FLEXIBILITY SAFETY RELIABILITY

Digital dosing
since 2000

THE SMART DIGITAL RANGE

Accurate digital diaphragm dosing pumps

be
think
innovate

GRUNDFOS

A SOLUTION FOR **ALL** DOSING APPLICATIONS

Whether your job is to ensure safe pool water or to add coagulants in complex industrial manufacturing processes, you know that dosing pumps are an important part of the process. You probably also have some strict requirements that need to be met: Chemicals must be dosed accurately so you can avoid overdosing, spillage, and soaring costs. Pumps must be tough and reliable, but still user-friendly, so you get dependable and safe processes, especially when hazardous chemicals are involved. Pumps must be energy-efficient, and must require minimal service and maintenance, so you can control operating costs. And if you need to handle many different installation sites, perhaps even in many different countries, you need pumps that are flexible and easy to configure.

Fulfilling all requirements

The SMART Digital range of diaphragm dosing pumps from Grundfos gives you all of this, and more. Covering flow rates up to 200 litres an hour, and output pressure ratings up to 16 bar, the SMART Digital range delivers reliable, safe, and cost-effective dosing in any application across a wide selection of businesses, with industry-leading user friendliness and flexibility. And the advanced monitoring and self-analysis features offered by several control variants provide intelligent process control that looks beyond the pump and keeps an eye on the entire system for you.

A complete package

The SMART Digital range comes with a wide selection of accessories such as installation kits, signal cables, and dosing tanks that make it even easier to customise the pumps to any application. SMART Digital pumps have very long service and maintenance intervals, significantly lowering pump life-cycle cost and contributing to disruption-free, reliable dosing performance. And when service is needed, our tailor-made service kits ensure optimal service that keeps pumps running in top condition for years.

In short: The SMART Digital range offers a complete package of dosing solutions for any business. Including yours.

KEY FEATURES AT A GLANCE

Superior technology since 1999

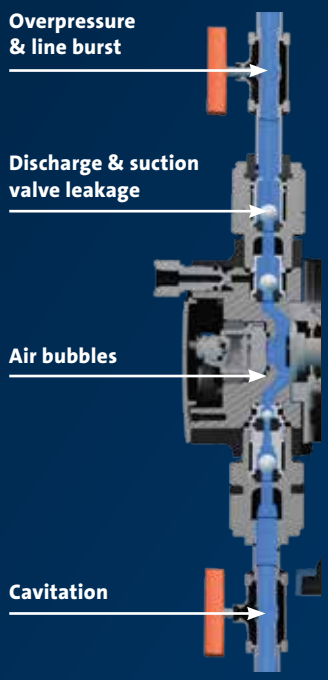
Grundfos pioneered Digital Dosing™ technology in 1999. Our SMART Digital Diaphragm dosing pumps provide decisive advantages over pumps that rely on traditional technologies such as stroke length/stroke frequency adjustment with synchronous motors or solenoid drives. Our powerful variable-speed stepper motors feature internal stroke speed control for smooth, continuous dosing and an impressive turn-down ratio.

Taking the challenge out of challenging liquids

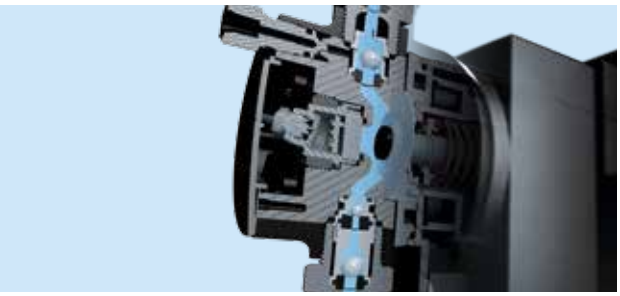
With SMART Digital, dosing degassing or high-viscosity liquids is a breeze. The auto-deaeration feature offered by several models means that degassing chemicals do not result in vapour lock which can block the dosing process. And with the SlowMode feature, high-viscosity liquids can be dosed without clogging up the pump. In fact, some SMART Digital models can dose liquids with a viscosity up to 3,000 mPas!

Several control variants

All SMART Digital pumps come in several control variants so you can pick a solution that suits your application, with features ranging from simple and intuitive start/stop buttons to advanced remote communication and self-diagnosis features.



MAIN BENEFITS OF THE SMART DIGITAL RANGE

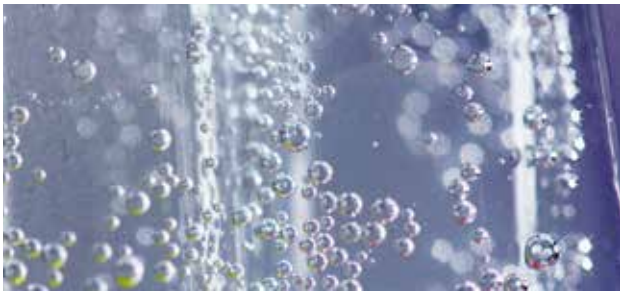


Accurate

Stepper and permanent magnet synchronous motor technology with optional flow control features make it possible for the SMART Digital range to achieve market leading dosing accuracy. The SMART Digital DDA-FCM, for example, deviates less than one percent from the set point at flow rates from 50 ml/h and up.

Flexible

High turn-down ratio. Wide supply voltage range. Mounting plate. Adjustable control cube. These are just some of the features that make the SMART Digital range flexible enough for any application. Pumps can quickly be reconfigured and assigned for new tasks in response to changes in demand.



Safe and reliable

The unmatched accuracy of the SMART Digital pumps minimises spillage and contributes to safe operating procedures. Several control variants provide auto-deaeration, monitoring, and self-diagnosis features that improve installation safety and reliability.

User-friendly

From intuitive wheel and button interfaces to clear, backlit navigation menus available in well over 20 languages, SMART Digital pumps are very easy to set up and operate. With many control variants, calibration is not necessary, and you can trust the pump to do its job – or warn you in case of problems.

Cost-effective

Robust pump components such as the full-PTFE diaphragm provide thousands of hours of reliable operation before service is needed. Several control variants make external flow meters and pulsation dampeners unnecessary, and the great dosing accuracy and energy efficiency save chemicals and power.

SMART DIGITAL S

EXTREME ACCURACY AT LOW DOSING VOLUMES

At dosing volumes up to 30 l/h, the SMART Digital DDA, DDC, and DDE offer extreme dosing accuracy and several control and communication options. The compact pumps can easily be mounted on horizontal or vertical surfaces with the click-stop mounting plate.

DDA

The high-end DDA pump is designed as the perfect solution for complex and demanding applications. It handles degassing liquids without any problems thanks to its auto-deaeration feature – also during pump standby. The FC control variant offers FlowControl with selective fault diagnosis as well as built-in pressure monitoring, and the FCM control variant additionally offers integrated flow measurement and the AutoFlowAdapt feature which allows the pump to adjust pump speed to actual conditions. The pump offers batch modes (timer or pulse based) and can be delivered with an optional E-box for Profibus DP integration.

DDC

The DDC pump is the optimum solution for many common applications. The pump offers manual and pulse control operation modes, and the built-in SlowMode can be used to dose high-viscosity liquids. The easy-to-use interface with the click wheel makes setup and operation as easy as turning up your stereo. The AR control variant offers analogue control, relay settings for alarm, warning, stroke signal, and pump dosing, an input for analogue 0/4-20 mA control, and two output relays.

DDE

The DDE pump offers a cost-effective Digital Dosing™ solution with basic functions for simple applications. Only two pump variants cover the entire flow range. Setting dosing capacity from 0.1 to 100% is easy on the intuitive user interface. The PR and P control variants offer pulse control (1:n), and inputs for external stop, low level, and empty tank signals. The PR control variant also offers relay setting of alarm, warning, stroke signal, and pump dosing as well as two output relays.

Industries

- Water treatment
- Industry

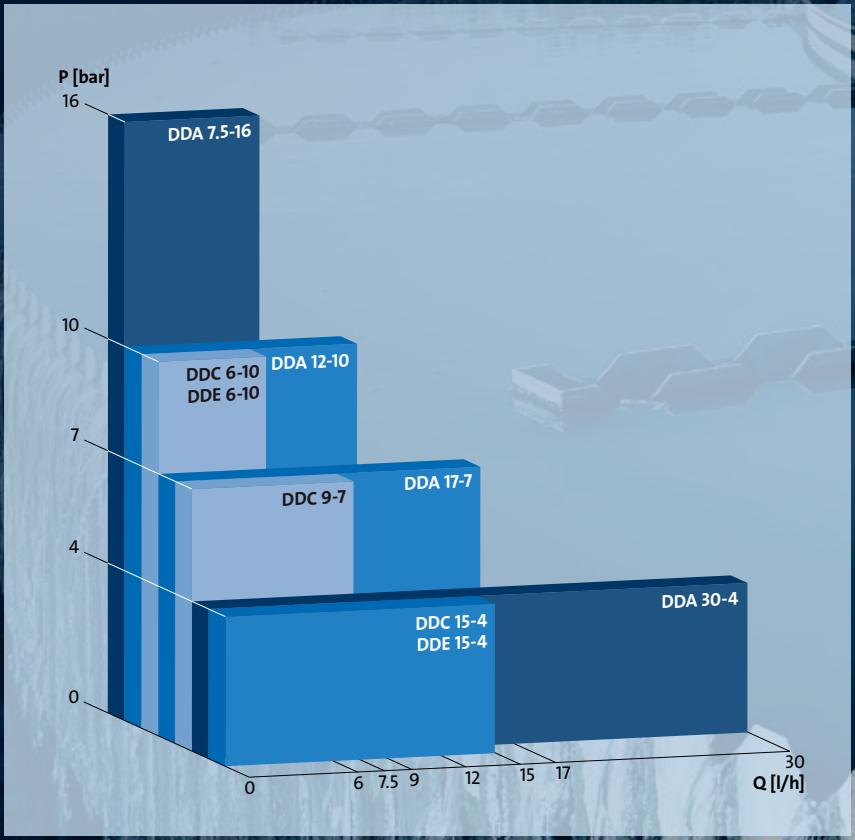
Applications

- Disinfection
- pH adjustment
- Chemical dosing (anti foamers, cleaners, biocides, etc.)
- Cleaning in place (CIP)
- Coagulation
- Precipitation/flocculation
- Filtration
- Reverse osmosis

For a complete overview of control variant features, see page 8.

TECHNICAL SPECIFICATIONS

Dosing capacity	max 30 l/h
Operating pressure	up to 16 bar
Dosing accuracy deviation	<1% of set point at 50 ml/h and up (DDA-FCM)
Turn-down ratio	1:3000 or 1:1000
Liquid viscosity	max 2500 mPas, depending on model and setup
Supply voltage	100-240 V, 50-60 Hz
Power consumption	max 18 W
Weight	2.4 kg
Sound pressure level	< 60 dB(A)
Enclosure rating	IP65, NEMA 4X



SMART DIGITAL XL

THREE MODEL VARIANTS, ENDLESS POSSIBILITIES

For applications requiring accuracy at flows up to 200 l/h, the SMART Digital XL DDA and DDE units cover the entire range with only three pump models. The pumps offer many of the same control and communication options as the SMART Digital S dosing pumps but with greater flow performance. The pumps can easily be mounted on horizontal surfaces with the click-stop mounting plate.

The high flow performance of the SMART Digital XL pumps make them the ideal option for applications that require high flow and high accuracy, such as flocculant dosing. For other applications, such as polymer dosing in drinking water treatment, the combination of high flow rates and high pressure offered by the SMART Digital XL pumps (such as 120 l/h at 7 bar) delivers the results needed.

DDA

With CIU integration options and multiple built-in control and communication features, the DDA pump is the most advanced SMART Digital XL offering. Like the SMART Digital S DDA, it offers value-added features such as auto-deaeration and can be specified in control variants with FlowControl, built-in pressure monitoring and flow measurement, and AutoFlowAdapt. With accuracy that is unrivalled in this flow performance range, the DDA delivers safety, flexibility, and user friendliness for a wide range of applications.

DDE

Like the small SMART Digital DDE, the SMART Digital XL DDE offers cost-effective Digital Dosing™, but it meets more application requirements thanks to its larger flow range. The AR control variant offers value-added features such as pulse control in ml/pulse and an input for analogue 0/4-20 mA control. The B control variant delivers basic dosing features with manual speed control in an operator-friendly unit. When high flow performance at a competitive price is needed, the SMART Digital XL DDE is the answer.

Industries

- Water utility (drinking water and wastewater)
- Water treatment (pool water, ultrafiltration)
- Industry
- Agriculture

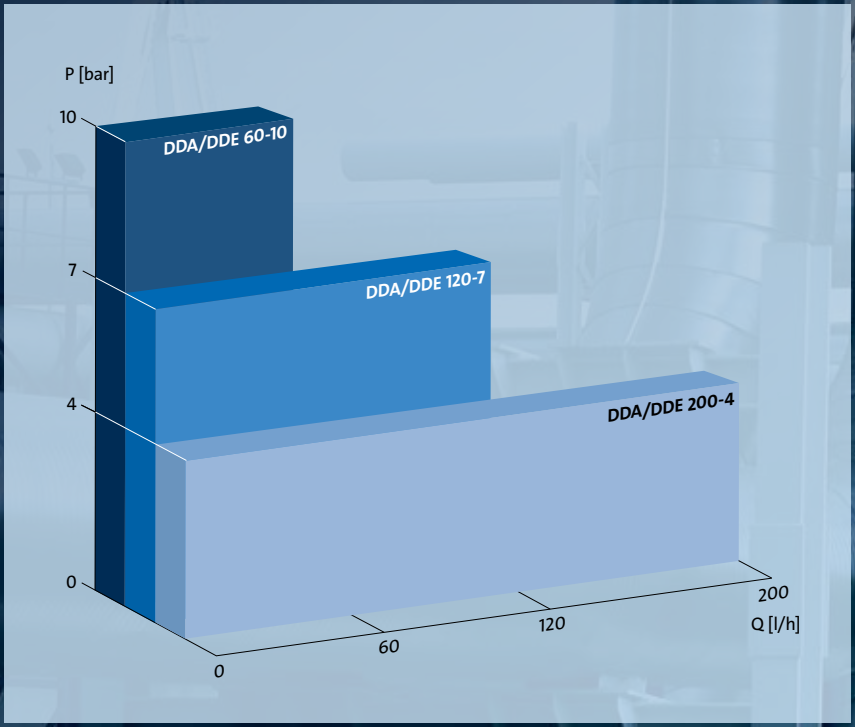
Applications

- Disinfection
- pH adjustment
- Chemical dosing (anti foamers, cleaners, biocides, bleaches, surface handling agents, etc.)
- Cleaning in place (CIP)
- Coagulation
- Precipitation/flocculation
- Filtration
- Reverse osmosis

For a complete overview of control variant features, see page 9.

TECHNICAL SPECIFICATIONS

Dosing capacity	max 200 l/h
Operating pressure	up to 10 bar
Accuracy of repeatability	±1.5% of set point, ±0.1% of full scale
Turn-down ratio	1:800
Liquid viscosity	max 3000 mPas, depending on model and setup
Supply voltage	100-240 V, 50-60 Hz
Power consumption	max 80 W
Weight	6.7-15 kg, depending on material
Sound pressure level	80 dB(A)
Enclosure rating	IP65, NEMA 4X



FEATURE OVERVIEW, **SMART DIGITAL S**

Model	**DDA**			**DDC**		**DDE**		
Control variant	**FCM**	**FC**	**AR**	**AR**	**A**	**PR**	**P**	**B**
Operation modes								
Manual speed control	X	X	X	X	X	X	X	X
Pulse control in ml/pulse	X	X	X	X	X			
Pulse control (1:n)						X	X	
Analog control 0/4-20 mA	X	X	X	X				
Batch control (pulse-based)	X	X	X					
Dosing timer cycle	X	X	X					
Dosing timer week	X	X	X					
Fieldbus control	X	X	X					
Functions								
Auto deaeration also during pump standby	X	X	X					
FlowControl system with selective fault diagnosis	X	X						
Pressure monitoring (min / max)	X	X						
Flow measurement	X							
AutoFlowAdapt	X							
SlowMode (anti-cavitation)	X	X	X	X	X			
Calibration mode	X	X	X	X	X			
Scaling of analogue input	X	X	X					
Service information display	X	X	X	X	X			
Relay setting: alarm, warning, stroke signal, pump dosing	X	X	X	X		X		
Relay setting (additionally): timer cycle, timer week	X	X	X					
Inputs/outputs								
Input for external stop	X	X	X	X	X	X	X	
Input for pulse control	X	X	X	X	X	X	X	
Input for analogue 0/4-20 mA control	X	X	X	X				
Input for low-level signal	X	X	X	X	X	X	X	
Input for empty tank signal	X	X	X	X	X	X	X	
Output relay (2 relays)	X	X	X	X		X		
Output, analogue 0/4-20 mA	X	X	X					
Input/output for GeniBus	X	X	X					
Input/output for E-box (Profibus DP or additional alarm relays)	X	X	X					

CONTROL VARIANTS

FCM: Flow Control Measurement	**AR:** Analogue Relay	**PR:** Pulse Relay	**B:** Basic
FC: Flow Control	**A:** Analogue	**P:** Pulse input	

FEATURE OVERVIEW, **SMART DIGITAL XL**

Model	**DDA**		**DDE**	
Control variant	**FCM**	**AR**	**AR**	**B**
Operation modes				
Manual speed control	X	X	X	X
Pulse control in ml/pulse	X	X	X	
Analog control (0)4-20 mA	X	X	X	
Batch control (pulse-based)	X	X		
Dosing timer, cycle	X	X		
Dosing timer, week	X	X		
Fieldbus control	X	X		
Functions				
Auto-deaeration also during pump standby	X	X		
FlowControl system with selective fault diagnosis	X			
Pressure monitoring (min/max)	X			
Flow measurement	X			
AutoFlowAdapt	X			
SlowMode (anti-cavitation)	X	X		
Double-diaphragm leakage detection (optional)		X		
Inputs/outputs				
Input for external stop	X	X	X	
Input for pulse control	X	X	X	
Input for analogue 0/4-20 mA control	X	X	X	
Input for low-level signal	X	X	X	
Input for empty tank signal	X	X	X	
Output relay (2 relays)	X	X	X	
Output, analogue 0/4-20 mA	X	X		
Input/output for GeniBus	X	X		
Input/output for Grundfos CIU (Profibus DP or additional alarm relays)	X	X		

ACCESSORIES AND SERVICE

KEEP YOUR DOSING SOLUTION IN PERFECT SHAPE

We offer a complete range of accessories for the SMART Digital pump range to ease installation and operation in any application.

SMART Digital pumps have outstandingly long maintenance intervals. Wear parts which have been in contact with the media only have to be replaced after 8,000 operating hours* (or after two years at the latest). Our range of service kits enables you to perform high-quality pump service and maintenance with original spare parts, keeping your dosing solution in perfect shape for years.

Accessories

The range of accessories for the SMART Digital range includes:

- Installation kit including foot valve, injection unit and hose
- Multi-function valve (PVDF)
- Rigid suction lance (PE, PVDF) with low level and empty tank signal
- Foot valve for flexible suction line (PE, PVDF, stainless steel)
- Injection unit (PP, PVC, PVDF, stainless steel) in different designs
- Hose (PVC, PE, ETFE) in different sizes
- Signal cables for all inputs and outputs
- Dosing tanks in different sizes

Service kits

You can order the following service kits (for PP, PVC, PVDF and stainless steel):

- Complete dosing head kit
- Valve and diaphragm kit
- Valve kit
- Diaphragm kit

Full details of service kits are available in the Grundfos service catalogue or the online Grundfos Product Center.

E-Box module or Grundfos CIU: increased connectivity for DDA models

With the optional E-Box module (SMART Digital DDA) or Grundfos CIU (SMART Digital XL DDA), you can increase the connectivity options for high-end DDA pumps, for example to integrate them in a Profibus DP network for remote monitoring and pump set-up.

** At 100% operation. Longer intervals may be possible at intermittent operation, while shorter maintenance intervals may be necessary when dosing highly abrasive media.*

GRUNDFOS PRODUCT CENTER

QUICKLY FIND THE DOSING SOLUTION YOU NEED BY LIQUID OR PUMP SIZE

The Grundfos Product Center is our free digital product catalogue and sizing tool, offering one-point access for all product information including pump curves, CAD drawings, instruction videos, and service manuals.

You can quickly search our entire catalogue by pumped liquid or by pump sizing information, or you can browse the catalogue by pump design, application, or product family. You can also get quick pump replacement recommendations.

Signing up on the Grundfos Product Center gives you several advantages. You can save search results and entire projects for future reference.

Available online and as a desktop (offline) edition, the Grundfos Product Center is optimised for viewing on mobile devices such as your smartphone or tablet.

Quickly find the dosing solutions you need at

product-selection.grundfos.com.

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