SMART Digital
DDA, DDC, DDE

Digital Dosing™

Contents

Mission

It is our mission — the basis of our existence — to successfully develop, produce and sell high-quality pumps and pumping systems world-wide, contributing to a better quality of life and a healthy environment

Bjerringbro, Denmark

Fresno, California

Olathe, Kansas

Monterrey, Mexico

Allentown, Pennsylvania

Oakville, Ontario

- World's leading pump company
- World's largest manufacturer of circulator pumps
- Second largest manufacturer of submersible motors in the world
- Global headquarters in Denmark
- North American headquarters in Kansas City - Manufacturing in Fresno, California
- 80 companies in 45 countries
- More than 16 million motors and pumps produced annually worldwide
- North American companies operating in USA, Canada and Mexico
- Continuous reinvestment in growth and development enables the company to **BE** responsible, **THINK** ahead, and **INNOVATE**

Introduction

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Fig. 1 DDA, DDC, DDE

Digital Dosing™

The SMART Digital generation DDA, DDC and DDE with powerful variable-speed stepper motor brings state-of-the-art technology to perfection, combining expert knowledge and patented dosing solutions. With Smart Digital Dosing, traditional adjustments such as stroke length / stroke frequency used on a synchronous motor or solenoid drives are now a thing of the past.

Features

Unique flexibility with only a few variants

The click-stop mounting plate makes the new pump more flexible. Three different positions are possible without using any additional accessories such as wall brackets. Service and pump exchange are now fast and easy simply by clicking the pump in and out of the mounting plate. The control cube on the DDA and DDC pump can be lifted and turned easily into three different positions: front, left or right.

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Fig. 2 Modularity of the control cube

A turn-down ratio of up to 3000:1, a wide supply voltage range (100-240 V; 50/60 Hz), combined connection sets and other features reduce the models and variants to a minimum.

Precise and easy setting / usability and interaction

The operator can easily install the pump and set it to pump exactly the quantity of dosing liquid required for the application. The pump flow setting is read directly on the display, and it is shown in gph, ml/h, or l/h.

The click wheel (turn-and-push knob) and the graphical LCD with plain-text menu in more than 20 languages make commissioning and operation intuitive. The LCD is backlit in different colors, so the pump status can be seen from a distance (traffic-light concept).

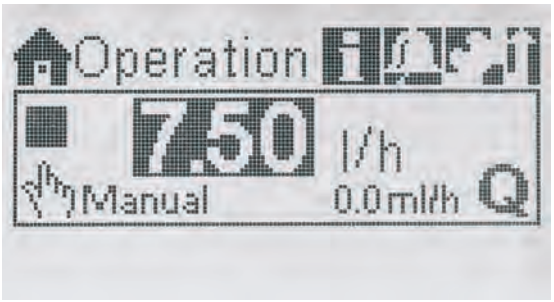

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Fig. 3 Display DDA, DDC

Thanks to a variety of operation modes, signal inputs and outputs, the pump can easily be integrated into various processes.

Advanced process reliability

An intelligent drive and microprocessor control ensures that dosing is performed precisely and with low pulsation, even if the pump is dosing high-viscosity or degassing liquids. Malfunctions — such as those caused by air bubbles — are detected quickly by the maintenance-free FlowControl system and then displayed in the alarm menu. The AutoFlowAdapt function automatically adjusts the pump according to the process conditions, such as varying backpressure. The integrated flow measurement makes additional monitoring and control equipment redundant.

Designed to save costs

In general, the initial investment in a dosing pump installation is low compared to its life cycle costs including the cost of the chemicals. These features minimize life cycle costs:

- No underdosing or overdosing due to high dosing accuracy and FlowControl
- Longer maintenance intervals thanks to the universal chemical resistance of the full-PTFE diaphragm
- Reduced energy consumption thanks to state-of-the-art drive technology.

Applications

There are three application-oriented type ranges: DDA, DDC, and DDE.

DDA

High-end pump models for extended flow and pressure ranges with sensor-based FlowControl and measurement functions for challenging industrial applications, such as:

- Process water
- food and beverage
- ultrafiltration and reverse osmosis
- pulp and paper
- boiler feed water
- CIP (Clean-In-Place).

DDC

User-friendly pump range with standard inputs and outputs for common applications, such as:

- Drinking water
- waste water
- swimming pool water
- cooling tower
- chemical industry.

DDE

Economical pump range with basic functions including manual operation or control via PLC for OEM applications, such as:

- Car wash
- irrigation
- well water.

Performance range

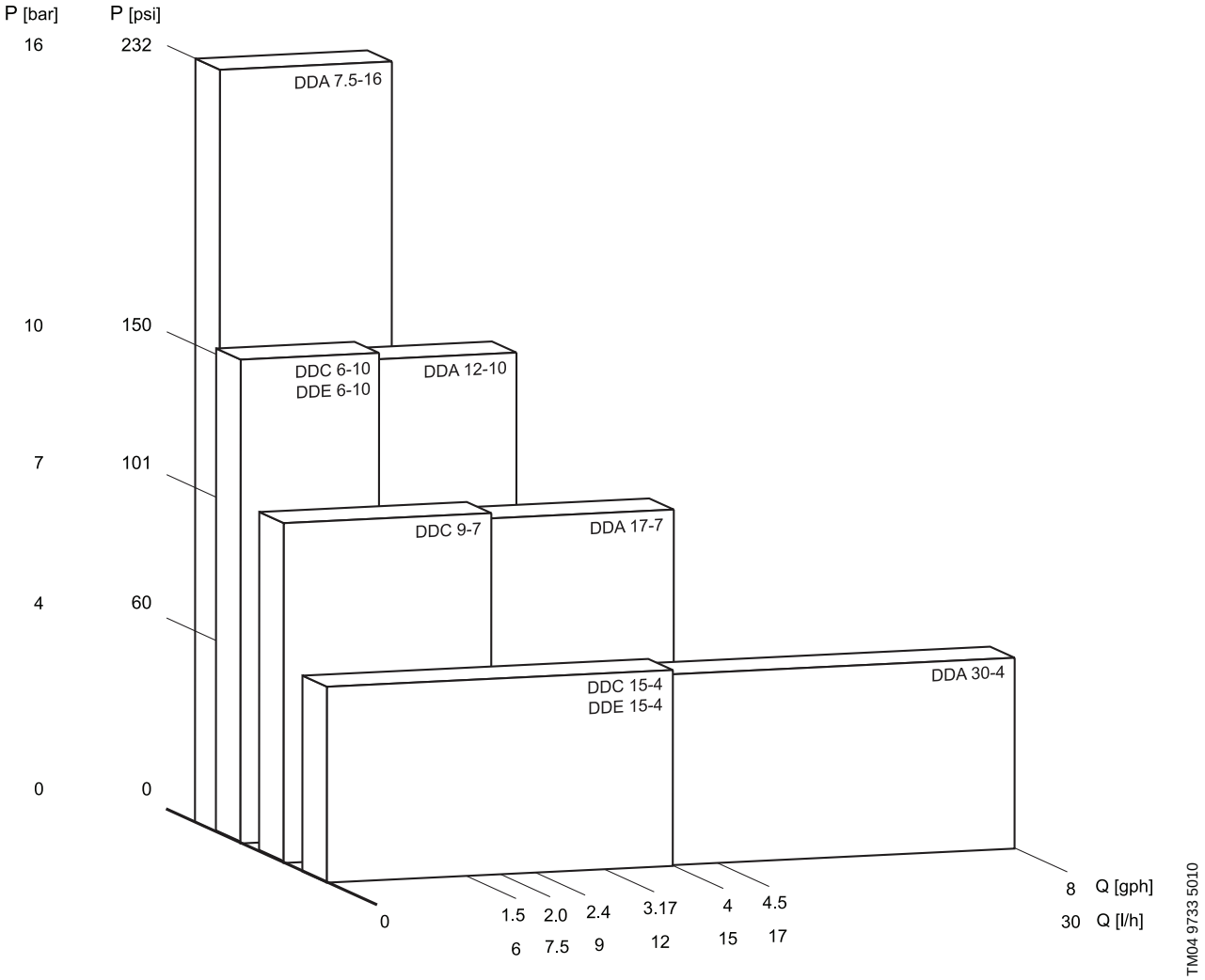

Fig. 1 Smart Digital performance range

Indentification

Type key

Example:	DDA	7.5-	16	AR-	PP	/V	/C	-F	-3	1	U2U2	F	G

Type range

DDE
DDC
DDA

Maximum flow (l/h)

Maximum pressure (bar)

Control variant

B	Basic (DDE)
P	B with pulse mode (DDE)
A	Standard (DDC)
AR	A with alarm relay and analog input
FC	AR with FlowControl (DDA)
FCM	FC with flow measurement (DDA)

Dosing head variant

PP	Polypropylene
PVC	Polyvinyl chloride**
PV	PVDF (polyvinylidene fluoride)
SS	Stainless steel (316L - 1.4401)

Gasket material

E	EPDM
V	FKM
T	PTFE

Valve ball material

C	Ceramic
SS	Stainless steel (316 - 1.4401)

Control cube position

F	Front-mounted (change to left and right possible)
X	No control cube (DDE)

Design

G	Grundfos Alldos

Mains plug

F	EU (Schuko)
B	USA, Canada, Mexico
G	UK
I	Australia, New Zealand, Taiwan
E	Switzerland
J	Japan
L	Argentina
X	No plug (only 24-48 VDC) ***

Connection, suction/discharge

U2U2	Hose 4/6 mm, 6/9 mm, 6/12 mm, 9/12 mm
U7U7	Hose 0.17" x 1/4"; 1/4" x 3/8"; 3/8" x 1/2"
AA	Threaded, Rp 1/4", female (SS)
VV	Threaded, NPT 1/4", female (SS)
XX	No connection

Installation set*

I001	Hose 4/6 mm (up to 2.0 gph (7.5 l/h), 232 psi (16 bar))
I002	Hose 9/12 mm (up to15.85 gph (60 l/h), 189 psi (13 bar))
I003	Hose 0.17" x 1/4" (up to 2.0 gph (7.5 l/h), 232 psi (16 bar))
I004	Hose 3/8" x 1/2" (up to 15.85 gph (60 l/h), 150 psi (10 bar))

Valve type

1	Standard
2	Spring-loaded 1.45 psi (0.1 bar) suction opening pressure 1.45 psi (0.1 bar) discharge opening pressure

Supply voltage

3	1 x 100-240 V, 50/60 Hz
I	24-48 VDC (DDC) ***

* Including 2 pump connections, foot valve, injection unit, 19.6 ft (6 m) PE discharge hose, 6.5 ft (2 m) PVC suction hose, 6.5 ft (2 m) PVC deaeration hose (4/6 mm)

** Max pressure rating on PVC heads is 150 PSI (10 bar)

*** Availability TBD

Functions

Overview of functions

	DDA			DDC		DDE	
	 TM04 1636 2110			 TM04 1637 2110		 TM04 1638 2110	
Control variant:	**FCM**	**FC**	**AR**	**AR**	**A**	**P**	**B**
General							
Digital Dosing: Internal stroke speed and frequency control	●	●	●	●	●	●	●
Mounting plate (basic / wall mounting)	●	●	●	●	●	●	●
Control panel, see page 10							
Control cube mountable in three positions: front, left, right	●	●	●	●	●		
Control panel position: front mounted						●	●
Transparent protective cover for control elements	●	●	●	●	●		
Capacity setting in US gallons, milliliters, or liters	●	●	●	●	●		
Graphical display with background light in four colors for status indication: white, green, yellow, red	●	●	●	●	●		
Plain-text menu in different languages	●	●	●	●	●		
Turn-and-push knob (click wheel) for easy navigation	●	●	●	●	●		
Capacity adjustment knob (0.1 - 100 %)						●	●
Start / Stop key	●	●	●	●	●		
Priming button	●	●	●	●	●	●	
Operation mode switch (manual / pulse)						●	
Operation modes, see page 12							
Manual speed control	●	●	●	●	●	●	●
Pulse control in ml/pulse	●	●	●	●	●		
Pulse control (X:1)						●	
Analog control 0/4-20 mA	●	●	●	●			
Batch control (pulse-based)	●	●	●				
Dosing timer cycle	●	●	●				
Dosing timer week	●	●	●				
Fieldbus control	●	●	●				
Functions, see page 14							
Auto deaeration also during pump standby	●	●	●				
FlowControl system with selective fault diagnostic	●	●					
Pressure monitoring (min / max)	●	●					
Flow measurement	●						
AutoFlowAdapt	●						
SlowMode (anti-cavitation)	●	●	●	●	●		
Calibration mode	●	●	●	●	●		
Scaling of analog input	●	●	●				
Service information display	●	●	●	●	●		
Relay setting: alarm, warning, stroke signal, pump dosing	●	●	●	●			
Relay setting (additionally): timer cycle, timer week	●	●	●				
Inputs/outputs, see page 15							
Input for external stop	●	●	●	●	●	●	
Input for pulse control	●	●	●	●	●	●	
Input for analog 0/4-20 mA control	●	●	●	●			
Input for low-level signal	●	●	●	●	●		
Input for empty tank signal	●	●	●	●	●	●	
Output relay (2 relays)	●	●	●	●			
Output analog 0/4-20 mA	●	●	●				
Input / Output for GeniBus	●	●	●				
Input / Output for E-box (Profibus DP or additional alarm relays)	●	●	●				

Functional description

The electronically controlled variable-speed motor (stepper motor) of the DDA, DDC and DDE pumps provides optimum control of the stroke speed. The duration of each discharge stroke varies according to the set capacity, resulting in optimum discharge flow in any operating situation, while the duration of each suction stroke is constant (see figure below).

The advantages are as follows:

- The pump always operates at full stroke length, independent of the set capacity; this ensures optimum accuracy, priming and suction.
- A capacity range of up to 3000:1 (turndown ratio) reduces variants and spare parts.
- Smooth and continuous dosing ensuring an optimum mixing ratio at the injection point. The need for a static mixer may be eliminated in some applications.
- Significant reduction of pressure spikes, preventing mechanical stress on wearing parts such as diaphragm, tubing, connections, resulting in longer life expectancy on the pump and components.
- The installation is less affected by long suction and discharge lines.
- Easier dosing of high-viscosity and degassing liquids (SlowMode).

The optimum dosing control shown below takes place in any operation mode.

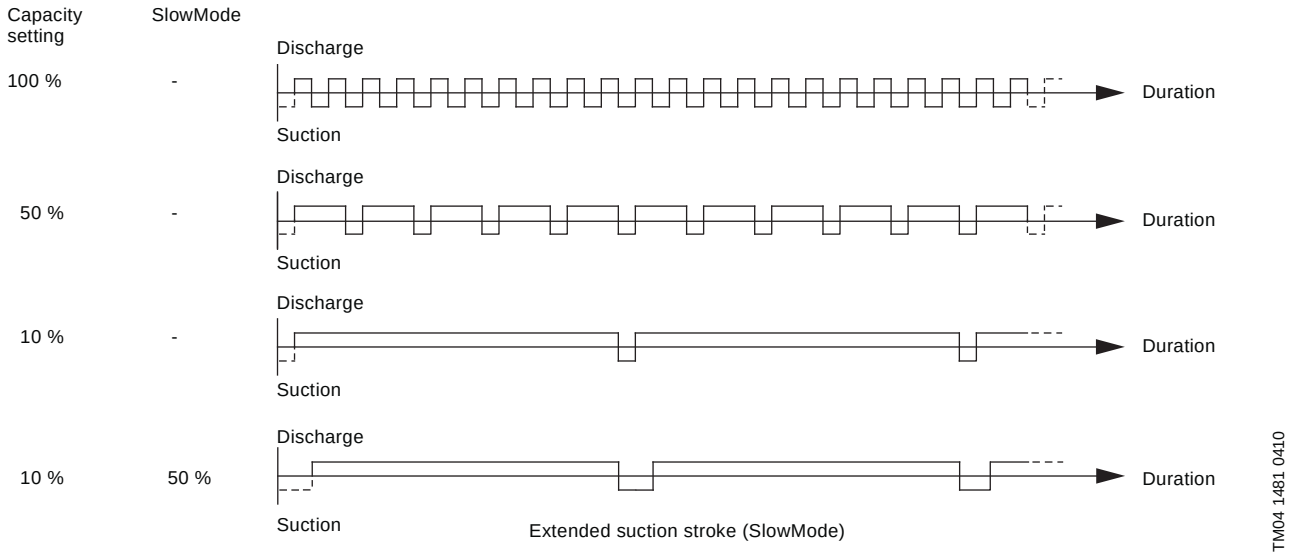

Fig. 2 Relation between stroke-frequency adjustment and capacity

Control cube (DDA and DDC)

DDA and DDC pumps are supplied with front-mounted control cube. The position of the control cube can easily be changed by unfastening 2 screws, lifting the cube, turning it to 90 or 180 degrees horizontally and fastening both screws again.

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Fig. 3 Two of three possible control cube positions: front, left, or right side of the pump

Operating elements DDA and DDC

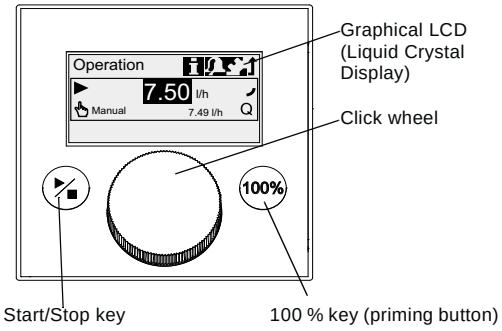

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Fig. 4 Operating elements DDA and DDC

The click wheel guides the user quickly and easily through the plain-text menu.

If the maximum capacity is required over a short period of time, for example during start-up, press the 100 % key. To set the pump to run for a specific number of seconds at maximum capacity, press the 100 % key and turn the click wheel clockwise simultaneously.

Operating elements DDE

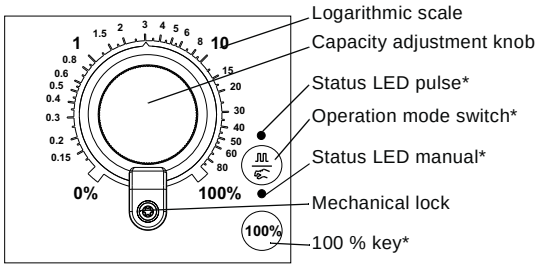

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Fig. 5 Operating elements DDE

The capacity of the pump can easily be adjusted in % of the maximum flow with the capacity adjustment knob.

** Applies to DDE-P*

When holding down the operation mode switch, the pump changes from manual operation to pulse mode or vice versa.

If the maximum capacity is required over a short period of time, for example during start-up, press the 100 % key.

Depending on the selected operation mode, the respective status LED (pulse or manual) is activated according to the following table:

LED color	Pump status
green (flashing)	stopped
green	running
yellow	externally stopped
red	empty tank (alarm)
red (flashing)	motor blocked (alarm)

Menu

The DDA and DDC dosing pumps feature a user-friendly plain-text menu. The menu consists of 4 icon tabs: Operation; Info; Alarm; Setup. During initial start-up, all menu text appears in the English language. The menu can be set to display other languages.

This example applies to DDA pumps:

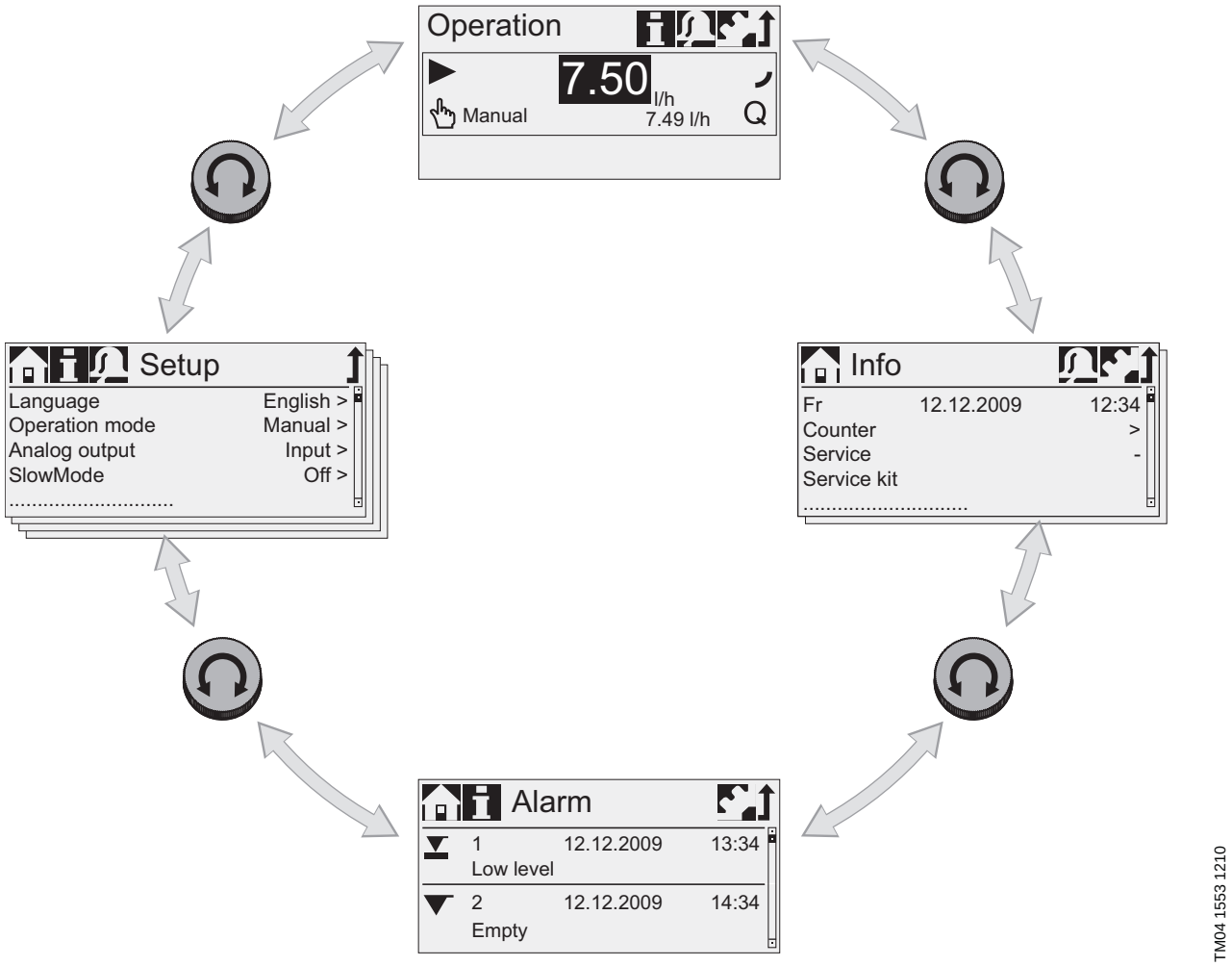


Fig. 6 Menu overview

The menu text appears in up to 29 languages on a large graphical display, backlit in four different colors according to the traffic light concept.

Display	Fault	Pump status
white	-	stop ■ standby ‖
green	-	running ▶
yellow	warning	stop ■ standby ‖ running ▶
red	alarm	stop ■ standby ‖

Operation modes

Manual control

The pump ensures constant dosing according to the set quantity in gph, ml/h, or l/h by means of the click wheel. Measuring units can be easily changed in the set up menu.

Setting range

Pump type	Setting range*	
	From [gph (l/h)]	To [gph (l/h)]
DDA 7.5-16	0.00066 (0.0025)	2.00 (7.5)
DDA 12-10	0.00317 (0.0120)	3.17 (12.0)
DDA 17-7	0.00449 (0.0170)	4.50 (17.0)
DDA 30-4	0.00793 (0.0300)	8.00 (30.0)
DDC 6-10	0.00159 (0.0060)	1.50 (6.0)
DDC 9-7	0.00238 (0.0090)	2.40 (9.0)
DDC 15-4	0.00396 (0.0150)	4.00 (15.0)
DDE 6-10	0.00159 (0.0060)	1.50 (6.0)
DDE 15-4	0.00396 (0.0150)	4.00 (15.0)

* When the SlowMode function is enabled the max. flow is reduced (see page 14)

Pulse control

The pump doses in proportion to an external potential-free pulse signal, such as a water meter. Unlike traditional pumps, there is no need to program a number of strokes per pulse. Instead, the pump is set to a volume per pulse, and the required number of strokes in calculated internally.

Applies to DDA and DDC

The quantity to be dosed is set in ml/pulse. The pump adjusts its speed according to two factors:

- the frequency of external pulses
- the set quantity per pulse.

Setting range

Pump type	Setting range [ml/pulse]
DDA 7.5-16	0.0015 - 14.8
DDA 12-10	0.0029 - 29.0
DDA 17-7	0.0031 - 31.0
DDA 30-4	0.0062 - 62.0
DDC 6-10	0.0016 - 16.2
DDC 9-7	0.0017 - 16.8
DDC 15-4	0.0032 - 31.6

The frequency of external pulses is multiplied by the set quantity. If the product exceeds the maximum flow of the pump, a maximum of 65,000 pulses can be stored for later processing with the Memory pulse function, when activated.

Applies to DDE-P control variant

The dosing quantity per pulse is adjusted with the adjustment knob according to the scale from 0.1 to 100 % of the stroke volume. The pump adjusts its speed according to two factors:

- the frequency of external pulses
- the set percentage of stroke volume.

Setting range, DDE-P

Pump type	Setting range [ml/pulse]
DDE 6-10	0.0008 - 0.81
DDE 15-4	0.0016 - 1.58

Analog 0/4-20 mA control

Applies to DDA and DDC-AR control variant

The pump ensures dosing according to an external analog signal. The dosed capacity is proportional to the input value in mA.

Operation mode	Input signal	Dosing capacity
4-20	≤ 4.1 mA	0 %
	≥ 19.8 mA	100 %
0-20	≤ 0.1 mA	0 %
	≥ 19.8 mA	100 %

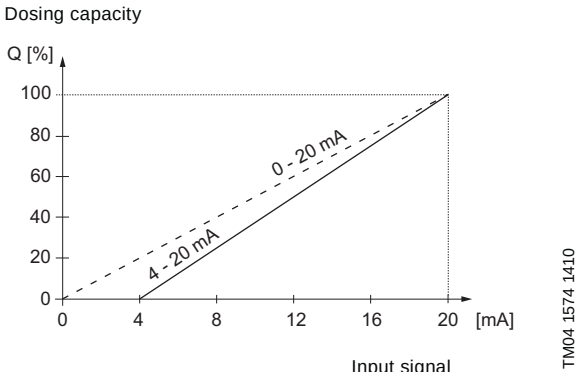


Fig. 7 0/4-20 mA control

Applies to DDA

With the analog scaling function, the curve can be individually drawn between two arbitrary points: I_1/Q_1 and I_2/Q_2.

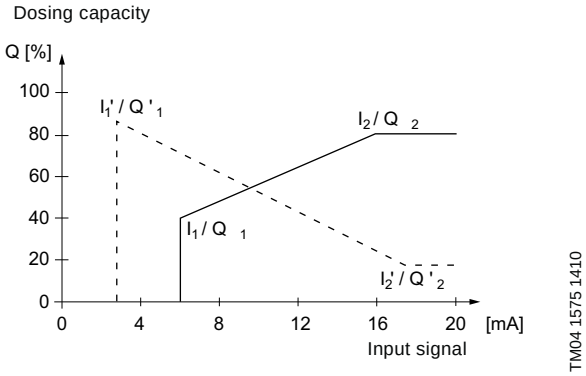


Fig. 8 Analog scaling

Pulse-based batch control

Applies to DDA

The set quantity is dosed in batches within the set dosing time (t_1). A batch is dosed every time the pump receives an external pulse. If the pump receives new pulses before a batch is completed, these pulses will be ignored. In the event of interrupts such as external stop or alarm, incoming pulses will also be ignored. A new batch will be dosed with the first new pulse after all interrupts are cleared.

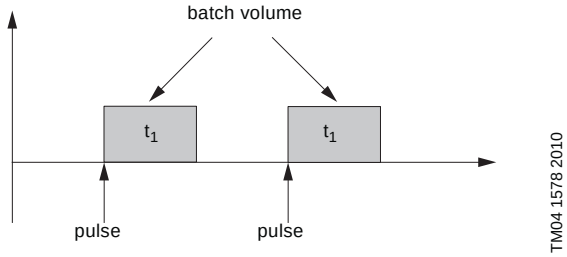


Fig. 9 Pulse-based batch control

Setting range

Pump type	Setting range		
	From [gal/batch (ml/batch)]	To [gal/batch (l/batch)]	Resolution* [gal (ml)]
DDA 7.5-16	0.000195 (0.74)	263.9 (999)	0.0000237 (0.09)
DDA 12-10	0.000383 (1.45)	263.9 (999)	0.0000475 (0.18)
DDA 17-7	0.000409 (1.55)	263.9 (999)	0.0000501 (0.19)
DDA 30-4	0.000818 (3.10)	263.9 (999)	0.0001029 (0.39)

* Due to the digital motor control, down to 1/8 of the stroke volume of the pump can be dosed.

Dosing timer cycle

Applies to DDA

After a start delay (t_2) the set batch volume is repeatedly dosed in the set cycle time (t_3). The dosing time (t_1) can be adjusted. The cycle time (t_3) must be longer than the dosing time (t_1), otherwise the next batch will be ignored. Batch dosing is stopped during any interrupt, like power supply failure or external stop while the time continues running in the background (real-time clock). After the interrupt ends, batch dosing proceeds according to the current status in the timeline.

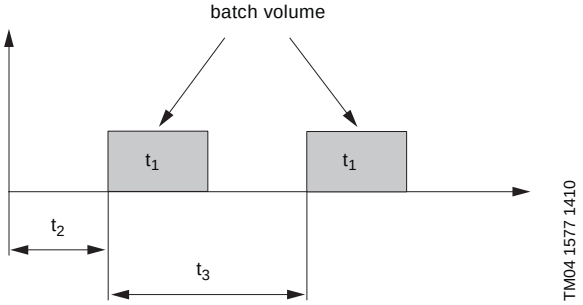


Fig. 10 Dosing timer cycle

Setting range

The batch volume setting range corresponds to the pulse-based batch control setting range.

Dosing timer week

Applies to DDA

The integrated real-time clock features also batch dosing based on a weekly period. There is a maximum of 16 procedures per week. Each dosing procedure consists of:

- Batch volume
- dosing time
- start time
- 1 to 7 weekdays (Monday to Sunday).

In case several procedures are overlapping, the procedure with the highest flow rate has the highest priority. Batch dosing is stopped during any interrupt, such as power supply failure or external stop, while the time continues running in the background (real-time clock). After the interrupt ends, batch dosing proceeds according to the current status in the timeline.

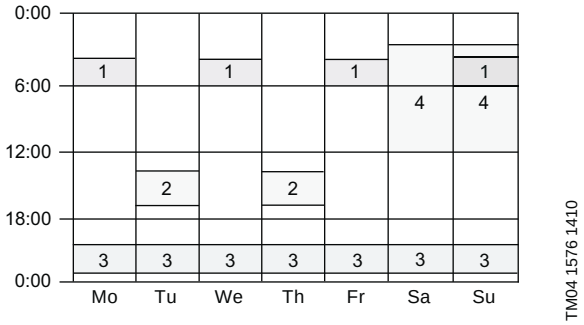


Fig. 11 Dosing timer week (example with 4 procedures)

Setting range

The batch volume setting range corresponds to the pulse-based batch control setting range.

Functions

SlowMode

Applies to DDA, DDC

When the SlowMode function (anti-cavitation) is selected, the pump extends and smooths its suction stroke. This results in a softer suction stroke.

The SlowMode function is used in these situations:

- when pumping high-viscosity liquids
- when pumping degassing liquids
- when the suction line is long
- when the suction lift is high.

Depending on the application, the motor speed during the suction stroke can be reduced individually to approximately 50 % or 25 % of the normal motor speed.

The maximum pump capacity is reduced accordingly. See pages 26 and 27 for further details.

Auto deaeration

Applies to DDA

The auto deaeration function avoids dosing process stoppage due to air-locking, when dosing degassing liquids such as sodium hypochlorite. During long dosing breaks, such as during the overnight hours or weekend, air-bubbles can form in the suction line and be pulled into the dosing head. If too much air is in the dosing head, and the dosing process is started again, no liquid will be dosed (air-lock). Software-controlled diaphragm movements at regular intervals encourage the air bubbles to rise and finally to be pumped out of the dosing head.

These movements are executed...

- when the pump is not stopped
- during dosing breaks (such as external stop or no incoming pulses).

Calibration

Applies to DDA and DDC

The pump is calibrated in the factory at the nominal pressure of the respective pump type (see maximum pressure in the Technical data section, page 26, 27). After start-up, the dosing pump can be calibrated for the actual installation to ensure that the displayed value (gph, ml, l) is correct. A calibration program in the setup menu facilitates this process. The AutoFlowAdapt function maintains the dosing precision (DDA-FCM control variant), even if the backpressure changes. For the description of the AutoFlowAdapt function, see page 19.

External stop

Applies to DDA, DDC and DDE-P control variant

With the external stop function, the pump can be stopped from a remote place by an external contact signal. It is not recommended to switch on and off the power supply as as you would do with other types of dosing pumps. When working with microprocessor-controlled digital dosing pumps, the external stop signal has to be used, in order to keep the optimal dosing precision and to prevent damages to the electronics.

When activating the external stop contact, the pump changes from running ▶ to standby ❚❚. The operation display shows an activated external stop ▶❚❚. The signal input can be set to normally open (default) or normally closed contact.

Counters

Applies to DDA and DDC

The pump displays resettable and non-resettable counters in the info menu tab.

Counter	Description	Resettable
Volume	Accumulated dosed quantity in liters or US gallons	Yes
Operating hours	Accumulated number of operating hours (power-on)	No
Motor runtime	Accumulated number of motor runtime hours	No
Strokes	Accumulated number of dosing strokes	No
Power on/off	Accumulated number of times the mains supply has been switched on	No

Service display

Applies to DDA, DDC

Thanks to the optimized construction and smooth digital dosing principle, service periods are more than twice as long, compared to conventional pumps. However, the wear parts have to be exchanged in regular intervals in order to keep the dosing precision and the process reliability at a high level. The service display in the pump shows when service of the wear parts is required. The displayed service kit product number makes service more convenient. The following information is displayed in the Info display:

Display		Description
Service	- soon now	no service required order parts to service soon service must be performed
Service kit	8-digit Grundfos product number	The service kit contains all parts needed for standard maintenance: diaphragm + valves
Reset service system		After performing the service, reset the system

The following service messages appear, depending on what happens first:

Display	Motor runtime [h]	Regular intervals [months]
Service soon	7,500	23
Service now	8,000	24

In case of difficult liquids, such as liquids with abrasive particles, the service intervals can be shorter and service has to be performed earlier.

Level control

Applies to DDA and DDC

A dual level control unit for monitoring of the chemical level in the tank can be connected to the pump. The pump can react to two level signals:

Level sensors	Pump reaction*
Low-level signal (pre-empty)	• Display is yellow (Warning) • ⧗ is flashing • Pump continues running
Empty tank signal	• Display is red (Alarm) • ▼ is flashing • Pump stops

* Depending on the pump model and settings, the relay outputs can be activated (see *Relay output*, page 15)

Applies to DDE-P control variant

A one-level control unit (empty tank signal) can be connected to the pump. The pump reacts with a red LED and the pump stops in case the tank runs empty.

Relay output

Applies to DDA and DDC-AR control variant

The pump can activate 2 external signals by means of built-in relays switched via internal potential-free contacts. Depending on the process control requirements, the following relay output settings can be chosen:

Signal		Description
Relay 1	**Relay 2**	
Alarm*	Alarm	Display red, pump stopped (e.g. empty tank signal, etc.)
Warning*	Warning	Display yellow, pump running (low level signal, etc.)
Stroke signal	Stroke signal*	Every completed stroke
Pump dosing	Pump dosing	Pump is running and dosing
Bus control	Bus control	Set by a command in the Bus communication function (page 16)
	Timer cycle	Timer can be set in menu: on-time, cycle-time, start delay (only DDA)
	Timer week	Timer can be set in menu: procedure, on-time, start time and weekdays (only DDA)
Contact type		
NO*	NO*	Normally Open Contact
NC	NC	Normally Closed Contact

* default setting

Analog output

Applies to DDA

In addition to the analog input (operation mode: analog 0/4-20 mA) the pump is also equipped with an analog 0/4-20 mA output signal. Depending on the process control requirements, the following analog output settings are available:

Setting	Description of analog output signal	Control variant		
		FCM	FC	AR
Output = Input	Mapped 1:1 to the analog input, e.g. used in master-slave applications	X	X	X
Actual flow	Flow measured in the dosing head (Flow Measurement page 19)	X	X*	X*
Backpressure	Backpressure measured in the dosing head (Pressure monitoring page 19)	X	X	
Bus control	Set by a command in the bus communication (see below)	X	X	X

* Output signal is calculated based on motor speed and pump status (target flow rate)

Bus communication

BUS

Applies to DDA

The pump is equipped with a built-in module for Genibus communication. With the additional E-Box module (extension box: retrofit possible) the pump can be integrated in a Profibus DP network.

The pump's bus communication capabilities enable it for remote monitoring and control via the fieldbus system. The Profibus GSD-file can be downloaded from www.grundfosalldos.com.

TM04 1640 2110

Fig. 12 DDA with E-box

Key lock and mechanical lock

Applies to DDA and DDC

To protect the pump from unauthorized use, a password can be set by entering a 4-digit PIN-code. When the pump is locked, it is still possible to navigate through the menus Alarm and Info and to acknowledge alarms. Two levels of protection are available:

- Settings: the keys and are still available.
- Settings + keys: the keys and are also locked.

The 4-digit PIN-code has to be entered to access the setup menus or to temporarily or permanently activate the password.

Applies to DDE

The adjustment knob can be locked with a locking screw to fix the current setting.

Basic settings

Applies to DDA, DDC

The pump can be reset to the default settings by using the "load factory settings" command on the setup menu. In addition, with "save customer settings," the current configuration of the pump can be stored and activated later by using the "load customer settings" command. The latest saved configuration is stored in the pump's memory.

Units

Applies to DDA, DDC

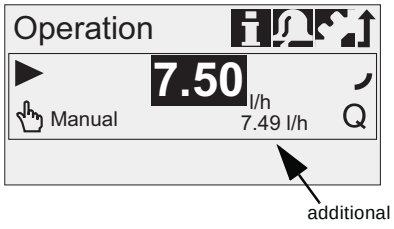
It is possible to select metric units (liter/milliliter/bar) or US units (US gallons/psi). Depending on the operation mode and menu, the following units are displayed:

Operation mode / Function	US units	Metric units
Manual control	gph	ml/h or l/h
Pulse control	ml/⊓	ml/⊓
Analog 0/4-20 mA control	gph	ml/h or l/h
Batch control (pulse- or timer-based)	gal	ml or l
Calibration	ml	ml
Volume counter	gal	l
Pressure monitoring	psi	bar

Additional display

Applies to DDA, DDC

The additional display function provides further useful status information, such as the target flow rate as well as the actual flow rate. The value is shown in the operation display along with the corresponding symbol.



TM04 1633 1810

Fig. 13 Additional display

The following additional information can be selected:

Settings		Description
Default display		Depending on the operation mode:
	Q	actual flow (manual, pulse) [1]
	Q	target flow (pulse)
		input current (analog) [4]
		remaining batch volume (batch, timer) [3]
		time until next batch (timer) [3]
Dosed volume	V	Total dosed volume (Counters see page 14)
Actual flow	Q	Actually measured flow [1]
Backpressure	P	Current backpressure in the dosing head [2]

[1] only DDA-FCM control variant
[2] only DDA-FCM/FC control variant
[3] only DDA pumps control variant
[4] only DDA pumps and DDC-AR control variant

FlowControl

Applies to DDA-FC/FCM control variant

TM04 1641 2110

Fig. 14 DDA FlowControl

When the FlowControl function is activated the pump monitors the dosing process. Some influences such as air bubbles may cause reduced flow rates or even stop the dosing process even if the pump is still operating. For optimal process safety and reliability, the activated FlowControl function immediately detects and displays the following malfunctions:

- Overpressure
- discharge line burst
- air bubbles in the dosing head
- cavitation at the suction side
- suction valve leakage
- discharge valve leakage.

The unique FlowControl is based on an intelligent, maintenance-free sensor integrated in the dosing head. During the dosing process, the sensor measures the actual pressure and sends the measured value to the microprocessor in the pump. An internal indicator diagram is generated combining the actual pressure value with the diaphragm position (stroke length), allowing the pump to monitor the dosing process by immediately detecting specific deviations from the curve. Compressible air bubbles, for instance, will reduce the discharge phase and the stroke volume (see fig. 15).

The sensitivity and the delay of the FlowControl function can be adjusted individually.

FlowControl requires a minimum backpressure of 29 psi (2 bar). Grundfos recommend an additional spring-loaded valve, approx. 43.5 psi (3 bar), on the discharge side for dosing operation on low capacities < .264 gph (1 l/h). Please see Accessories product guide.

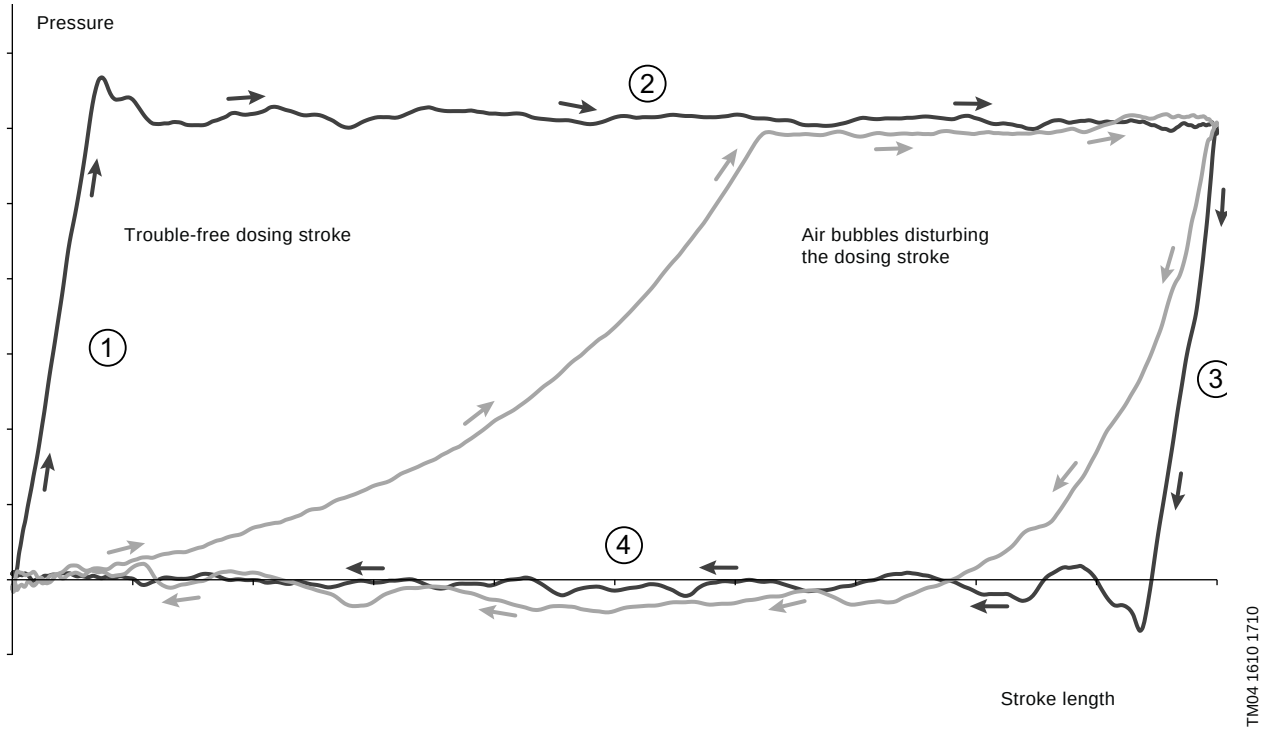


Fig. 15 Indicator diagram

1	Compression phase
2	Discharge phase
3	Expansion phase
4	Suction phase

Pressure monitoring

Applies to DDA-FC/FCM control variant

The integrated pressure sensor measures the actual pressure of the system and displays it on the pump's screen. A maximum pressure value can be set. If the pressure in the system exceeds the set maximum (i.e. overpressure caused by a closed valve), the pressure monitoring function stops the dosing process immediately. As soon as the backpressure falls below the set maximum, the dosing process will continue. If the pressure drops below the minimum limit (i.e. a burst discharge line) the pump stops, preventing major chemical spills.

Pressure setting range

Pump type	Fixed min. pressure* [psi (bar)]	Adjustable max. pressure [psi (bar]
DDA 7.5-16	< 29 (2)	43.5 ... 246.5 (3 ... 17) (default)
DDA 12-10	< 29 (2)	43.5 ... 159.5 (3 ... 11) (default)
DDA 17-7	< 29 (2)	43.5 ... 116 3 ... 8 (default)
DDA 30-4	< 29 (2)	43.5 ... 72.5 3 ... 5 (default)

*Can be either set as a warning (pump keeps running) or as an alarm (pump stops).

Flow measurement

Applies to DDA-FCM control variant

The pump can precisely measure and display the actual dosing flow. By using the analog 0/4-20 mA output, the actual flow signal can easily be integrated into a process control system, without need for any additional measurement equipment.

The Flow measurement function is based on an indicator diagram as described in the *FlowControl* section (page 17). The displayed actual flow can be calculated by accumulating the length of each discharge stroke phase and multiplying it by the stroke frequency. Any malfunctions, such as air bubbles or backpressure, will result in a lower or higher actual flow rate. When the AutoFlowAdapt function (page 19) is activated, the pump compensates these variations by correcting the stroke frequency.

AutoFlowAdapt

Applies to DDA-FCM control variant

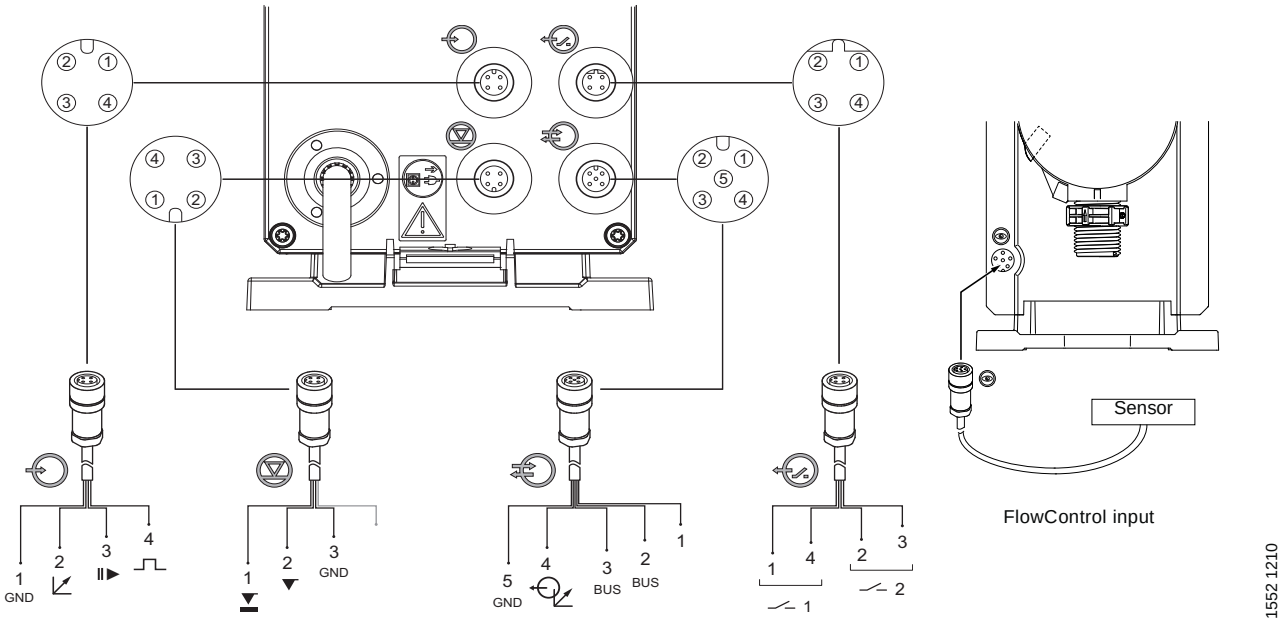
By activating the AutoFlowAdapt function, pressure fluctuations can be detected and compensated for by reducing or increasing the pump's speed, allowing the pump to achieve its targeted flow rate. The integrated AutoFlowAdapt makes additional monitoring and control devices redundant. The AutoFlowAdapt function is based on:

- FlowControl: malfunctions are detected
- Pressure monitoring: system pressure changes are detected
- Flow measurement: deviations in the target flow are detected.

Examples:

- FlowControl detects air bubbles in the system. Due to a special motor drive technology and a controllable speed increase, the pump will try to keep the flow rate constant. This is especially important when dosing degassing liquids.
- In general, increasing system pressure reduces the stroke volume whereas falling system pressure increases the stroke volume. The AutoFlowAdapt function compensates this by automatically and continuously adapting the motor speed. Despite fluctuating system pressure, dosing accuracy is maintained.

Wiring diagram, DDA



TM04 1121 0110; TM04 1552 1210

Cable 1
Analog/external stop/pulse
Product No.
6.5 ft (2 m) cable:
96609014
16.4 ft (5 m) cable:
96609016

Cable 2
Level input
Product No.
6.5 ft (2 m) cable:
96609014
16.4 ft (5 m) cable:
96609016

Cable 3
Genibus, analog output
Product No.
6.5 ft (2 m) cable:
96632921
16.4 ft (5 m) cable:
96632922

Cable 4
Relay output
Product No.
6.5 ft (2 m) cable:
96609017
16.4 ft (5 m) cable:
96609019

Cable 1: Analog, external stop and pulse input

Function	Pin holes				Plug type
	1/brown	2/white	3/blue	4/black	
Analog	GND/ (-) mA	(+) mA			mA signal
External stop	GND		X		contact
Pulse	GND			X	contact

Cable 2: Level input

Function	Pin holes				Plug type
	1/brown	2/white	3/blue	4/black	
Low level	X		GND		contact
Empty tank		X	GND		contact

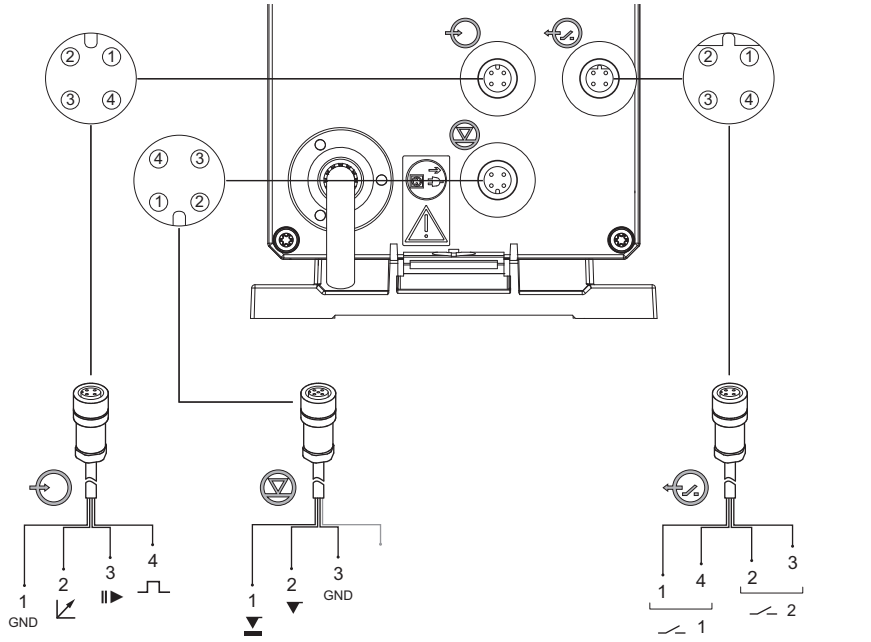
Cable 3: Genibus, analog output

Function	Pin holes					Plug type
	1/brown	2/white	3/blue	4/black	5/yellow-green	
Genibus	+30 V	GENI bus TXD	GENI bus RXD		GND	Bus
Analog output				(+) mA	GND/ (-) mA	mA signal

Cable 4: Relay output

Function	Pin holes				Plug type
	1/brown	2/white	3/blue	4/black	
Relay 1	X			X	contact
Relay 2		X	X		contact

Wiring diagram, DDC



Cable 1
Analog/external stop/pulse
Product No.
6.5 ft (2 m) cable: 96609014
16.4 ft (5 m) cable: 96609016

Cable 2
Level input
Product No.
6.5 ft (2 m) cable: 96609014
16.4 ft (5 m) cable: 96609016

Cable 4
Relay output
Product No.
6.5 ft (2 m) cable: 96609017
16.4 ft (5 m) cable: 96609019

TM04 1531 1010

Cable 1: Analog, external stop and pulse input

	Function	Pin holes				Plug type
		1/brown	2/white	3/blue	4/black	
	Analog*	GND/ (-) mA	(+) mA			mA signal
	External stop	GND		X		contact
	Pulse	GND			X	contact

Cable 2: Level input

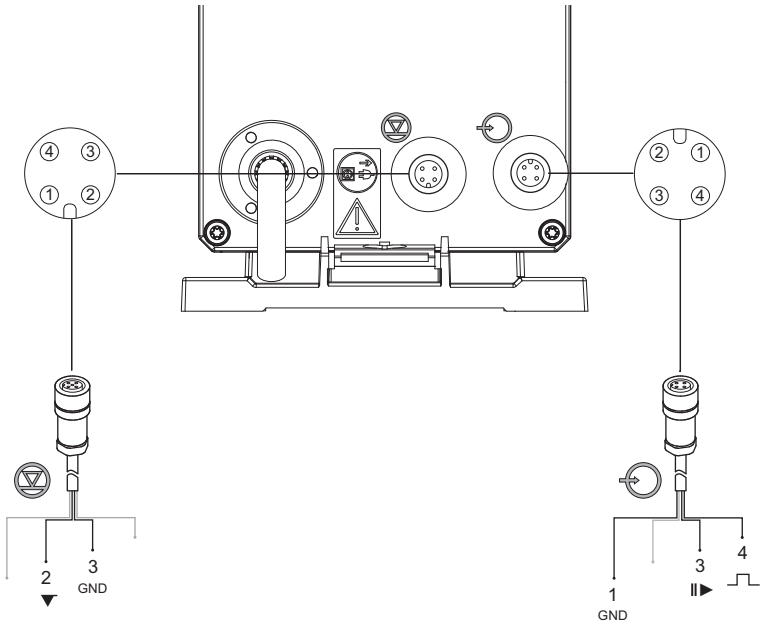
	Function	Pin holes				Plug type
		1/brown	2/white	3/blue	4/black	
	Low level	X		GND		contact
	Empty tank		X	GND		contact

Cable 4: Relay output*

	Function	Pin holes				Plug type
		1/brown	2/white	3/blue	4/black	
	Relay 1	X			X	contact
	Relay 2		X	X		contact

* applies to DDC-AR control variant

Wiring diagram, DDE-P



Cable 2
Level input
Product No.
6.5 ft (2 m) cable: 96609014
16.4 ft (5 m) cable: 96609016

Cable 1
External stop/pulse
Product No.
6.5 ft (2 m) cable: 96609014
16.4 ft (5 m) cable: 96609016

TM04 1532 1010

Cable 1: External stop and pulse input*

	Function	Pin holes				Plug type
		1/brown	2/white	3/blue	4/black	
	External stop	GND		X		contact
	Pulse	GND			X	contact

Cable 2: Level input*

	Function	Pin holes				Plug type
		1/brown	2/white	3/blue	4/black	
	Empty tank		X	GND		contact

* applies to DDE-P control variant

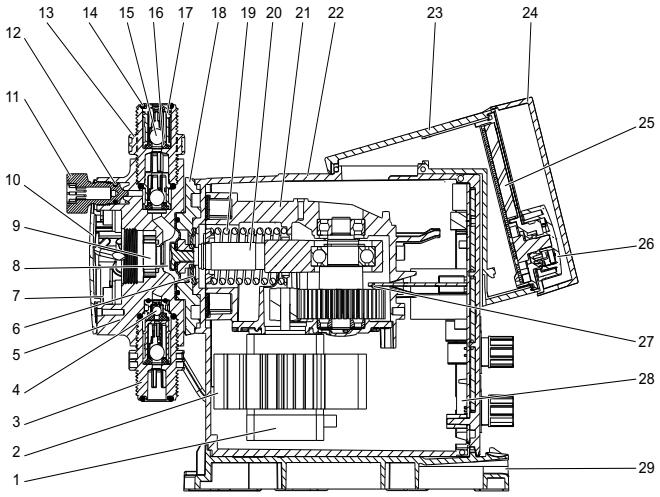


Fig. 16 Sectional drawing, DDA

DDA and DDC

The DDA and DDC pumps are motor-driven diaphragm dosing pumps consisting of the following main parts:

Dosing head: Patented design with a minimum of clearance space optimized for degassing liquids. With integrated deaeration valve for priming and venting complete with connection for a 4/6 mm or 0.17" x 1/4" tubing. DDA-FCM/FC pumps also have an integrated pressure sensor in the dosing head.

Valves: Double-ball discharge and suction valve* design for less clearance space — optimized for degassing liquids. Spring-loaded valves for higher viscosities are available as an option.

Connections: Robust and easy-to-use connection packages for various sizes of tubing or pipes.

Diaphragm: Full PTFE diaphragm designed for long life and universal chemical resistance.

Flange: With separation chamber, safety diaphragm and drain hole.

Drive unit: Positive return crank with patented noiseless spur gear drive, energy recovery spring for high efficiency (only DDA), stepper motor, all mounted in a robust gear housing.

Control cube: Contains operation electronics with display, keys, click-wheel and protective cover.

Housing: Contains drive unit and power electronics with robust signal sockets. The housing can be clicked on the mounting plate.

Material specification

Pos.	Description	Material options
1	Stepper motor	–
2	Cooling element**	Aluminium
3	Suction valve, complete***	–
4	Valve ball, DN 4*	Ceramics Al2O3 99.5 %, SS 1.4401
5	Dosing head	PP, PVC, PVDF, SS 316L - 1.4435
6	Safety diaphragm	EPDM
7	Dosing head screw	SS 1.4301
8	Diaphragm	full PTFE
9	Pressure sensor	–
10	Dosing head cover	PP, SS 1.4301
11	Deaeration valve	PP, PVC, PVDF
12	Deaeration valve O-ring	EPDM/FKM
13	Discharge valve, complete***	–
14	Discharge valve O-ring	EPDM, FKM, PTFE
15	Discharge valve ball, DN 8	Ceramics Al2O3 99.5 %, SS 316 - 1.4401
16	Discharge valve seat	EPDM, FKM, PTFE
17	Discharge valve ball cage	PP, PVC, PVDF, SS 1.4435
18	Flange	PPO/PS 20 % gf
19	Energy recovery spring**	EN 10270-2/VD SiCr
20	Connecting rod	PA 6.6 30 % gf
21	Gear box	PPO/PS 20 % gf
22	Housing	PPO/PS 20 % gf
23	Control cube	PPO/PS 20 % gf
24	Display cover	PC
25	Operation PCB	–
26	Click wheel	PPO/PS 20 % gf
27	Hall sensor	–
28	Power PCB	–
29	Mounting plate	PPO/PS 20 % gf

* Only for pumps up to 7.5 l/h with standard valves

** Only for DDA

*** Pump can be supplied with spring-loaded valves (spring m aterial: Tantal)

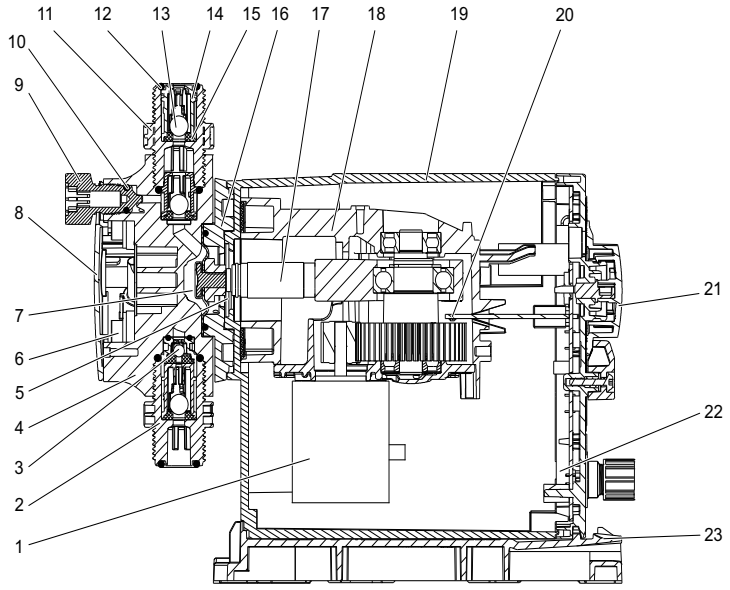


Fig. 17 Sectional drawing, DDE

DDE

The DDE pump is a motor-driven diaphragm dosing pump consisting of the following main parts:

Dosing head: Patented design with a minimum of clearance space optimized for degassing liquids. With integrated deaeration valve for priming and venting complete with connection for a 4/6 mm or 0.17“ x 1/4“ tubing.

Valves: Double-ball discharge and suction valve* design for less clearance space — optimized for degassing liquids. Spring-loaded valves for higher viscosities are available as an option.

Connections: Robust and easy-to-use connection packages for various sizes of tubing or pipes.

Diaphragm: Full PTFE diaphragm designed for long life and universal chemical resistance.

Flange: With separation chamber, safety diaphragm and drain hole.

Drive unit: Positive return crank with patented noiseless spur gear drive, stepper motor, all mounted in a robust gear housing.

Housing: Contains drive unit, control panel and electronics with robust signal sockets. The housing can be clicked on the mounting plate.

Material specification

Pos.	Description	Material options
1	Stepper motor	–
2	Suction valve, complete**	–
3	Valve ball, DN 4*	Ceramics Al2O3 99.5 %, SS 1.4401
4	Dosing head	PP, PVC, PVDF, SS 316L - 1.4435
5	Safety diaphragm	EPDM
6	Dosing head screw	SS 1.4301
7	Diaphragm	full PTFE
8	Dosing head cover	PP, SS 1.4301
9	Deaeration valve	PP, PVC, PVDF
10	Deaeration valve O-ring	EPDM/FKM
11	Discharge valve, complete**	–
12	Discharge valve O-ring	EPDM, FKM, PTFE
13	Discharge valve ball, DN 8	Ceramics Al2O3 99.5 %, SS 316 - 1.4401
14	Discharge valve ball cage	PP, PVC, PVDF, SS 1.4435
15	Discharge valve seat	EPDM, FKM, PTFE
16	Flange	PPO/PS20 % gf
17	Connecting rod	PA 6.6 30 % gf
18	Gear box	PPO/PS 20 % gf
19	Housing	PPO/PS 20 % gf
20	Hall sensor	–
21	Capacity adjustment knob	PPO/PS 20 % gf
22	Power PCB	–
23	Mounting plate	PPO/PS 20 % gf

* Only for pumps up to 1.5 gpm (6 l/h) with standard valves

** Pump can be supplied with spring-loaded valves (spring material: Tantal)

Dimensions

DDA and DDC

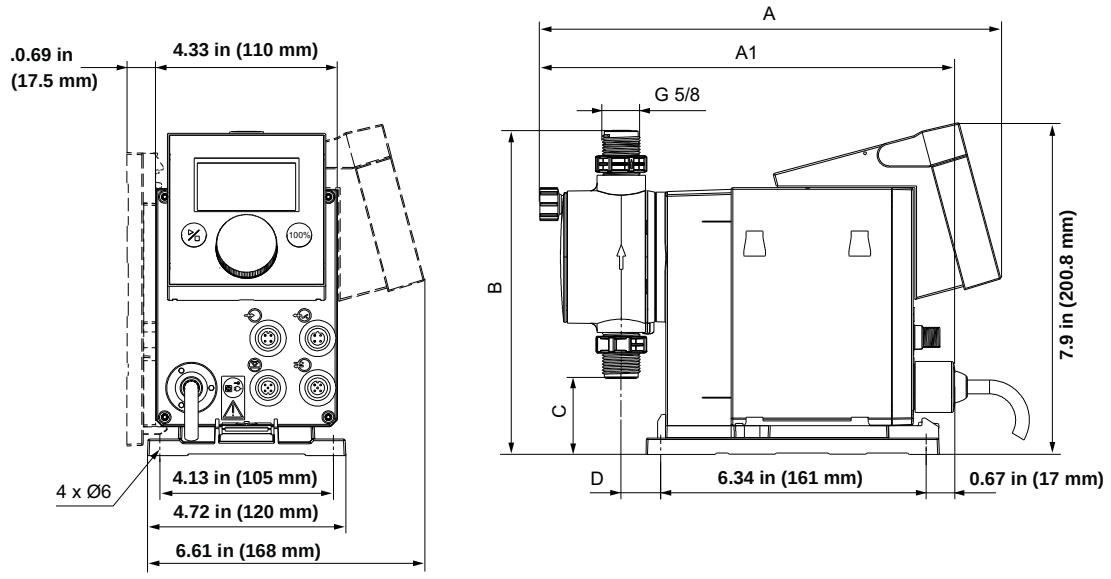


Fig. 18 DDA and DDC with front-fitted or side-fitted control cube (--- option: wall-mounted)

DDE

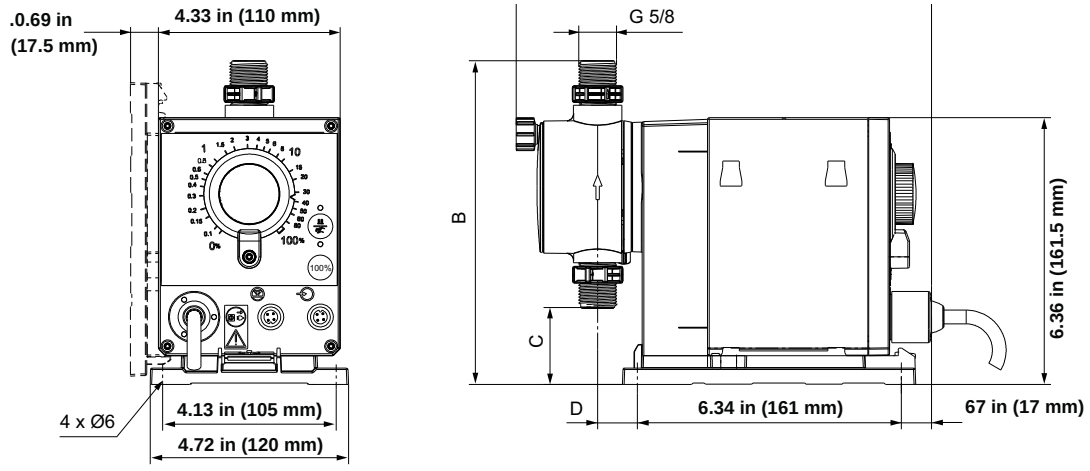


Fig. 19 DDE front fitted control elements (--- option: wall-mounted)

Pump type	A [in (mm)]	A1 [in (mm)]	B [in (mm)]	C [in (mm)]	D [in (mm)]
DDA 7.5-16 **DDC 6 - 10** **DDC 9 - 7** **DDE 6-10**	11.02 (280)	9.88 (251)	7.72 (196)	1.83 (46.5)	0.94 (24)
DDA 12-10 **DDA 17-7** **DDC 15-4** **DDE 15-4**	11.02 (280)	9.88 (251)	7.89 (200.5)	1.56 (39.5)	0.94 (24)
DDA 30-4	11.61 (295)	10.52 (267)	8.05 (204.5)	1.40 (35.5)	1.51 (38.5)

DDA

Pump type	DDA		7.5-16	12-10	17-7	30-4
Mechanical data	Max. turn-down ratio	[X:1]	3000	1000	1000	1000
	Max. dosing flow	[gph]	2.0	3.1	4.5	8.0
		[l/h]	7.5	12.0	17.0	30.0
	Max. dosing flow with SlowMode 50 %	[gph]	1.00	1.55	2.25	4.00
		[l/h]	3.75	6.00	8.50	15.00
	Max. dosing flow with SlowMode 25 %	[gph]	0.50	0.78	1.13	2.00
		[l/h]	1.88	3.00	4.25	7.50
	Min. dosing flow	[gph]	0.0007	0.0031	0.0045	0.0080
		[l/h]	0.0025	0.0120	0.0170	0.0300
	Max. operating pressure	[psi]	230	150	100	60
		[bar]	16	10	7	4
	Max. stroke frequency [1]	[stroke/min]	190	155	205	180
	Stroke volume	[gal]	.00020	.00040	.00041	0.00082
		[ml]	0.74	1.45	1.55	3.10
	Max. suction lift during operation [2]	[ft]	20			
		[m]	6			
	Max. suction lift when priming with wet valves [2]	[ft]	6.56	9.84	9.84	6.56
		[m]	2	3	3	2
	Min. pressure difference between suction and discharge valve	[psi]	14.5 (FC) and 29 (FCM)			
		[bar]	1 (FC) and 2 (FCM)			
	Max. admission pressure at suction valve	[psi]	29			
		[bar]	2			
	Max. viscosity in SlowMode 25 % with spring-loaded valves [3]	[mPas] (= cP)	2500	2500	2000	1500
	Max. viscosity in SlowMode 50 % with spring-loaded valves [3]	[mPas] (= cP)	1800	1300	1300	600
	Max. viscosity without SlowMode with spring-loaded valves [3]	[mPas] (= cP)	600	500	500	200
	Max. viscosity without spring-loaded valves [3]	[mPas] (= cP)	50	300	300	150
	Min. internal hose/pipe diameter suction/discharge side [4, 2]	[inch]	0.157	0.236	0.236	0.354
		[mm]	4	6	6	9
	Min. internal hose/pipe diameter suction side (high viscosity)[4]	[inch]	0.354			
		[mm]	9			
	Min. internal hose/pipe diameter discharge side (high viscosity)[4]	[inch]	0.354			
		[mm]	9			
	Max. liquid temperature	[°F]	113			
		[°C]	45			
	Min. liquid temperature	[°F]	14			
		[°C]	-10			
	Max. ambient temperature	[°F]	113			
		[°C]	45			
	Min. ambient temperature	[°F]	32			
		[°C]	0			
	Accuracy of repeatability	[%]	±1			
Electrical data	Supply voltage	[V]	100-240 V, 50-60 Hz			
	Length of power supply cable	[ft]	4.9			
		[m]	1.5			
	Max. inrush current at 100 V	[A]	8			
	Max. inrush current at 230 V	[A]	25			
	Max. power consumption P1 [5]	[W]	18			
	Enclosure class		NEMA 4X, IP 65			
	Electrical safety class		II			

Pump type	DDA		7.5-16	12-10	17-7	30-4
Signal input	Max. rating low-level / empty tank / pulse / external stop input		12 V, 5 mA			
	Min. pulse length	[ms]	5			
	Max. pulse frequency	[Hz]	100			
	Impedance in analog 0/4-20 mA input	[Ω]	15			
	Max. loop resistance in level signal circuit	[Ω]	1000			
	Max. loop resistance in pulse signal circuit	[Ω]	1000			
Signal output	Max. load of relay output, at ohmic load	[A]	0.5			
	Max. voltage, relay output	[V]	30 VDC / 30 VAC			
	Max. impedance in analog 0/4-20 mA output	[Ω]	500			
Weight and size	Weight PVC, PP, PVDF	[lb]	5.29	5.29		5.73
		[kg]	2.4	2.4		2.6
	Weight stainless steel	[lb]	7.05	7.05		8.82
		[kg]	3.2	3.2		4.0
	Diaphragm diameter	[inches]	1.73	1.97		2.91
		[mm]	44	50		74
Sound pressure	Max. sound pressure level	[dB(A)]	60			
Approvals			CE, CSA-US, GHOST, PSE/cosmos, C-Tick			

1) The max. stroke frequency varies according to calibration

2) Data based on measurement with water

3) Max. suction lift: 3.3 ft (1 m) and reduced maximum flow (approx. 30 %)

4) Length of suction hose: 4.9 ft (1.5 m) / Length of discharge hose: 32.8 ft (10 m) (at max. viscosity)

5) With E-box: 24 W

DDC

Pump type	DDC		6-10	9-7	15-4
Mechanical data	Max. turn-down ratio	[1:X]	1000	1000	1000
	Max. dosing flow	[gph]	1.5	2.4	4.0
		[l/h]	6.0	9.0	15.0
	Max. dosing flow with SlowMode 50 %	[gph]	0.75	1.20	2.00
		[l/h]	3.00	4.50	7.50
	Max. dosing flow with SlowMode 25 %	[gph]	0.38	0.60	1.00
		[l/h]	1.50	2.25	3.75
	Min. dosing flow	[gph]	0.0015	0.0024	0.0040
		[l/h]	0.0060	0.0090	0.0150
	Max. pressure	[psi]	150	100	60
		[bar]	10	7	4
	Max. stroke frequency [1]	[stroke/min]	140	200	180
	Stroke volume	[gal]	0.00021	0.00022	0.00042
		[ml]	0.81	0.84	1.58
	Max. suction lift during operation [2]	[ft]	20		
		[m]	6		
	Max. suction lift when priming with wet valves [2]	[ft]	6.5	6.5	10
		[m]	2	2	3
	Min. pressure difference between suction and discharge valve	[psi]	14.5		
		[bar]	1		
	Max. admission pressure at suction valve	[bar]	2		
	Max. viscosity in SlowMode 25 % with spring-loaded valves [3]	[mPas] (= cP)	2500	2000	2000
	Max. viscosity in SlowMode 50 % with spring-loaded valves [3]	[mPas] (= cP)	1800	1300	1300
	Max. viscosity without SlowMode with spring-loaded valves [3]	[mPas] (= cP)	600	500	500
	Max. viscosity without spring-loaded valves [3]	[mPas] (= cP)	50	50	300
	Min. internal hose/pipe diameter suction/discharge side [4, 2]	[inch]	0.157	0.236	0.236
		[mm]	4	6	6
	Min. internal hose/pipe diameter suction side (high viscosity)[4]	[inch]	0.354		
		[mm]	9		
	Min. internal hose/pipe diameter discharge side (high viscosity)[4]	[inch]	0.354		
		[mm]	9		
	Max. liquid temperature	[°F]	113		
		[°C]	45		
	Min. liquid temperature	[°F]	50		
		[°C]	-10		
	Max. ambient temperature	[°F]	113		
		[°C]	45		
	Min. ambient temperature	[°F]	32		
		[°C]	0		
	Accuracy of repeatability	[%]	±1		
Electrical data	Supply voltage AC	[V]	100-240 V, 50-60 Hz		
	Supply voltage DC (option)	[V]	24-48 VDC		
	Length of power supply cable	[ft]	5		
		[m]	1.5		
	Max. inrush current at 100 V	[A]	8		
	Max. inrush current at 230 V	[A]	25		
	Max. power consumption P1	[W]	14		
	Enclosure class		NEMA 4X, IP 65		
	Electrical safety class		II		

Pump type	DDC		6-10	9-7	15-4
Signal input	Max. rating low-level / empty tank / pulse / external stop input		12 V, 5 mA		
	Min. pulse length	[ms]	5		
	Max. pulse frequency	[Hz]	100		
	Max. loop resistance in level signal circuit	[Ω]	1000		
	Max. loop resistance in pulse signal circuit	[Ω]	1000		
Signal output	Max. load of relay output, at ohmic load	[A]	0.5		
	Max. voltage, relay output	[V]	30 VDC / 30 VAC		
Weight and size	Weight PVC, PP, PVDF	[ft]	5.3		
		[kg]	2.4		
	Weight stainless steel	[ft]	7.1		
		[kg]	3.2		
	Diaphragm diameter	[inch]	1.73		1.97
		[mm]	44		50
Sound pressure	Max. sound pressure level	[dB(A)]	60		
Approvals			CE, CSA-US, GHOST, PSE/cosmos, C-Tick		

1) The max. stroke frequency varies according to calibration

2) Data based on measurement with water

3) Max. suction lift: 3.3 ft [1 m] and reduced maximum flow (approx. 30 %)

4) Length of suction hose: 4.9 ft (1.5 m) / Length of discharge hose: 32.8 ft (10 m) (at max. viscosity)

DDE

Pump type	DDE		6-10	15-4
Mechanical data	Max. turn-down ratio	[1:X]	1000	1000
	Max. dosing flow	[gph]	1.5	4.0
		[l/h]	6.0	15.0
	Min. dosing flow	[gph]	0.0015	0.0040
		[l/h]	0.0060	0.0150
	Max. pressure	[psi]	150	60
		[bar]	10	4
	Max. stroke frequency [1]	[stroke/min]	140	180
	Stroke volume	[gal]	0.00021	0.00042
		[ml]	0.81	1.58
	Max. suction lift during operation [2]	[ft]	20	
		[m]	6	
	Max. suction lift when priming with wet valves [2]	[ft]	6.56	9.84
		[m]	2	3
	Min. pressure difference between suction and discharge valve	[psi]	14.5	
		[bar]	1	
	Max. admission pressure at suction valve	[psi]	29	
		[bar]	2	
	Max. viscosity with spring-loaded valves [3]	[mPas] (= cP)	600	500
	Max. viscosity without spring-loaded valves [3]	[mPas] (= cP)	50	50
	Min. internal hose/pipe diameter suction/discharge side [4, 2]	[inch]	0.157	0.236
		[mm]	4	6
	Min. internal hose/pipe diameter suction side (HV)[4]	[inch]	0.354	
		[mm]	9	
	Min. internal hose/pipe diameter discharge side (HV)[4]	[inch]	0.354	
		[mm]	9	
	Max. liquid temperature	[°F]	113	
		[°C]	45	
	Min. liquid temperature	[°F]	14	
		[°C]	-10	
	Max. ambient temperature	[°F]	113	
		[°C]	45	
	Min. ambient temperature	[°F]	32	
		[°C]	0	
	Accuracy of repeatability	[%]	±5	
Electrical data	Supply voltage	[V]	100-240 V, 50-60 Hz	
	Length of power supply cable	[ft]	4.9	
		[m]	1.5	
	Max. inrush current at 100 V	[A]	8	
	Max. inrush current at 230 V	[A]	25	
	Max. power consumption P1	[W]	12	
	Enclosure class		NEMA 4X, IP 65	
	Electrical safety class		II	
Signal input	Max. rating empty tank / pulse / external stop input		12 V, 5 mA	
	Min. pulse length	[ms]	5	
	Max. pulse frequency	[Hz]	100	
	Max. loop resistance in level signal circuit	[Ω]	1000	
	Max. loop resistance in pulse signal circuit	[Ω]	1000	

Pump type	DDE		6-10	15-4
Weight and size	Weight PVC, PP, PVDF	[lb]	5.3	
		[kg]	2.4	
	Weight stainless steel	[lb]	7.1	
		[kg]	3.2	
	Diaphragm diameter	[inch]	1.73	1.97
		[mm]	44	50
Sound pressure	Max. sound pressure level	[dB(A)]	60	
Approvals			CE, CSA-US, GHOST, PSE/cosmos, C-Tick	

1) The max. stroke frequency varies according to calibration

2) Data based on measurement with water

3) Max. suction lift: 3.3 ft (1 m) and reduced maximum flow (approx. 30 %)

4) Length of suction hose: 4.9 ft (1.5 m) / Length of discharge hose: 32.8 ft (10 m) (at max. viscosity)

DDA, standard range

Power supply: 1x100-240 V, 50/60 Hz (switch mode)
Mains plug: USA, Canada
Valves: Standard
Connection set: Hose, 0.17" x 1/4“, 1/4" x 3/8", 3/8" x 1/2"

Max. flow [l/h]	Max. pressure [bar]	Materials			Installation set*	Type key**	Product number		
		Dosing head	Gaskets	Valve balls			AR	FC	FCM
7.5	16	PP	EPDM	Ceramic	no	DDA 7.5-16 AR-PP/E/C-F-31U7U7BG	97722357	97722391	97722425
					yes	DDA 7.5-16 AR-PP/E/C-F-31I003BG	97722358	97722392	97722426
			FKM	Ceramic	no	DDA 7.5-16 AR-PP/V/C-F-31U7U7BG	97722361	97722395	97722429
					yes	DDA 7.5-16 AR-PP/V/C-F-31I003BG	97722362	97722396	97722430
		PVC	EPDM	Ceramic	no	DDA 7.5-16 AR-PVC/E/C-F-31U7U7BG	97722365	97722399	97722433
					yes	DDA 7.5-16 AR-PVC/E/C-F-31I003BG	97722366	97722400	97722434
			FKM	Ceramic	no	DDA 7.5-16 AR-PVC/V/C-F-31U7U7BG	97722369	97722403	97722437
					yes	DDA 7.5-16 AR-PVC/V/C-F-31I003BG	97722370	97722404	97722438
		PVDF	PTFE	Ceramic	no	DDA 7.5-16 AR-PV/T/C-F-31U7U7BG	97722385	97722419	97722453
					yes	DDA 7.5-16 AR-PV/T/C-F-31I003BG	97722386	97722420	97722454
		SS	PTFE	SS 1.4401	no	DDA 7.5-16 AR-SS/T/SS-F-31VVBG	97722389	97722423	97722457
12	10	PP	EPDM	Ceramic	no	DDA 12-10 AR-PP/E/C-F-31U7U7BG	97722459	97722493	97722527
					yes	DDA 12-10 AR-PP/E/C-F-31I004BG	97722460	97722494	97722528
			FKM	Ceramic	no	DDA 12-10 AR-PP/V/C-F-31U7U7BG	97722463	97722497	97722531
					yes	DDA 12-10 AR-PP/V/C-F-31I004BG	97722464	97722498	97722532
		PVC	EPDM	Ceramic	no	DDA 12-10 AR-PVC/E/C-F-31U7U7BG	97722467	97722501	97722535
					yes	DDA 12-10 AR-PVC/E/C-F-31I004BG	97722468	97722502	97722536
			FKM	Ceramic	no	DDA 12-10 AR-PVC/V/C-F-31U7U7BG	97722471	97722505	97722539
					yes	DDA 12-10 AR-PVC/V/C-F-31I004BG	97722472	97722506	97722540
		PVDF	PTFE	Ceramic	no	DDA 12-10 AR-PV/T/C-F-31U7U7BG	97722487	97722521	97722555
					yes	DDA 12-10 AR-PV/T/C-F-31I004BG	97722488	97722522	97722556
		SS	PTFE	SS 1.4401	no	DDA 12-10 AR-SS/T/SS-F-31VVBG	97722491	97722525	97722559

17	7	PP	EPDM	Ceramic	no	DDA 17-7 AR-PP/E/C-F-31U7U7BG	97722561	97722596	97722630
					yes	DDA 17-7 AR-PP/E/C-F-31I004BG	97722562	97722597	97722631
			FKM	Ceramic	no	DDA 17-7 AR-PP/V/C-F-31U7U7BG	97722565	97722600	97722634
					yes	DDA 17-7 AR-PP/V/C-F-31I004BG	97722566	97722601	97722635
		PVC	EPDM	Ceramic	no	DDA 17-7 AR-PVC/E/C-F-31U7U7BG	97722569	97722604	97722638
					yes	DDA 17-7 AR-PVC/E/C-F-31I004BG	97722570	97722605	97722639
			FKM	Ceramic	no	DDA 17-7 AR-PVC/V/C-F-31U7U7BG	97722574	97722608	97722642
					yes	DDA 17-7 AR-PVC/V/C-F-31I004BG	97722575	97722609	97722643
		PVDF	PTFE	Ceramic	no	DDA 17-7 AR-PV/T/C-F-31U7U7BG	97722590	97722624	97722658
					yes	DDA 17-7 AR-PV/T/C-F-31I004BG	97722591	97722625	97722659
		SS	PTFE	SS 1.4401	no	DDA 17-7 AR-SS/T/SS-F-31VVBG	97722594	97722628	97722662
30	4	PP	EPDM	Ceramic	no	DDA 30-4 AR-PP/E/C-F-31U7U7BG	97722664	97722698	97722732
					yes	DDA 30-4 AR-PP/E/C-F-31I004BG	97722665	97722699	97722733
			FKM	Ceramic	no	DDA 30-4 AR-PP/V/C-F-31U7U7BG	97722668	97722702	97722736
					yes	DDA 30-4 AR-PP/V/C-F-31I004BG	97722669	97722703	97722737
		PVC	EPDM	Ceramic	no	DDA 30-4 AR-PVC/E/C-F-31U7U7BG	97722672	97722706	97722740
					yes	DDA 30-4 AR-PVC/E/C-F-31I004BG	97722673	97722707	97722741
			FKM	Ceramic	no	DDA 30-4 AR-PVC/V/C-F-31U7U7BG	97722676	97722710	97722744
					yes	DDA 30-4 AR-PVC/V/C-F-31I004BG	97722677	97722711	97722745
		PVDF	PTFE	Ceramic	no	DDA 30-4 AR-PV/T/C-F-31U7U7BG	97722692	97722726	97722760
					yes	DDA 30-4 AR-PV/T/C-F-31I004BG	97722693	97722727	97722761
		SS	PTFE	SS 1.4401	no	DDA 30-4 AR-SS/T/SS-F-31VVBG	97722696	97722730	97722764

*Installation set includes: 2 pump connections, foot valve, injection unit, 6 m PE discharge tube, 2 m PVC suction tube, 2 m PVC vent tube (4/6 mm)

** Also available in **FC-** and **FCM-**control version

DDC, standard range

Power supply: 1x100-240 V, 50/60 Hz (switch mode)
Mains plug: USA, Canada
Valves: Standard
Connection set: Hose, 0.17" x 1/4“, 1/4" x 3/8", 3/8" x 1/2"

Max. flow [l/h]	Max. pressure [bar]	Materials			Installation set*	Type key**	Product number	
		Dosing head	Gaskets	Valve balls			A	AR
6	10	PP	EPDM	Ceramic	no	DDC 6-10 A-PP/E/C-F-31U7U7BG	97721529	97721563
					yes	DDC 6-10 A-PP/E/C-F-31I003BG	97721530	97721564
			FKM	Ceramic	no	DDC 6-10 A-PP/V/C-F-31U7U7BG	97721533	97721567
					yes	DDC 6-10 A-PP/V/C-F-31I003BG	97721534	97721568
		PVC	EPDM	Ceramic	no	DDC 6-10 A-PVC/E/C-F-31U7U7BG	97721537	97721571
					yes	DDC 6-10 A-PVC/E/C-F-31I003BG	97721538	97721572
			FKM	Ceramic	no	DDC 6-10 A-PVC/V/C-F-31U7U7BG	97721541	97721575
					yes	DDC 6-10 A-PVC/V/C-F-31I003BG	97721542	97721576
			PTFE	Ceramic	no	DDC 6-10 A-PV/T/C-F-31U7U7BG	97721557	97721591
					yes	DDC 6-10 A-PV/T/C-F-31I003BG	97721558	97721592
		SS	PTFE	SS 1.4401	no	DDC 6-10 A-SS/T/SS-F-31VVBG	97721561	97721595
9	7	PP	EPDM	Ceramic	no	DDC 9-7 A-PP/E/C-F-31U7U7BG	97721597	97721631
					yes	DDC 9-7 A-PP/E/C-F-31I004BG	97721598	97721632
			FKM	Ceramic	no	DDC 9-7 A-PP/V/C-F-31U7U7BG	97721601	97721635
					yes	DDC 9-7 A-PP/V/C-F-31I004BG	97721602	97721636
		PVC	EPDM	Ceramic	no	DDC 9-7 A-PVC/E/C-F-31U7U7BG	97721605	97721639
					yes	DDC 9-7 A-PVC/E/C-F-31I004BG	97721606	97721640
			FKM	Ceramic	no	DDC 9-7 A-PVC/V/C-F-31U7U7BG	97721609	97721643
					yes	DDC 9-7 A-PVC/V/C-F-31I004BG	97721610	97721644
		PVDF	PTFE	Ceramic	no	DDC 9-7 A-PV/T/C-F-31U7U7BG	97721625	97721659
					yes	DDC 9-7 A-PV/T/C-F-31I004BG	97721626	97721660
		SS	PTFE	SS 1.4401	no	DDC 9-7 A-SS/T/SS-F-31VVBG	97721629	97721663
15	4	PP	EPDM	Ceramic	no	DDC 15-4 A-PP/E/C-F-31U7U7BG	97721665	97721699
					yes	DDC 15-4 A-PP/E/C-F-31I004BG	97721666	97721700
			FKM	Ceramic	no	DDC 15-4 A-PP/V/C-F-31U7U7BG	97721669	97721703
					yes	DDC 15-4 A-PP/V/C-F-31I004BG	97721670	97721704
		PVC	EPDM	Ceramic	no	DDC 15-4 A-PVC/E/C-F-31U7U7BG	97721673	97721707
					yes	DDC 15-4 A-PVC/E/C-F-31I004BG	97721674	97721708
			FKM	Ceramic	no	DDC 15-4 A-PVC/V/C-F-31U7U7BG	97721677	97721711
					yes	DDC 15-4 A-PVC/V/C-F-31I004BG	97721678	97721712
		PVDF	PTFE	Ceramic	no	DDC 15-4 A-PV/T/C-F-31U7U7BG	97721693	97721727
					yes	DDC 15-4 A-PV/T/C-F-31I004BG	97721694	97721728
		SS	PTFE	SS 1.4401	no	DDC 15-4 A-SS/T/SS-F-31VVBG	97721697	97721731

*Installation set includes: 2 pump connections, foot valve, injection unit, 6 m PE discharge tube, 2 m PVC suction tube, 2 m PVC vent tube (4/6 mm)
** Also available in **AR**-control version

DDE, standard range

Power supply: 1x100-240 V, 50/60 Hz (switch mode)
Mains plug: USA, Canada
Valves: Standard
Connection set: Hose, 0.17" x 1/4“, 1/4" x 3/8", 3/8" x 1/2"

Max. flow [l/h]	Max. pressure [bar]	Materials			Installation set*	Type key**	Product number	
		Dosing head	Gaskets	Valve balls			B	P
6	10	PP	EPDM	Ceramic	no	DDE 6-10 B-PP/E/C-F-31U7U7BG	97721051	97721085
					yes	DDE 6-10 B-PP/E/C-F-31I003BG	97721052	97721086
			FKM	Ceramic	no	DDE 6-10 B-PP/V/C-F-31U7U7BG	97721055	97721089
					yes	DDE 6-10 B-PP/V/C-F-31I003BG	97721056	97721090
		PVC	EPDM	Ceramic	no	DDE 6-10 B-PVC/E/C-F-31U7U7BG	97721059	97721093
					yes	DDE 6-10 B-PVC/E/C-F-31I003BG	97721060	97721094
			FKM	Ceramic	no	DDE 6-10 B-PVC/V/C-F-31U7U7BG	97721063	97721097
					yes	DDE 6-10 B-PVC/V/C-F-31I003BG	97721064	97721098
		PVDF	PTFE	Ceramic	no	DDE 6-10 B-PV/T/C-F-31U7U7BG	97721079	97721113
					yes	DDE 6-10 B-PV/T/C-F-31I003BG	97721080	97721114
		SS	PTFE	SS 1.4401	no	DDE 6-10 B-SS/T/SS-F-31VVBG	97721083	97721117
15	4	PP	EPDM	Ceramic	no	DDE 15-4 B-PP/E/C-F-31U7U7BG	97721119	97721153
					yes	DDE 15-4 B-PP/E/C-F-31I004BG	97721120	97721154
			FKM	Ceramic	no	DDE 15-4 B-PP/V/C-F-31U7U7BG	97721123	97721157
					yes	DDE 15-4 B-PP/V/C-F-31I004BG	97721124	97721158
		PVC	EPDM	Ceramic	no	DDE 15-4 B-PVC/E/C-F-31U7U7BG	97721127	97721161
					yes	DDE 15-4 B-PVC/E/C-F-31I004BG	97721128	97721162
			FKM	Ceramic	no	DDE 15-4 B-PVC/V/C-F-31U7U7BG	97721131	97721165
					yes	DDE 15-4 B-PVC/V/C-F-31I004BG	97721132	97721166
		PVDF	PTFE	Ceramic	no	DDE 15-4 B-PV/T/C-F-31U7U7BG	97721147	97721181
					yes	DDE 15-4 B-PV/T/C-F-31I004BG	97721148	97721182
		SS	PTFE	SS 1.4401	no	DDE 15-4 B-SS/T/SS-F-31VVBG	97721151	97721186

*Installation set includes: 2 pump connections, foot valve, injection unit, 6 m PE discharge tube, 2 m PVC suction tube, 2 m PVC vent tube (4/6 mm)
** Also available in **P-**control version

DDA, DDC, DDE, non-standard range

Key to the designations of the three following tables:

Non-standard range								
Max. flow and pressure	**Control variant**	**Materials of dosing head, gaskets and valve balls**	**Control cube position**	**Supply voltage**	**Valve type**	**Connection / Installation set**	**Mains plug**	**Design**
[gph-psi ([l/h)-(bar)]	see page 7 in Product Guide	PP = Polypropylene PVC = Polyvinyl chloride PV = PVDF SS = Stainless steel 316L - 1.4401 Gaskets: E = EPDM V = FKM T = PTFE Valve balls: C = Ceramic SS = Stainless steel 316 - 1.4401	F = Front-mounted (change to left and right possible) X = No control cube	3 = 1x100-240 V, 50/60 Hz I = 24-48 VDC (DDC)	1 = Standard 2 = Spring-loaded (HV-Version)	Connection, suction/ discharge U2U2 = Tube, 4/6mm, 6/9mm, 6/12mm, 9/12mm U7U7 = Tube, 0.17"x1/4", 1/4"x3/8", 3/8"x1/2" AA = Threaded, Rp 1/4", female (SS) VV = Threaded, NPT 1/4", female (SS) XX = Without connector Installation set* I001 = 4/6mm up to 2.0 gph, 232 psi (7.5l/h, 16 bar) I002 = 9/12mm up to 15.85 gph, 188.5 psi (60l/h, 13 bar) I003 = 0.17"x1/4" up to 2.0 gph, 232 psi (7.5l/h, 16 bar) I004 = 3/8"x1/2" up to 15.85 gph, 145 psi (60l/h, 10 bar)	B = USA, Canada X = No plug F = EU (Schuko) G = UK I = Australia, New Zealand, Taiwan E = Switzerland J = Japan L = Argentina	G = Grundfos

DDA										
		Dosing head	**Gasket**	**Ball**						
2.0-232 (7.5-16)	AR FC FCM	PP	E V	C	F	3	1 2	U2U2 U7U7 XX I001 I003	F B G I E J L	G
		PVC	E V T	C						
		PV								
		SS	T	SS	F	3	1 2	AA VV XX		
3.17-150 (12-10) 4.5-101.5 (17-7) 8-60 (30-4)	AR FC FCM	PP	E V	C	F	3	1 2	U2U2 U7U7 XX I002 I004		
		PVC	E V T	C						
		PV								
		SS	T	SS	F	3	1 2	AA VV XX		

DDC										
		Dosing head	**Gasket**	**Ball**						
1.5-150 (6-10)	A AR	PP	E V	C	F	3 I	1 2	U2U2 U7U7 XX I001 I003	F B G I E J L	G
		PVC	E V T	C						
		PV								
		SS	T	SS	F	3 I	1 2	AA VV XX		
2.4-101 (9-7) 4-60 (15-4)	A AR	PP	E V	C	F	3 I	1 2	U2U2 U7U7 XX I002 I004		
		PVC	E V T	C						
		PV								
		SS	T	SS	F	3 I	1 2	AA VV XX		

Note: PTFE balls available as a separate kit,not a configurable non-standard option.

Non-standard range								
Max. flow and pressure	**Control variant**	**Materials of dosing head, gaskets and valve balls**	**Control cube position**	**Supply voltage**	**Valve type**	**Connection / Installation set**	**Mains plug**	**Design**
[gph-psi ([l/h)-(bar)]	see page 7 in Product Guide	PP = Polypropylene PVC = Polyvinyl chloride PV = PVDF SS = Stainless steel 316L - 1.4401 Gaskets: E = EPDM V = FKM T = PTFE Valve balls: C = Ceramic SS = Stainless steel 316 - 1.4401	F = Front-mounted (change to left and right possible) X = No control cube	3 = 1x100-240 V, 50/60 Hz I = 24-48 VDC (DDC)	1 = Standard 2 = Spring-loaded (HV-Version)	Connection, suction/ discharge U2U2 = Tube, 4/6mm, 6/9mm, 6/12mm, 9/12mm U7U7 = Tube, 0.17"x1/4", 1/4"x3/8", 3/8"x1/2" AA = Threaded, Rp 1/4“, female (SS) VV = Threaded, NPT 1/4“, female (SS) XX = Without connector Installation set* I001 = 4/6mm up to 2.0 gph, 232 psi (7.5l/h, 16 bar) I002 = 9/12mm up to 15.85 gph, 188.5 psi (60l/h, 13 bar) I003 = 0.17"x1/4“ up to 2.0 gph, 232 psi (7.5l/h, 16 bar) I004 = 3/8"x1/2" up to 15.85 gph, 145 psi (60l/h, 10 bar)	B = USA, Canada X = No plug F = EU (Schuko) G = UK I = Australia, New Zealand, Taiwan E = Switzerland J = Japan L = Argentina	G = Grundfos

DDE										
1.5-150 (6-10)	B P	PP	E V	C	X	3	1 2	U2U2 U7U7 XX I001 I003	F B G I E J L	G
		PVC PV	E V T	C						
		SS	T	SS	X	3	1 2	AA VV XX		
4-60 (15-4)	B P	PP	E V	C	X	3	1 2	U2U2 U7U7 XX I002 I004		
		PVC PV	E V T	C						
		SS	T	SS	X	3	1 2	AA VV XX		

*Installation set includes: 2 pump connections, foot valve, injection valve,19.6 ft (6 m) PE discharge tubing, 6.5 ft (2 m) PVC suction tubing, 6.5 ft (2 m) PVC vent tubing (4/6 mm).

List of pumped liquids

The resistance table below is intended as a general guide for material resistance (at room temperature), and does not replace testing of the chemicals and pump materials under specific working conditions.

The data shown are based on information from various sources available, but many factors (purity, temperature, abrasive particles, etc.) may affect the chemical resistance of a given material.

Note: Some of the liquids in this table may be toxic, corrosive or hazardous. Please be careful when handling these liquids. Please check chemical compatibility with your chemical supplier.

For further information see Pumped Liquid Guide.

Pumped liquid (68 °F or 20 °C)			Material							
			Dosing head				Gasket			Ball
Description	Chemical	Concentration	PP	PVDF	SS1.4401	PVC	FKM	EPDM	PTFE	Ceramic
Acetic acid	CH_3COOH	25	●	●	●	●	–	●	●	●
		60	●	●	●	●	–	❍	●	●
		85	●	●	●	–	–	–	●	●
Aluminium chloride	$AlCl_3$	40	●	●	–	●	●	●	●	●
Aluminium sulphate	$Al_2(SO_4)_3$	60	●	●	●	●	●	●	●	●
Ammonia, aqueous	NH_4OH	28	●	●	●	●	–	●	●	●
Calcium hydroxide★[7]	$Ca(OH)_2$		●	●	●	●	●	●	●	●
Calcium hypochlorite	$Ca(OCl)_2$	20	❍	●	–	●	●	●	●	●
Chromic acid★[5]	H_2CrO_4	10	●	●	●	●	●	●	●	●
		30	–	●	–	●	●	❍	●	●
		40	–	●	–	●	●	–	●	●
		50	–	●	–	●	●	–	●	●
Copper sulphate	$CuSO_4$	30	●	●	●	●	●	●	●	●
Ferric chloride★[3]	$FeCl_3$	100	●	●	–	●	●	●	●	●
Ferric sulphate★[3]	$Fe_2(SO_4)_3$	100	●	●	●	●	●	●	●	●
Ferrous chloride	$FeCl_2$	100	●	●	–	●	●	●	●	●
Ferrous sulphate	$FeSO_4$	50	●	●	●	●	●	●	●	●
Hydrochloric acid	HCl	< 25	●	●	–	●	❍	●	●	●
		25-37	●	●	–	●	–	●	●	●
Hydrogen peroxide	H_2O_2	30	●	●	●	●	●	●	●	●
Nitric acid	HNO_3	10	●	●	●	●	●	●	●	●
		30	●	●	●	●	●	●	●	●
		40	❍	●	●	●	●	●	●	●
		70	–	●	●	–	●	–	●	●
Peracetic acid	CH_3COOOH	5	●	●	–	●	–	●	●	●
Potassium hydroxide	KOH	50	●	–	●	●	–	●	●	●
Potassium permanganate	$KMnO_4$	10	●	●	●	●	–	●	●	●
Sodium chlorate	$NaClO_3$	30	●	●	●	●	❍	●	●	●
Sodium chloride	NaCl	30	●	●	–	●	●	●	●	●
Sodium chlorite	$NaClO_2$	20	●	❍	–	–	●	●	●	●
Sodium hydroxide	NaOH	20	●	❍	●	●	❍	●	●	●
		30	●	–	●	●	❍	●	●	●
		50	●	–	●	●	❍	●	●	●
Sodium hypochlorite	NaOCl	20	❍	●	–	●	●	❍	●	●
Sodium sulphide	Na_2S	30	●	●	●	●	●	●	●	●
Sodium sulphite★[6]	Na_2SO_3	20	●	●	●	●	●	●	●	●
Sulphurous acid	H_2SO_3	6	●	●	●	●	●	●	●	●
Sulphuric acid★[4]	H_2SO_4	< 80	●	●	–	❍	●	❍	●	●
		80-98	❍	●	–	–	●	–	●	●

● Resistant

❍ Limited resistance

– Not resistant

★[3] Risk of crystallization.

★[4] Reacts violently with water and generates much heat.

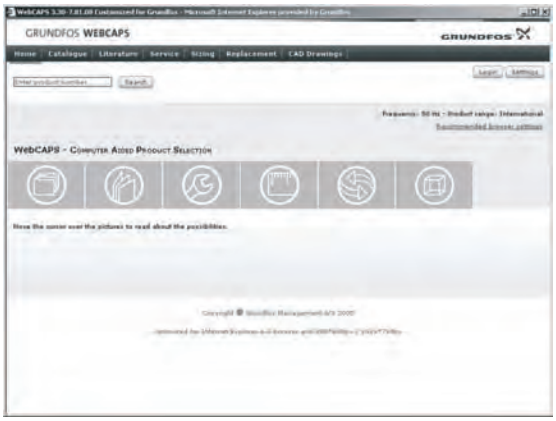
★[5] Must be fluoride-free when glass balls are used.

★[6] In neutral solutions.

★[7] Saturated solution 0.1 %.

Further product documentation

WebCAPS

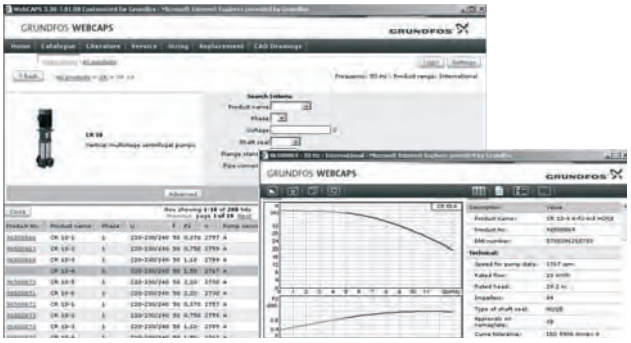


WebCAPS is a **Web**-based **C**omputer **A**ided **P**roduct **S**election program available on www.grundfos.com.

WebCAPS contains detailed information on more than 185,000 Grundfos products in more than 20 languages.

In WebCAPS, all information is divided into 6 sections:

- Catalog
- Literature
- Service
- Sizing
- Replacement
- CAD drawings.



Catalog

This section is based on fields of application and pump types, and contains
- technical data
- curves (QH, Eta, P1, P2, etc) which can be adapted to the density and viscosity of the pumped liquid and show the number of pumps in operation
- product photos
- dimensional drawings
- wiring diagrams
- quotation texts, etc.

Literature

In this section you can access all the latest documents of a given pump, such as
- product guides
- installation and operating instructions
- service documentation, such as Service kit catalog and Service kit instructions
- quick guides
- product brochures, etc.

Service

This section contains an easy-to-use interactive service catalog. Here you can find and identify service parts of both existing and discontinued Grundfos pumps.
Furthermore, this section contains service videos showing you how to replace service parts.

Further product documentation

Sizing

This section is based on different fields of application and installation examples, and gives easy step-by-step instructions in how to
- select the most suitable and efficient pump for your installation
- carry out advanced calculations based on energy consumption, payback periods, load profiles, life cycle costs, etc.
- analyse your selected pump via the built-in life cycle cost tool
- determine the flow velocity in wastewater applications, etc.

Replacement

In this section you find a guide to selecting and comparing replacement data of an installed pump in order to replace the pump with a more efficient Grundfos pump.
The section contains replacement data of a wide range of pumps produced by other manufacturers than Grundfos.

Based on an easy step-by-step guide, you can compare Grundfos pumps with the one you have installed on your site. When you have specified the installed pump, the guide will suggest a number of Grundfos pumps which can improve both comfort and efficiency.

CAD drawings

In this section it is possible to download 2-dimensional (2D) and 3-dimensional (3D) CAD drawings of most Grundfos pumps.

These formats are available in WebCAPS:

2-dimensional drawings:
- .dxf, wireframe drawings
- .dwg, wireframe drawings.

3-dimensional drawings:
- .dwg, wireframe drawings (without surfaces)
- .stp, solid drawings (with surfaces)
- .eprt, E-drawings.

WinCAPS

WinCAPS CD-ROM

WinCAPS is a **Win**dows-based **C**omputer **A**ided **P**roduct **S**election program containing detailed information on more than 185,000 Grundfos products in more than 20 languages.

The program contains the same features and functions as WebCAPS, but is an ideal solution if no Internet connection is available.

WinCAPS is available on CD-ROM and updated once a year.

Subject to alterations.

Further product documentation

Available Grundfos Dosing brochures:

Smart Digital brochure	L-SD-SL-01
Dosing All Product brochure	L-DOS-SL-02
Dosing Systems brochure	L-DOS-SL-01
Instrumentation brochure	L-INS-SL-01
Disinfection brochure	L-DD-SL-15

BE > THINK > INNOVATE >

Being responsible is our foundation
Thinking ahead makes it possible
Innovation is the essence

L-SD-PG-001 12.10
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