

CHEMICAL DOSING SOLUTIONS

Product Portfolio Overview

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DUFF co.

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Smart Digital

GRUNDFOS DDA/DDC/DDE

The SMART Digital DDA, DDC and DDE models with powerful variable-speed stepper motors bring state-of-the-art technology to perfection. Expert knowledge combined with the new patented solutions set the standard for the future. Traditional technologies such as stroke length/stroke frequency adjustment with synchronous motor or solenoid drive become a thing of the past. The click-stop mounting plate provides unique mounting flexibility, and the entire dosing range up to 8 gph is covered with only a few pump variants.



KEY FEATURES AND BENEFITS

- Modularity: The included click-stop mounting plate is an example of the unique flexibility offered, with only a few variants
- Simplicity: Easy handling and perfect overview and control ensure simple installation, commissioning and operation
- Flow intelligence: The pump monitors the dosing process of liquids when the FlowControl function is activated, for advanced process reliability with accuracy of 1% of setpoint

DDA MODELS

- High-end solution for complex and demanding applications
- Flow and pressure up to 8 gph and up to 232 psi
- Auto-deaeration during pump standby
- Flexible Fieldbus control
- Turn-down ratio 3000:1 with constant 100% stroke length

DDC MODELS

- Optimal price-performance ratio
- Flow and pressure up to 4 gph and up to 145 psi
- Two SlowMode functions (25% and 50%), calibration mode, service display
- External stop, dual-level tank control, 2 relay outputs

DDE MODELS

- Digital Dosing™ even for the low budget segment
- Flow and pressure from 0.0015 to 4 gph and up to 145 psi; two models cover entire range
- Control options: manual control 0.1-100%, pulse in % of stroke volume
- External stop, empty tank control

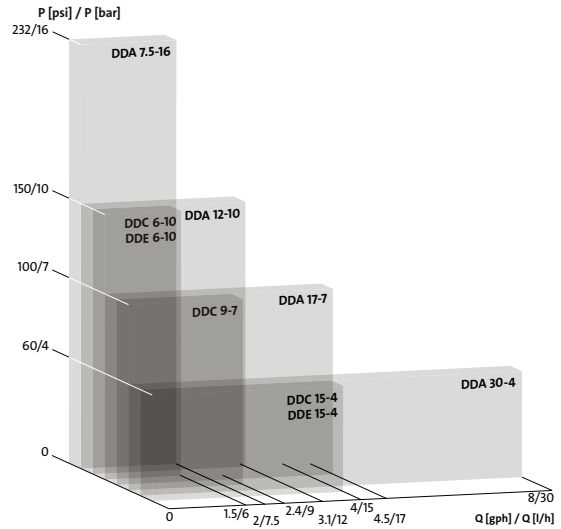
APPLICATIONS

- Disinfection and pH adjustment
- Drinking water, process water and wastewater
- Food and beverage
- Clean-in-place
- Ultrafiltration and reverse osmosis
- Boiler feed water
- Cooling towers
- Coagulation, flocculation, precipitation
- Chemical industry
- Car wash
- Irrigation
- Anywhere chemical treatment and conditioning of water is required

TECHNICAL DATA & FEATURE OVERVIEW

DDA/DDC/DDE	
DOSING HEAD:	PP, PVC, PVDF and Stainless Steel 1.4401
GASKETS:	EPDM, FKM or PTFE
VALVE BALLS:	Ceramics or stainless steel 1.4401 (SS heads only)
CONNECTION SETS (SUCTION / PRESSURE):	Tubing: 1/4", 3/8", 1/2" Threaded: 1/2" MNPT for PP, PVC and PVDF; 1/4"FNTP for SS
MAX FLOW, Q:	8 gph (30 l/h)
MAX PRESSURE, P:	232 psi (16 bar)
TURNDOWN RATIO:	3000:1 or 1000:1
LIQUID VISCOSITY:	max. 2500mPas, depending on model and setup
SUPPLY VOLTAGE:	100-240V, 50-60 Hz
POWER CONSUMPTION:	max. 18 W
WEIGHT:	5.3-8.8 lbs (2.4-4 kg), depending on material
SOUND PRESSURE LEVEL:	60 dB(A)
ENCLOSURE RATING:	IP65, NEMA 4X
APPROVALS:	NSF61, CSA-US

PERFORMANCE RANGE



FEATURE OVERVIEW

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

CONTROL VARIANTS

- FCM: Flow Control Measurement
- FC: Flow Control
- PR: Pulse Relay
- P: Pulse Input
- AR: Analog Relay
- A: Analog
- B: Basic

Visit grundfos.us/pei to learn more about Department of Energy (DOE) pump energy index (PEI) requirements and PEI ratings on specific Grundfos models.



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Digital Dosing Pumps

GRUNDFOS DME

The DME Digital Dosing pumps combine perfect precision and user-friendliness for large dosing quantities from 15.9 to 248 gph, offering all the benefits of the highly acclaimed smaller Digital Dosing range, making accurate dosing easier than ever.



KEY FEATURES AND BENEFITS

- Wide dosing range with a turndown ratio of 800:1 for a range of water supply, wastewater and water treatment applications
- Easy to install, the operator can set the pump to discharge exactly the quantity of dosing liquid required in the application
- Available with Profibus interface to supply performance data and status information for quality control, preventive maintenance and future reference
- The dosing heads of DME pumps are available in stainless steel, PVDF, and environmentally friendly, cost-efficient polypropylene
- Simple display allows easy navigation of the menus to use the impressive range of standard control features—including pulse, analog, timer, batch, and anti-cavitation control—as well as simple calibration and much more
- Anti-cavitation: slows down the suction stroke speed 75%, 50%, or 25% to facilitate handling viscous fluids
- DME uses a full stroke length every time, and the speed of each stroke is carefully timed, ensuring even concentration in the system and optimal priming throughout the entire operating range.
- Built-in overload protection monitors pump counter pressure and protects against exceptionally high pressure loads

APPLICATIONS

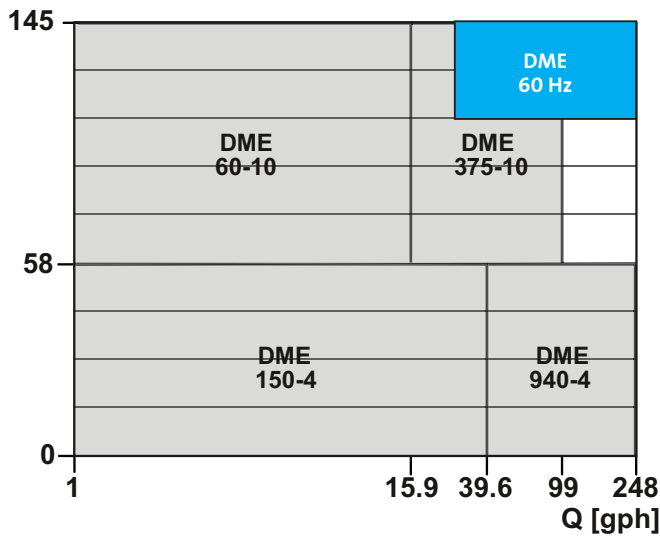
- Drinking water treatment
- Water distribution
- Wastewater transport
- Wastewater treatment
- Pulp and paper
- Textile industry

TECHNICAL DATA

DME INFORMATION	
FLOW, Q:	0.2 to 248 gph
OPERATING PRESSURE:	60 to 145 psi
TURNDOWN RATION:	max. 800:1

PERFORMANCE DATA

[PSI]



Digital Instrumentation for Dosing

GRUNDFOS DID

The new Grundfos by s::can DID systems are the perfect combination of s::can's state-of-the-art digital sensor technology and Grundfos experience in PID controlling of dosing and disinfection processes. DID systems are designed to perfectly match Grundfos dosing pumps, gas dosing systems and systems for the generation and dosing of chlorine dioxide and hypochlorite.

DID systems are available as compact systems with bypass flow cell or as kits for applications with tank-immersed sensors. The DID is extremely easy to set up due to the pre-assembled and pre-calibrated configurations. Installation is easy due to the Fieldbus-based communication with both controller and sensors.



KEY FEATURES AND BENEFITS

- Automatic setting of water flow and detection of missing water flow in systems with flow cell
- Probe carrier included in systems for tank installation
- 25 feet cable included in systems for tank installation
- Probe guard included in systems for tank installation
- Temperature compensation included for all sensors
- Designed for extra-long maintenance intervals (0.5 to 1 year)
- Pre-calibrated sensors (pH, ORP, conductivity)
- One sensor variant per parameter for all applications and measuring ranges (pH, ORP, conductivity sensors)
- Diaphragm-covered amperometric sensor principle (free and total chlorine, ClO₂, H₂O₂ and PAA)
- Lowered pH dependency for free-chlorine sensors

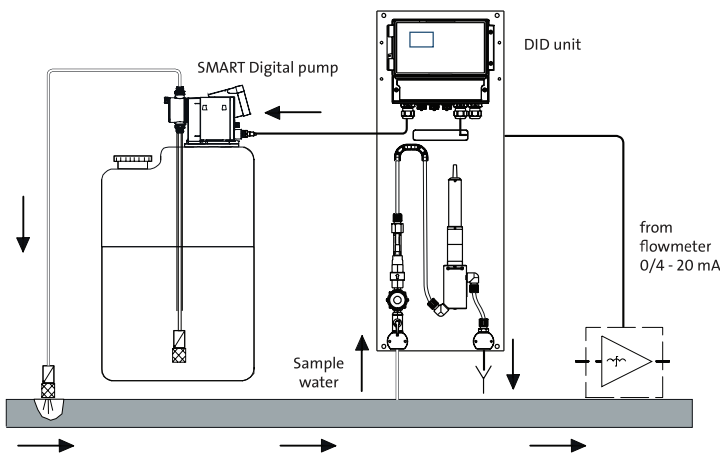
APPLICATIONS

- Drinking water treatment
- Industrial process water and wastewater treatment (effluent disinfection): pH control for dosing acids and alkalis and control of chlorine, chlorine dioxide or ozone
- Food and beverages: disinfection in filling tanks and CIP applications
- Swimming pool water treatment: pH control for dosing acids and alkalis, monitoring & control of residual chlorine

TECHNICAL DATA

CONTROLLER								
ELECTRONICS:	High-speed 32 bit Cortex M4 processor							
DISPLAY:	128 x 64 px graphical display							
MEMORY:	512 MB, industrial grade SLC							
DATA LOGGER:	Internal SD card or USB stick							
OUTPUTS/INPUTS:	1 x or 3 x 4-20 mA outputs 2 x digital inputs 1 x 4-20 mA input 2 x digital outputs 1 alarm relay							
INTERFACES:	RS485 GENibus and Modbus							
HUMIDITY:	5 to 90%, non-condensing							
SUPPLY VOLTAGE:	85 to 264V/47 to 63 Hz							
ENCLOSURE CLASS:	IP 65							
SENSORS								
MEASURED PARAMETER:	Free chlorine	Total chlorine	ClO ₂	H ₂ O ₂	PAA	pH	ORP	Conductivity
OPERATING TEMPERATURE:	41 to 113°F	41 to 113°F	41 to 122°F	41 to 113°F	41 to 113°F	32 to 158°F	32 to 158°F	-4 to 158°F
MAX. OPERATING PRESSURE:	7.25 psi	7.25 psi	14.5 psi	14.5 psi	14.5 psi	145 psi	145 psi	290 psi
MIN. FLOW RATE/FLOW SPEED:	8 gph	8 gph	8 gph	8 gph	8 gph	0.032 f/s	0.032 f/s	-
PH RANGE:	4-9	4-12	4-11	4-11	1-6	0-14	2-12	2-12
RESPONSE TIME T₉₀:	2 min	2 min	1 min	5-10 min	5 min at 50°F 1.5 min at 122°F	30 s	30 s	60 s

TYPICAL DOSING AND FLOWMETER SYSTEM SETUP



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Dosing Skid Systems

GRUNDFOS DSS

The DSS is a pre-engineered floor or panel dosing system package that offers integrated controls and one, two or three pump configurations designed to accurately meter liquid chemicals for a variety of water supply/treatment systems, as well as industrial and manufacturing applications. At the heart of each DSS is the Grundfos metering pump: hydraulically actuated and mechanically actuated pumps including SMART Digital Dosing pumps with stepper motor technology offering up to 3000:1 flow turndown.

KEY FEATURES AND BENEFITS

- Grundfos SMART Digital Dosing pumps provide precise performance and reliability in a complete solution
- Available in one, two and three pump system configurations making the system suitable for a broad scope of applications
- Plug and pump solution ensures quick and easy installation
- Pre engineered system allows quick delivery, even for customized skids
- Factory tested to the highest standard to ensure trouble free installation
- Floor and wall mount provides a wide range of flexible installation solutions
- User friendly panel options include: junction, HOA, plug only, and none
- Control cables options include: analog/pulse/stop input, relay output and analog output
- Durable materials include PVC/CPVC pipe and EPDM/Viton gaskets
- Available with or with pulsation dampener
- ISO certified manufacturing options

Custom ETO Dosing Skid Systems

Grundfos understands that there are applications and installations that require a completely unique Engineered to Order (ETO) solution for project based work. The custom DSS may be constructed in nearly any configuration and include any dosing pump offered by Grundfos. The Custom ETO systems are reliable solutions built with Grundfos quality and sure to meet your project needs.



APPLICATIONS

- Sodium hypochloride
- Sodium bisulfate
- Alum
- Potassium permanganate
- Sodium hydroxide
- Acids
- Anti-scalants

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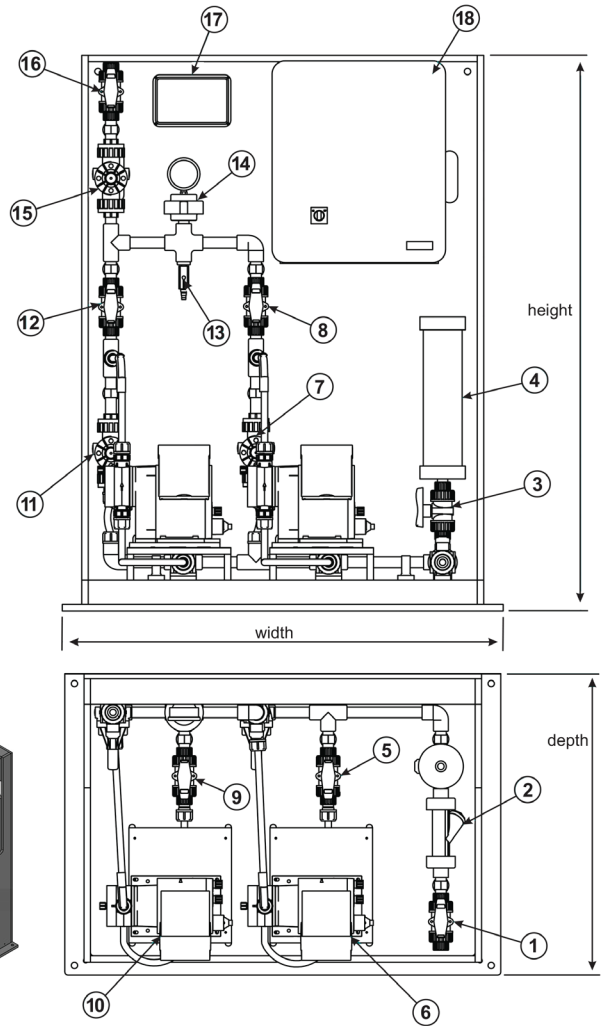
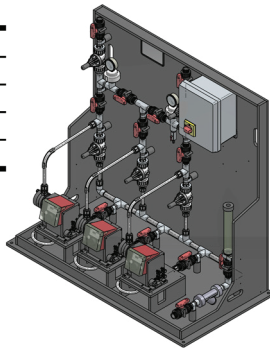
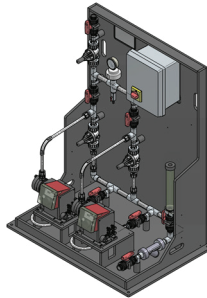
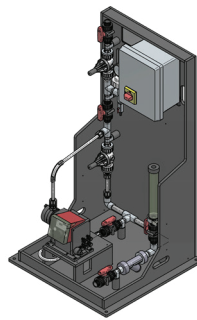
TECHNICAL DATA

DSS INFORMATION (Standard)	
FLOW, Q:	0.0007 to 8 gph
OPERATING PRESSURE:	max. 150 psi
TURNDOWN RATION:	max. 3000:1
POWER:	115 VAC/60 Hz/1 phase

DSS INFORMATION (Custom ETO)	
FLOW, Q:	0.0007 to 556 gph
OPERATING PRESSURE:	max. 2900 psi
TURNDOWN RATION:	max. 3000:1
POWER:	115 or 230 VAC/50 or 60 Hz/1 or 3 phase

COMPONENTS

Pos.	Description
1	Inlet isolation valve
2	Y-strainer
3	Calibration column isolation valve
4	Calibration column
5	Dosing pump inlet isolation valve
6	Dosing pump
7	Pressure relief valve
8	Dosing pump outlet isolation valve
9	Dosing pump inlet isolation valve
10	Dosing pump
11	Pressure relief valve
12	Dosing pump outlet isolation valve
13	Sample valve/bleed valve
14	Pressure gauge with diaphragm gauge guard
15	Back pressure valve
16	Discharge isolation valve
17	Nameplate
18	Junction box/control panel (optional)



DIMENSIONS

Smart Digital Dosing Skid System Dimensions			
	Height	Width	Depth
Simplex	43"	24"	23.5"
Duplex	43"	34"	23.5"
Triplex	43"	46"	23.5"