



VarioSpray II

Nozzle valve system for the variable atomization of very small liquid volumes



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VERY SMALL LIQUID VOLUMES – MAXIMUM BENEFIT

Innovative spraying technology opens up new applications

The pressure to standardize is increasing in almost all areas, and the demand for more economical and more environmentally friendly production processes is growing. The newly developed Lechler VarioSpray II nozzle valve system with pulse width modulation impresses with its enormous flexibility and offers the possibility of spraying very small volumes of liquid with precision.

In the case of hydraulic nozzle systems, the narrowest cross section of the spray nozzle determines the liquid flow rate. For reasons of economy and production however, it is not possible to reduce this narrowest cross sections to any further degree desired. For this reason there are physical limits to a nozzle's minimum flow rate. Pneumatic systems are therefore used in order to realize the lowest flow rates.

This allows very small flow rates to be generated by using air. However, this pneumatic atomization has its limits where the volumes delivered must be varied and adapted to changed process parameters. This often makes control disproportionately complex.

Using air can also have an unfavorable effect on operating costs, as aerosols form and liquid is lost due to the rebound effect.

VarioSpray II allows very small volumes of liquid to be atomized while using hydraulic nozzles at the same time.

Flexible system

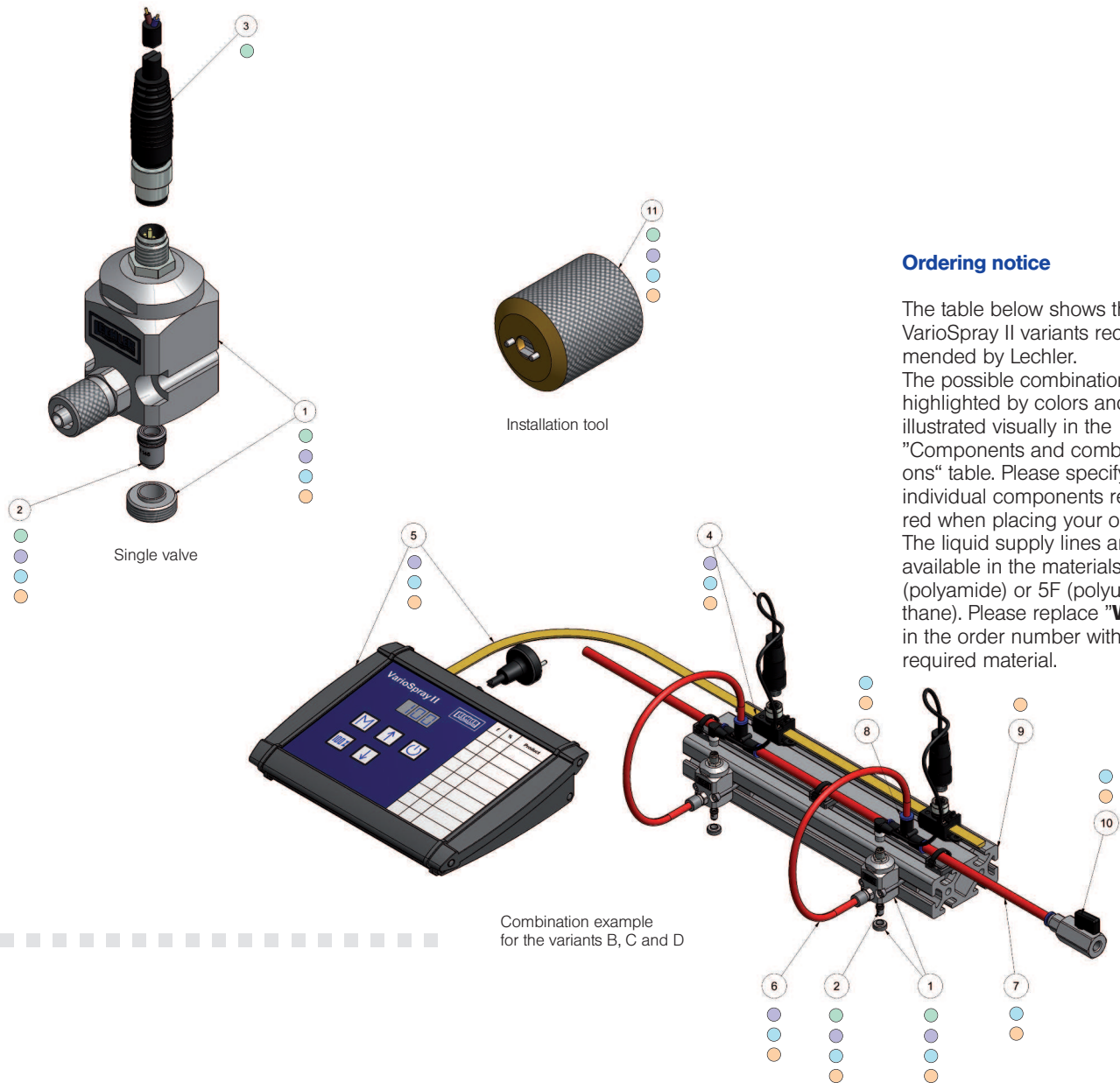
- Simple change to the pulse width and cycle frequency
- Flushing function
- Modular design and modular system
- Start/Stop signal (e.g. via light barrier)



Characteristics	The benefits to you
Minimum flow rates - Liquid saving - No expensive and complex twin-fluid system	→ Cost reduction → Increased efficiency
Frequency up to 100 Hz - Flexible belt speeds	→ Increased productivity → Production time reduction
Control ratio up to 11 : 1 - Large flow rates covered with one nozzle	→ No nozzle change
Variable flow rate - Flexible adjustment of the volume applied for different products	→ Product change time reduction
Different flow rates have no influence on spraying parameters - Constant spray angle - Constant droplet size	→ Constant process parameters
Flow rate is not regulated via the pressure - No high pressure required - Simple configuration	→ Short installation time → Low maintenance costs → Low operating costs
Low-wear valve - Only one movable object	→ Low maintenance
No atomization air - No aerosol formation - Less liquid loss	→ Less risk to health → Does not pollute the environment → Cost reduction
Not susceptible to blockages - Larger cross sections compared to normal nozzles	→ Increased operating safety

THE COMPONENTS

AND THE POSSIBILITIES FOR COMBINING THEM



Ordering notice

The table below shows the VarioSpray II variants recommended by Lechler. The possible combinations are highlighted by colors and are illustrated visually in the "Components and combinations" table. Please specify the individual components required when placing your order. The liquid supply lines are available in the materials 5N (polyamide) or 5F (polyurethane). Please replace "WW" in the order number with the required material.

Nozzle overview

Spray angle [°]		Ordering no., nozzle	Suitable for valve		Flow rate* [ml/min]	
NW 0.3 mm	NW 0.5 mm		NW 0.3 mm	NW 0.5 mm	NW 0.3 mm	NW 0.5 mm
		634.XXX.16.05.00.0	742.030.1Y.00.00.0	742.050.1Y.00.00.0		
75 - 80	80 - 90	634.145.16.05.00.0	○	○	8 - 73	11 - 85
55 - 65	65 - 70	634.165.16.05.00.0	○	○	10 - 85	15 - 111
-	74 - 85	634.185.16.05.00.0	-	○	-	16 - 128
-	70 - 75	634.215.16.05.00.0	-	○	-	17 - 161
-	70 - 75	634.245.16.05.00.0	-	○	-	22 - 206
-	55 - 60	634.275.16.05.00.0	-	○	-	24 - 239
-	80 - 90	634.216.16.05.00.0	-	○	-	18 - 165
-	70 - 75	634.246.16.05.00.0	-	○	-	21 - 211
-	60 - 65	634.276.16.05.00.0	-	○	-	25 - 238
-	100 - 110	634.187.16.05.00.0	-	○	-	14 - 130
-	95 - 105	634.217.16.05.00.0	-	○	-	19 - 168
-	100 - 110	634.247.16.05.00.0	-	○	-	23 - 215
-	80 - 85	634.277.16.05.00.0	-	○	-	24 - 237

The available nozzles are shown in the adjacent table. Please enter the appropriate nozzle number in your order.

NW = nominal width
DC = pulse width ratio

Nozzle material: Stainless steel 1.4305 (303 SS)
incl. O-ring (material: FPM)

* DC: 15 % - 90 %; fluid pressure: 4 - 6 bar

Components and combinations

Variant	No.	Description	Ordering no.	Pcs.	Technical specification	Length
A	①	Valve, incl. connecting nut	742.030.1Y.00.00.0		NW 0.3 mm, additional information see table	
		Valve, incl. connecting nut	742.050.1Y.00.00.0		NW 0.5 mm, additional information see table	
	②	Nozzle	634.XXX.16.05.00.0		See separate table	
	③	Valve cable, M8, open end	074.211.00.00.00.0		Cable length: 2 m	
		Valve cable, M8, open end	074.211.00.01.00.0		Cable length: 5 m	
	⑪	Installation tool	074.290.30.00.00.0	1	For flat fan nozzle, material: brass	
B	①	Valve, incl. connecting nut	742.030.1Y.00.00.0	max. 8	NW 0.3 mm, additional information see table	
		Valve, incl. connecting nut	742.050.1Y.00.00.0	max. 8	NW 0.5 mm, additional information see table	
	②	Nozzle	634.XXX.16.05.00.0	max. 8	See separate table	
	④	Valve cable, M12 - M8	074.210.00.00.00.0	max. 8	Including BUS plug connector, loose insert	1 m
	⑤	Control unit	074.200.00.00.00.0	1	Including BUS cable, BUS end plug, instruction manual and quick start manual	
	⑥	Valve hose, Ø 6 x 1 mm	074.212.WW.00.00.0	1	Valve hose, up to 4 valves, available materials: 5N (Polyamid) or 5F (Polyurethan)	1.5 m
		Valve hose, Ø 6 x 1 mm	074.212.WW.01.00.0	1	Valve hose, up to 8 valves, available materials: 5N (Polyamid) or 5F (Polyurethan)	2.5 m
		Wall fastening for control unit	074.257.00.00.00.0	1	Fastening set to mount the control unit to a wall	
		Rubber feet	074.258.00.00.00.0	1	4 pcs., black, for control unit	
	⑪	Installation tool	074.290.30.00.00.0	1	For flat fan nozzle, material: brass	
C	①	Valve, incl. connecting nut	742.030.1Y.00.00.0	max. 8	NW 0.3 mm, additional information see table	
		Valve, incl. connecting nut	742.050.1Y.00.00.0	max. 8	NW 0.5 mm, additional information see table	
	②	Nozzle	634.XXX.16.05.00.0	max. 8	See separate table	
	④	Valve cable, M12 - M8	074.210.00.00.00.0	max. 8	Including BUS plug connector, loose insert	1 m
	⑤	Control unit	074.200.00.00.00.0	1	Including BUS cable, BUS end plug, instruction manual and quick start manual	
	⑥	Valve hose, Ø 6 x 1 mm	074.212.WW.00.00.0	1	Valve hose, up to 4 valves, available materials: 5N (Polyamid) or 5F (Polyurethan)	1.5 m
		Valve hose, Ø 6 x 1 mm	074.212.WW.01.00.0	1	Valve hose, up to 8 valves, available materials: 5N (Polyamid) or 5F (Polyurethan)	2.5 m
	⑦	Central liquid line, Ø 8 x 1,25 mm	074.213.WW.00.00.0	1	Central liquid line, available materials: 5N (Polyamid) or 5F (Polyurethan)	3 m
		Central liquid line, Ø 8 x 1,25 mm	074.213.WW.01.00.0	1	Central liquid line, available materials: 5N (Polyamid) or 5F (Polyurethan)	5 m
	⑧	T-distributor	074.214.00.00.00.0	max. 8	Ø 8 to Ø 6 mm	
	⑩	Ball valve for bleeding	074.216.00.00.00.0	1	Ball valve with push-in fitting	
		Wall fastening for control unit	074.257.00.00.00.0	1	Fastening set to mount the control unit to a wall	
	Rubber feet	074.258.00.00.00.0	1	4 pcs., black, for control unit		
	⑪	Installation tool	074.290.30.00.00.0	1	For flat fan nozzle, material: brass	
D	①	Valve, incl. connecting nut	742.030.1Y.00.00.0	max. 8	NW 0.3 mm, additional information see table	
		Valve, incl. connecting nut	742.050.1Y.00.00.0	max. 8	NW 0.5 mm, additional information see table	
	②	Nozzle	634.XXX.16.05.00.0	max. 8	See separate table	
	④	Valve cable, M12 - M8	074.210.00.00.00.0	max. 8	Including BUS plug connector, loose insert	1 m
	⑤	Control unit	074.200.00.00.00.0	1	Including BUS cable, BUS end plug, instruction manual and quick start manual	
	⑥	Valve hose, Ø 6 x 1 mm	074.212.WW.00.00.0	1	Valve hose, up to 4 valves, available materials: 5N (Polyamid) or 5F (Polyurethan)	1.5 m
		Valve hose, Ø 6 x 1 mm	074.212.WW.01.00.0	1	Valve hose, up to 8 valves, available materials: 5N (Polyamid) or 5F (Polyurethan)	2.5 m
	⑦	Central liquid line, Ø 8 x 1,25 mm	074.213.WW.00.00.0	1	Central liquid line, available materials: 5N (Polyamid) or 5F (Polyurethan)	3 m
		Central liquid line, Ø 8 x 1,25 mm	074.213.WW.01.00.0	1	Central liquid line, available materials: 5N (Polyamid) or 5F (Polyurethan)	5 m
	⑧	T-distributor	074.214.00.00.00.0	max. 8	Ø 8 to Ø 6 mm	
	⑨	ITEM - profile, 80 x 40 mm	074.215.40.00.00.0	1	Including T-Slot Nuts, screws, caps, universal holder	1 m
		ITEM - profile, 80 x 40 mm	074.215.40.01.00.0	1	Including T-Slot Nuts, screws, caps, universal holder	2 m
	⑩	Ball valve for bleeding	074.216.00.00.00.0	1	Ball valve with push-in fitting	
		Wall fastening for control unit	074.257.00.00.00.0	1	Fastening set to mount the control unit to a wall	
		Rubber feet	074.258.00.00.00.0	1	4 pcs., black, for control unit	
	⑪	Installation tool	074.290.30.00.00.0	1	For flat fan nozzle, material: brass	

WW = material code: 5N (Polyamid)
5F (Polyurethane)

Technical data

Valve		Control unit	
Nominal width:	0.5 mm / (0.3 mm)	Max. number of valves:	8
Pressure range:	0-8 / (10) bar	Electric connection:	115 – 230 V AC
Voltage:	24 V DC	Control voltage:	24 V DC
Type:	2/2-way N.C.	Total power:	20 W
Nominal power:	2.0 W	Frequency:	25 / 50 / 75 / 100 Hz
Sealing material:	FPM	Pulse width:	10 – 90 / 100%
Housing material:	1.4404 (316L SS)	Follower time:	0 – 10 s
Spring material:	1.4310 (301 SS)	External signal input:	yes
Coil resistance:	288 Ohm	Protection type:	IP 54
Protection type:	IP 65		
Frequency:	0-100 Hz		
Hose:	Ø 6 x 1 mm		



PULSE WIDTH MODULATION

IDEAL TECHNOLOGY FOR MANY APPLICATIONS

Applications

Coating

- Food industry
 - Vitamin spraying
 - Spraying of low-viscosity sugar solutions
- Beverages industry
 - Anti-Scuffing of glass bottles
- Disinfection
 - Hygiene applications



- Nanoparticle application
 - Construction industry
 - Fabric processing
- Release agent application
 - Application of demoulding oils
 - Foil production
 - Coating of plastic moulds
 - Electronics applications

Moisturizing

- Food industry
 - Product moisturizing
- Paper industry
 - Moisturizing
 - Moisturizing of printing rollers



Belt lubrication

- Automotive industry
 - Application of anti-corrosion agent
- Degreasing systems

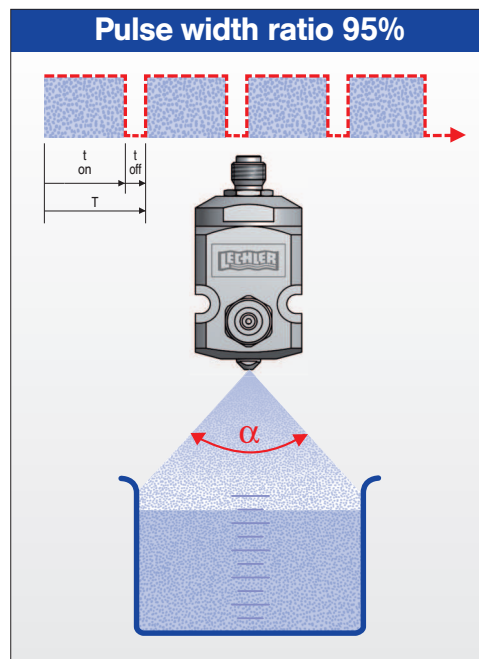


What is pulse width modulation?

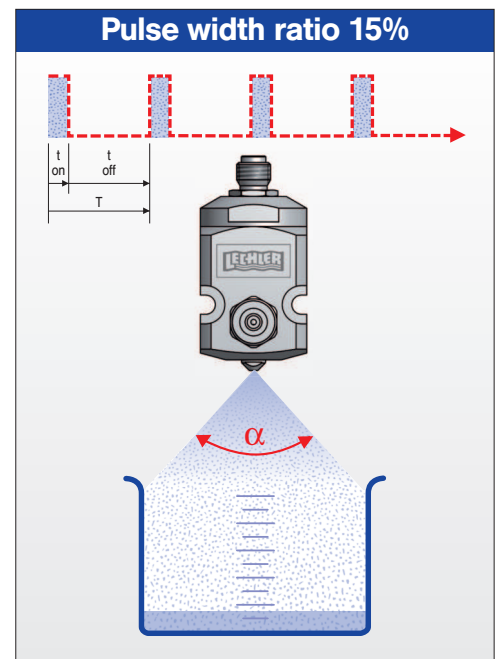
Pulse width modulation refers to the variation of the ON time t_{on} / OFF time t_{off} of a square-wave signal when the frequency f remains constant. Here, the frequency f corresponds to the reciprocal value of the period duration T .

The ratio of the ON time t_{on} to the period duration T is referred to as the pulse width ratio (DC = duty cycle). The pulse width ratio determines the flow rate. The valve is open during the ON time t_{on} . The shorter the DC, the less the flow rate. Depending on the frequency selected, the pulsation is barely perceptible to the naked eye.

Example for flow control



$\alpha = \text{constant at DC } 10\text{--}100\%$



$\alpha = \text{constant at DC } 10\text{--}100\%$

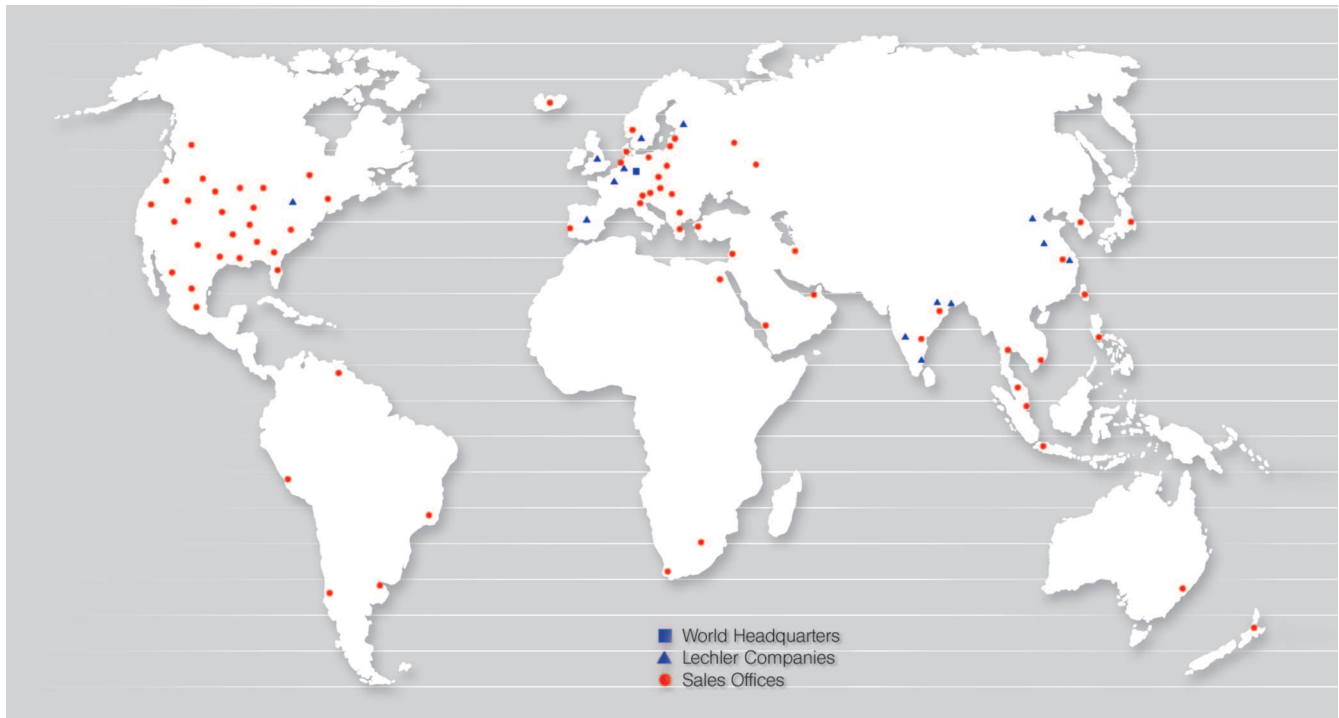


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Over 130 years of practice and experience have resulted in know-how of an international standard. Interdisciplinary teams of process engineers, designers and production specialists are constantly working to enhance and optimize Lechler products at our main works in Metzingen near Stuttgart. Worldwide, 10 subsidiary companies and over 40 branches of our representatives provide on-site support for our customers.



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