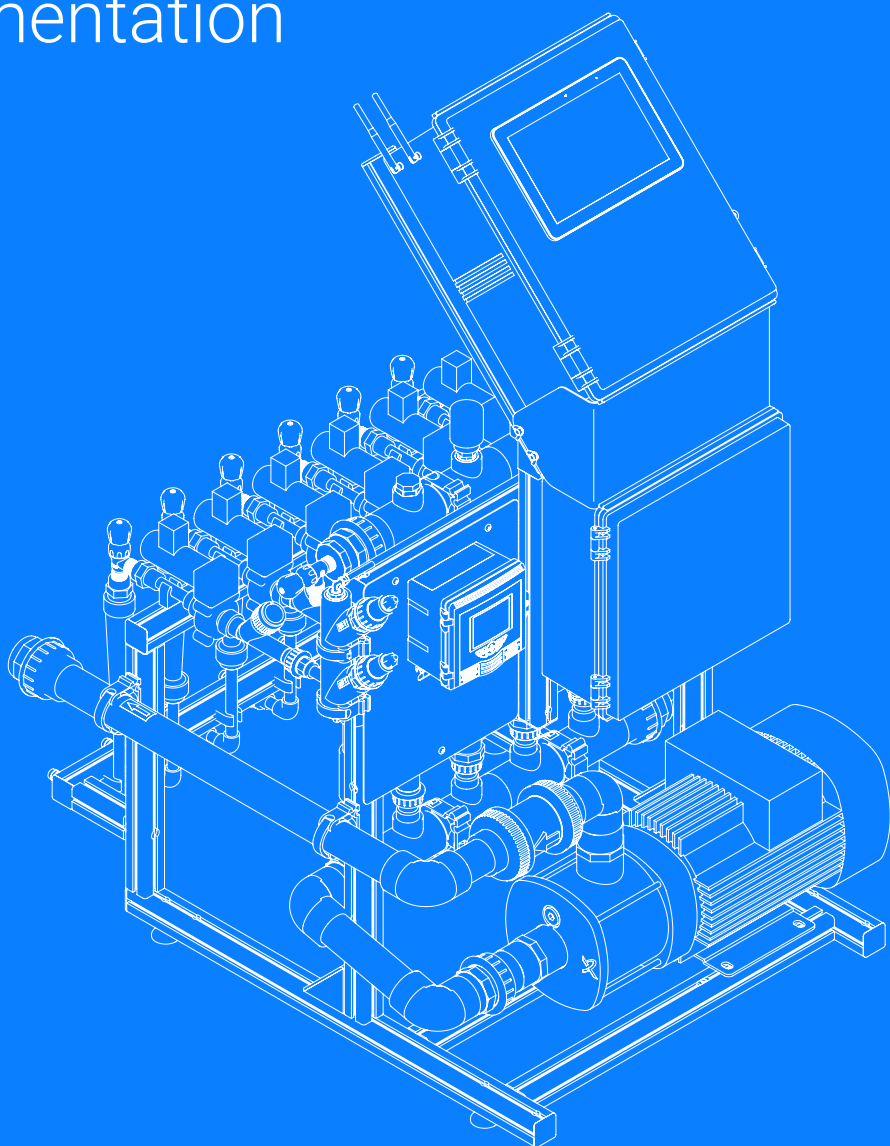


# FERTIKIT™ 5G WITH GROWSPHERE MAX CONTROLLER

Sales Documentation



## → THE SYMBOLS USED IN THIS DOCUMENT REFER TO THE FOLLOWING:



### **WARNING**

Contains instructions aimed at preventing bodily injury or direct damage to the crops, the NetBeat™ system and/or the infrastructure.



### **CAUTION**

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



### **ATTENTION**

Contains instructions aimed at enhancing the efficiency of usage of the instructions in the manual.



### **NOTE**

Contains instructions aimed at emphasizing certain aspect of the operation of the system or installation.



### **ACID HAZARD**

Contains instructions aimed at preventing bodily injury or direct damage to the crops and/or the irrigation system in the presence of acid.



### **PROTECTIVE EQUIPMENT**

Contains instructions aimed at preventing damage to health or bodily injury in the presence of nutrients, acid or chemicals.



### **TIP**

Provides clarification, tips or useful information.

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### **FOREIGN LANGUAGES**

In the event that you are reading this manual in a language other than the English language, you acknowledge and agree that the English language version shall prevail in case of inconsistency or contradiction in interpretation or translation.

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# THE FERTIKIT™ 5G

## → DESCRIPTION

The FertiKit™ 5G is a fully configurable fertilizer/acid dosing unit - a highly cost-effective solution for precise Nutrigation™.

Based on a standard platform, the FertiKit™ offers 8 different operation modes, selectable according to the site conditions, in order to maximize usage of available water flow rate and pressure on the main irrigation line, ensuring the highest efficiency with minimum investment.

The FertiKit™ can accommodate a variety of dosing channels, dosing boosters, controllers, peripherals and accessories to meet a vast range of applications and infrastructure constraints.

### Capacity range

**The FertiKit™ ensures a satisfactory mixture in an extremely vast range of flow capacities.**

- It will accommodate a 0.1 Ha (0.25 Acres) nursery or a 400 Ha (1000 Acres) sugar cane plantation.
- Main line pressure range: up to 8.5 bars (123.0 PSI).
- Main line flow rate range: from 1.0 to 700.0 m<sup>3</sup>/h (from 4.4 to 3000.0 GPM).

To select a specific flow capacity see the [Selecting a Fertikit™](#) chapter, page 7.

## → 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 6 fertilizer/acid dosing channels
- Nutrigation™ recipes can be changed quickly and efficiently
- Can be operated manually or fully computerized
- GrowSphere MAX and other controllers can be assembled on the FertiKit™ for advanced Nutrigation™ control
- Features lightning protection - RPLP
- 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™

## → 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. This requires a pressure differential - available on the main line or supplied by the main line pump or the FertiKit's dosing booster.

## → MODULARITY

The modular FertiKit™ 5G concept is based upon an array of interchangeable components that enables rapid assembly of a wide range of configurations.

Each FertiKit™ is delivered according to the precise customer's order, either fully factory assembled or assembled by the local dealer.

The dealer stocks the assortment of the FertiKit™ interchangeable components.

This concept enables the dealer to assemble any specific FertiKit™ according to the customer's order, saving the need to stock a large quantity of fully assembled FertiKit™ units of various common configurations.

The modular FertiKit™ 5G concept ensures prompt delivery schedules without delays!

### **Stock selection option**

Enables the dosing of multiple fertilizers through a single dosing channel (in cases where simultaneous dosing is not required). Suits all modes of FertiKit™. Available in a wide variety of configurations, from a single dosing channel with 2 fertilizers to as many dosing channels and fertilizers as required.

There are fertilizer combinations that at high concentration might induce crystallization in the FertiKit's lower manifold and cause clogging of the pipes (see [CAUTION](#) on page 16).

## → COMPATIBILITY

The FertiKit™ 5G can be incorporated in an existing or a planned project; in either case it offers a highly cost-effective solution for Nutrigation™ by taking maximum advantage of the infrastructure conditions.

Any available pressure surplus can be used for the FertiKit's operation. In order to configure the most cost-effective FertiKit™, making the maximum use of available pressure, see [Selecting a Fertikit™](#), page 7.



### **ATTENTION**

Calculations are either in metric or in US units - consistency in the type of units used is essential.



### **ATTENTION**

Each mode can accommodate a specific range of Venturis - see [page 18](#).

## → SERVICE

Servicing the FertiKit™ 5G 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.

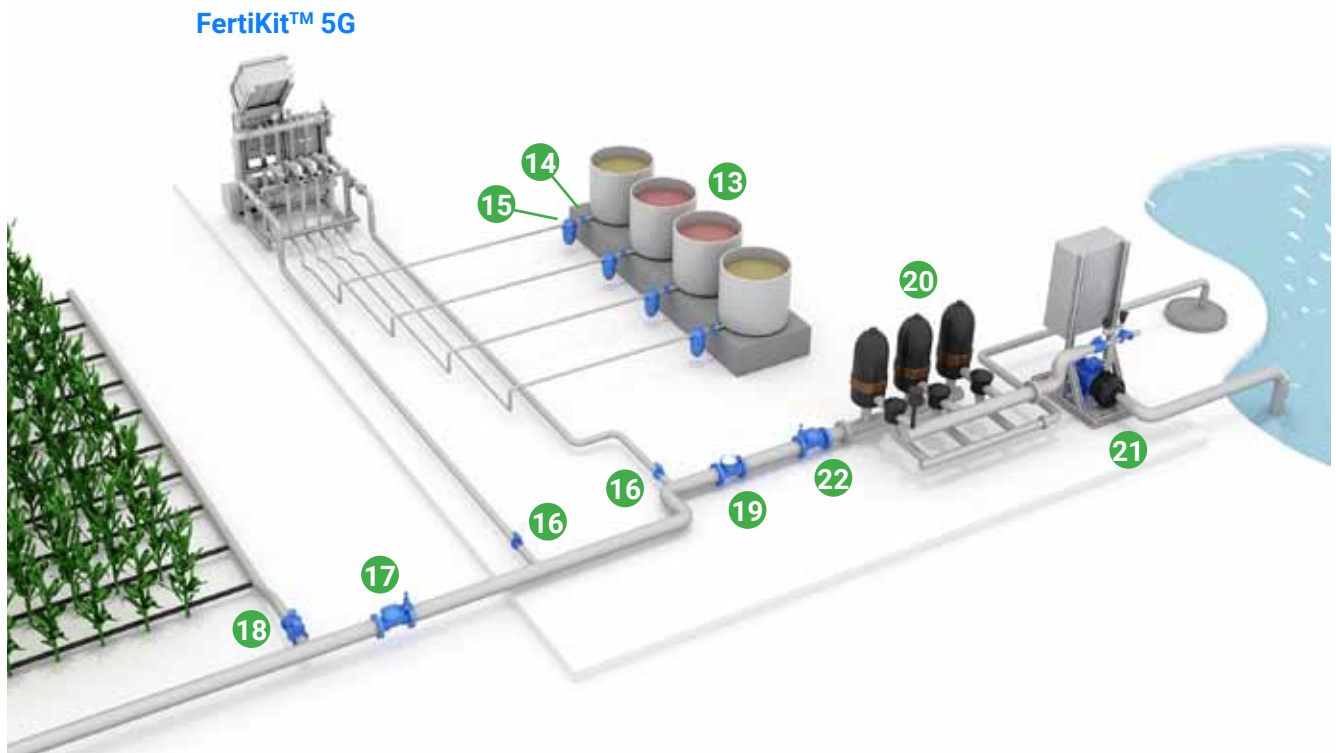
## → MAINTENANCE

To prevent failures and extend the life cycle of the FertiKit™, regular maintenance must be carried out by the user, such as periodic rinsing of filters and calibration of the EC/pH sensors.

For full maintenance instructions, see Maintenance in the User Manual (contact your Netafim™ local representative).

## → TYPICAL INSTALLATION OVERVIEW

The drawing below represents the typical infrastructure suitable for the PL mode. Each one of the FertiKit™ 5G 8 modes fits a different infrastructure configuration. (see the schematic diagrams in the [Selecting a FertiKit™](#) chapter, pages 7-14).



## → MAIN PARTS OF THE FERTIKIT™ 5G AND ITS INFRASTRUCTURE

The list below presents the main parts of the FertiKit™ and the parts of the infrastructure required for the operation of the FertiKit™ various modes (see the [Selecting a FertiKit™](#) chapter, page 7).

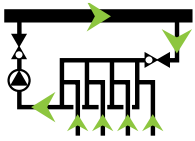
- |                                 |  |  |
|---------------------------------|--|--|
| 1 Dosing channel + Venturi      | 11 Check valve                               | 21 Main line pump                          |
| 2 Upper manifold pressure gauge | 12 Pressure switch                           | 22 Main line pressure reducing valve (PRV) |
| 3 Lower manifold pressure gauge | 13 Fertilizer/acid stock tank                | 23 Sampling outlet                         |
| 4 Sampling outlet               | 14 Manual valve (fertilizer)                 | 24 Saddle fitting                          |
| 5 Controller                    | 15 Fertilizer/acid filter                    | 25 Command tube                            |
| 6 EC sensor                     | 16 Manual valve (isolation)                  | 26 Pressure sustaining valve (PSV)         |
| 7 pH sensor                     | 17 Main line pressure sustaining valve (PSV) | 27 Pressure reducing valve (PRV)           |
| 8 EC/pH transmitter             | 18 Irrigation valve                          | 28 Water meter                             |
| 9 Dosing booster                | 19 Water meter                               | 29 Air release valve                       |
| 10 Dosing booster switchbox     | 20 Main line filter                          | 30 Hydrometer (incl. PRV)                  |

### Legend:

- Supplied (part of the FertiKit™),
- Not supplied (part of infrastructure),
- Optional in most modes (standard in MX mode).

# SELECTING A FERTIKIT™

## → PL MODES (PL/PS/PR/RL)



**Operating principle:** The pressure differential required to generate fertilizer suction via the Venturis is produced by a booster pump integrated in the FertiKit™.

These modes of operation, where the lower manifold is under low pressure (around 0 bars/PSI), permits the use of high-efficiency Venturis with high suction capacity and low motive flow consumption.

**Flow rate:** 20 - 700 m³/h (85 - 3000 GPM)

**Suitable for main line pressure:**

- **PL:** 2.5 - 6.5 bars (36 - 94 PSI)
- **PR with PRV 27:** 6.5 - 8.5 bars (94 - 123 PSI)
- **PS with PSV 26:** Based on cavitation risk (see page 19)
- **RL with PRV 27 and PSV 26:** 2.5 - 8.5 bars (36 - 123 PSI)

**Dosing channels:**

Accommodates a wide variety of dosing channels for fertilizer and concentrated/diluted acid:

- **50Hz:** Up to 6 x 50 - 1000 l/h (13 - 265 GPH)
- **60Hz:** Up to 5 x 50 - 1000 l/h (13 - 265 GPH) - Includes compensation channel



**NOTE**

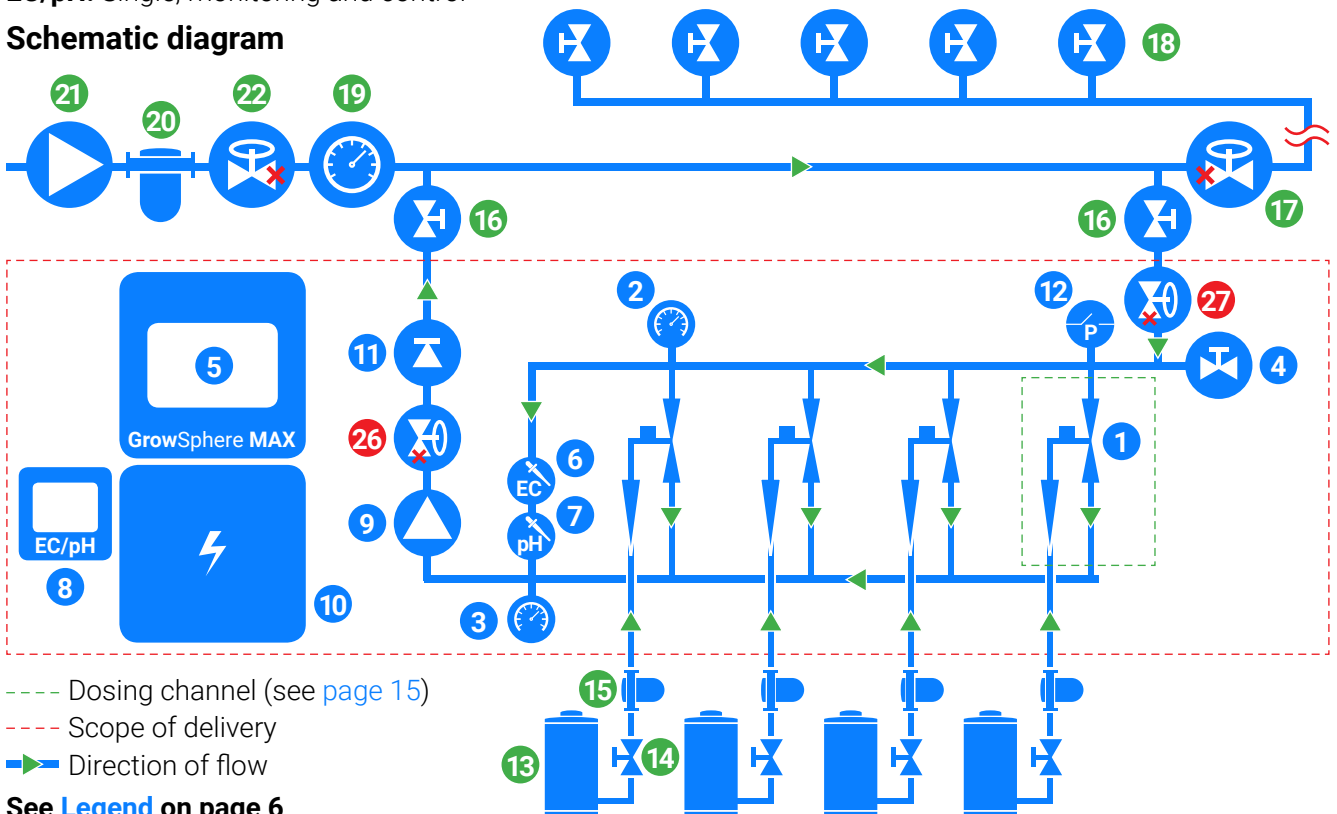
In 60Hz units only, add 3 m³/h (13.2 GPM) for the consumption of the compensation channel.

- **Optional** - Concentrated acid channel, 50 l/h (13 GPH)

**Controller:** GrowSphere™ MAX (Other controllers or manual system without controller - optional)

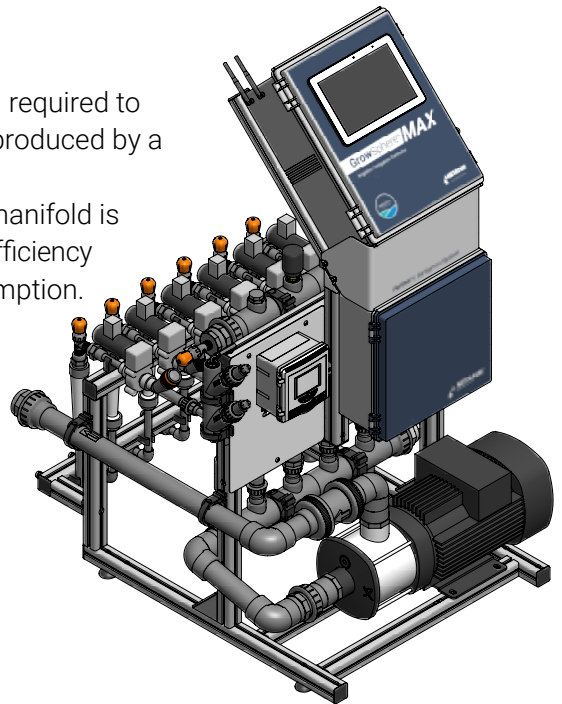
**EC/pH:** Single, monitoring and control

**Schematic diagram**



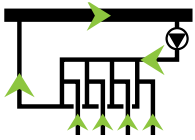
**Total fertilizer/acid suction capacity:**

- **50Hz:** Up to 6000 l/h (1585 GPH).
- **60Hz:** Up to 5000 l/h (1320 GPH).



See **Legend** on page 6

## → PB MODE



**Operating principle:** The pressure differential required to generate fertilizer suction via the Venturis is produced by a booster pump integrated in the FertiKit™.

This mode of operation, where the smaller system pump is installed upstream from the Venturis, permits the use of a small booster pump, reducing the investment required and saving energy. This mode is suitable for relatively low flow rates and pressures.

**Flow rate:** 5 - 70 m<sup>3</sup>/h (22 - 300 GPM)

**Suitable for main line pressure:** 1.5 - 2.5 bars (22 - 36 PSI)

### Dosing channels:

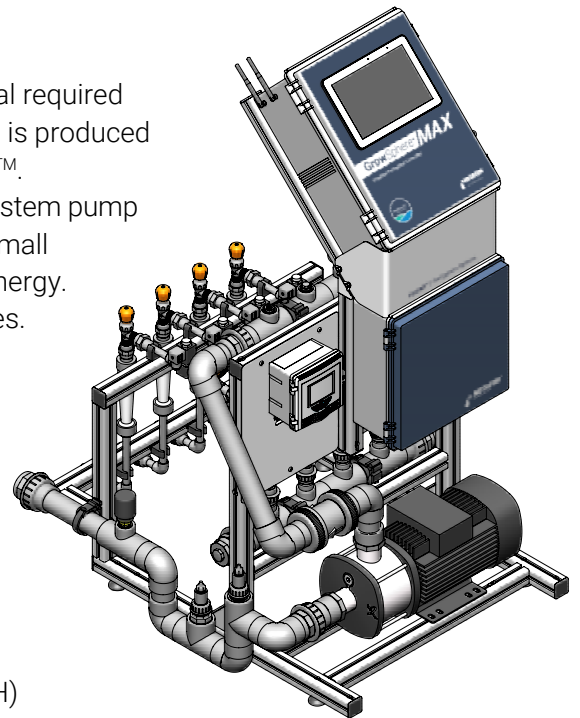
Accommodates a wide variety of dosing channels for fertilizer and concentrated/diluted acid:

- Up to 4 x 50 - 370 l/h (13 - 100 GPH)
- Optional - Concentrated acid channel, 50 l/h (13 GPH)

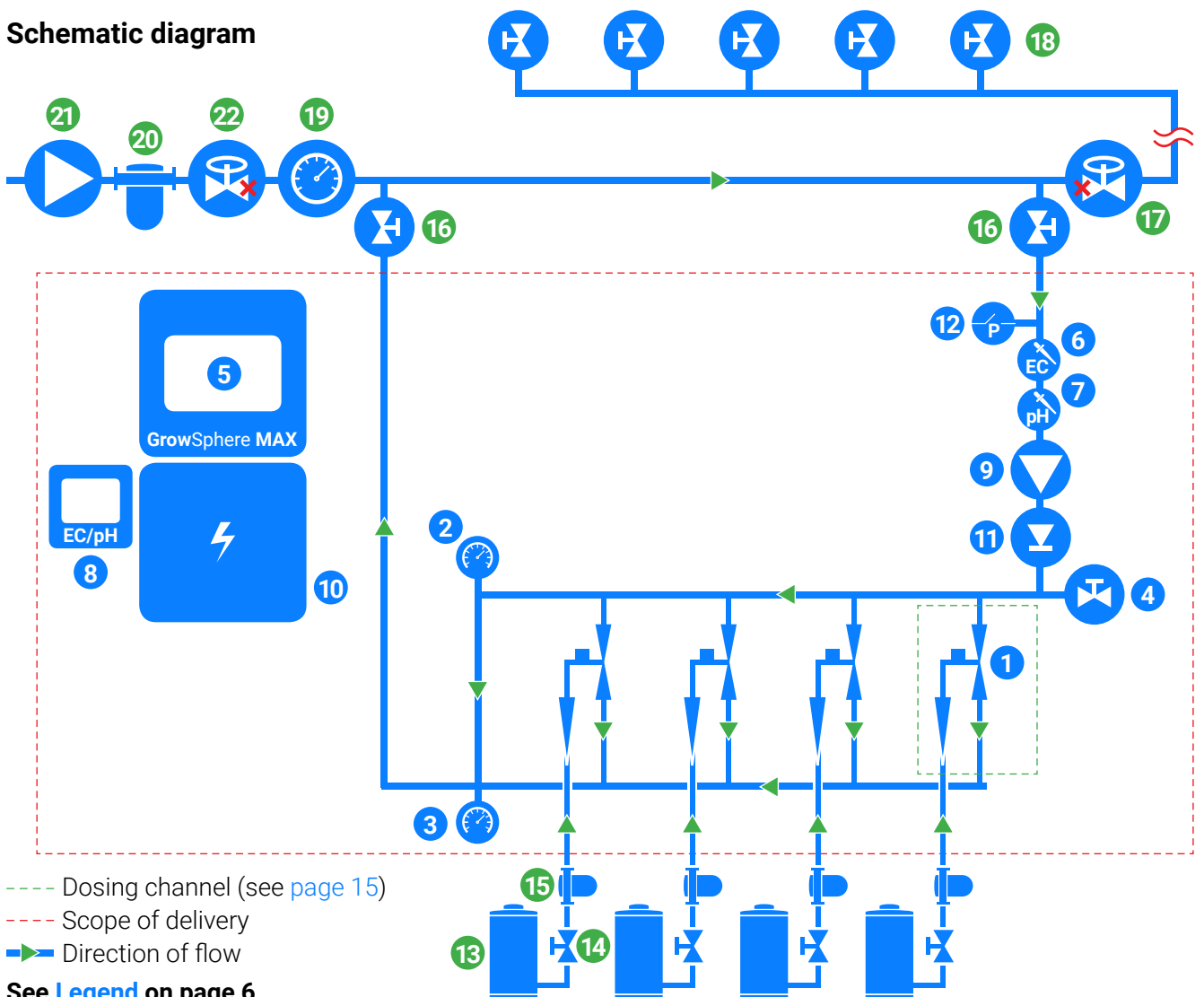
**Total fertilizer/acid suction capacity:** up to 1480 l/h (390 GPH)

**Controller:** GrowSphere™ MAX (Other controllers or manual system without controller - optional)

**EC/pH:** Single, monitoring and control

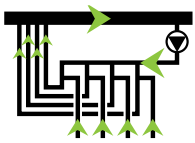


### Schematic diagram





## → SP MODE



**Operating principle:** The pressure differential required to generate fertilizer suction via the Venturis is produced by a booster 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 booster pump, reducing the investment required and saving energy. This mode is suitable for relatively low flow rates and pressures. For applications that use very high concentration fertilizers and acid. The solution has to be mixed in the main line. SP mode is not equipped with a lower manifold. (Can be supplied to the USA market with all parts inch-based to facilitate replacement using locally available spare parts).

**Flow rate:** 5 - 250 m<sup>3</sup>/h (22 - 1100 GPM)

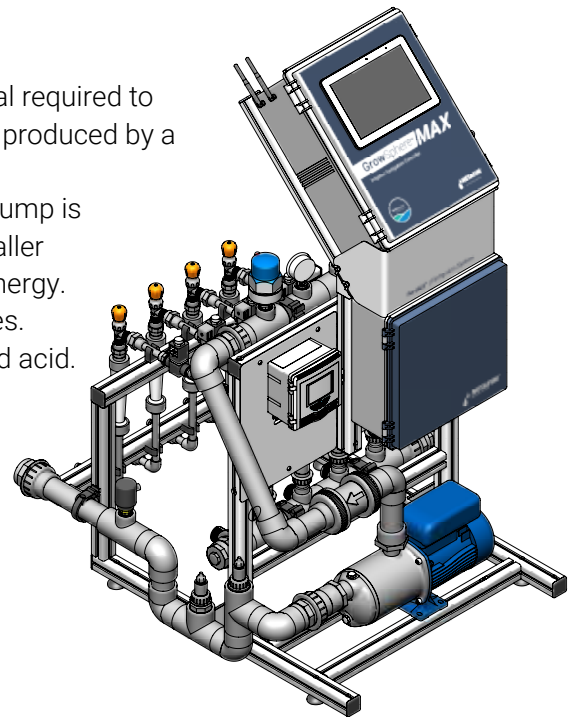
**Suitable for main line pressure:** 1.5 - 3.5 bars (22 - 51 PSI)

### Dosing channels:

Accommodates a wide variety of dosing channels for fertilizer and concentrated/diluted acid:

- Up to 4 x 50 - 370 l/h (13 - 100 GPH)
- Optional - Concentrated acid channel, 50 l/h (13 GPH)

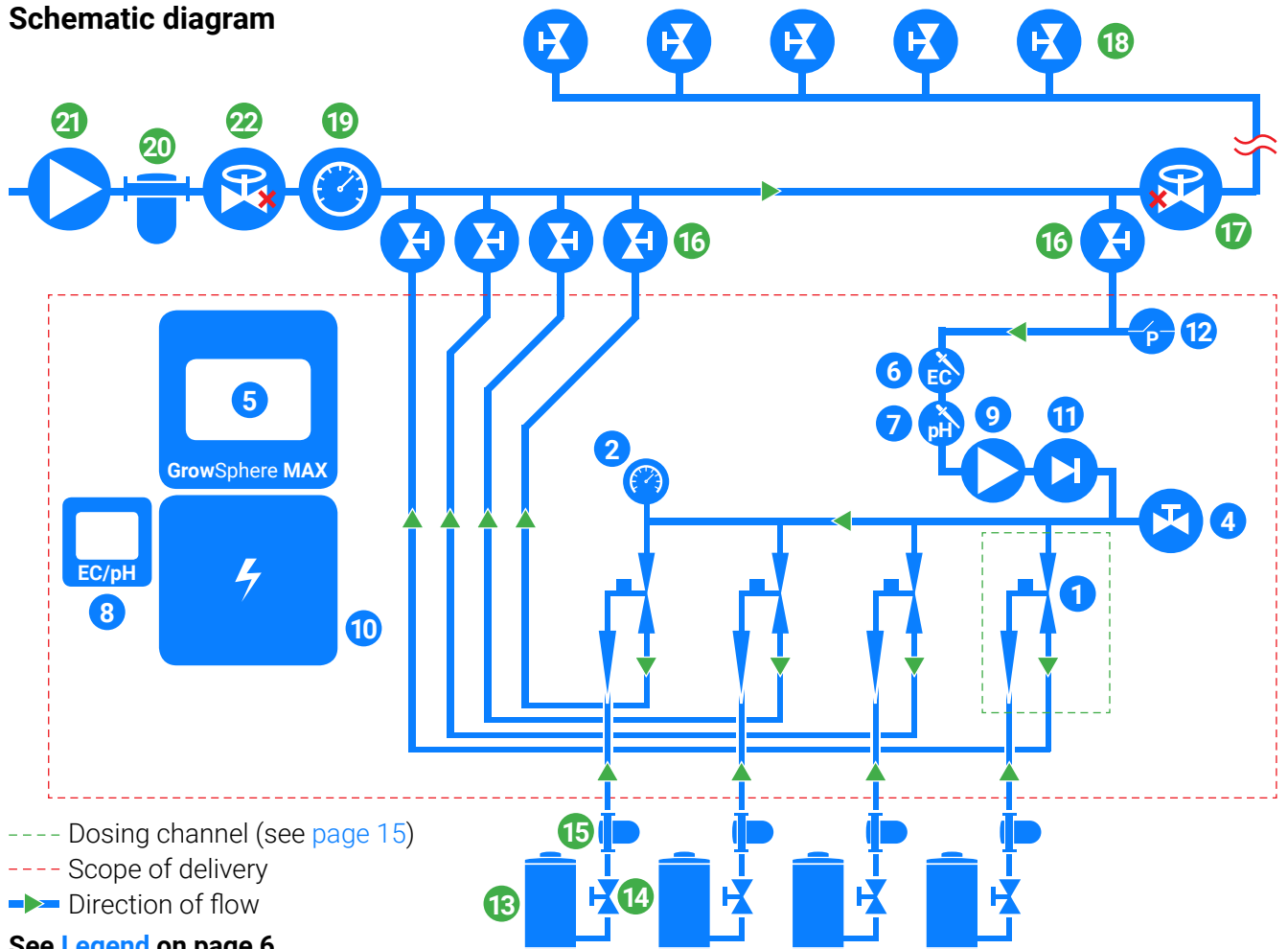
**Total fertilizer/acid suction capacity:** Up to 1480 l/h (390 GPH)



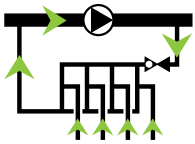
**Controller:** GrowSphere™ MAX  
(Other controllers or manual system without controller - optional)

**EC/pH:** Single, monitoring and control

## Schematic diagram



## → MS MODE (MS/RS)



**Operating principle:** For systems operating under negative suction - from a reservoir or a tank [max. height: 6 meters (20 feet)] Utilizes the main line pump pressure. Saves the need for a dosing booster.

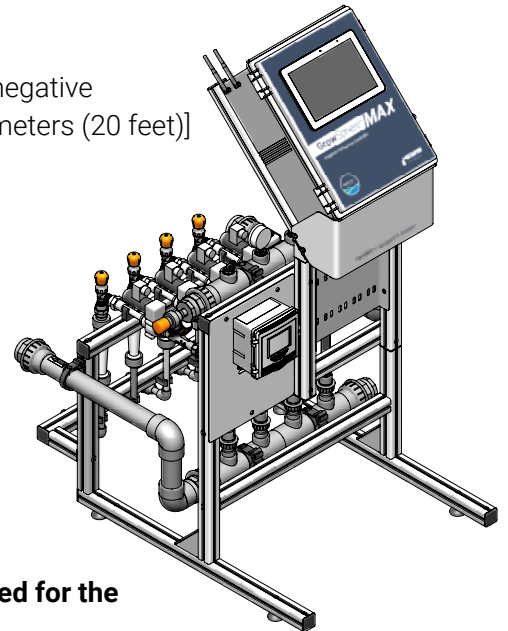
**Flow rate:** 20 - 700 m<sup>3</sup>/h (85 - 3000 GPM)

**Suitable for main line pressure:**

- **Upstream from the pump:** -0.3 - +0.6 bar (-4 - +9 PSI)
- **At the outlet of the pump:** 2.5 - 6.5 bars (36 - 94 PSI)
- **RS with PRV:** 6.5 - 8.5 bars (94 - 123 PSI) at the FertiKit™ inlet.

**Additional conditions:**

- Requires the connection of the FertiKit's outlet to the main line upstream from the pump.
- **The main line pump should be able to deliver the flow rate required for the operation of the FertiKit™ + the field consumption.**



**Dosing channels:**

Accommodates a wide variety of dosing channels for fertilizer and concentrated/diluted acid:

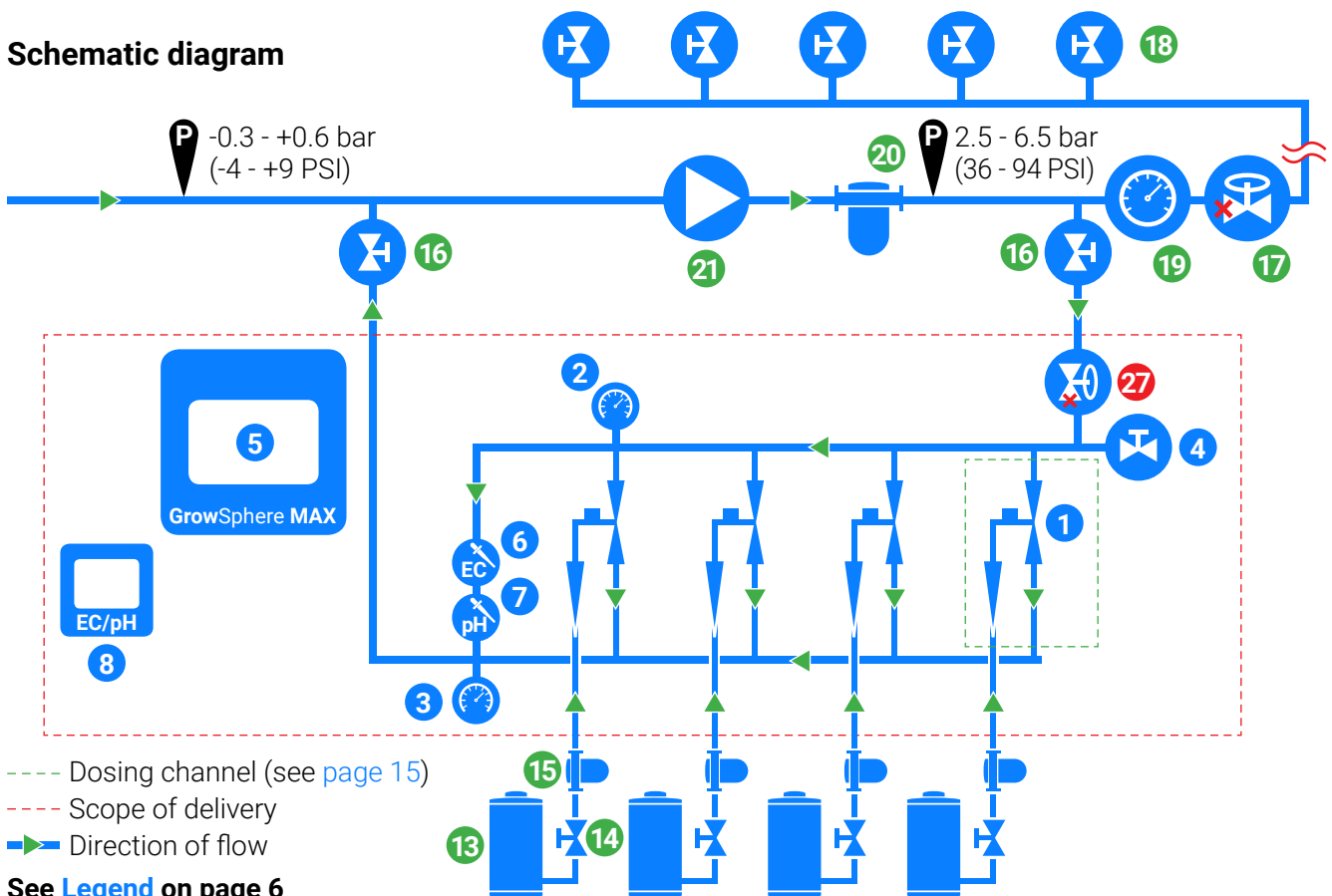
- **50Hz:** Up to 6 x 50 - 1000 l/h (13 - 265 GPH)
- **Optional** - Concentrated acid channel, 50 l/h (13 GPH)

**Total fertilizer/acid suction capacity:** up to 6000 l/h (1585 GPH)

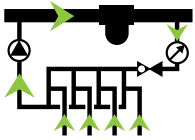
**Controller:** GrowSphere™ MAX (Other controllers or manual system without controller - optional)

**EC/pH:** Single, monitoring and control

**Schematic diagram**



## → IL MODE



**Operating principle:** The pressure differential required to generate fertilizer suction via the Venturis is produced by a booster pump integrated in the FertiKit™.

In this mode of operation, the lower manifold is at low pressure (around 0 bar/psi) this allows the use of high-efficiency Venturis with high suction capacity and low motive flow consumption. Since all the main line water flows through the system, slight pressure losses at the FertiKit™ outlet should be considered (see the table below).

**Flow rate:** 3 - 18 m³/h (13 - 85 GPM)

**Suitable for main line pressure:** 2.5 - 5.5 bars (36 - 79 PSI)

### Dosing channels:

Accommodates a wide variety of dosing channels for fertilizer and concentrated/diluted acid:

- **50Hz:** Up to 6 x 50 - 600 l/h (13 - 156 GPH)
- **60Hz:** Up to 3 x 50 - 600 l/h (13 - 156 GPH) - Includes compensation channel.
- **Optional** - Concentrated acid channel, 50 l/h (13 GPH)

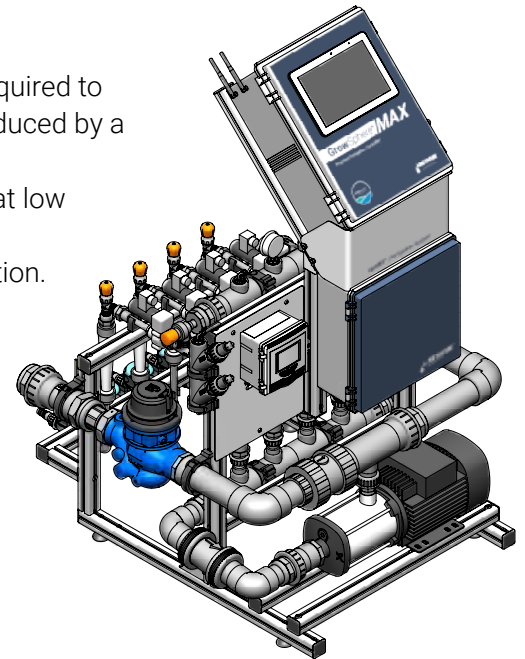
### Total fertilizer/acid suction capacity:

- **50Hz:** Up to 3600 l/h (950 GPH)
- **60Hz:** Up to 1800 l/h (475 GPH)



### NOTE

In 60Hz units only, add 3 m³/h (13.2 GPM) for the consumption of the compensation channel.



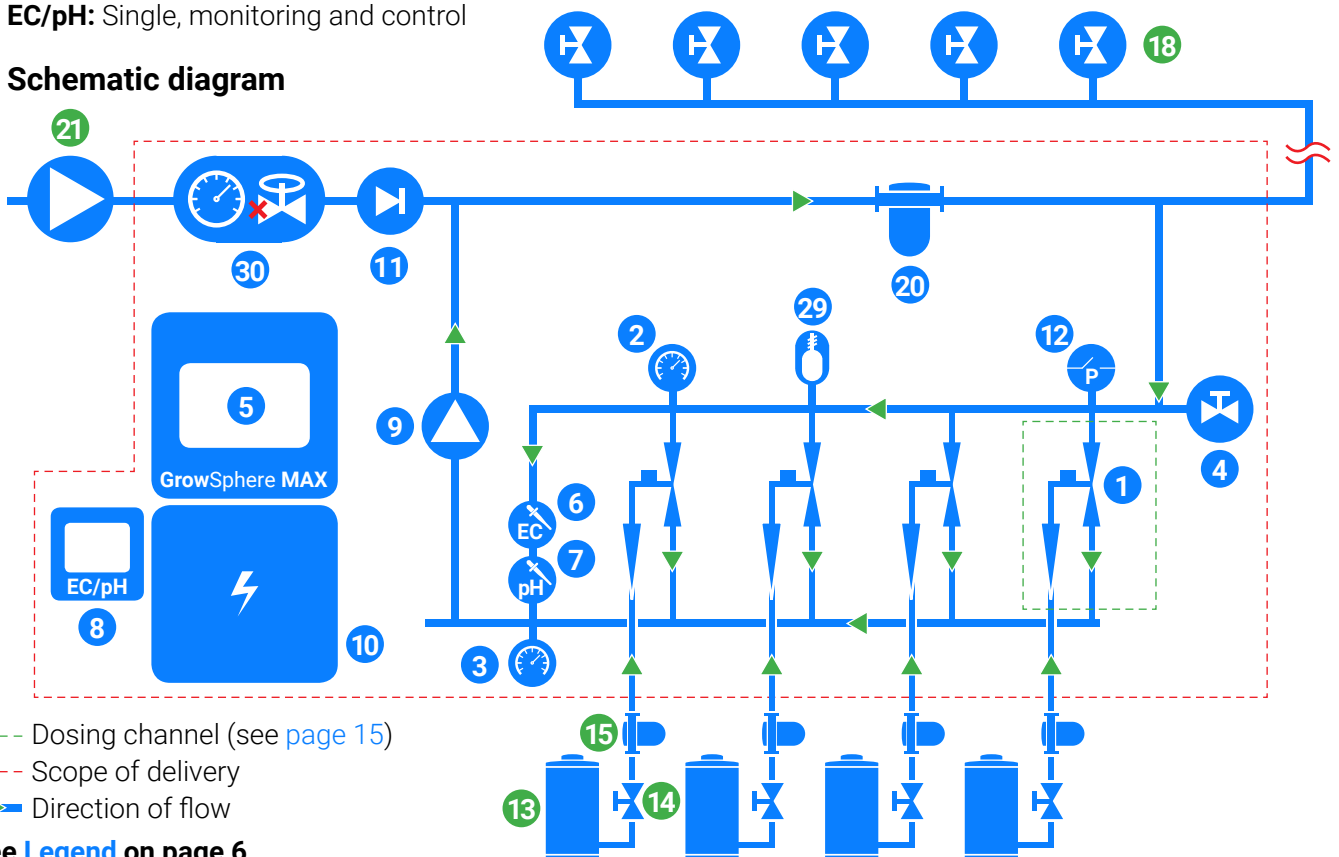
### pressure losses

Flow rate m³/h (GPM)	Pressure loss bar (PSI)
5 (22)	0.1 (1.45)
10 (44)	0.3 (4.35)
15 (66)	0.6 (9.55)

**Controller:** GrowSphere™ MAX (Other controllers or manual system without controller - optional)

**EC/pH:** Single, monitoring and control

### Schematic diagram



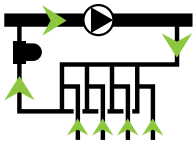
--- Dosing channel (see page 15)

--- Scope of delivery

➔ Direction of flow

See Legend on page 6

## → ST MODE



**Operating principle:** For systems operating at low pressure - from an on-ground reservoir or a tank [max. height: 6 meters (20 feet)]

**The dosing booster pump also serves as main line pump.** Supplied with a manual or a semi-automatic filter.

**Flow rate:** 1 - 16 m<sup>3</sup>/h (4.4 - 70 GPM)

**Suitable for main line pressure:**

- **Upstream from the pump:** -0.3 - +0.6 bar (-4 - +9 PSI)
- **At the outlet of the pump:** 2.0 - 5.5 bars (29 - 80 PSI)

**Additional conditions:**

When selecting a dosing booster, consider the required field flow + the TC.

**Dosing channels:**

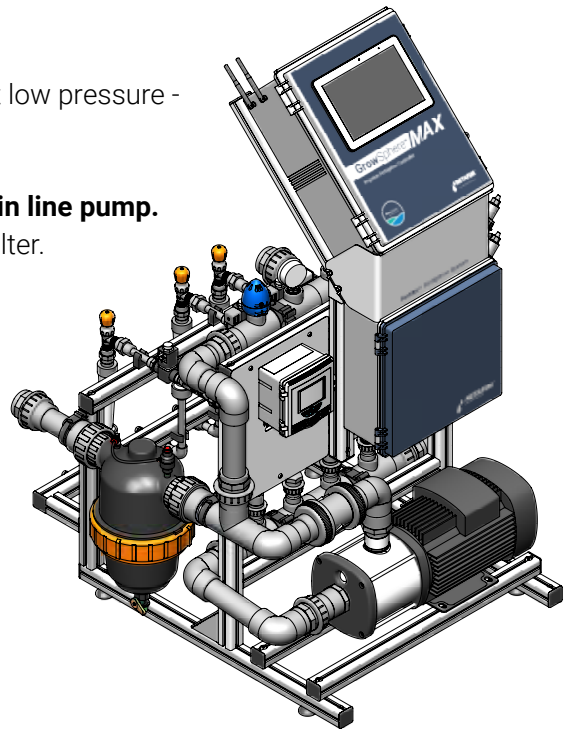
Accommodates a wide variety of dosing channels for fertilizer and concentrated/diluted acid:

- Up to 6 x 50 - 600 l/h (13 - 156 GPH)
- **Optional** - Concentrated acid channel, 50 l/h (13 GPH)

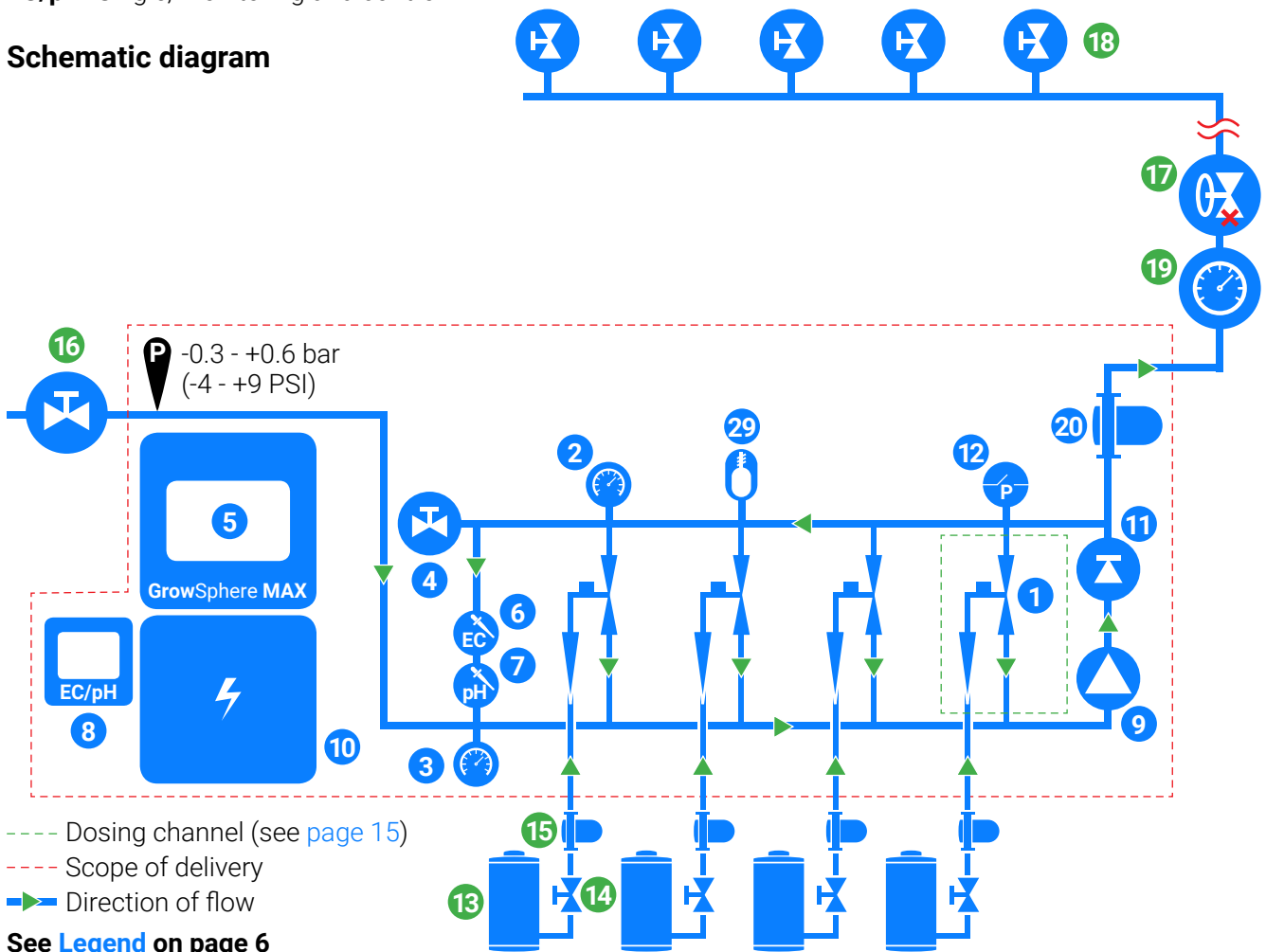
**Total fertilizer/acid suction capacity:** Up to 3600 l/h (950 GPH)

**Controller:** GrowSphere™ MAX (Other controllers or manual system without controller - optional)

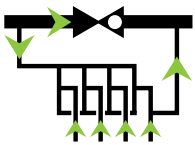
**EC/pH:** Single, monitoring and control



### Schematic diagram



## → PD MODE



### Operating principle:

Utilizes the main line pressure or gravity feed.  
Saves the need for a dosing booster.  
Also suitable for applications where there is no electricity on the site (contact Netafim™).

**Flow rate:** 10 - 200 m<sup>3</sup>/h (44 - 880 GPM)

**Suitable for main line pressure:** 4.5 - 8.0 Bars (65 - 116 PSI)

### Additional conditions:

For the dosing channels to provide proper suction, the pressure downstream from the PRV should be at least 50% of the the pressure upstream from the PRV (The efficiency of the Venturis decreases if this condition is not met). In addition the system must supply sufficient pressure for the field demand.

### Dosing channels:

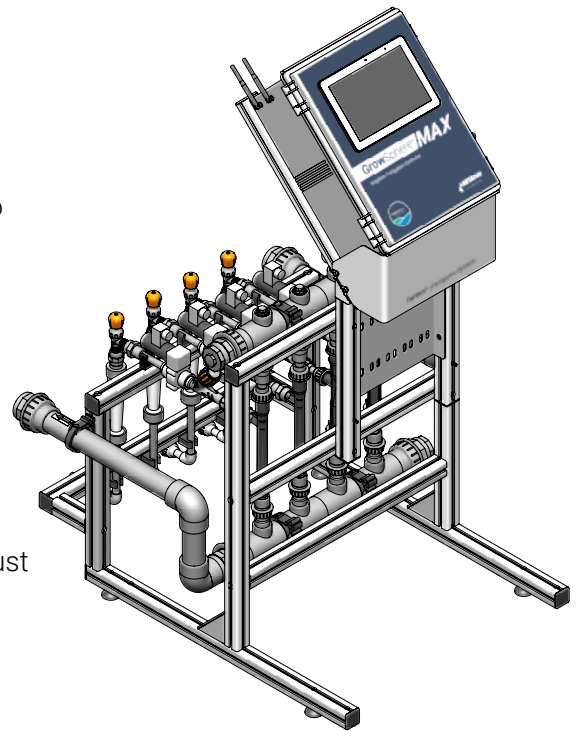
Accommodates a wide variety of dosing channels for fertilizer and concentrated/diluted acid:

- Up to 4\* x 50 - 370 l/h (13 - 100 GPH)  
\*If EC/pH is installed it occupies the location of one dosing channel (power required).
- **Optional** - Concentrated acid channel, 50 l/h (13 GPH)

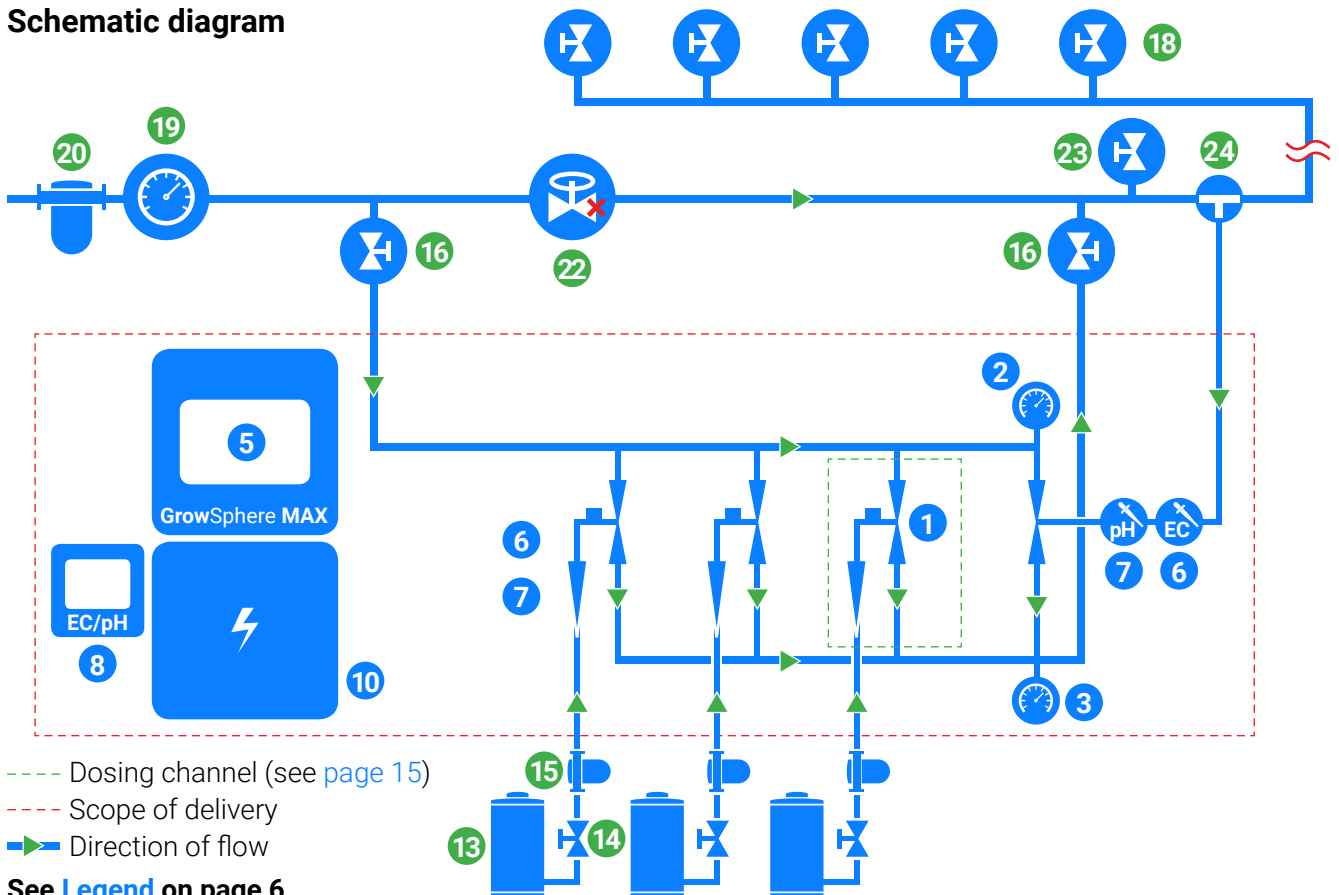
**Total fertilizer/acid suction capacity:** up to 1480 l/h (390 GPH)

**Controller:** GrowSphere™ MAX (Other controllers or manual system without controller - optional)

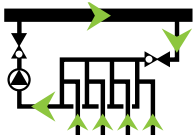
**EC/pH:** None (Single monitoring only - optional)



### Schematic diagram



## → MX MODE



**Operating principle:** The pressure differential required to generate fertilizer suction via the Venturis is produced by a booster pump integrated in the FertiKit™.

This mode of operation, where the lower manifold

is under low pressure (around 0 bars/PSI), permits the use of high-efficiency Venturis with high suction capacity and low motive flow consumption. PRV and PSV as standard.

**Flow rate:** 20 - 700 m<sup>3</sup>/h (85 - 3000 GPM)

**Suitable for main line pressure:** 2.5 - 8.5 bars (36 - 123 PSI)

### Dosing channels:

Accommodates a wide variety of dosing channels for fertilizer and concentrated/diluted acid:

- Up to 5 x 50 - 1000 l/h (13 - 265 GPH)  
(Includes compensation channel)



### NOTE

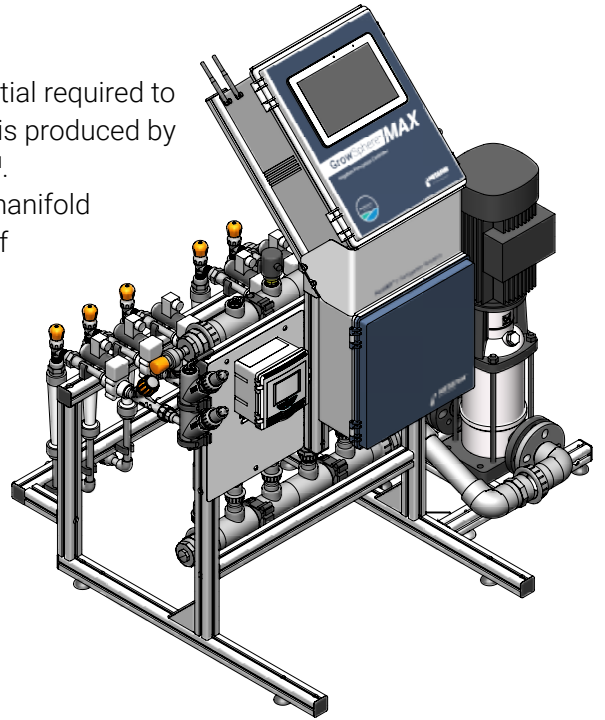
Add 3 m<sup>3</sup>/h (13.2 GPM) for the consumption of the compensation channel.

- **Optional** - Concentrated acid channel, 50 l/h (13 GPH)

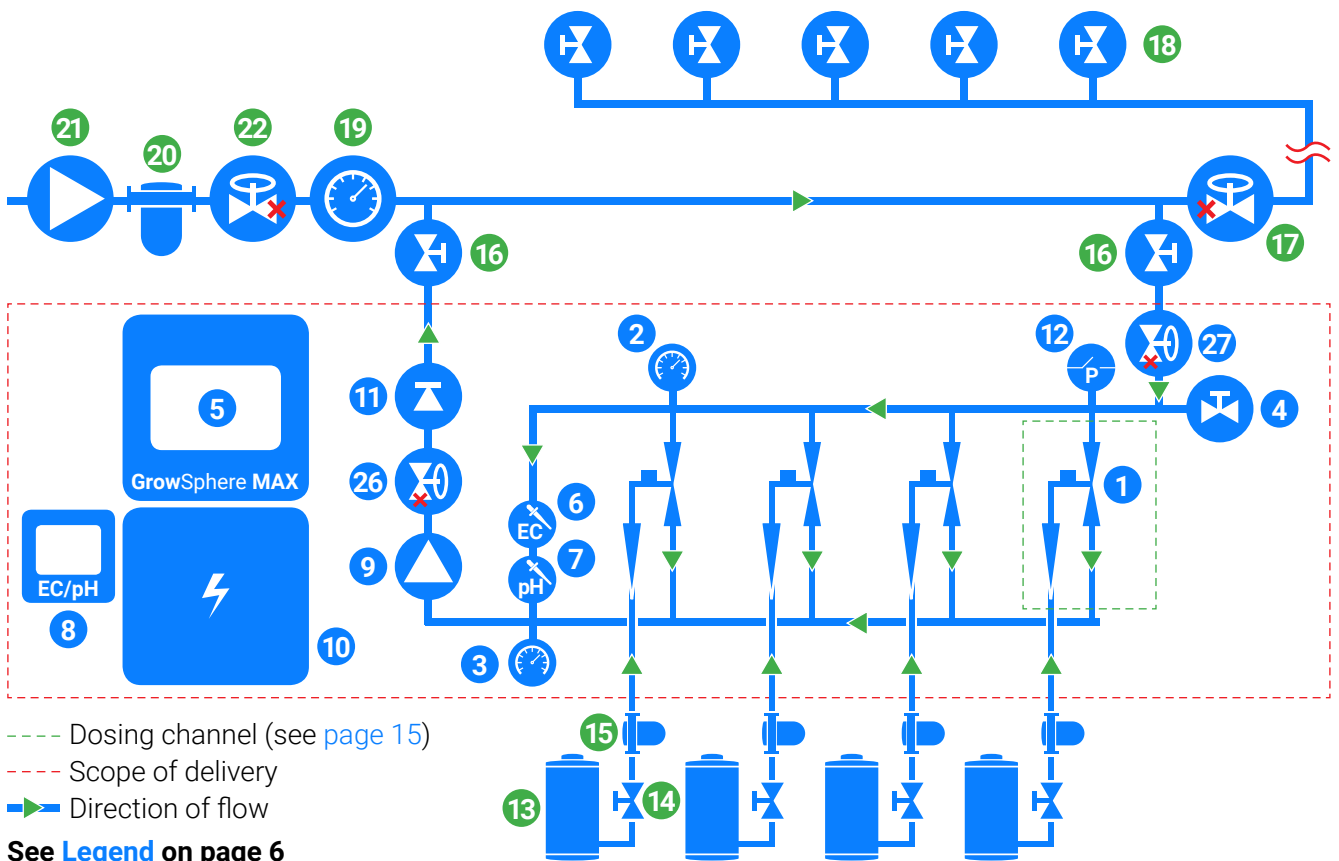
**Total fertilizer/acid suction capacity:** Up to 5000 l/h (1320 GPH).

**Controller:** GrowSphere™ MAX (Other controllers or manual system without controller - optional)

**EC/pH:** Single, monitoring and control















## Schematic diagram



## → DOSING CHANNELS

To accommodate a variety of installations, flow rates and Nutrigation™ needs, the FertiKit™ 5G offers a wide range of dosing channels for fertilizer and acid. Some of them are listed below. For a full overview go to the online configurator at <https://cmtconfig.netafim.com>.

<p><b>Electrical</b> Up to 600 l/h (158 GPH), without manual override</p> 	<p><b>Electrical</b> Up to 600 l/h (158 GPH), with manual override</p> 	<p><b>Electrical</b> Up to 600 l/h (158 GPH), with fertilizer meter; without manual override</p> 	<p><b>Electrical</b> Up to 600 l/h (158 GPH), with fertilizer meter; with manual override</p> 
<p><b>Electrical</b> Up to 1000 l/h (264 GPH)</p> 	<p><b>Electrical</b> Up to 1000 l/h (264 GPH), with fertilizer meter</p> 	<p><b>Hydraulic</b> Up to 600 l/h (158 GPH), with fertilizer meter</p> 	<p><b>Hydraulic</b> Up to 1000 l/h (264 GPH)</p> 
<p><b>Manual</b> Up to 600 l/h (158 GPH)</p> 	<p><b>Manual</b> Up to 600 l/h (158 GPH), with fertilizer meter</p> 	<p><b>Manual</b> Up to 1000 l/h (264 GPH)</p> 	<p><b>Manual</b> Up to 1000 l/h (264 GPH), with fertilizer meter</p> 

## Dosing channels for fertilizer or diluted acid

**Capacity - l/h (GPH):** ● 50 (13) ● 150 (40) ● 400 (106) ● 600 (158) ● 1000 (265)

**Each of the above dosing channels is available in any of the following options:**

- **AC 50 or 60 Hz** - according to the electricity frequency.
- **Manual** - for applications without a controller.
- **Hydraulic** - for DC latch with RTU applications.
- **Bio** - for applications with high viscosity fertilizers (e.g. bio, organic), enabling controlled flushing after each irrigation shift.



### CAUTION

There are fertilizer combinations that at high concentration might induce crystallization in the FertiKit's lower manifold and cause clogging of the pipes.

#### Fertilizer combinations prone to induce crystallization:

Calcium Nitrate	+	Ammonium Sulfate	⇒	Calcium Sulfate
Calcium Nitrate	+	Potassium Sulfate	⇒	Calcium Sulfate
MKP	+	Calcium Nitrate	⇒	Calcium Phosphate
MAP	+	Calcium Nitrate	⇒	Calcium Phosphate
Phosphoric acid	+	Calcium Nitrate	⇒	Calcium Phosphate

#### When injecting these fertilizer combinations:

- Make sure to dilute each fertilizers to the allowed concentration in the fertilizer tank prior to injection through the FertiKit™
- Immediately after each injection of any of the fertilizer combination above, flush the FertiKit™ with clean water for at least 2 minutes.

In case of doubt regarding the use of any combination of fertilizers, contact your Netafim™ local representative.

## Dosing channel for concentrated acid

**Capacity - l/h (GPH):** ● 50 (13) ● 150 (40) ● 370 (98), AC 50 or 60 Hz - according to the electricity frequency.



### ATTENTION

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

Type of dosing channel	Diaphragm and O-rings	For pH correction					For maintenance of drippers		
		Nitric acid (HNO <sub>3</sub> )	Phosphoric acid (H <sub>3</sub> PO <sub>4</sub> )	Sulfuric acid (H <sub>2</sub> SO <sub>4</sub> )	Potassium hydroxide (KOH)	Acetic acid (CH <sub>3</sub> COOH)	Hydrochloric (HCl)	Hydrogen peroxide (H <sub>2</sub> O <sub>2</sub> )	Chlorine (as hypochloride)
For diluted acid	EPDM	<3%	<85%	<30%	<35%	<30%	<10%	<30%	<1%
For concentrated acid	Viton	<40%	<85%	<90%	<10%	<5%	<33%	<50%	<10%

% is by weight at 21°C (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 recommended acid concentrations will damage the dosing channels.

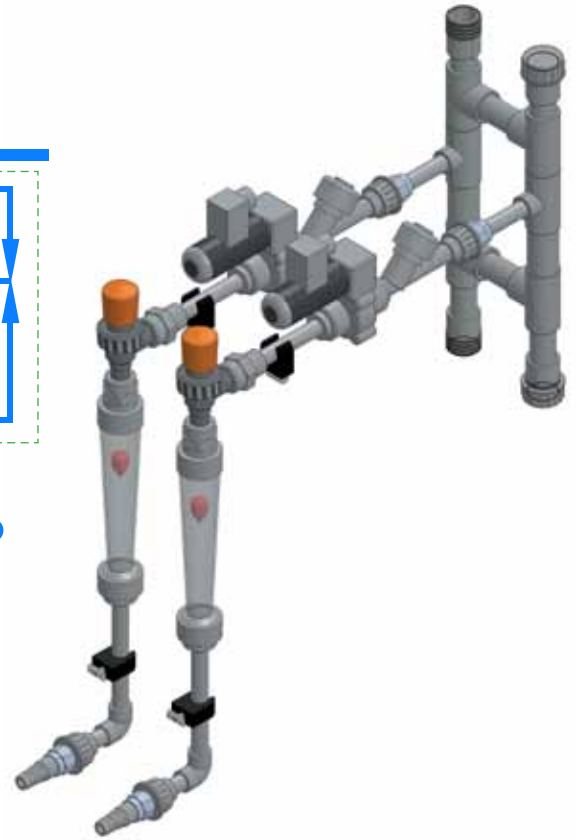
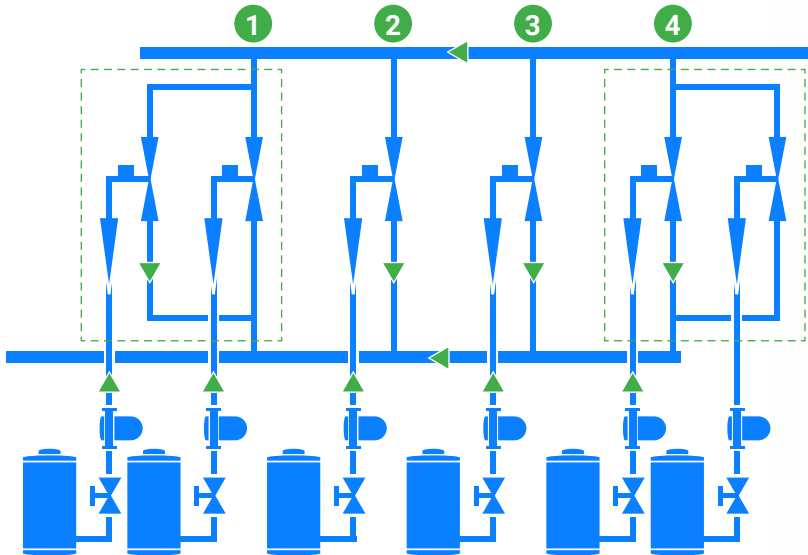


## Dual dosing channel

If more than 4 dosing channels are required (up to 6), the dual dosing channel option can be used.

- Up to 2 dual dosing channels can be installed on the FertiKit™ 5G, at the No.1 and No. 4 manifold positions.
- The dual dosing channel option is applicable with 50 l/h (13 GPH), 600 l/h (158 GPH) and 1000 l/h (265 GPH) Venturis only.

## Schematic diagram



### Legend

- Scope of the dual dosing channel
- ➡ Direction of flow



### CAUTION

Only compatible products can be injected through the dual dosing channel. There are fertilizer combinations that should **never** be used in the dual dosing channel as they will induce crystallization and cause clogging of the pipes.

### Fertilizer combinations prone to induce crystallization:

Calcium Nitrate	+	Ammonium Sulfate	⇒	Calcium Sulfate
Calcium Nitrate	+	Potassium Sulfate	⇒	Calcium Sulfate
MKP	+	Calcium Nitrate	⇒	Calcium Phosphate
MAP	+	Calcium Nitrate	⇒	Calcium Phosphate
Phosphoric acid	+	Calcium Nitrate	⇒	Calcium Phosphate

In case of doubt regarding the use of any combination of fertilizers in the dual dosing channel, contact your Netafim™ local representative.

## Compute the fertilizer flow rate

To select the appropriate fertilizer dosing channels and Venturis, perform the following calculation:

Enter the flow rate of the largest irrigation shift	<input type="text"/>	m <sup>3</sup> /h	<input type="text"/>	GPM
	X		X	
Enter the dosing ratio of a single fertilizer (for guidelines see <a href="#">appendix 1</a> , pages 32-37)	<input type="text"/>	l/m <sup>3</sup>	<input type="text"/>	US gal/1000 US gal
	=		X 0.06 =	
<b>Result:</b> a single fertilizer flow rate	<input type="text"/>	l/h	<input type="text"/>	GPH

## Matching the Venturis and the dosing channels

A complete line of Venturis is available to accommodate various flow rates of fertilizer or acid.

Venturi	Applicable for mode	Nominal suction flow - l/h (GPH)	Typical consumption* - m <sup>3</sup> /h (GPM) (at pressure up to 5 bars)
PVDF - M050	Any mode	50 (13)	1.0 (4.4)
PP - N150	Any mode	150 (40)	1.2 (5.3)
PP - M370	SP/PB/PD	370 (98)	4.0 (17.5)
PVC - N600	PL/MS/ST/IL	600 (158)	1.2 (5.3)
PVC - N1000	PL/MS	1000 (265)	4.0 (17.5)

\*Consumption = the flow of water and fertilizers that pass through the dosing channel.



### NOTE

In **MX, PL** and **IL** modes 60Hz units only, add 3 m<sup>3</sup>/h (13.2 GPM) for the consumption of the compensation channel.

Use the table below to formulate the appropriate combination of Venturis and dosing channels.

Dosing channel - nominal capacity l/h (GPH)	Venturi				
	PVDF - M050	PP - N150	PP - M370	PVC - N600	PVC - N1000
50 (13) concentrated acid	+				
50 (13)		+			
150 (40)		+		+	
400 (106)			+	+	
600 (158)				+	
1000 (265)					+



### ATTENTION

The fertilizer/acid suction capacity of a dosing channel depends on suitable pressure conditions on site (see main line pressure of each mode in the [Selecting a Fertikit™](#) chapter, pages 7-14).

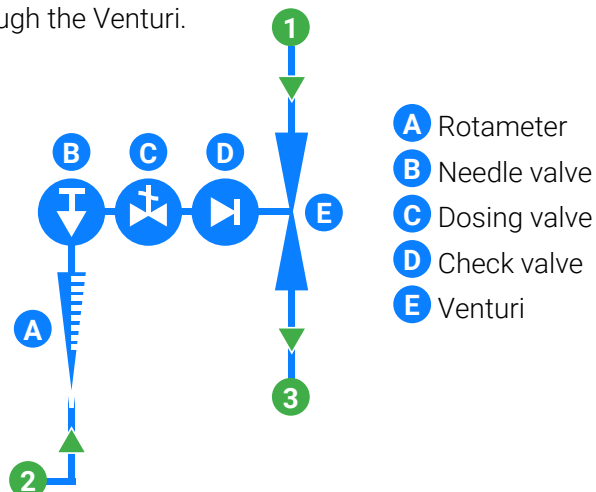
## Compute the Fertikit total consumption (TC)

In order to assess the suitability of the selected mode or to identify the correct dosing booster pump needed for the application, it is necessary to know the Fertikit's total consumption (TC).

### Typical dosing channel description and flow scheme

- Motive flow** = the flow of water required through the Venturi to enable suction of fertilizer/acid.
- Suction flow** = the flow of fertilizer/acid through the Venturi.
- Total flow** = motive flow + suction flow.

**TC** = Total flow of all the dosing channels



## → PREVENTING DAMAGE TO THE DOSING BOOSTER DUE TO CAVITATION

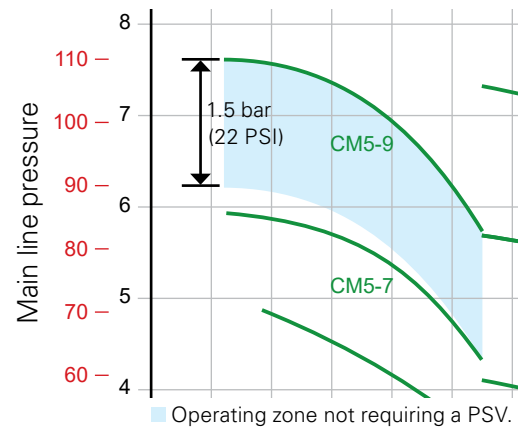
Cavitation is the formation of vapor cavities ('bubbles' or 'voids') in a liquid. It usually occurs when a liquid is subjected to rapid changes of pressure that cause the formation of cavities where the pressure is relatively low. When subjected to higher pressure, the voids implode and can generate an intense shockwave causing significant damage to the pump's impeller and chamber.

If the main line pressure is lower than 1.5 bar (22 PSI) under the performance curve of the selected pump (see appendix 1 - performance curves, pages 32-37) and/or the system is installed at an altitude higher than 700 m (2300 feet) above sea level, install a PSV (Pressure sustaining valve) at the FertiKit's outlet.

### To prevent the risk of damage to the EC and pH sensors:

If the main line pressure is higher than 6.5 bars (94 PSI), install a PRV (Pressure reducing valve) at the FertiKit's inlet.

For calibration of PSV and PRV see the installation manual (contact your Netafim™ local representative).



## → ELECTRICAL SUPPLY

To select the proper dosing channels, dosing booster, controller and accessories, it is essential to know the properties of the electricity on site.

The electricity frequency (Hz) and voltage (V) depends on the country (in some countries frequencies and voltages differ by area).



### NOTE

**In cases where 3-phase electricity is supplied in addition to a single phase, take note:**

- The controller is single phase.
- In most cases, a 3-phase dosing booster is preferable.



### TIP

If there is no electricity on site, check the possibility of operating under the PD mode fed by a 12 VDC battery (solar panel - optional), contact Netafim™.

## → DOSING BOOSTERS

To select the dosing booster, see the appropriate graph in [appendix 1 - performance curves](#) (pages 32-37). Consult the appropriate graph according to the electricity frequency on the site and the mode you selected - **PB** or **PL**, **IL**, **ST** or **MX** only (**PD** and **MS** do not require a dosing booster).

Identify the performance curve where the pressure corresponding to the FertiKit's total consumption (TC) is at least 0.5 bar (7.25 PSI) greater than the maximum main line pressure, and select the appropriate dosing booster.



### ATTENTION

Make sure that the selected dosing booster fits the electricity voltage, phases and frequency on site.

### Horizontal pumps (for all modes except MX)

#### For 50 Hz installations

Phases	Volts	Dosing booster	FertiKit's total power consumption (kW)
1	220-240	5-5/1.3M	1.45
3	220-240/ 380-415	CM 5-7	1.73
		CM 5-9	2.35
		CM 5-12	3.35
		CM 10-3	2.35
		CM 10-3	3.35
		CM 10-4	3.35
		CM 10-5	4.15
		CM 10-6	5.95
		CM 10-8	4.15
		CM 15-4	5.95
		CM 25-3	5.95
CM 25-4	7.55		

#### For 60 Hz installations

Phases	Volts	Dosing booster	FertiKit's total power consumption (kW)
1	220-240	5-3T6/1.3M	1.45
3	208-230/ 440-480	ST CDXM 200/206	1.45
		CM 5-4	1.85
		CM 5-5	2.65
		CM 5-6	2.65
		CM 5-8	4.15
		CM 10-2	4.15
		CM 10-3	4.15
		CM 10-4	6.35
		CM 10-5	4.15
		CM 15-2	4.15
		CM 15-3	6.35
		CM 25-2	6.35

### Vertical pumps (for MX mode)

#### For 50 Hz installations

Phases	Volts	Dosing booster	FertiKit's total power consumption (kW)
3	220-240/ 380-415	CRI 5-12	1.73
		CRI 5-12 high pressure	2.35
		CRI 10-8	3.35
		CRI 10-10 high pressure	2.35
		CRI 15-5	3.35
		CRI 15-7 high pressure	3.35
		CRI 20-5	4.15

#### For 60 Hz installations

Phases	Volts	Dosing booster	FertiKit's total power consumption (kW)
3	220-277/ 380-480	CRI 5-7 60Hz	2.35
		CRI 5-11 high pressure	3.15
		CRI 10-5	3.15
		CRI 10-6 high pressure	4.15
		CRI 15-3	4.15
		CRI 15-4 high pressure	5.65
		CRI 20-3 high pressure	5.65

## → EC/pH CONTROL

In case of flow variations, the EC/pH control set enables the controller to perform precise fertilizer/acid optimization.

### **The EC/pH transmitter**

- Compatible with the GrowSphere™ MAX controller
  - Selectable in the FertiKit™ online configurator at <https://cmtconfig.netafim.com>
  - For further details, contact Netafim™.

## → CONTROLLER

**The FertiKit™ controlled by the GrowSphere™ MAX controller offers many useful functions.**

**It is the affordable option for:**

- Small applications.
- Mid-range to large applications.
- A perfect solution for mid-range to large applications where a single controller controls multiple dosing units, multiple main lines or water meters.
- The GrowSphere™ MAX offers many additional options (contact Netafim™).
- In cases where the FertiKit™ is to be connected to another type of controller, contact Netafim™.



### **ATTENTION**

Many parameters should be considered in selecting a GrowSphere™ MAX controller configuration for the FertiKit™, depending on various factors such as, operating method, size of the field, number of valves, distance from the controller and many more.

A comprehensive discussion on selecting a controller is beyond the scope of this document.

See the GrowSphere™ MAX controllers documentation (contact your Netafim™ local representative).

### **Controller languages**

English, French, Spanish, Italian, Chinese, Korean, Hebrew, Turkish & Portuguese

## Controller features

Below are listed the basic features of the GrowSphere™ MAX controller, for a full list of the controller's features see the GrowSphere™ MAX controller literature (contact your Netafim™ local representative).

Feature	GrowSphere™ MAX
Digital outputs, 24 VAC	102
Irrigation programs	10
External condition programs	-
ET (evapo-transpiration) trigger for irrigation	-
Maximum number of valves in the system	up to 256
Maximum number of valves running simultaneously	up to 256
Maximum number of dosing programs running in parallel	40-10 per ML
Type of output, 24 VAC	Relay/triac
Dry contact outputs	Yes
Number of digital inputs	up to 256
Number of analog inputs	up to 256
RadioNet valve control (RTU)	Yes
SingleNet valve control (RTU)	Yes
Misting program by time	-
Cooling program by temperature/humidity	-
Maximum number of supply pumps	4
Maximum number of main lines	4
Master flow meters	4
Auxiliary flow meters	-
Fertilizer flow meters	32
(not simultaneously)	
Master flow meters	4
Auxiliary flow meters	-
Fertilizer flow meters	32
Control by pressure transmitter	yes
Filter flushing - number of filters	32x4
Fertilizer programs	40
water source	4
Tanks management	-
Mixing Valve	-
Agitator	-
water heating	-

## General guidelines to help you select a controller

Select the basic configuration of the controller according to the number of AC outputs required to control all AC irrigation valves and local devices (the FertiKit's internal devices - dosing channels and dosing booster, and the local devices in the pump house - filter flushing, main line pumps, main line valves, etc.).

The controller can be selected in the controller online configurator at <https://cmtconfig.netafim.com> (for further details, contact Netafim™).

## Select the connectivity to remote units

If there are **DC latch** irrigation valves, select the connectivity type according to the type of the remote units (**SingleNet** or **RadioNet**) that accommodates the number of remote units (up to 128 or up to 256).

- **DC latch** is the operating principle of activating at a distance an hydraulic valve equipped with a solenoid.
- **SingleNet** is a remote operation method to open/close DC latch valves via a 2-wire cable.
- **RadioNet** is a remote operation method to open/close DC latch valves via wireless transmission (radio frequency).

## Select the PC communication



### NOTE

The controllers can be connected to a control program on a PC (for further details, contact your Netafim™ local representative).

### **Wired, wireless or both. The PC communication offers many convenient features:**

- Enables remote access for service and consultation.
- Enables data logging.
- Enables “push” notifications.
- Presents color graphs of the system activity history.
- Comfortable and intuitive graphic interface.

## Additional controller accessories

- Power line protector
  - Weather station
    - Temperature and humidity measuring box
    - Radiation sensor
  - Field sensors (monitoring)
- For further details, contact your Netafim™ local representative.

# INSTALLATION REQUIREMENTS

## → INFRASTRUCTURE

**Each FertiKit™ mode requires a slightly different infrastructure.**

The [Typical installation overview](#) on page 6 represents the typical infrastructure suitable for the **PL** mode.

The infrastructure for other modes is slightly different.

For the specific infrastructure required for the installation of each mode, see the schematic diagrams in the [Selecting a FertiKit™](#) chapter, page 7).

- In all the modes the distance between the inlet and the outlet of the FertiKit™ on the main line should be minimum 2 meters to allow better fertilizer mixing on the main line.
- Sufficient space should be available between the fertilizer/acid tanks and the FertiKit™ to allow inspection and maintenance operations.
- In **PD** mode, the pressure on the main line upstream from the PRV should be at least twice the pressure downstream from the PRV.
- In **PL** mode, the pressure on the main line should be minimum 2.5 bars

### Infrastructure installation items

Item	Specifications
13 Fertilizer/acid stock tank	Between 1 and 6 fertilizer/acid solution stock tanks
14 Manual valve (fertilizer)	A manual ball valve on each fertilizer/acid line at the stock tank outlet
15 Fertilizer/acid filter	≤ 130 μm (≥ 120 mesh)
16 Manual valve (isolation)	To be installed at the inlet and at the outlet of the FertiKit™, for use during system maintenance.
17 Main line pressure sustaining valve (PSV)	To be installed on the main line downstream from the FertiKit™ and able to sustain a constant pressure at the outlet of the FertiKit™, regardless of pressure changes in the field. Should be calibrated to 3-4 bars (43-58 PSI) for most projects.
18 Irrigation valve	Controllable
19 Water meter	With electrical pulses. The pulse should be as short as possible according to the main line diameter and the controller's limitations (See <a href="#">Flow meter recommended pulse rate</a> , page 25.)
20 Main line filter	≤ 130 μm (≥ 120 mesh)
21 Main line pump	Suitable for the required pressure and flow rate according to the mode of the FertiKit™ and the field requirements (Ensure stable pressure).
22 Main line pressure reducing valve (PRV)	In the <b>PL</b> , <b>PB</b> or <b>MX</b> mode - Should be installed on the main line, between the main line filters and the water meter and be able to reduce the main line pressure as specified for <b>PL</b> , <b>PB</b> or <b>MX</b> modes (pages 7/8/14). In <b>PD</b> mode only - Should be installed on the main line, between the inlet and the outlet of the FertiKit™ and be able to reduce the main line pressure as specified for the <b>PD</b> mode (page 13).
23 Sampling outlet	In <b>PD</b> mode only - Should be installed on the main line, downstream from the FertiKit's outlet (in all other modes the sampling outlet is built-in).
24 Saddle fitting	In <b>PD</b> mode only - Should be installed on the main line, downstream from the FertiKit's outlet, equipped with an outlet suitable for the EC/pH sampling tube.
25 Command tube	In <b>PD</b> mode only - Should connect the saddle fitting to the EC/pH sampling tube.



## Flow meter recommended pulse rate for the GrowSphere™ MAX controller

Flow rate m <sup>3</sup> /h	Flow meter output l/pulse	Flow rate GPM	Flow meter output US gal/pulse
Up to 6	1	Up to 88	1
6 - 60	10	88 - 1000	10
60 - 600	100	1000 - 4500	100

### → ELECTRICAL INSTALLATION

An electrical mains installation including a circuit breaker, complying with the local safety standards and regulations should be supplied in accordance with the FertiKit's power consumption requirements.

#### FertiKit's power consumption (kW)

- All FertiKit™ configurations without a dosing booster (**PD** or **MS** modes) consume under 150 W.
- In **PL, PB, IL, ST, SP** or **MX** modes, the FertiKit's total power consumption depends mainly on the consumption of the dosing booster (see [Dosing boosters](#), page 20).

### → FLOW RATE STABILITY

To ensure flow rate stability, the consumption of the individual irrigation shifts should be as equal as possible. Each changeover between shifts with different consumption will result in consumption fluctuation that will affect the EC and pH stability. **The consumption of the smallest shift should not be less than 75% of the consumption of the largest shift.**

### → SOURCE WATER

- The water entering the FertiKit™ 5G should be within a temperature range of 10°C and 35°C (50°F and 95°F).
- The source water to the FertiKit™ 5G should be of a satisfactory chemical quality. If water pre-treatment is required, apply chemical conditioning before the water reaches the FertiKit™ 5G.

#### Source water quality (High bicarbonate levels)

FertiKit™ 5G is specially designed for Fertigation™ in the medium tech sector, using a substrate of high water retention or/and volume, the pulse duration is 3-5 min, so source water with a bicarbonate (HCO<sub>3</sub>) content of up to 4 meq/l can be used in the FertiKit™ 5G without acid pre-treatment.

Adding high concentration of fertilizers to water with a high bicarbonate (HCO<sub>3</sub>) content may create low-solubility salts in the solution, that reduces Fertigation™ efficiency and may cause clogging of filters and drippers. This is why it is recommended not to use water with bicarbonate (HCO<sub>3</sub>) content higher than 4 meq/l.

When the bicarbonate (HCO<sub>3</sub>) content is higher than the required level, a pre-acidification of the source water is recommended. In this process the incoming water is brought to a mild acid pH level of approx. 6.0 prior to its storage in a day-storage tank. This process can be performed by an additional FertiKit™ fitted with the appropriate features (Contact Netafim™). The acid applied will neutralize the bicarbonate (HCO<sub>3</sub>) in the storage tank by means of a chemical reaction and the carbon dioxide (CO<sub>2</sub>) will be released from the source water. Aerating or spraying the acidified water to the storage tank will improve the discharge of CO<sub>2</sub>, accelerating the neutralization process.

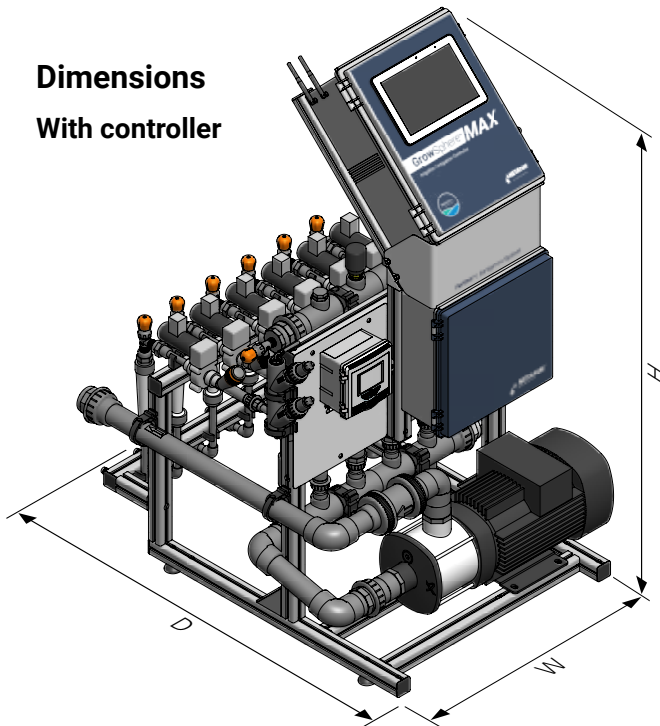


#### NOTE

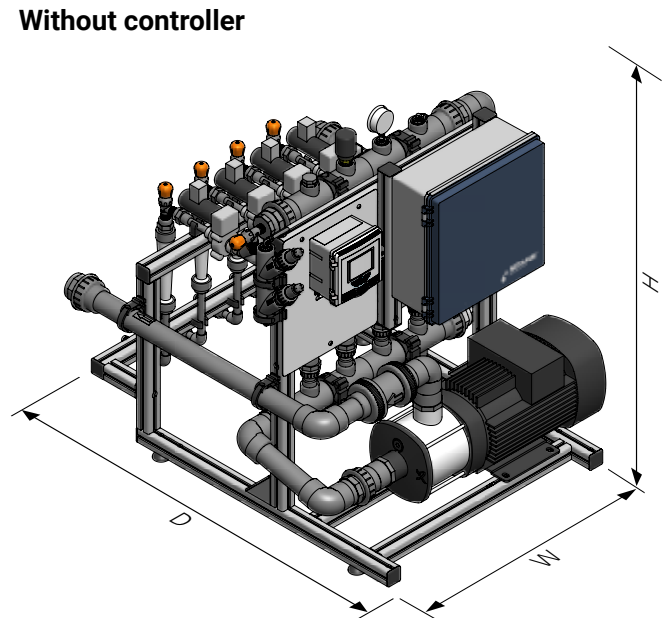
A full analysis of the water is recommended. In case of doubt, consult a Netafim™ expert.

# DIMENSIONS AND WEIGHTS

→ ALL MODES EXCEPT MX



**Dimensions**  
**With controller**



**Without controller**

Configuration	FertiKit™ external dimensions (W/D/H*)	Package dimensions (W/D/H**)
Without controller	84/103/92 cm (33/40.5/36")	103/117/100 cm (40.5/46/39.5")
With controller	84/103/134.5 cm (33/40.5/53")	103/117/154 cm (40.5/46/60.5")

\*The height varies by  $\pm 1$  cm ( $\pm 0.5$ "  
according to the adjustment of the legs.

\*\*The package height includes the  
pallet height of 15 cm (6").

## Weights

### FertiKit™ with dosing booster

Controller	Matrix 5		CM5		CM15	
	Net weight Kg (lbs.)	Packed weight Kg (lbs.)	Net weight Kg (lbs.)	Packed weight Kg (lbs.)	Net weight Kg (lbs.)	Packed weight Kg (lbs.)
Without	60 (132)	85 (187)	73 (161)	98 (216)	100 (220)	125 (276)
With	72 (159)	100 (220)	85 (187)	113 (249)	113 (249)	140 (308)

For the weight of FertiKit™ units with other dosing boosters, contact Netafim™.

### FertiKit™ without dosing booster

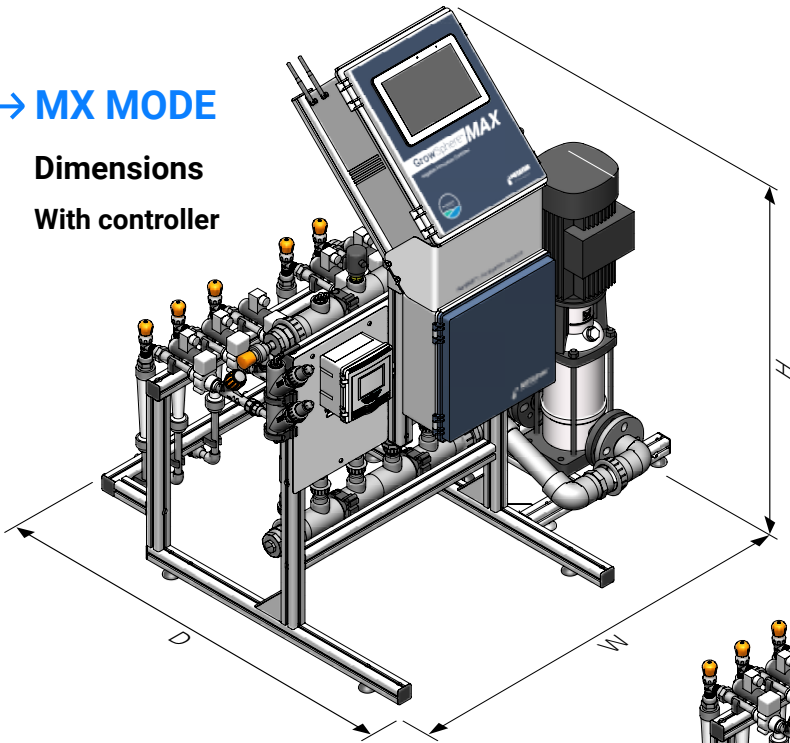
Controller	Net weight Kg (lbs.)	Packed weight Kg (lbs.)
Without	43 (95)	68 (150)
With	55 (121)	83 (183)

The weights in the tables above are order of magnitude only - final data are issued with the product order.

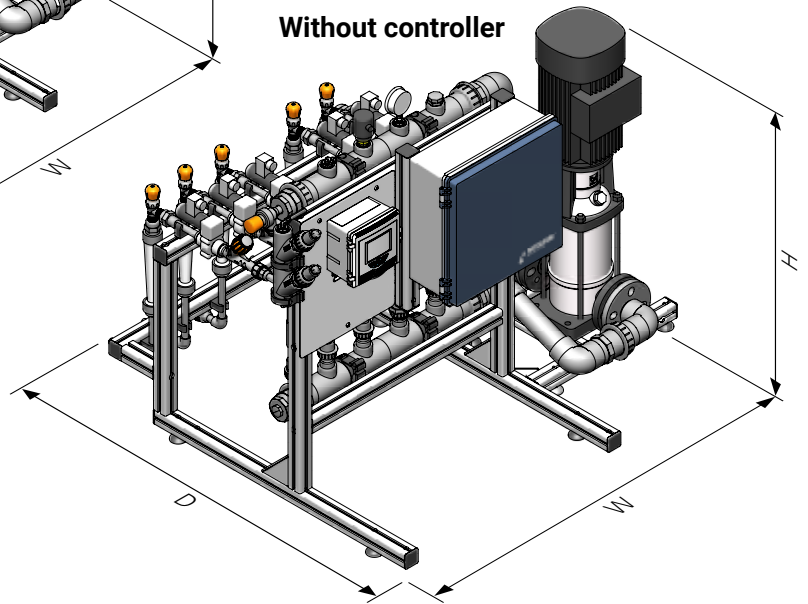
→ MX MODE

**Dimensions**

**With controller**



**Without controller**



Configuration	FertiKit™ external dimensions (W/D/H*)	Package dimensions (W/D/H**)
Without controller	119/97/105 cm (47/38/42")	131/112/158 cm (52/44/62")
With controller	119/97/131 cm (47/38/52")	131/112/158 cm (52/44/62")

\*The height varies by ±1 cm (±0.5") according to the adjustment of the legs.

\*\*The package height includes the pallet height of 15 cm (6").

**Weights**

**FertiKit™ with dosing booster**

Controller	CR5		CR10		CR15		CR20	
	Net weight Kg (lbs.)	Packed weight Kg (lbs.)	Net weight Kg (lbs.)	Packed weight Kg (lbs.)	Net weight Kg (lbs.)	Packed weight Kg (lbs.)	Net weight Kg (lbs.)	Packed weight Kg (lbs.)
Without	81 (179)	131 (289)	102 (225)	152 (335)	124 (273)	174 (384)	144 (317)	194 (428)
With	93 (205)	143 (315)	114 (251)	165 (361)	136 (299)	186 (410)	156 (344)	206(408)

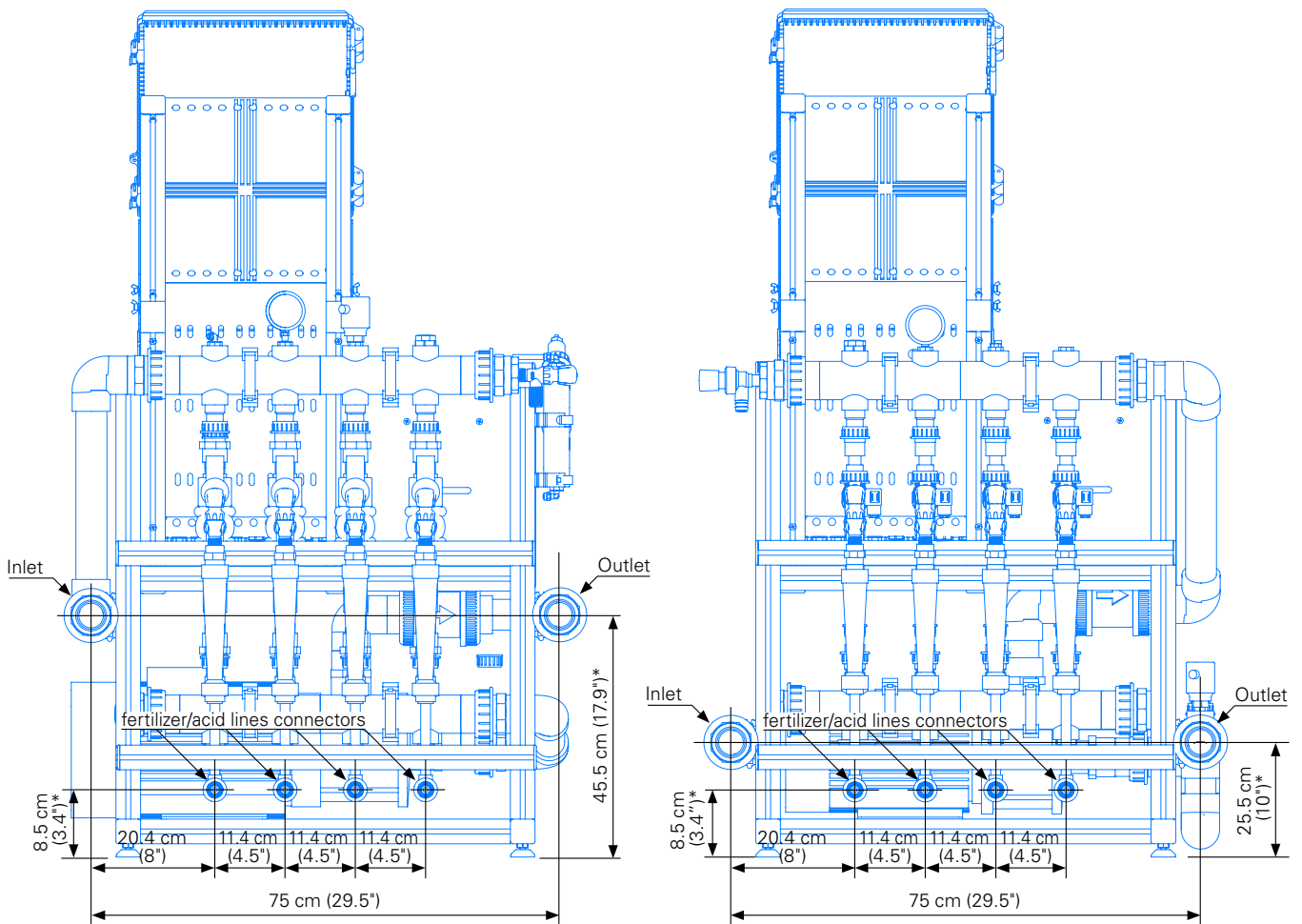
For the weight of FertiKit™ units with other dosing boosters, contact Netafim™.

The weights in the tables above are order of magnitude only - final data are issued with the product order.

## → LOCATION OF INLET, OUTLET AND FERTILIZER/ACID LINE CONNECTORS

All modes except PB, SP and MX

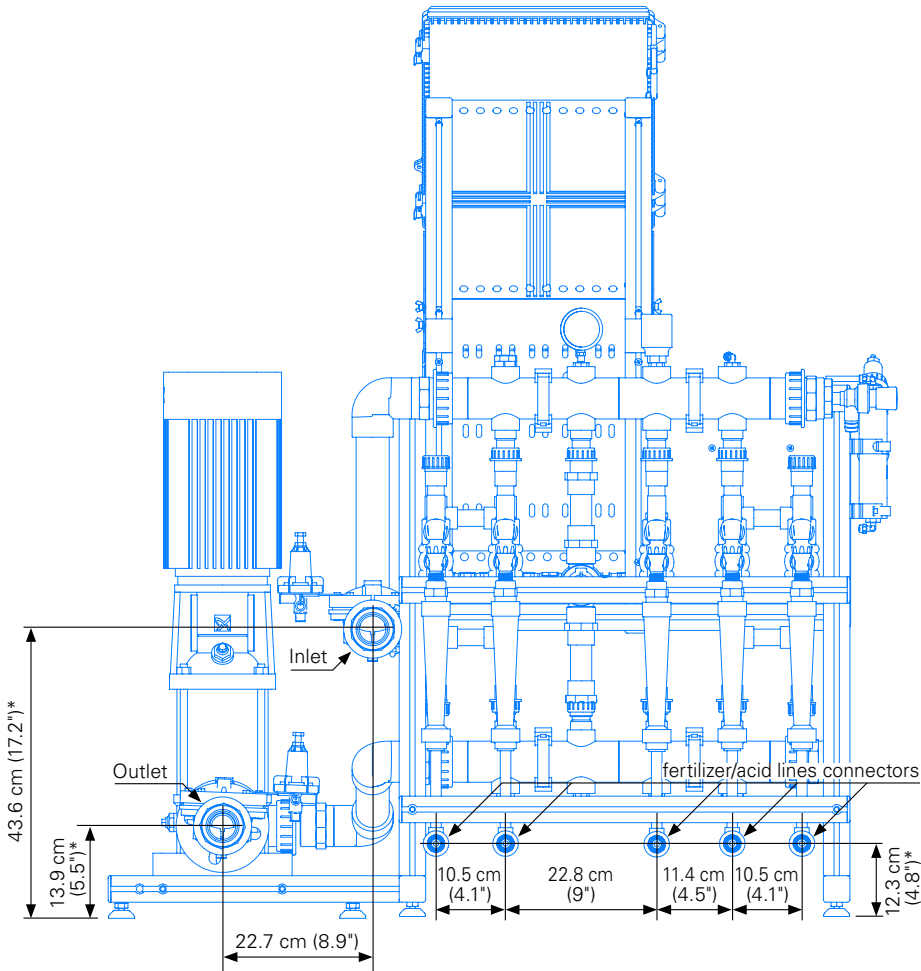
PB mode (SP mode\*\*)



\*The height varies by  $\pm 1$  cm ( $\pm 0.5$ " ) according to the adjustment of the legs.

\*\*The **SP** mode is equipped with a separate outlet for each dosing channel (see [page 9](#))

## MX mode



\*The height varies by  $\pm 1$  cm ( $\pm 0.5$ " ) according to the adjustment of the legs.

### → INLET AND OUTLET CONNECTION TYPES

Fittings (interchangeable)	Diameter
PVC, adaptor union - glue connector (installed)	50 mm
PVC, BSP or NPT nipple - male thread connector (supplied)	1.5"

### → FERTILIZER AND ACID LINE CONNECTION TYPES

Fittings (interchangeable)	Diameter
PVC, hose nozzle insert connector (installed)	16 mm
PVC, nipple - male thread connector (supplied)	1/2"
PVC, half union - female thread connector (supplied)	3/4"

# SAFETY AND WARRANTY

## → SAFETY

- **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 should be performed by an authorized electrician only.
- The electrical installation must comply with the local safety standards and regulations.
- Installation should be performed by authorized technicians only.
- Protection provided by the equipment can be impaired if the equipment is used in a manner other than that specified by the manufacturer.



### **ACID HAZARD**

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



### **PROTECTIVE EQUIPMENT**

Always use protective equipment, gloves and goggles when handling fertilizers, acid and other chemicals!



### **WARNING**

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



### **NOTE**

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

## → 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 considered perishable items. 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.



### **NOTE**

When not installed, the pH sensor must be immersed in KCL solution (pH ≈ 4.0) at all time, protected from freezing and not be exposed to pressure greater than 6 bars (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™ local representative.

### **Limited Warranty**

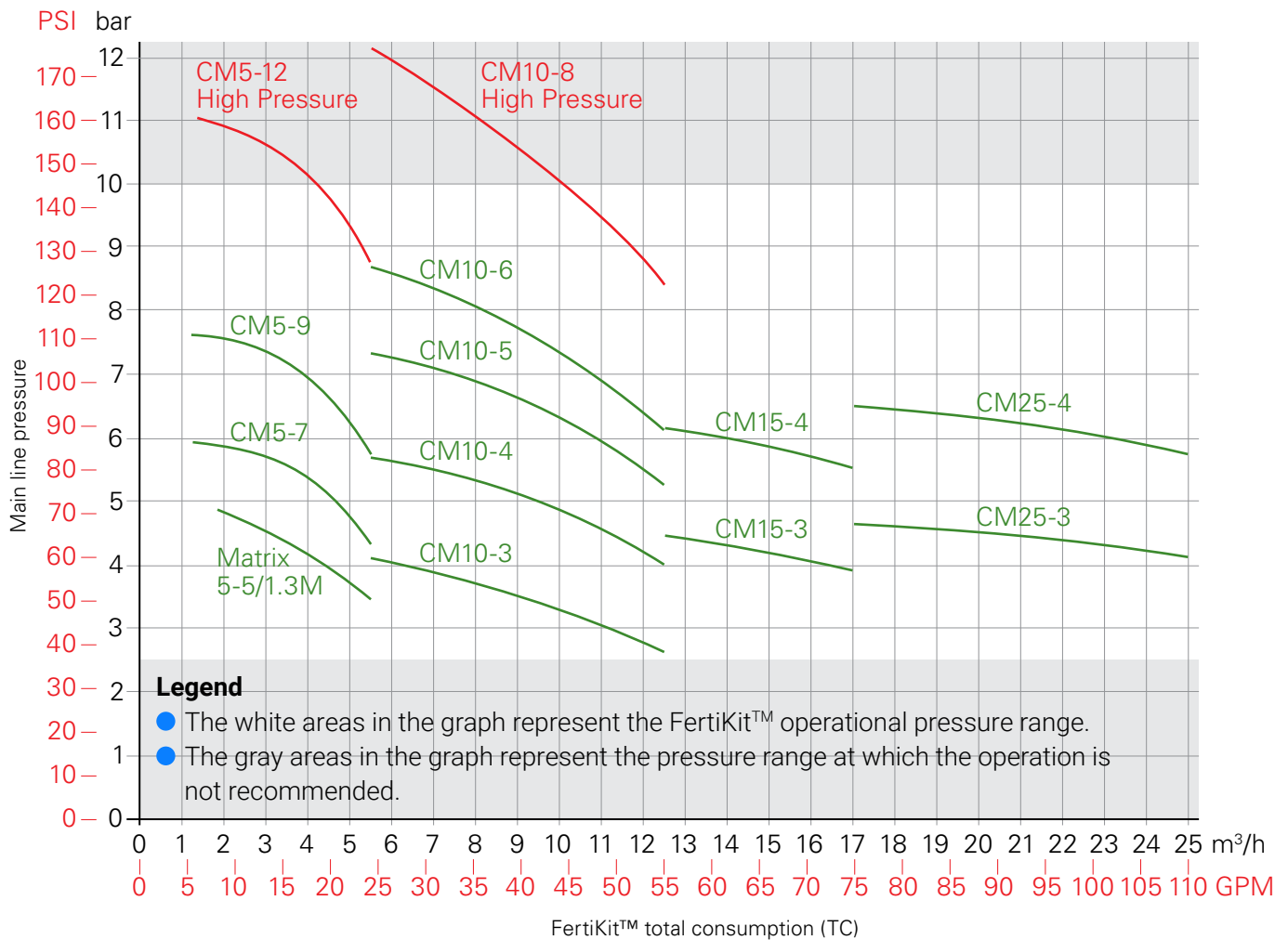
This warranty is subject to the conditions in Netafim's official warranty statement.

(For the full text of Netafim's official warranty statement, contact your Netafim™ local representative).

# APPENDIX 1

## → FERTIKIT™ PERFORMANCE CURVES FOR SELECTION OF THE DOSING BOOSTER

PL (PL/PS/PR/RL)\*, PB, SP and IL modes, 50 Hz



\* When selecting the dosing booster for the PL mode, see the data on [page 7](#).



### NOTE

The curves above represent the performance of the FertiKit™ and thus are different from the performance curves presented in the literature issued by the pump manufacturers.

### Typical consumption of Venturis

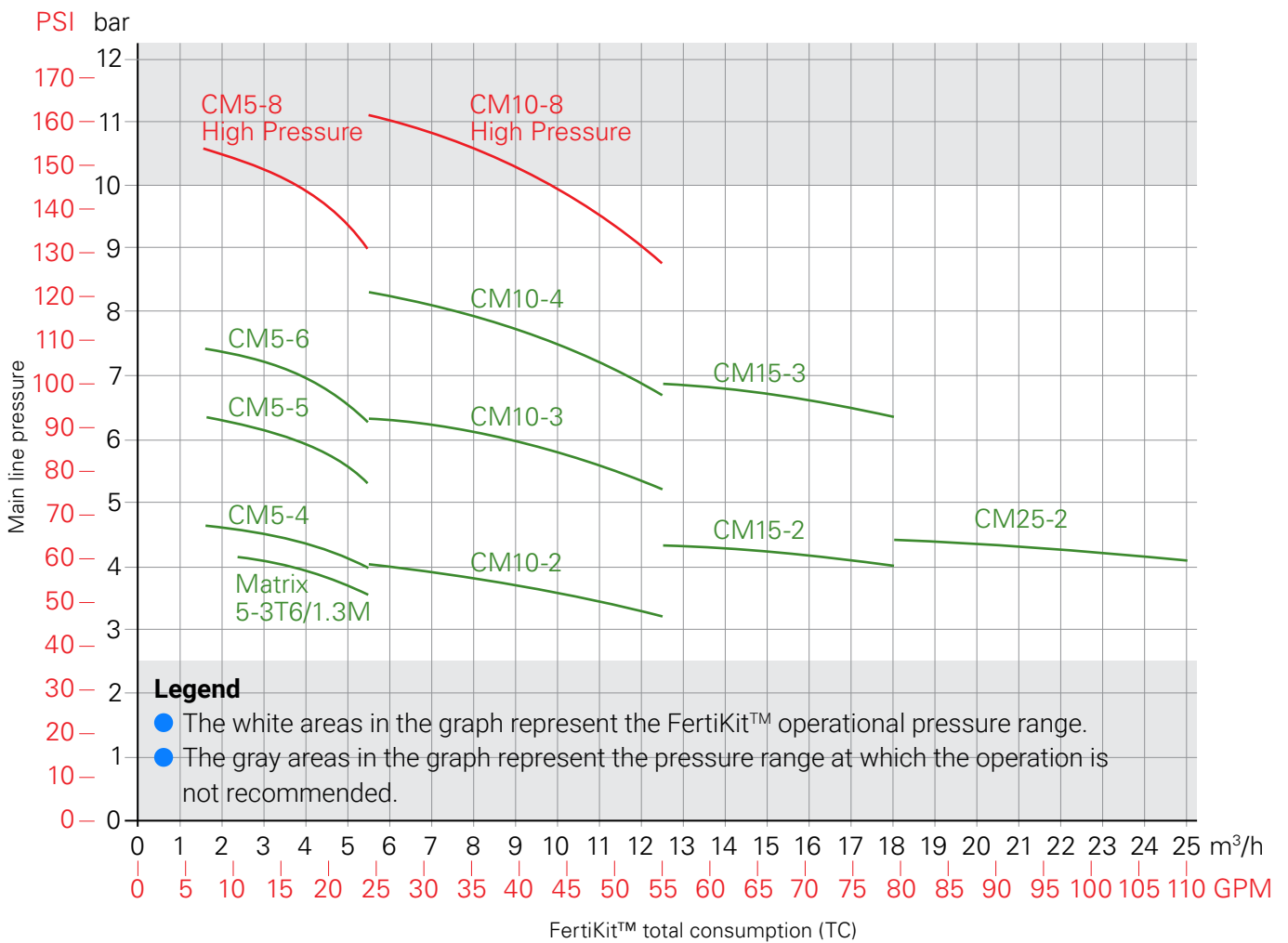
A complete line of Venturis is available to accommodate various flow rates of fertilizer or acid.

Venturi	Applicable for mode	Nominal suction flow l/h (GPH)	Typical consumption** - m³/h (GPM) (at pressure up to 5 bars)
PVDF - M050	Any mode	50 (13)	1.0 (4.4)
PP - N150	Any mode	150 (40)	1.2 (5.3)
PP - M370	SP/PB/PD	370 (98)	4.0 (17.5)
PVC - N600	PL/MS/MX	600 (158)	1.2 (5.3)
PVC - N1000	PL/MS/MX	1000 (265)	4.0 (17.5)

\*\* Consumption = the flow of water that needs to pass through the Venturi to enable nominal suction. See [Compute the FertiKit™ total consumption \(TC\)](#), page 18.



## PL (PL/PS/PR/RL)\*, PB, SP and IL modes, 60 Hz



\* When selecting the dosing booster for the PL mode, see the data on [page 7](#).



### NOTE

The curves above represent the performance of the FertiKit™ and thus are different from the performance curves presented in the literature issued by the pump manufacturers.

### Typical consumption of Venturis

A complete line of Venturis is available to accommodate various flow rates of fertilizer or acid.

Venturi	Applicable for mode	Nominal suction flow l/h (GPH)	Typical consumption** - m <sup>3</sup> /h (GPM) (at pressure up to 5 bars)
PVDF - M050	Any mode	50 (13)	1.0 (4.4)
PP - N150	Any mode	150 (40)	1.2 (5.3)
PP - M370	SP/PB/PD	370 (98)	4.0 (17.5)
PVC - N600	PL/MS/MX	600 (158)	1.2 (5.3)
PVC - N1000	PL/MS/MX	1000 (265)	4.0 (17.5)

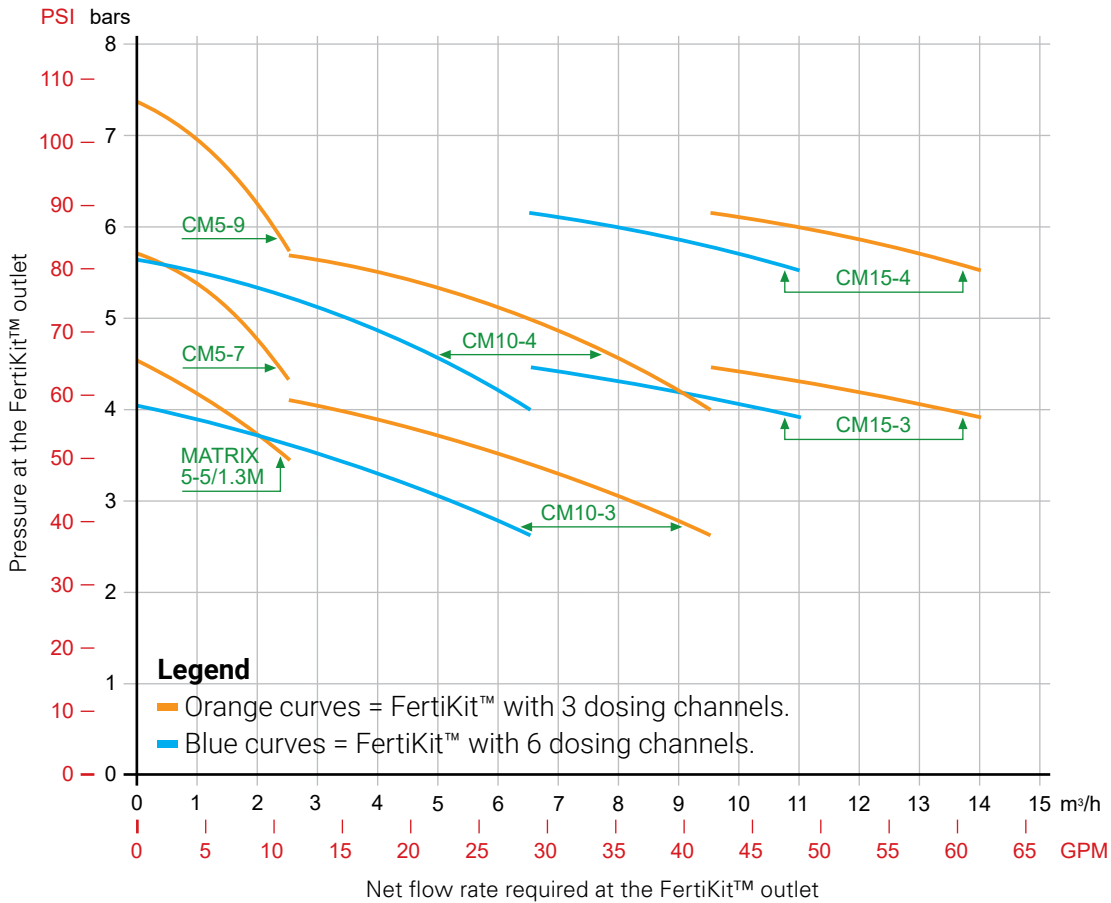


### NOTE

Add 3 m<sup>3</sup>/h (13.2 GPM) for the consumption of the compensation channel.

\*\* Consumption = the flow of water that needs to pass through the Venturi to enable nominal suction. See [Compute the FertiKit™ total consumption \(TC\)](#), page 18.

## ST mode\*, 50 Hz



\* When selecting the dosing booster for the ST mode, see the data on [page 12](#).



### NOTE

The curves above represent the performance of the FertiKit™ and thus are different from the performance curves presented in the literature issued by the pump manufacturers.

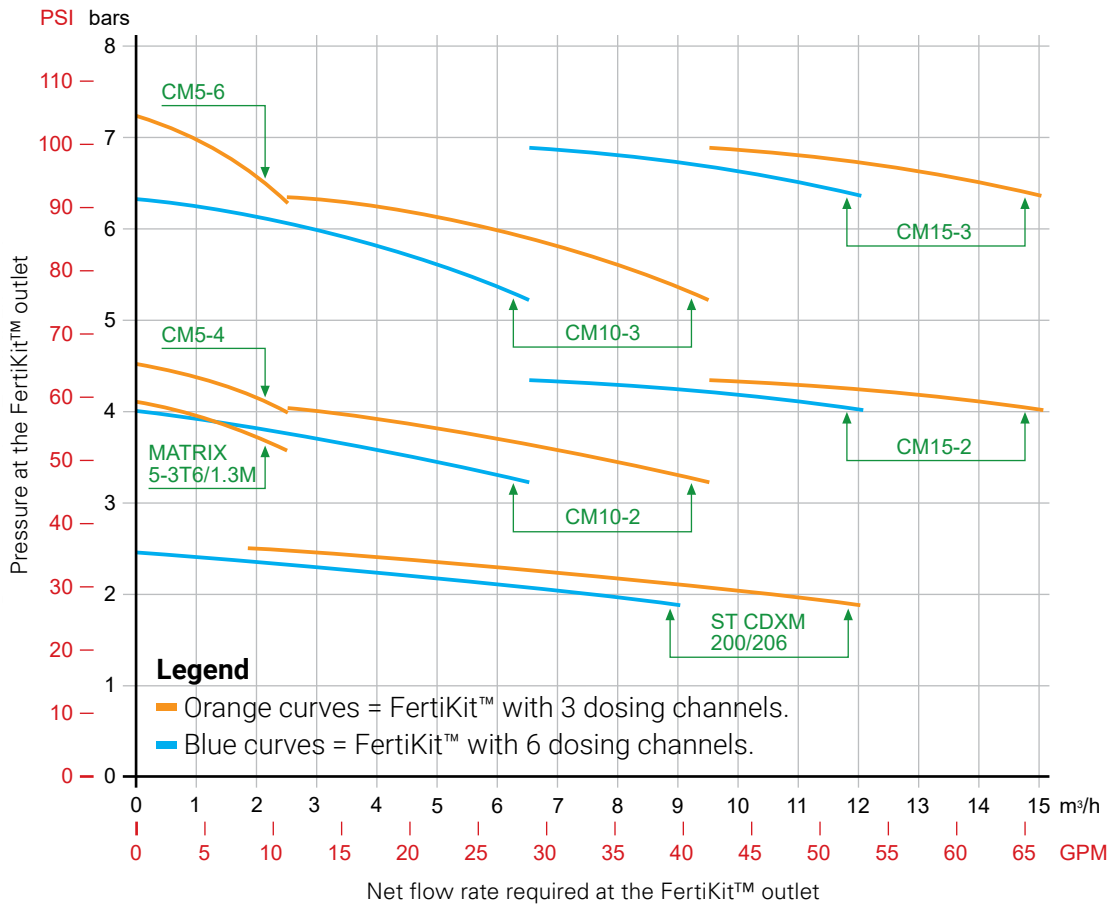
### Venturis

A complete line of Venturis is available to accommodate various flow rates of fertilizer or acid.

In the ST mode the typical consumption of the Venturi of each dosing channel is 1.0 m³/h (4.4 GPM).

Venturi	Nominal suction flow l/h (GPH)
PVDF - M050	50 (13)
PP - N150	150 (40)
PVC - N600	600 (158)

## ST mode\*, 60 Hz



\* When selecting the dosing booster for the ST mode, see the data on [page 12](#).



### NOTE

The curves above represent the performance of the FertiKit™ and thus are different from the performance curves presented in the literature issued by the pump manufacturers.

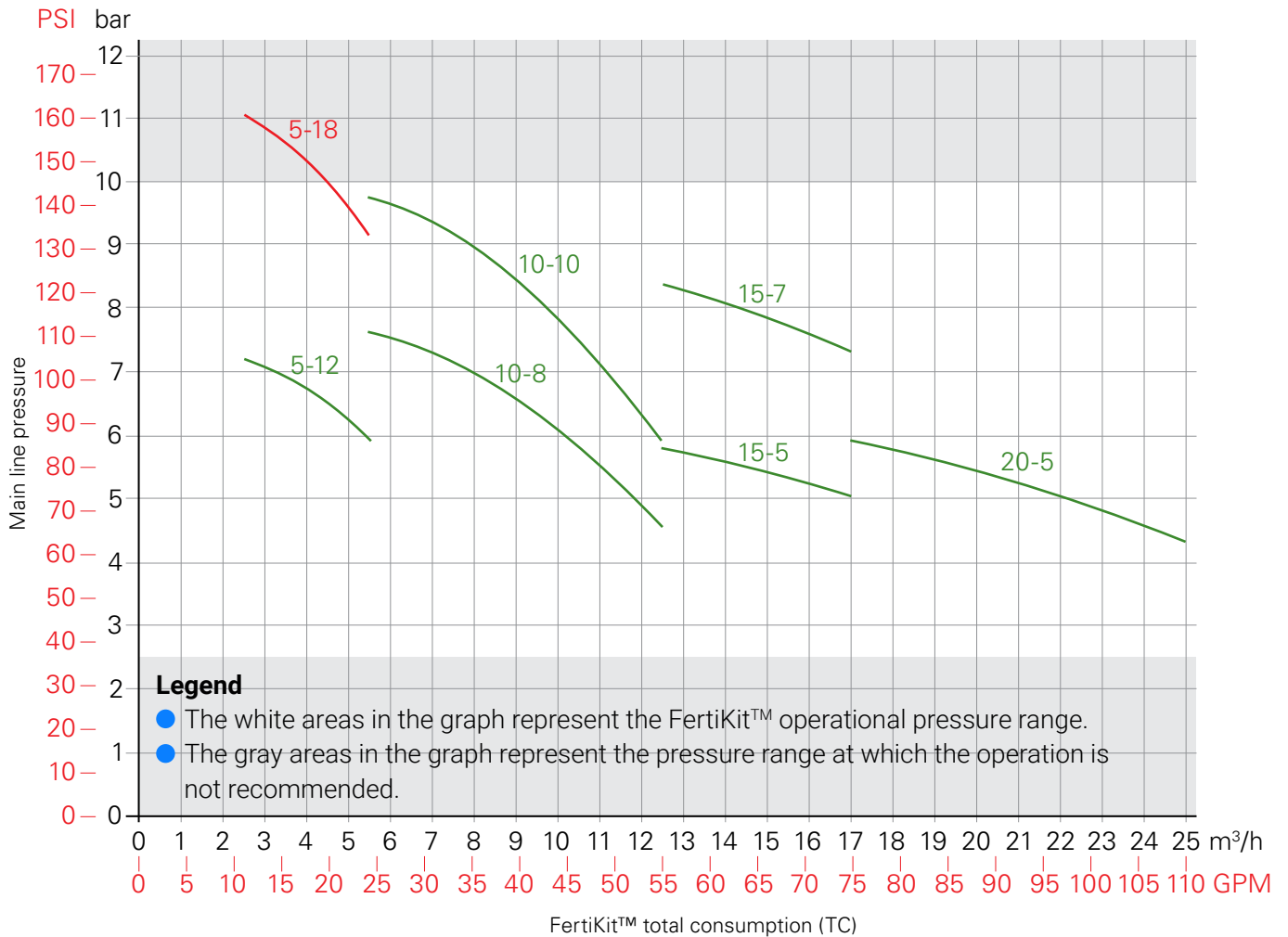
### Venturis

A complete line of Venturis is available to accommodate various flow rates of fertilizer or acid.

In the ST mode the typical consumption of the Venturi of each dosing channel is 1.0 m³/h (4.4 GPM).

Venturi	Nominal suction flow l/h (GPH)
PVDF - M050	50 (13)
PP - N150	150 (40)
PVC - N600	600 (158)

## MX mode, 50 Hz



\* When selecting the dosing booster for the MX mode, see the data on [page 14](#).



### NOTE

The curves above represent the performance of the FertiKit™ and thus are different from the performance curves presented in the literature issued by the pump manufacturers.

### Typical consumption of Venturis

A complete line of Venturis is available to accommodate various flow rates of fertilizer or acid.

Venturi	Applicable for mode	Nominal suction flow l/h (GPH)	Typical consumption** - m³/h (GPM) (at pressure up to 5 bars)
PVDF - M050	Any mode	50 (13)	1.0 (4.4)
PP - N150	Any mode	150 (40)	1.2 (5.3)
PP - M370	SP/PB/PD	370 (98)	4.0 (17.5)
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PVC - N1000	PL/MS/MX	1000 (265)	4.0 (17.5)

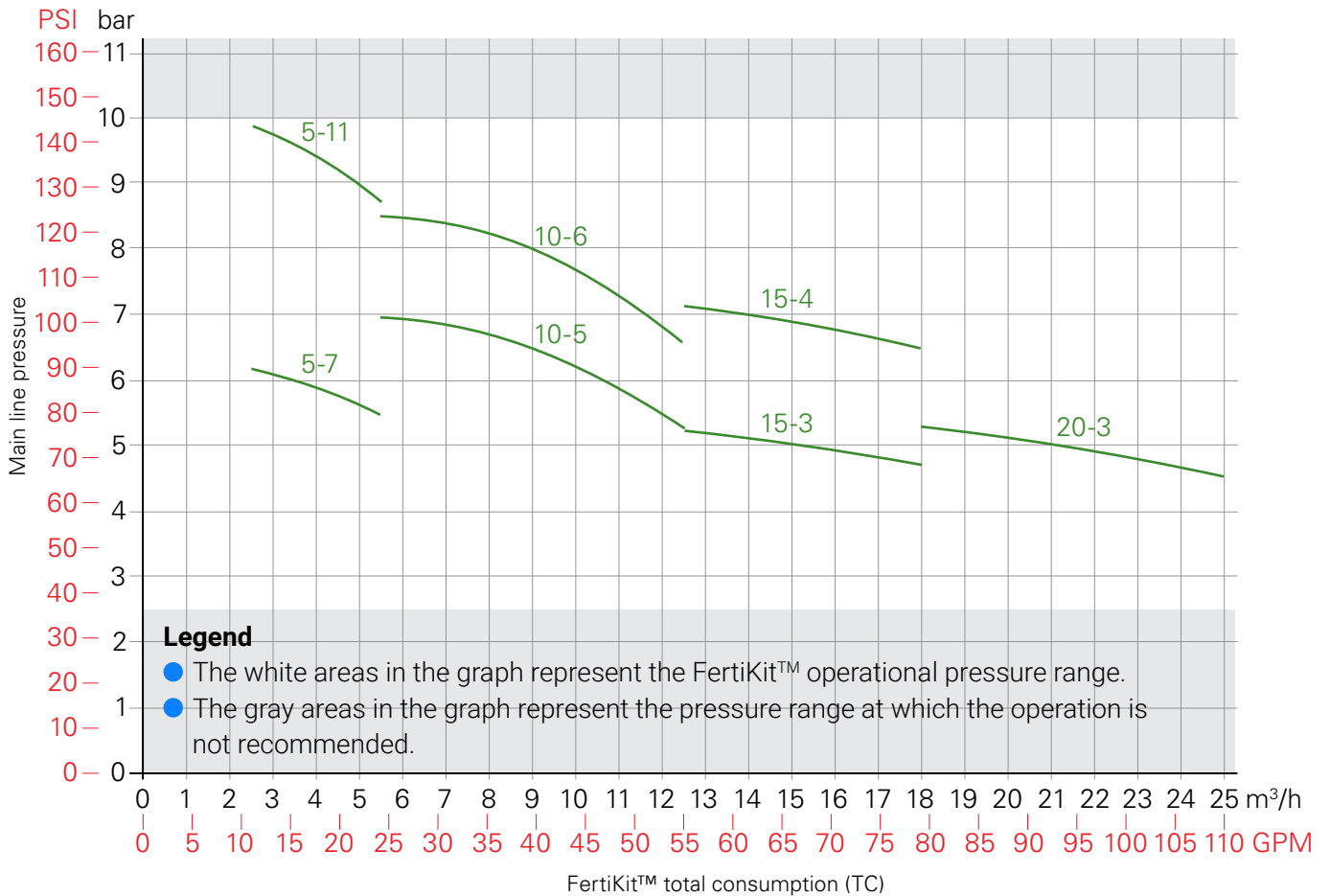


### NOTE

Add 3 m³/h (13.2 GPM) for the consumption of the compensation channel.

\*\* Consumption = the flow of water that needs to pass through the Venturi to enable nominal suction. See [Compute the FertiKit™ total consumption \(TC\)](#), page 18.

## MX mode, 60 Hz



\* When selecting the dosing booster for the MX mode, see the data on [page 14](#).



### NOTE

The curves above represent the performance of the FertiKit™ and thus are different from the performance curves presented in the literature issued by the pump manufacturers.

### Typical consumption of Venturis

A complete line of Venturis is available to accommodate various flow rates of fertilizer or acid.

Venturi	Applicable for mode	Nominal suction flow l/h (GPH)	Typical consumption** - m³/h (GPM) (at pressure up to 5 bars)
PVDF - M050	Any mode	50 (13)	1.0 (4.4)
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PP - M370	SP/PB/PD	370 (98)	4.0 (17.5)
PVC - N600	PL/MS/MX	600 (158)	1.2 (5.3)
PVC - N1000	PL/MS/MX	1000 (265)	4.0 (17.5)



### NOTE

Add 3 m³/h (13.2 GPM) for the consumption of the compensation channel.

\*\* Consumption = the flow of water that needs to pass through the Venturi to enable nominal suction.  
See [Compute the FertiKit™ total consumption \(TC\)](#), page 18.

# APPENDIX 2

## → ON-LINE CONFIGURATOR

To receive a quote or find the catalogue Number for a selected FertiKit™ configuration - after selecting the FertiKit™, go to <https://cmtconfig.netafim.com>.

### In the on-line configurator:

- Follow the instructions
- Send the resulting string to Netafim™.

### String example

**F5 PL -3 E 60 +1 D40 -50H 400 CM54 EH -22 G2 -256 -FM**

**A B C D E F G H I J K L M N O**



### ATTENTION

**Not every configuration of the FertiKit™ is practicable.**

Do not use the following List of configurator items to establish a FertiKit™ configuration. To avoid unpracticable configurations, always use the on-line configurator.

### List of configurator items

#### **A** FertiKit™ 5G

#### **B** Mode

Code	Description
PL	PL
PR	PL with PRV (for high pressure)
PS	PL with PSV (for low pressure)
RL	PL with PRV & PSV
PB	PB
MS	MS
RS	MS with PRV
IL	IL- (Inline up to 20 m/h)
PD	PD
SP	Split (USA & Peru)
STM	ST with manual filter
STS	ST with semi automatic filter

#### **C** Number of fertilizer channels

(Fertilizer only, excluding acid)

Code	Description
N/A	No Channel for fertilizer
-1	1 Channel for fertilizers
-2	2 Channels for fertilizers
-3	3 Channels for fertilizers
-4	4 Channels for fertilizers
-5	5 Channels for fertilizers
-6	6 Channels for fertilizers

#### **D** Dosing channel operator

Code	Description
N/A	No channel for fertilizer
E	Electric - standard. Baccara W/O manual override 8W
U	Electric (S12)
H	Hydraulic
M	Manual
CF	Electric - concentrated fertilizer. Baccara W/O manual override 8W, Viton

#### **E** Fertilizer channel flowrate

Code	Description
N/A	No channel for fertilizer
100	1000 l/h (4.0 m³/h per Channel. FIP S22)
60	600 l/h (1.2 m³/h per Channel)
40	400 l/h (1.2 m³/h per Channel)
37	370 l/h (1.2 m³/h per Channel)
15	150 l/h (1.2 m³/h per Channel)
05	50 l/h (1.0 m³/h per Channel)

#### **F** Number of acid channels

Code	Description
N/A	No channel for acid
+1	1 channel for acid
+2	2 channel for acid
+3	3 channel for acid
+4	4 channel for acid
+5	5 channel for acid
+6	6 channel for acid

## G Acid channel

Code	Description
D60	Diluted acid 600 l/h (1.2 m <sup>3</sup> /h per Channel)
D40	Diluted acid 400 l/h (1.2 m <sup>3</sup> /h per Channel)
D37	Diluted acid 370 l/h (1.2 m <sup>3</sup> /h per Channel)
D15	Diluted acid 150 l/h (1.2 m <sup>3</sup> /h per Channel)
D05	Diluted acid 50 l/h (1.0 m <sup>3</sup> /h per Channel)
SA05	Concentrated acid 50 l/h S12 (1.0 m <sup>3</sup> /h per Channel)
SA15	Concentrated acid 150 l/h S12 (1.0 m <sup>3</sup> /h per Channel)
CA05	Concentrated acid 50 l/h (Baccara. 1.0 m <sup>3</sup> /h per Channel)
CA15	Concentrated acid 150 l/h (Baccara. 1.2 m <sup>3</sup> /h per Channel)
N/A	No channel for acid

## H Frequency

Code	Description
-50H	50Hz
-60H	60Hz
N/A	No frequency (DC or manual)

## I Voltage

Code	Description
12VDC	12 VDC
24VAC	24VAC
400	3x400 - 440V (Europe, Africa, Middle East, Australia, India, China)
440	3x400 - 440V (USA, Mexico, Peru, Korea, Brazil)
220	3x220V (USA, Mexico, Central America, Colombia)
200	3x200V (Japan)
1X220	1x220V
1X110	1x110V
N/A	Manual

## J Pump type

Code	Description
CM54	Grundfos -CM5-4
CM55	Grundfos -CM5-5
CM56	Grundfos -CM5-6
CM57	Grundfos -CM5-7
CM58	Grundfos -CM5-8
CM59	Grundfos -CM5-9
CM512	Grundfos -CM5-12
CM102	Grundfos -CM10-2
CM103	Grundfos -CM10-3
CM104	Grundfos -CM10-4
CM105	Grundfos -CM10-5
CM106	Grundfos -CM10-6
CM108	Grundfos -CM10-8
CM152	Grundfos -CM15-2
CM153	Grundfos -CM15-3
CM154	Grundfos -CM15-4
CM254	Grundfos -CM25-4
CM252	Grundfos -CM25-2
CM253	Grundfos -CM25-3 50Hz
MTX55	Ebara Matrix 5-5T (Single phase)
MTX53	Ebara Matrix 5-3T (Single phase)
CD22	Ebara CDXM 200/206 60Hz
N/A	No pump

## K EC/pH measurement

Code	Description
EH	Single EC/pH
EC	Single EC
PH	Single pH
N/A	None

## L Number of outputs

Code	Description
-14	14 outputs 6 DO + 8 Triac
-30	30 outputs 6 DO + 8 Triac + 16 Relay
-46	46 outputs 6 DO + 8 Triac + 32 Relay
-62	62 outputs 6 DO + 8 Triac + 48 Relay
-78	78 outputs 6 DO + 8 Triac + 64 Relay
-94	94 outputs 6 DO + 8 Triac + 80 Relay
N/A	Without controller

## M Controller

Code	Description
G1	GS-MAX-Display 110V
G2	GS-MAX-Display 220V
G3	GS-MAX-Display+Double door 110V
G4	GS-MAX-Display+Double door 220V
G5	GS-MAX-No display 110V
G6	GS-MAX-No display 220V
G7	GS-MAX-Display+Double door 110V-USA
G8	GS-MAX-No display 110V-USA
-WOC	Without controller

## **N** Communication port

<b>Code</b>	<b>Description</b>
-SN2	Singlenet 256 (including host & SLSM)
-256	Radionet 256 (complete extenstion. Host & base)
N/A	None

## **O** Special configuration

<b>Code</b>	<b>Description</b>
N/A	None
-FM	Fertilizer meters - liters
-FG	Fertilizer meters - gallons



# APPENDIX 3

## → DOSING RATIO ESTIMATES



### WARNING

These are only estimates - for the exact fertilizer dosing ratio in a given project, consult an agronomist.

### Irrigation according to the water consumption of the crop

Crop	Dosing ratio per channel (l/m <sup>3</sup> ) (US gal/1000 US gal)	
------	--	--

Open Field	Type 1	Type 2
Carrot	1	2.5
Corn / Maize	2	5
Cotton	2	5
Flowers	3	5
Industrial tomato	1	2.5
Onion	2	5
Plantations (Tea, coffee, citrus, avocado, almonds, pecan nuts)	1	2.5
Potato	1	2.5
Sorghum	1	2.5
Sugar cane	1.5	3
Vegetables	3	5
Watermelon	1	2.5

Protected Crops (greenhouse)	
Vegetable in soil (A+B+acid)	5
Flowers in soil (A+B+acid)	5
Vegetable in soil (A+B+C+D+acid)	3.5
Flowers in soil (A+B+C+D+acid)	3.5
Vegetable in substrate	5
Flowers in substrate	5
Vegetable in substrate (High-Tech greenhouse - Multi-pulse**)	10
Flowers in substrate (High-Tech greenhouse - Multi-pulse**)	10

**Type 1:** Normal irrigation/nutrigation - Usually out of the rainy season, where a lower fertilizer dosing ratio is required.

**Type 2:** Technical Nutrigation - Usually during rainy seasons, where a small quantity of irrigation water is required for application of the fertilizer.

V 001.01 - NOVEMBER 2023



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