

d.Drive PUMP C30 / X60



low pulsation pumping & dosing
in the range of nl/min - ml/min

DURATEC d.Drive PUMP

The d.Drive PUMP is a high-precision, low-pulsation dosing pump for laboratory, process engineering and industrial applications for dosing from nl/min to ml/min. Due to the used materials, a variety of different media (aqueous, organic, aggressive, highly viscous, gaseous) can be transferred metal-free. Thus, the application field of dDrive PUMP covers from chemistry, pharmaceuticals, biotechnology, medical technology, food industry up to manufacturing industries. The pump can be controlled via a touch display, computer-based via RS323 or by PLC via an I/O interface.

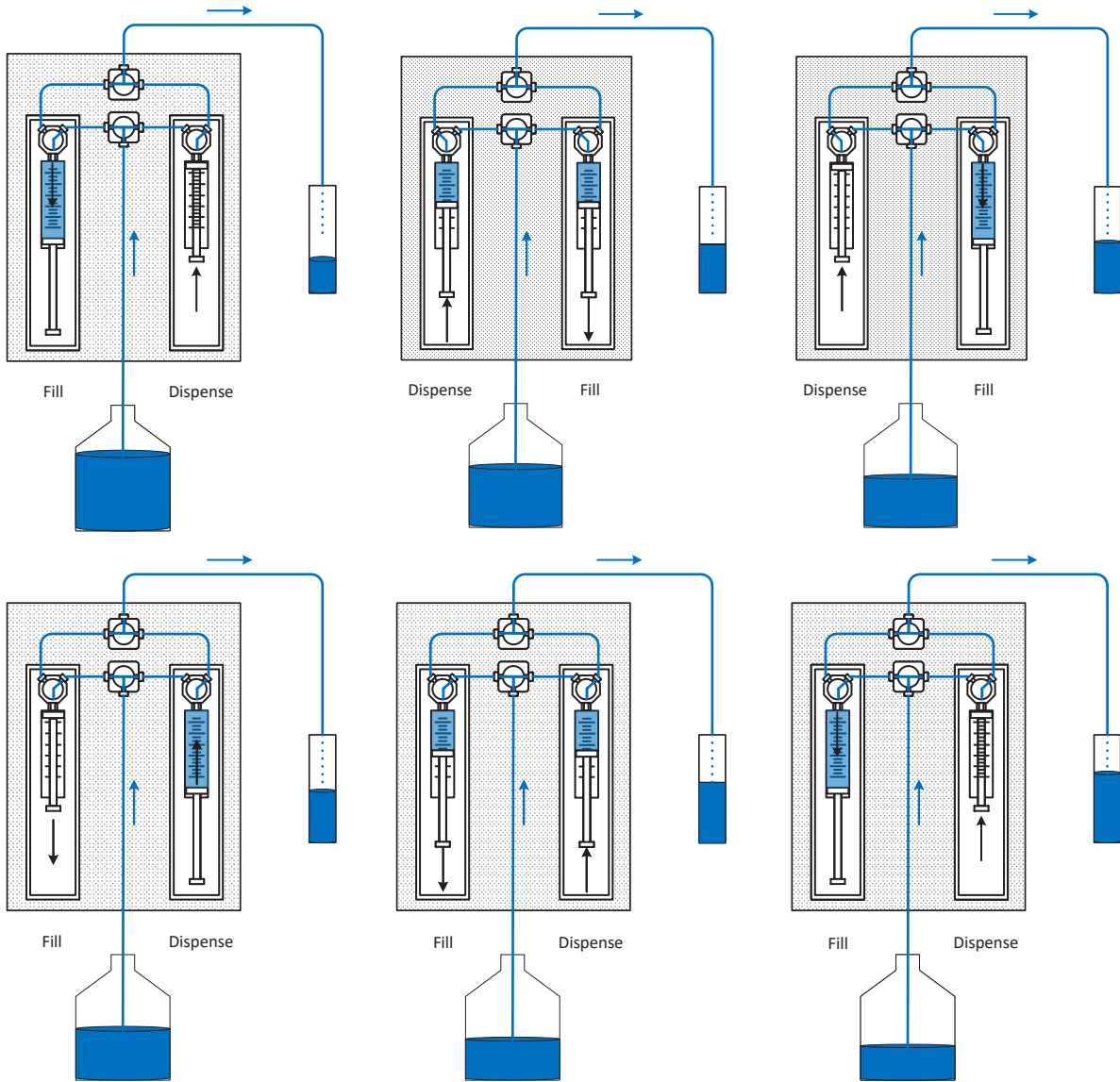


Modell C30



Modell X60

Operating principle



The pump consists of two individual syringe drives. While one syringe delivers the liquid, the other syringe is preparing for the subsequent stroke. The alternation of both syringe motions is performed by two contrary acceleration gradients in order to achieve a smooth transition. The flow is almost pulsation free. The valves are positively controlled and the pump is self-priming.

The flow rates cover – depending on assembled syringe - a range from 0.04µl/min to 300ml/min. Besides continuous flow also finite dosing is realizable. Control and monitoring of the pump can be ensured by RS232, Bluetooth as well as by analogue or TTL-signals.

Additional to the pump mode every syringe drive can be controlled separately which enables various applications of liquid handling in research, development, production and process engineering.

Functions / parameters / setting options

		Touchpanel	Software	IO Port
Continuous Pumping [Continuous Flow]	Indefinite pumping function with currently set flow rate	X	X	X
Finite Dosing [Total Time & Volume]	Dose volume and time are set and after dose volume or time is achieved the pump is stopped automatically.	X	X	
Start Pump [START]	Continuous pumping resp. finite dosing is started. For this purpose, one syringe is completely filled and then pumping starts. For pumping directly after start, the step "PREPARE" has to be performed beforehand.	X	X	X
Stop Pump [STOP]	Continuous pumping resp. finite dosing is stopped. Is the pump started again afterwards, first a syringe is lifted completely and then pumping starts again.	X	X	X
Reverse Flow Direction [Reverse Flow]	In „Reverse Flow“ Mode the pump picks up liquid under the set flow rate in µl/min instead of pumping.	X	X	
Set Syringe Size [Syringe Volume]	Different syringe sizes can be set.	X	X	
Change Flow Rate on the Fly	While pump process is running (only continuous flow) the flow rate can be adjusted. This flow rate is active for the next possible point in time.	X	X	X
Initialize [INIT]	Valves are set to defined position („Init Direction“). Afterwards, the syringes drive to the top with defined speed ("Init Prime Speed").	X	X	X
Change Initialization Direction [Init Direction]	Set valve direction for initialization. Input (left) or output port (right) can be chosen.	X	X	
Service Position [Move Syringes Down]	Syringes move down for easy disassembly and assembly.	X	X	
Rinse [PRIME]	Device is rinsed with defined speed [0-9].	X	X	X
Prepare [PREPARE]	Syringe drives down to achieve flow rate immediately after start.	X	X	
Display Period & Volume	Display period and dosed volume since last reset resp. restart of the pump.	X	X	
Reset Period and Volume [Reset Counters]	Reset display of period and volume.	X	X	
Chose Units	Chose units for flow rate, dosing rate, dose volume and dosing time from a list.		X	

Operation via touch panel

All functions can be controlled via the touch panel on the front. It enables simple, intuitive and direct operation of the pump. Relevant parameters can be easily configured and monitored.



Operation via RS232 interface / Software

Windows Software:

In principle, windows software enables the same control like the touch panel. An additional function is the selection of units for flow rate, dose volume and dosing time.

The user interface of the software is equal to the display of the touch panel.

Linking between control computer and pump is performed by RS232 interface using a RS232/USB cable or RS232/Bluetooth adapter.

RS232 Protocol:

Technically versed users can control the pump directly using the RS232 command protocol and without special software.

Operation via I/O port

It is possible to control the pump using the I / O port via a process control system. Beforehand, pump and flow parameters are saved into the memory of the pump via RS232 interface or selected by a trigger signal. Then, functions like: Init, Start, Stop, Prime, can be executed by a trigger signal. The flow rate is set by an analog signal and can be adapted during a running pumping process. For status check output signals for busy and error are provided.

PIN Configuration I/O Port

PIN	Function	Description
1	Init	Input, low active
2	Start	Input, low active
3	Stop	Input, low active
4	Prime	Input, low active
5	Error	Output, low active
6	Busy	Output, low active
7	n/a	not used
8	Boot	Only for service
9	5VDC	Auxiliary voltage, 500 mA max
10	GND	Ground
11	GND	Ground
12	GND	Ground
13	GND	Ground
14	GND	Ground
15	Flow	Analog signal, 0 to 5V = 0 to mas. flow (10bit)

Specifications

	d.Drive PUMP C30	d.Drive PUMP X60
Dosing module	Centris	XLP6000
Part no.	900763	900762
Scope of Delivery	Pump, 2 Valves, Power supply (without syringes, tubing, software)	
Dispensing range	0,042 µl/min - 75 ml/min	0,4 µl/min - 300 ml/min
Pumping modes	continuous, finite, reversed	
Pressure range	0 - 6 bar (depending on syringe size)	
Syringe Volume	25 µl - 12,5 ml	50 µl - 50 ml
Time for full stroke with single dosing	6 s - 3000 min	6 s - 160 min
Fluid path	Borosilicate glass, PTFE, PCTFE, FEP, PEEK	
Control	Touch panel; serial via RS232; I/O port for TTL signals	
Power supply	24 V / DC via external power supply	
Dimensions	W: 185 mm / H: 204 (220) mm / D: 130 (180) mm	W: 220 mm / H: 275 mm / D: 160 (215) mm
Weight	3,9 kg	6,5 kg

Specifications - Flow & Pressure

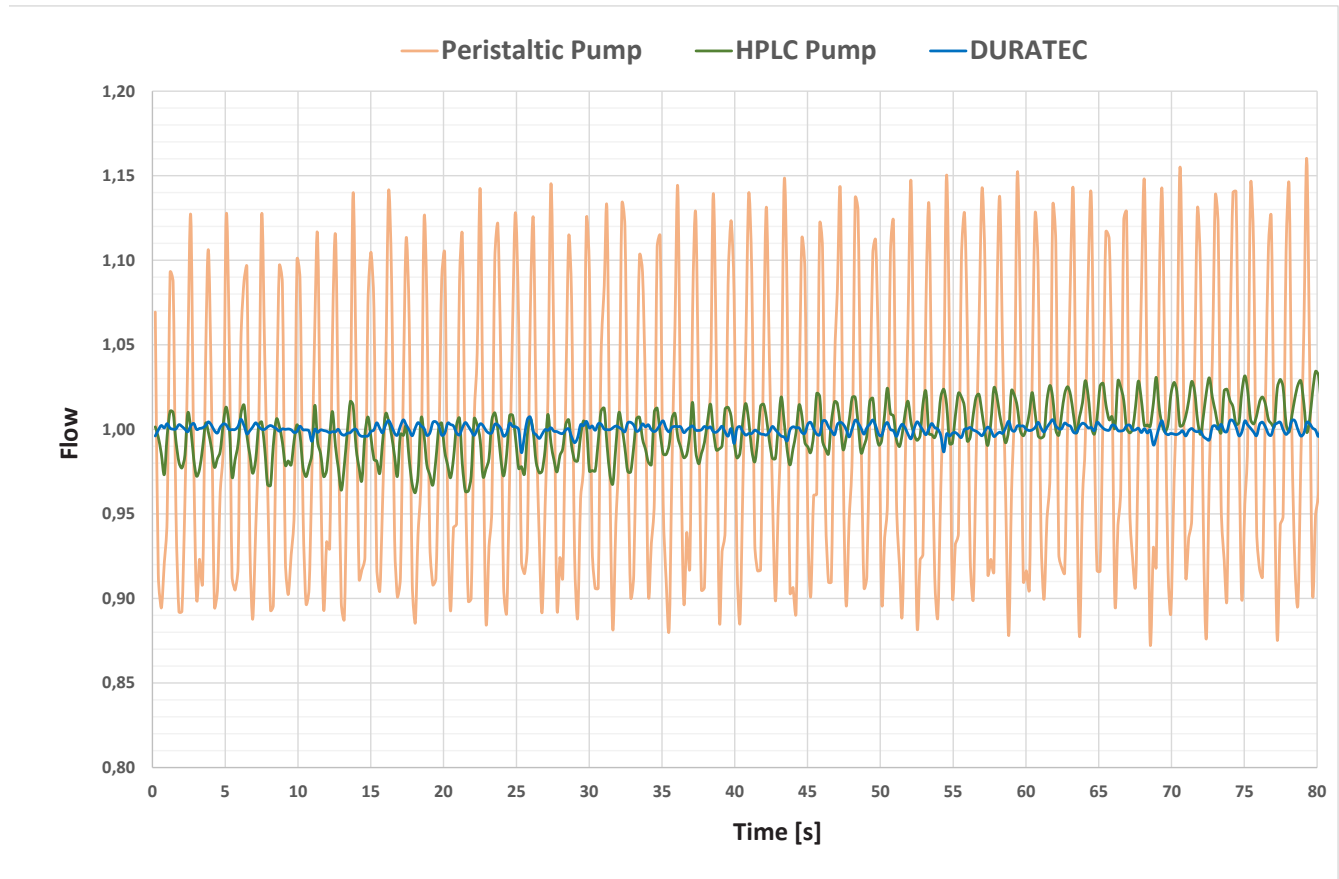
Syringe	d.Drive PUMP C30			d.Drive PUMP X60* ¹		
	Flow range [µl/min]		Pressure [bar]	Flow range [µl/min]		Pressure [bar]
	max	min	max	max	min	max
25 µl	150	0,042	6,0	#	#	#
50 µl	300	0,083	6,0	300	0,313	6,0
100 µl	600	0,166	6,0	600	0,625	6,0
250 µl	1.500	0,414	6,0	1.500	1,563	6,0
500 µl	3.000	0,827	6,0	3.000	3,125	6,0
1 ml	6.000	1,653	6,0	6.000	6,250	6,0
2,5 ml	15.000	4,133	6,0	15.000	15,625	6,0
5 ml	30.000	8,265	4,1	30.000	31,250	6,0
10 ml	#	#	#	60.000	62,500	4,1
12,5 ml	75.000	20,663	1,6	#	#	#
25 ml	#	#	#	150.000	156,250	1,6
50 ml	#	#	#	300.000	312,500	0,8

*¹Data still under reservation of correctness

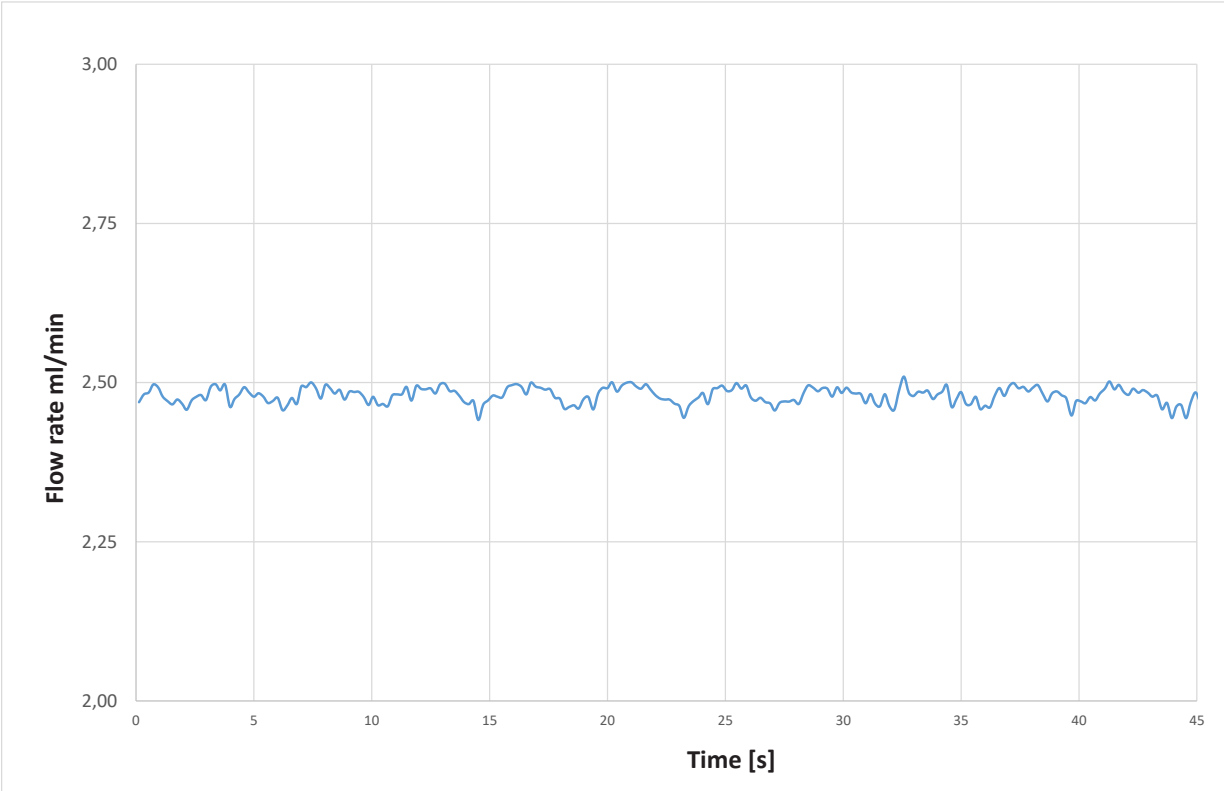
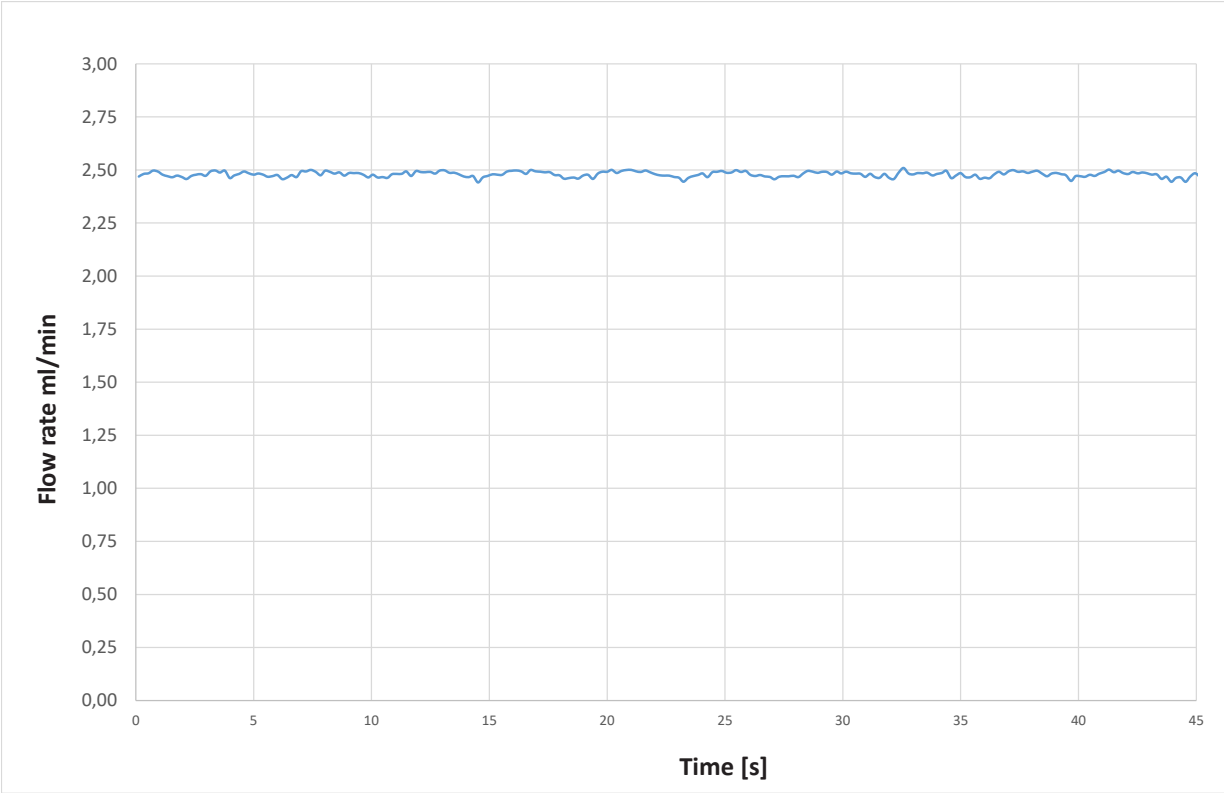
Additional options

- Monitor flow rate
- Monitor pressure  Available on request
- Monitor air bubbles

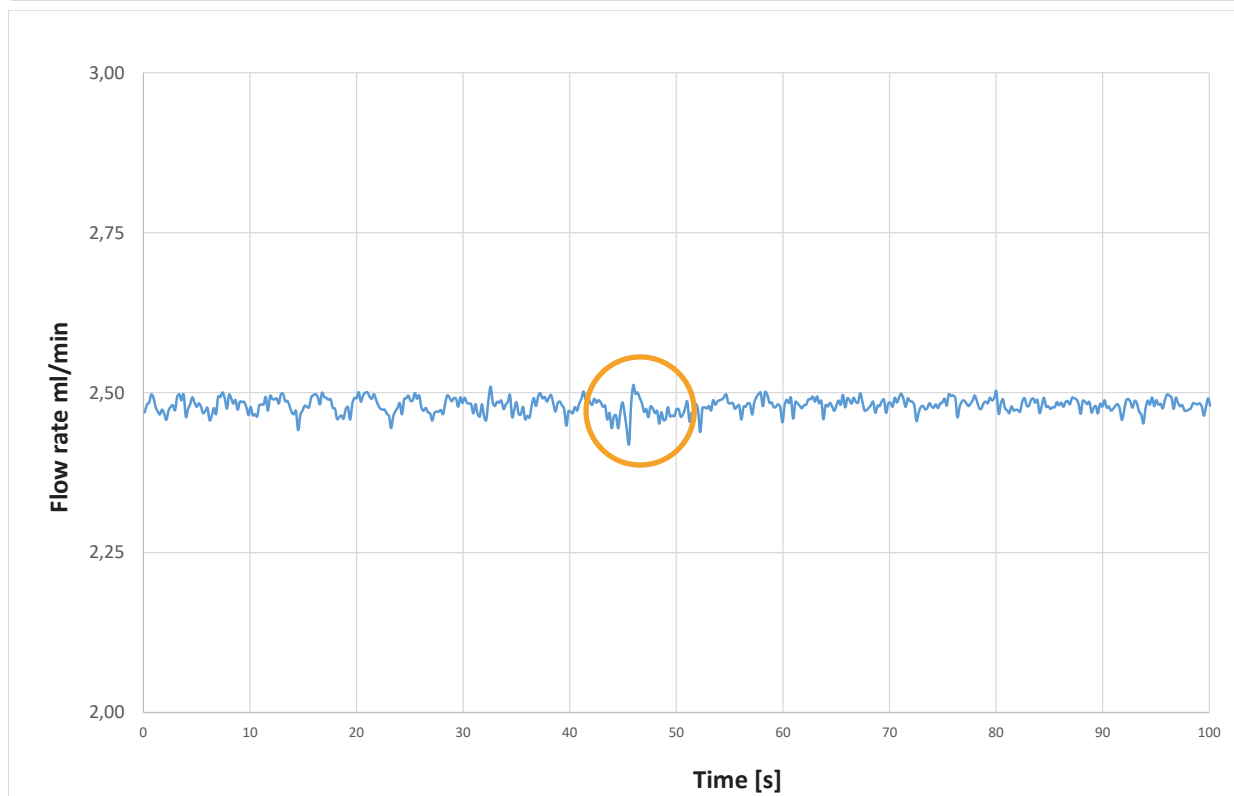
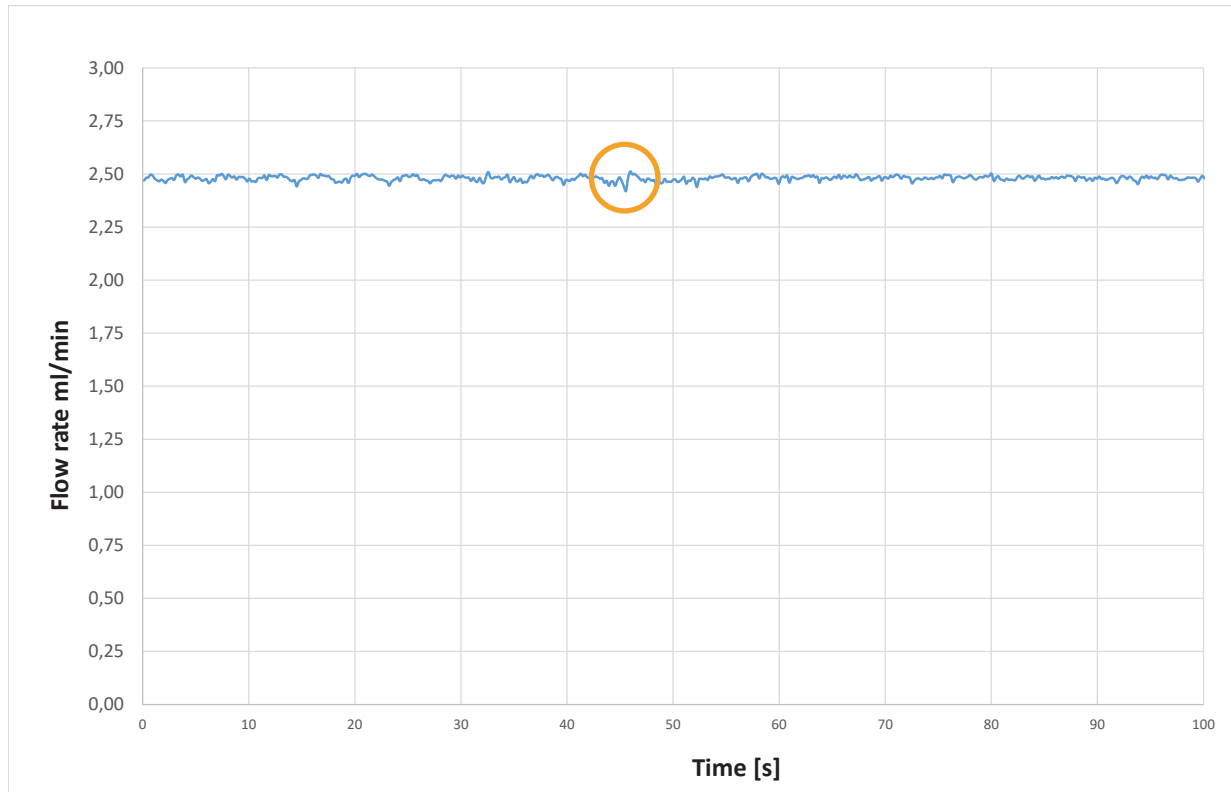
Pulse comparison



Pulsation during a syringe stroke (example with 2.5 ml syringe / C30)



Pulsation during switching between two syringe strokes (example with 2.5 ml syringe /C30)

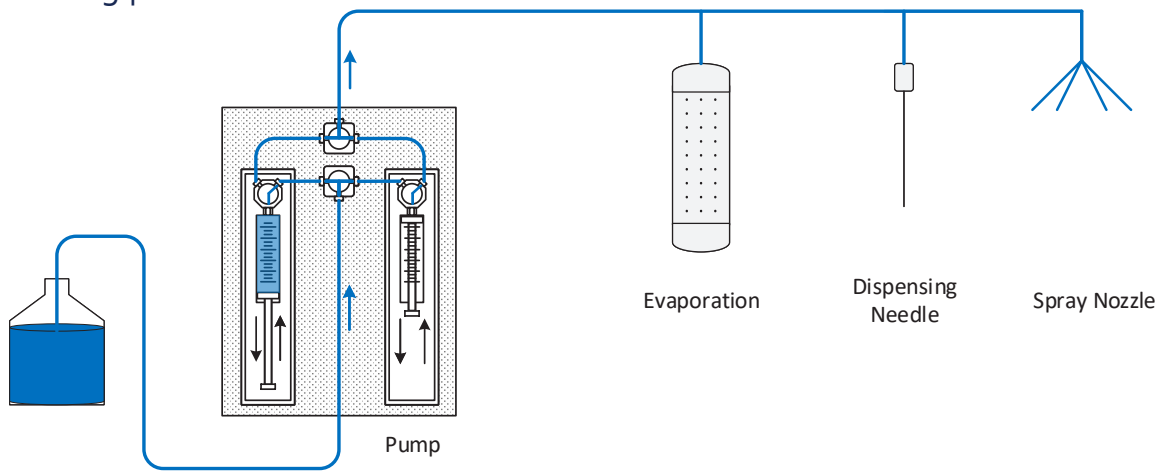


Examples of Application

Spread/ Spray/ Evaporate Liquids

Transportation of liquids to different dispensing systems for spreading, spraying or evaporation of liquids:

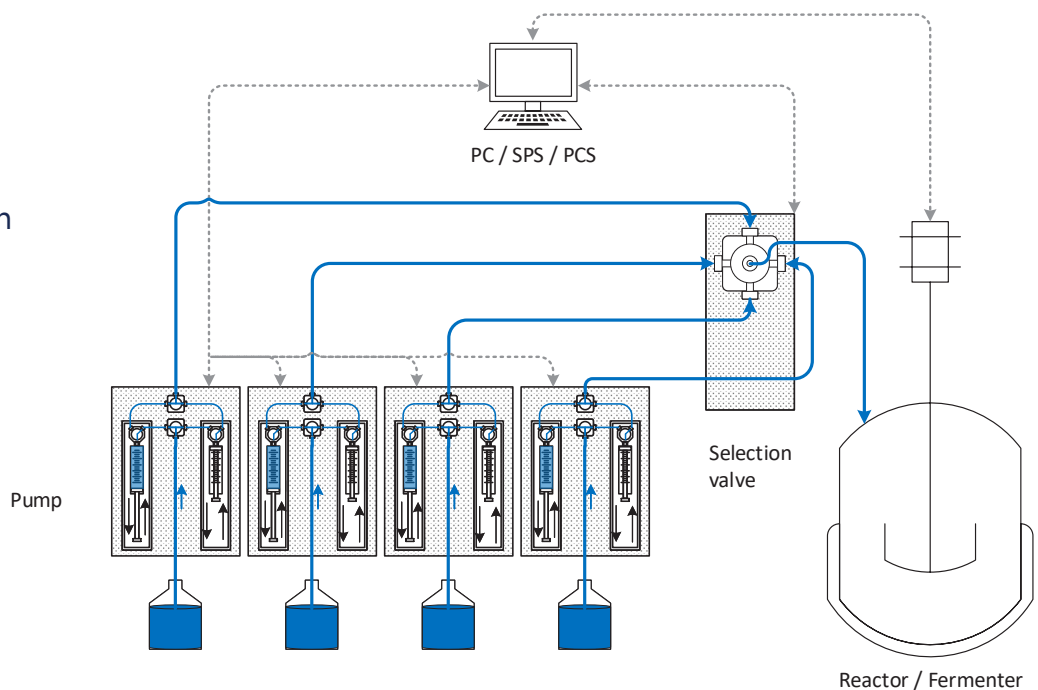
- Agent application in medical technology and medical diagnostics
- Test gas production via evaporation systems
- Cleaning processes semiconductor industry
- Gluing processes



Reaction Technology / Fermentation – Multi-Media Dosing System

Dosing different media via selection valve in one reactor / fermenter.

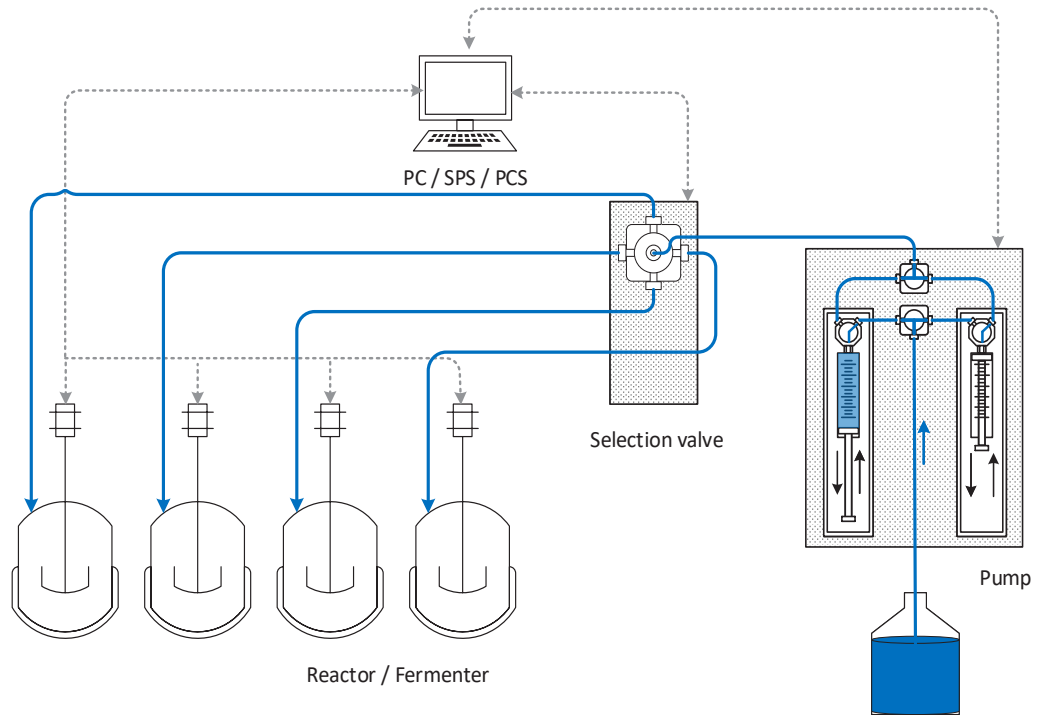
- Reactant
- Catalyzer
- Acid / Base
- Substrate
- Nutrient solution
- Detergents



Reaction Technology / Fermentation – Multi-Reactor Dosing System

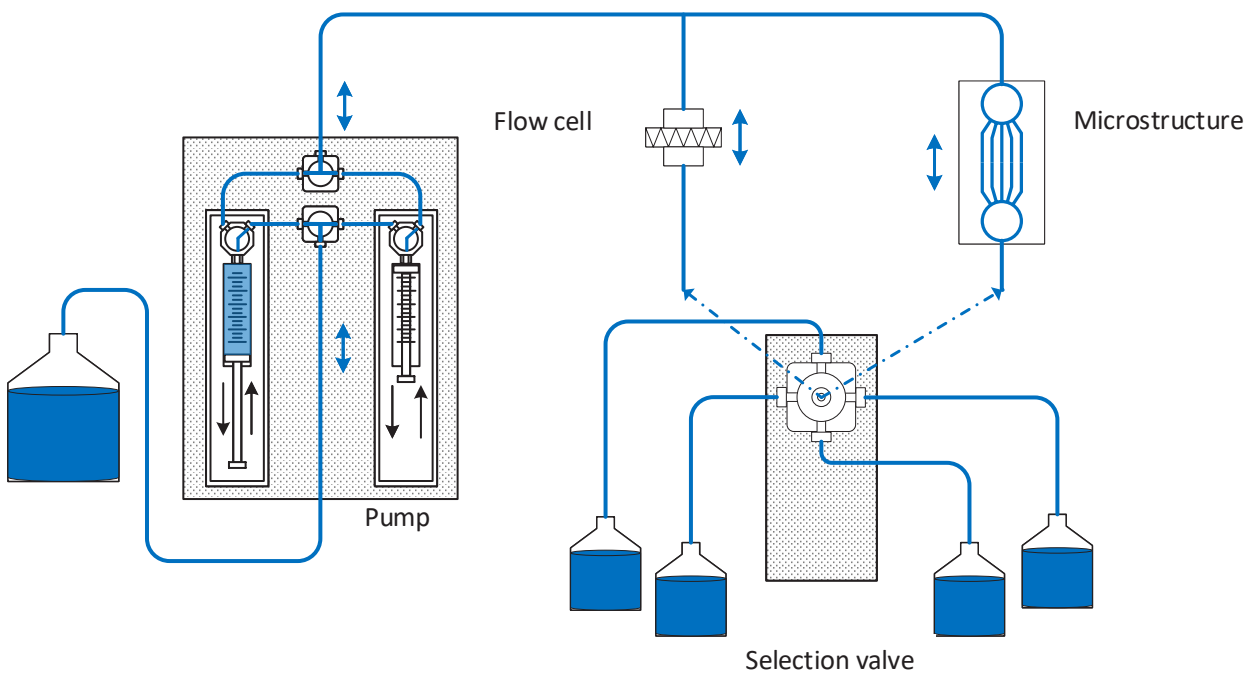
Dosing of one medium via distribution valve in different reactors / fermenters.

- Reactant
- Catalyzer
- Acid / Base
- Substrate
- Nutrient solution
- Detergents



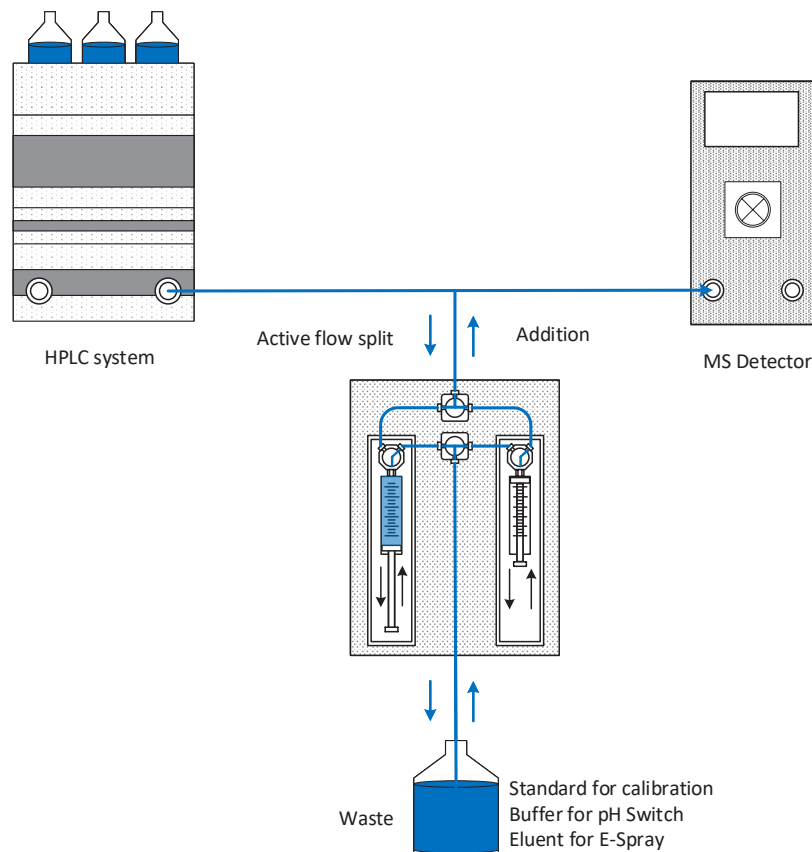
Liquid Handling / Microfluidics

Duplex dosing of different media using small streams/quantities in and through microstructures, microfluidic chips, measuring cells, filtration systems, etc.



Dispenser connected to LC/MS

1. Use of the pump as an active flow splitter. The pump picks up liquid from the fluid path between the HPLC system and the MS detector.
2. Add e.g. Standard for calibration, buffer for pH switch or eluent for e-spray in the fluid path between the HPLC system and MS detector.



Ordering Information - Equipment, Accessories, Valves & Syringes

d.Drive PUMP C30 [Part no.]	d.Drive PUMP X60 [Part no.]	Description
900763	900762	Pump with valves & power supply (Syringes & tubings must be ordered separately)
900760-001	900760-001	Windows Software
900760-002	900760-002	RS232/Bluetooth Adapter
900760-003	900760-003	RS232/USB control cable
900760-004	900760-004	PEEK Y-junction for d.Drive PUMP X60 / C30
900760-005	900760-005	Valve (3-2 port) PTFE/PCTFE
900763-001	900762-001	Tubing kit <1 ml Syringe
900763-002	900762-002	Tubing kit >1 ml Syringe
900760-C30-25	#	25 µl Syringe
900760-C30-50	900760-X60-50	50 µl Syringe
900760-C30-100	900760-X60-100	100 µl Syringe
900760-C30-250	900760-X60-250	250 µl Syringe
900760-C30-500	900760-X60-500	500 µl Syringe
900760-C30-1000	900760-X60-1000	1.000 µl Syringe
1900760-C30-2500	900760-X60-2500	2.500 µl Syringe
900760-C30-5000	900760-X60-5000	5.000 µl Syringe
#	900760-X60-10000	10.000 µl Syringe
900760-C30-12500	#	12.500 µl Syringe
#	900760-X60-25000	25.000 µl Syringe
#	900760-X60-50000	50.000 µl Syringe

Ordering Information - Tubing & Capillaries

Part no.	Description
PTFE Tubing/Capillaries (10 m/Pckg.)	
300160	1/16" PTFE-Capillary ID=0.17 mm
300161	1/16" PTFE-Capillary ID=0.25 mm
300162	1/16" PTFE-Capillary ID=0.50 mm
300163	1/16" PTFE-Capillary ID=0.75 mm
300164	1/16" PTFE-Capillary ID=1.00 mm
300151	1/8" PTFE-Tubing ID=1.60 mm
300152	1/8" PTFE-Tubing ID=2.40 mm
FEP Tubing/Capillaries (10 m/Pckg.)	
300092	1/16" FEP-Capillary ID=0.25mm
300093	1/16" FEP-Capillary ID=0.50 mm
300094	1/16" FEP-Capillary ID=0.75 mm
300095	1/16" FEP-Capillary ID=1.00 mm
300090	1/8" FEP-Capillary ID=1.58 mm
FEP Tubing/Capillaries incl. Fittings (10 m/Pckg.)	
H61614-01	2,9 mm x 2 mm x 1200 mm FEP Tubing incl. ¼-28 UNF Fitting
H61615-01	2 mm x 1 mm x 1200 mm FEP Tubing incl. ¼-28 UNF Fitting
H1172-02	2,9 mm x 2 mm x Custom length mm FEP Tubing incl. ¼-28 UNF Fitting
H1174-02	2 mm x 1 mm x 1200 mm FEP Tubing incl. ¼-28 UNF Fitting
PEEK Tubing/Capillaries (3 m/Pckg.)	
300032-K	1/16" PEEK-Capillary ID=0.064 mm natur
300036	1/16" PEEK-Capillary ID=0.13 mm red coded
300032	1/16" PEEK-Capillary ID=0.17 mm yellow coded
300033	1/16" PEEK-Capillary ID=0.25 mm blue coded
300034	1/16" PEEK-Capillary ID=0.50 mm orange coded
300035	1/16" PEEK-Capillary ID=0.75 mm green coded
300037	1/16" PEEK-Capillary ID=1.0 mm grey coded
300037-G	1/16" PEEK-Capillary ID=1.40 mm black coded
300038-160	1/8" PEEK-Capillary ID=1.6 mm

Ordering Information - Fittings & Adapters

Part no.	Description
H209721	¼-28 UNF PCTFE Low pressure fitting (flanged) incl. O-ring and kink protection spring for tubing with O.D. 2.9 mm
H209722	¼-28 UNF PCTFE Low pressure fitting (flanged) incl. O-ring and kink protection spring for tubing with O.D. 2.0 mm
XP-201	¼-28 UNF Delrin low pressure fitting (black) incl. ETFE ferrule (blue) for 1/16" capillary
XP-301	¼-28 UNF Delrin low pressure fitting (black) incl. ETFE ferrule (yellow) for 1/16" capillary
P-249	¼ 28 UNF Super Flangeless Low Pressure Fitting (PEEK), for 1/16" capillary, one-piece
P-349	¼ 28 UNF Super-Flangeless Low pressure fitting (PEEK), for 1/8" capillary, one-piece
P-646	ETFE Adapter, 1/16" ID tubing connection to ¼ -28 UNF male thread
P-647	ETFE Adapter, 1/8" ID tubing connection to ¼ -28 UNF male thread
P-648	ETFE Adapter, 3/16" ID tubing connection to ¼ -28 UNF male thread
P-624	ETFE Adapter, female Luer to ¼ -28 UNF male thread
P-625	ETFE Adapter, male Luer to ¼ -28 UNF male thread
P-670	PCTFE-Adapter, M6 female thread x ¼ -28 UNF male thread, max. 69 bar
P-669-01	PEEK-Adapter 10-32 UNF female thread to ¼ -28 UNF male thread

