
21	Pressure Switch		77800-002180





NETAFIM USA
5470 E. HOME AVE.
FRESNO, CA 93727
CS 888 638 2346
www.netafimusa.com