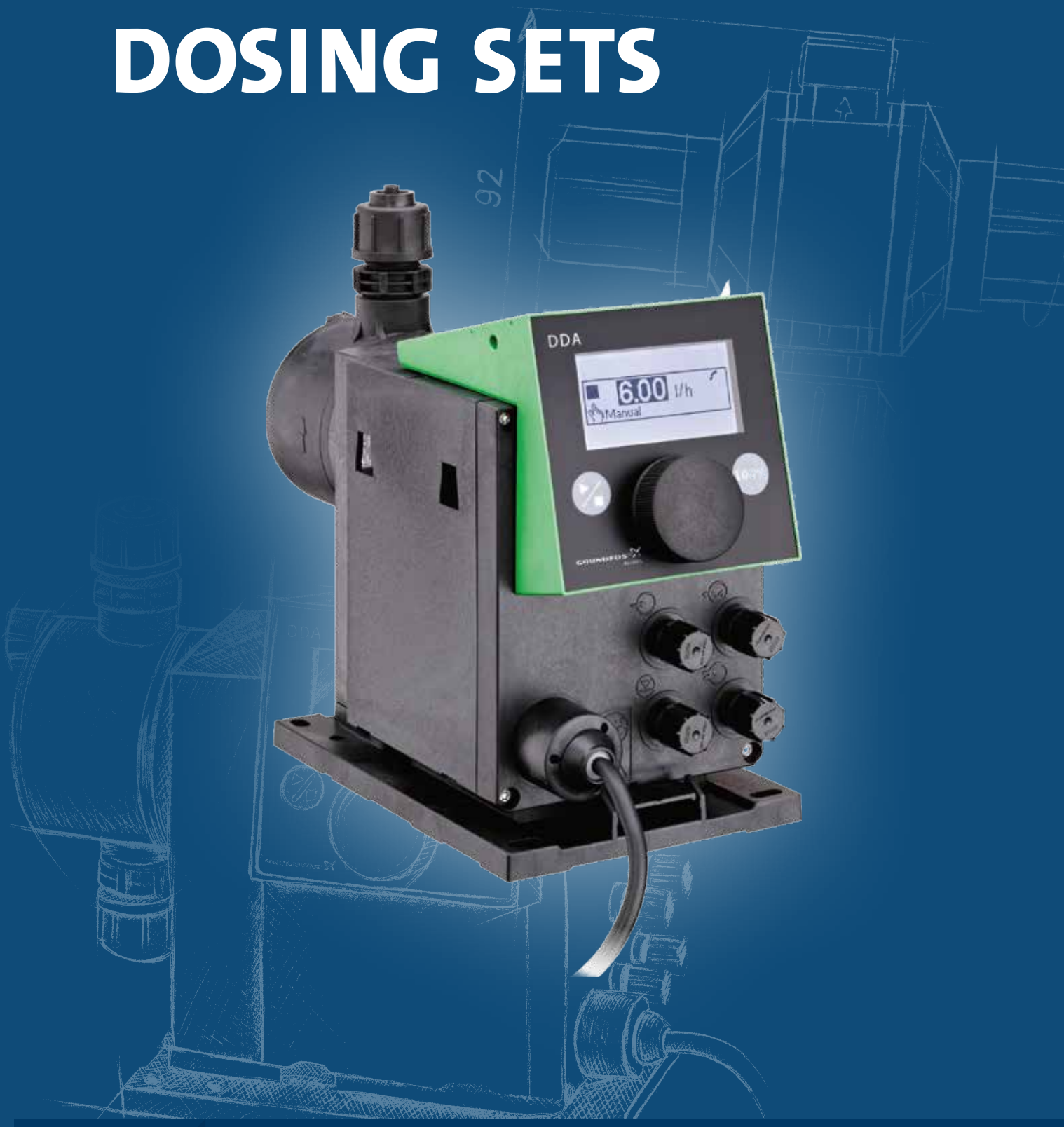
SMART DIGITAL DOSING SETS



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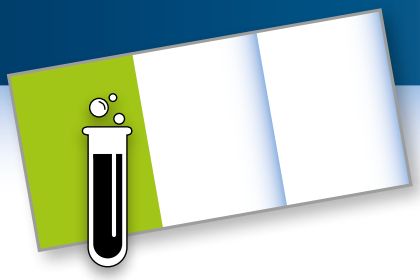
Scheme overview: How to select your dosing set

1 Select pumped liquid

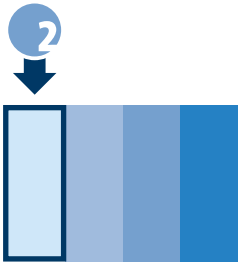


➡ **Select application group according to pumped liquid**

e.g. Application group 1

2 Select pump type

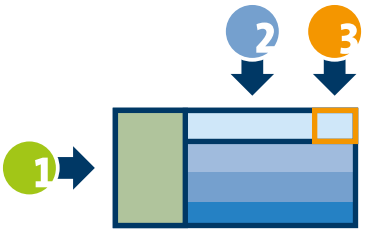
➡ **Select suitable pump type (control variant)**



e.g. DDA-FCM

3 Select dosing set

➡ **Combine 1 + 2 to find your SMART Digital dosing set**



e.g. Application group 1 + DDA- FCM
➡ 98954162

Parts of the dosing set

Option

Option

1. SMART Digital pump
2. Foot valve with 2 level switch
3. Suction hose, PVC*, 2 m
4. Deaeration hose, PE*, 2 m
5. Pressure Valve (only pump type DDA-FCM)
6. Discharge hose, PE*, 6 m
7. Injection unit with spring loaded-non return valve
8. Control cables for all input- and output signals, 5 m

Option: Multifunction valve
E-Box 150 Profibus

*Dosing sets in application group 4 (PVDF/T/C) always include ETFE hose

For further accessories and more details please see data booklet SMART Digital

1 Select pumped liquid

Selection based on pumped liquid

The selection 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.

Application group	Pumped liquid (20 °C)			Materials			
	Description	Chemical formula	Concentration (%)	Dosing head	Gaskets	Ball	Hose
1	Aluminium chloride	$AlCl_3$	40 %	PP	FKM (V)	Ceramic (C)	PVC/PE
	Aluminium sulphate	$Al_2(SO_4)_3$	60 %				
	Calcium hydroxide*1	$Ca(OH)_2$	saturated				
	Copper sulphate	$CuSO_4$	30 %				
	Ferric chloride*2	$FeCl_3$	saturated				
	Ferric sulphate*2	$Fe_2(SO_4)_3$	saturated				
	Ferrous chloride	$FeCl_2$	saturated				
	Ferrous sulphate	$FeSO_4$	50 %				
	Hydrochloric acid	HCl	up to 37 %				
	Hydrogen peroxide*3	H_2O_2	30 %				
	Sodium chlorate	$NaClO_3$	30 %				
	Sodium chloride	NaCl	30 %				
	Sodium chlorite	$NaClO_2$	20 %				
	Sodium sulphide	Na_2S	30 %				
	Sodium sulphite	Na_2SO_3	20 %				
	Sodium thiosulfate	$Na_2S_2O_3$	10 %				
	Sulphurous acid	H_2SO_3	6 %				
2	Acetic Acid	CH_3COOH	up to 60 %	PP	EPDM (E)	Ceramic (C)	PVC/PE
	Ammonia, aqueous	NH_4OH	28 %				
	Potassium hydroxide	KOH	50 %				
	Potassium permanganate	$KMnO_4$	10 %				
	Sodium hydroxide	NaOH	up to 50 %				
3	Calcium hypochlorite	$Ca(OCl)_2$	20 %	PVC	FKM (V)	Ceramic (C)	PVC/PE
	Chromic acid	H_2CrO_4	up to 50 %				
	Nitric acid	HNO_3	up to 40 %				
	Sodium hypochlorite*3	NaOCl	12 to 15 %				
	Sulphuric acid*4	H_2SO_4	up to 96 %				
4	Acetic acid	CH_3COOH	85 %	PVDF	PTFE (T)	Ceramic (C)	ETFE
	Fluosilicic acid	H_2SiF_6	40 %				
	Nitric acid	HNO_3	70 %				
	Peracetic acid	CH_3COOOH	5 to 15 %				
	Sulphuric acid *4	H_2SO_4	98 %				

*1 Once the pump is stopped, calcium hydroxide will sediment rapidly

*2 Risk of crystallisation

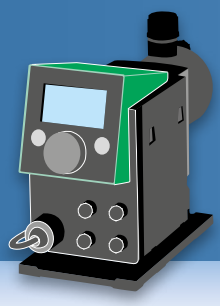
*3 Strongly degassing, pump type DDA-FC or -FCM recommended

*4 Reacts violently with water and generates much heat. Pump should be absolutely dry before dosing sulphuric acid

Note: Some of the liquids in this table may be toxic, corrosive or hazardous.

Note: Please be careful when handling these liquids.

2 Select pump type



Overview of functions	DDA		DDC	DDE
Control variant:	FCM	AR	AR	P
General				
Digital Dosing: Internal stroke speed and frequency control	•	•	•	•
Mounting plate (basic / wall mounting)	•	•	•	•
Control panel				
Control cube mountable in three positions: front, left, right	•	•	•	
Control panel position: front-fitted				•
Graphical display with background light in four colours 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 %)				•
Operation Modes				
Manual speed control (no automation, pump will run according a set dosing flow)	•	•	•	•
Pulse control in ml/pulse (pump modifies the dosing flow proportional to an external pulse signal e.g. from a water meter)	•	•	•	
Pulse control (1:n) (pump modifies the dosing flow proportional to an external pulse signal e.g. from a water meter)				•
Analog control 0/4-20 mA (pump modifies dosing the flow proportional to a external analog flow signal)	•	•	•	
Batch control (will dose one time a specific quantity after an external input signal)	•	•		
Dosing timer cycle (will dose one time a specific quantiity after an internal time interval)	•	•		
Dosing timer week (will dose one time a specific quantiity after the internal week timer)	•	•		
Fieldbus control (optional with E-Box or CIU Box)	•	•		
Functions				
Auto deaeration also during pump standby when handling gaseous media	•	•		
FlowControl system with selective fault diagnosis in plain text	•			
Pressure monitoring (min/max) to protect the system (e.g. pipe break)	•			
Integrated flow measurement to measure the dosing flow	•			
AutoFlowAdapt (automatic flow adjustment if there is a flow deviation from set flow)	•			
SlowMode (anti-cavitation) for degassing and highly viscous fluids	•	•	•	
Calibration mode	•	•	•	
Scaling of analog signal input and output for a better analog signal resolution	•	•		
Service information display (operation time, service reminder, specific spare part article number)	•	•	•	
Relay setting: alarm, warning, stroke signal, pump dosing, pulse input	•	•	•	
Relay setting (additionally): timer cycle, timer week	•	•		
Inputs / Outputs				
Input for external stop	•	•	•	•
Input for pulse control	•	•	•	•
Input for analog 0/4-20 mA control	•	•	•	
Input for low-level and empty tank signal	•	•	•	•
Output relay (2 relays)	•	•	•	
Output analog 0/4-20 mA for dosing flow, counter pressure or input signal	•	•		
Input/Output for E-box and CIU modules (e.g. E-box 150 with Profibus DP)	•	•		

For further control variants and details please see data booklet SMART Digital

3 Select dosing set

1	2				3	Optional	
Application Group	**Pump type**	**Max. flow (l/h)**	**Max. pressure (bar)**	**Hose size (mm)**	**Dosing Set Part number**	**Fieldbus**	**Multifunction valve Part number**
1 (PP/V/C)	DDA-FCM	7.5	16	4/6	98954162	97513994 (E-Box 150 Profibus) 98563350 (E-Box 200 Modbus)	Relief pressure 10 bar: 95704585 Relief pressure 16 bar: 95730821
		17	7	9/12	98954064		
		30	4	9/12	98954127		
	DDA-AR	7.5	16	4/6	97950230		
		17	7	9/12	97974133		
		30	4	9/12	97974140		
	DDC-AR	6	10	4/6	97974061		
		9	7	9/12	97974066		
		15	4	9/12	97974070		
	DDE-P	6	10	4/6	97974041		
		15	4	9/12	97974045		
2 (PP/E/C)	DDA-FCM	7.5	16	4/6	98954138	97513994 (E-Box 150 Profibus) 98563350 (E-Box 200 Modbus)	Relief pressure 10 bar: 95704591 Relief pressure 16 bar: 95730822
		17	7	9/12	98954061		
		30	4	9/12	98954124		
	DDA-AR	7.5	16	4/6	97974076		
		17	7	9/12	97974134		
		30	4	9/12	97974141		
	DDC-AR	6	10	4/6	97974062		
		9	7	9/12	97974067		
		15	4	9/12	97974071		
	DDE-P	6	10	4/6	97974042		
		15	4	9/12	97974046		
3 (PVC/V/C)	DDA-FCM	7.5	10	4/6	98954175	97513994 (E-Box 150 Profibus) 98563350 (E-Box 200 Modbus)	Relief pressure 10 bar: 95730807 Relief pressure 16 bar: 95730823
		17	7	9/12	98954121		
		30	4	9/12	98954134		
	DDA-AR	7.5	16	4/6	97974077		
		17	7	9/12	97974135		
		30	4	9/12	97974142		
	DDC-AR	6	10	4/6	97974063		
		9	7	9/12	97974068		
		15	4	9/12	97974072		
	DDE-P	6	10	4/6	97974043		
		15	4	9/12	97974047		
4 (PVDF/T/C)	DDA-FCM	7.5	16	4/6	98954164	97513994 (E-Box 150 Profibus) 98563350 (E-Box 200 Modbus)	Relief pressure 10 bar: 95730812 Relief pressure 16 bar: 95730828
		17	7	9/12	98954069		
		30	4	9/12	98954129		
	DDA-AR	7.5	16	4/6	97974079		
		17	7	9/12	97974138		
		30	4	9/12	97974145		

SMART Digital – breaking the barriers of dosing

Simplicity – Modularity – Flow Intelligence

- **Low operation costs**
- **Longer maintenance intervals**
- **Extremely high dosing accuracy**
- **Saving chemicals**
- **Saving energy**
- **High sustainability**

GRUNDFOS Holding A/S
Poul Due Jensens Vej 7
DK-8850 Bjerringbro
Tel: +45 87 50 14 00
www.grundfos.com

GRUNDFOS WATER TREATMENT GmbH
Reetzstraße 85
D-76327 Pfinztal
Tel: +49 7240 61 0
wt.grundfos.com

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