

# **ATEX Chemical Membrane Pump | Model BINDER VP5 EX**

The VP5 EX vacuum pump, together with the VDL series vacuum ovens, is perfectly suited for the safe drying of flammable solvents

#### **Benefits**

- Optimally matched for operation with BINDER VDL series vacuum drying ovens
- Resistant to a wide range of chemicals
- Very guiet and low-vibration operation
- Designed for S1 operating mode (continuous operation)
- Suction and pressure-side separators for collecting condensate
- Emission condenser at the pump outlet for solvent recondensation



- Maximum pumping speed at 230V/50Hz: 1,9 m<sup>3</sup>/h
- Final vacuum without gas ballast: 12 mbar¹
- Final vacuum with gas ballast: 18 mbar<sup>2</sup>
- Rated power: 1,5 kW
- Power connection via fixed connection. Pump is delivered with blank cable ends.
- Scope of delivery: Pumping station fully assembled, ready for operation, with instructions



Pumping chamber (pumped gases): II 2G Ex h IIC T3 Gb X; Outer compartement with inert gas purging: II 2G Ex h IIB T4 Gb X; Outer compartement without inert gas purging: II 3G Ex h IIB T4 Gc X

Motor: II 2G Ex db IIB T4 Gb

#### **Order Information:**

Art.No.	Article	Description		
5013-0258	Pump stand VP5 EX	ATEX Chemical membrane pump		
8012-2724	Connection kit VDL VP5 EX	Connecting VP5 EX to vacuum ovens of		
	stainless steel	series VDL with flexible		
		stainless steel hose		
8012-2614	Connection kit VDL VP5 EX	Connecting VP5 EX to vacuum ovens of		
	PTFE	series VDL with flexible,		
		electrostatically conductive PTFE hose		
8500-0538	Service kit VP5 EX <sup>3</sup>	Wear parts set, consisting of		
		membranes, valves, and seals		
8500-0542	Membranschlüssel SW 66	Special tool for replacing the membranes		
The pump VP5 EX is also available as a set with pump module (undercabinet) and				
connection kit, see page 5				



<sup>1</sup> The final vacuum of the entire system consisting of vacuum pump and vacuum oven is usually about 1-3 mbar above the ultimate vacuum of the pump alone

<sup>2</sup> When drying larger quantities of liquid (> 100 ml), the use of gas ballast is recommended

<sup>3</sup> It is recommended to replace the wearing parts after 15000 operating hours, which corresponds to 1,7 years of continuous operation.



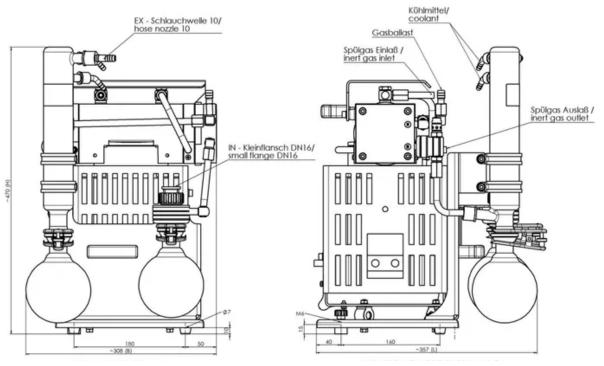
#### **Technical Data**

Maximum pumping speed 50/60 Hz according to ISO 21360 m³/h 1,9 Final vacuum without gas ballast (absolute) mbar 12 Final vacuum with gas ballast (absolute) mbar 18 Maximum permissible pressure at the inlet (absolute) bar 1,1 Maximum permissible pressure at the outlet (absolut) bar 1,1 Maximum permissible differential pressure between inlet and outlet and outlet bar 1,1 Permissible ambient temperature during storage °C -10 to +60 Permissible ambient temperature during operation °C +10 to +40 Permissible relative ambient humidity during operation (non-condensing) Maximum installation height m 2000 NN Rated power kW 0,15 Idle speed 1/min 1500 Maximum permissible range of supply voltage / mains frequency Rated current consumption A 1,2 Maximum starting current / A 5,5 / ms 125 Device fuse A 6,3 inert  Without! Supplied with 10 m long permanently mounted power cable and bare cable ends² Flameproof motor with integrated, self-locking overcurrent and overtemperature protection for direct 230 V / 50 Hz single-phase connection  Protection class according to IEC 529 Inlet mm small flange DN 16 Outlet mm hose nozzle DN 10 Volume of round flasks (each) ml 500 Emission sound pressure level* db(A) 50 Dimensions L x W x H ca mm 357 x 308 x 470 Weight ready for use approximately kg 25,4	Туре	Unit	BINDER VP5 EX	
Final vacuum witht gas ballast (absolute)  Maximum permissible pressure at the inlet (absolute)  Maximum permissible pressure at the outlet (absolute)  Maximum permissible differential pressure between inlet and outlet  Permissible ambient temperature during storage  Permissible ambient temperature during operation  Permissible relative ambient humidity during operation  (non-condensing)  Maximum installation height  Rated power  Maximum permissible range of  Supply voltage / mains frequency  Rated current consumption  Maximum starting current /  Starting time  Device plug  Motor protection  Motor protection  Protection class according to IEC 529  Inlet  Multiput 18  Maximum stall flange DN 16  Outlet  Woltage / mains flange DN 16  Mission sound pressure level <sup>5</sup> Dimensions L x W x H ca  Weight ready for use approximately  Maximum a 357 x 308 x 470  Weight ready for use approximately  Maximum and 18  Maximum bar 1,1  1,1  1,1  1,1  1,1  1,1  1,1  1,1	Maximum pumping speed 50/60 Hz according to ISO 21360	m³/h	1,9	
Maximum permissible pressure at the inlet (absolute)  Maximum permissible pressure at the outlet (absolut)  Maximum permissible differential pressure between inlet and outlet  Permissible ambient temperature during storage  Permissible ambient temperature during operation  Permissible relative ambient humidity during operation  (non-condensing)  Maximum installation height  Maximum installation height  Maximum permissible range of  supply voltage / mains frequency  Rated current consumption  Maximum starting current /  Starting time  Device fuse  Motor protection  Motor protection  Protection class according to IEC 529  Inlet  Mum starting curre louden and processore levels  Device found flasks (each)  Emission sound pressure levels  Meaning manufacture at the outlet (absolut)  bar 1,1  1,1  bar 1,1  bar 1,1  1,1  1,1  1,1  1,1  1,1  1,1  1,1	Final vacuum without gas ballast (absolute)		12	
Maximum permissible pressure at the outlet (absolut)  Maximum permissible differential pressure between inlet and outlet  Permissible ambient temperature during storage  Permissible ambient temperature during operation  Permissible relative ambient humidity during operation  (non-condensing)  Maximum installation height  Rated power  Idle speed  Maximum permissible range of supply voltage / mains frequency  Rated current consumption  Maximum starting current /  Starting time  Device plug  Motor protection  Protection class according to IEC 529  Inlet  Outlet  Volume of round flasks (each)  Emission sound pressure level <sup>5</sup> Dimensions L x W x H ca  Maximum permissible range at the outlet (absolut)  bar  1,1  1,1  10  10  10  10  10  10  10	Final vacuum witht gas ballast (absolute)		18	
Maximum permissible differential pressure between inlet and outlet  Permissible ambient temperature during storage  Permissible ambient temperature during operation  Permissible relative ambient humidity during operation  (non-condensing)  Maximum installation height  Rated power  Idle speed  Maximum permissible range of supply voltage / mains frequency  Rated current consumption  Maximum starting current /  Starting time  Device plug  Motor protection  Protection class according to IEC 529  Inlet  Outlet  Volume of round flasks (each)  Emission sound pressure level <sup>5</sup> Dimensions L x W x H ca  Medizing operation  Pc	Maximum permissible pressure at the inlet (absolute)	bar	1,1	
and outlet Permissible ambient temperature during storage Permissible ambient temperature during operation Permissible ambient temperature during operation Permissible relative ambient humidity during operation (non-condensing) Maximum installation height Rated power Rated power Rated power Rated current consumption Maximum permissible range of supply voltage / mains frequency Rated current consumption A 1,2 Maximum starting current / Starting time Device fuse A 6,3 inert  Without! Supplied with 10 m long permanently mounted power cable and bare cable ends <sup>4</sup> Flameproof motor with integrated, self-locking overcurrent and overtemperature protection for direct 230 V / 50 Hz single-phase connection  Protection class according to IEC 529 Inlet Doublet  mm small flange DN 16 Outlet mm hose nozzle DN 10 Volume of round flasks (each) Emission sound pressure level <sup>5</sup> db(A) 50 Dimensions L x W x H ca Meight ready for use approximately  kg 25,4	Maximum permissible pressure at the outlet (absolut)	bar	1,1	
Permissible ambient temperature during operation  Permissible relative ambient humidity during operation (non-condensing)  Maximum installation height  Rated power  Idle speed  Maximum permissible range of supply voltage / mains frequency  Rated current consumption  Maximum starting current /  Starting time  Device plug  Motor protection  Protection class according to IEC 529  Inlet  Outlet  Word of Supply sold and sold according to IEC 529  Inlet  Outlet  Without supplied with 10 m long permanently mounted power cable and bare cable ends*  IP 52  Inlet  Mithout supplied with 10 m long permanently mounted power cable and bare cable ends*  Flameproof motor with integrated, self-locking overcurrent and overtemperature protection for direct 230 V / 50 Hz single-phase connection  Protection class according to IEC 529  IP 52  Inlet  Mithout supplied with 10 m long permanently mounted power cable and bare cable ends*  Flameproof motor with integrated, self-locking overcurrent and overtemperature protection for direct 230 V / 50 Hz single-phase connection  Protection class according to IEC 529  IP 52  Inlet  Mm small flange DN 16  Mm hose nozzle DN 10  Volume of round flasks (each)  In 500  Emission sound pressure level <sup>5</sup> Mb(A) 50  Dimensions L x W x H ca  Weight ready for use approximately  Kg 25,4	Maximum permissible differential pressure between inlet and outlet	bar	1,1	
Permissible relative ambient humidity during operation (non-condensing)  Maximum installation height  Rated power  Rated power  Rated power  Rated power  Rated power  Maximum permissible range of supply voltage / mains frequency  Rated current consumption  A 1,2  Maximum starting current /  Starting time  Device fuse  A 6,3 inert  Without! Supplied with 10 m long permanently mounted power cable and bare cable ends <sup>4</sup> Flameproof motor with integrated, self-locking overcurrent and overtemperature protection for direct 230 V / 50 Hz single-phase connection  Protection class according to IEC 529  IP 52  Inlet  Outlet  Mm small flange DN 16  Outlet  Mm hose nozzle DN 10  Volume of round flasks (each)  Emission sound pressure level <sup>5</sup> Dimensions L x W x H ca  Weight ready for use approximately  My 0,15  MxW 0,15  A 2000 NN  Rated power  WW 0,15  A 1,2  A / 5,5 /  ms 125  A 6,3 inert  Without! Supplied with 10 m long permanently mounted power cable and bare cable ends <sup>4</sup> Flameproof motor with integrated, self-locking overcurrent and overtemperature protection for direct 230 V / 50 Hz single-phase connection  IP 52  Inlet  Mm small flange DN 16  Outlet  Mm hose nozzle DN 10  Mb(A) 50  Dimensions L x W x H ca  Mm 357 x 308 x 470  Weight ready for use approximately	Permissible ambient temperature during storage	°C	-10 to +60	
(non-condensing)       76       30 to 65         Maximum installation height       m       2000 NN         Rated power       kW       0,15         Idle speed       1/min       1500         Maximum permissible range of supply voltage / mains frequency       230V ±10% / 50 Hz         Rated current consumption       A       1,2         Maximum starting current / starting time       A / 5,5 / starting time       125         Device fuse       A 6,3 inert         Without! Supplied with 10 m long permanently mounted power cable and bare cable ends <sup>4</sup> Flameproof motor with integrated, self-locking overcurrent and overtemperature protection for direct 230 V / 50 Hz single-phase connection         Protection class according to IEC 529       IP 52         Inlet       mm       small flange DN 16         Outlet       mm       hose nozzle DN 10         Volume of round flasks (each)       ml       500         Emission sound pressure level <sup>5</sup> db(A)       50         Dimensions L x W x H ca       mm       357 x 308 x 470         Weight ready for use approximately       kg       25,4	Permissible ambient temperature during operation	°C	+10 to +40	
Rated power    Idle speed   1/min   1500	Permissible relative ambient humidity during operation (non-condensing)		30 to 85	
Idle speed  I/min 1500  Maximum permissible range of supply voltage / mains frequency  Rated current consumption  A 1,2  Maximum starting current / A 5,5 / ms 125  Device fuse  Device fuse  A 6,3 inert  Without! Supplied with 10 m long permanently mounted power cable and bare cable ends <sup>4</sup> Flameproof motor with integrated, self-locking overcurrent and overtemperature protection for direct 230 V / 50 Hz single-phase connection  Protection class according to IEC 529  IP 52  Inlet  mm small flange DN 16  Outlet  Motor product flasks (each)  Emission sound pressure level <sup>5</sup> Dimensions L x W x H ca  Without! Supplied with 10 m long permanently mounted power cable and bare cable ends <sup>4</sup> Flameproof motor with integrated, self-locking overcurrent and overtemperature protection for direct 230 V / 50 Hz single-phase connection  Protection class according to IEC 529  IP 52  Inlet  mm hose nozzle DN 10  Volume of round flasks (each)  mi 500  Emission sound pressure level <sup>5</sup> db(A) 50  Dimensions L x W x H ca  mm 357 x 308 x 470  Weight ready for use approximately  kg 25,4	Maximum installation height	m	2000 NN	
Maximum permissible range of supply voltage / mains frequency  Rated current consumption  A 1,2  Maximum starting current / Starting time  Device fuse  Device plug  Motor protection  Protection class according to IEC 529  Inlet  Outlet  Without Starting time in James according to IEC 529  Inlet  Mind part according to IEC 529  I	Rated power	kW	0,15	
Rated current consumption  A 1,2  Maximum starting current / Starting time  Device fuse  Device plug  Motor protection  Protection class according to IEC 529  Inlet  Outlet  Without starting time in Education Solution  Volume of round flasks (each)  Emission sound pressure level <sup>5</sup> Dimensions L x W x H ca  Maximum strating frequency  A 1,2  A / 5,5 / ms 125  A 6,3 inert  Without! Supplied with 10 m long permanently mounted power cable and bare cable ends <sup>4</sup> Flameproof motor with integrated, self-locking overcurrent and overtemperature protection for direct 230 V / 50 Hz single-phase connection  IP 52  Inlet  mm small flange DN 16  mm hose nozzle DN 10  Volume of round flasks (each)  mm 357 x 308 x 470  kg 25,4	Idle speed	1/min	1500	
Maximum starting current / Starting time	Maximum permissible range of supply voltage / mains frequency		230V ±10% / 50 Hz	
Starting time       ms       125         Device fuse       A       6,3 inert         Without! Supplied with 10 m long permanently mounted power cable and bare cable ends4         Motor protection       Flameproof motor with integrated, self-locking overcurrent and overtemperature protection for direct 230 V / 50 Hz single-phase connection         Protection class according to IEC 529       IP 52         Inlet       mm       small flange DN 16         Outlet       mm       hose nozzle DN 10         Volume of round flasks (each)       ml       500         Emission sound pressure level5       db(A)       50         Dimensions L x W x H ca       mm       357 x 308 x 470         Weight ready for use approximately       kg       25,4	Rated current consumption	Α	1,2	
Device plug  Without! Supplied with 10 m long permanently mounted power cable and bare cable ends4  Flameproof motor with integrated, self-locking overcurrent and overtemperature protection for direct 230 V / 50 Hz single-phase connection  Protection class according to IEC 529  IP 52  Inlet  mm small flange DN 16  Outlet  mm hose nozzle DN 10  Volume of round flasks (each)  Emission sound pressure level <sup>5</sup> Dimensions L x W x H ca  mm 357 x 308 x 470  Weight ready for use approximately  kg 25,4	Maximum starting current / Starting time		1	
Device plug permanently mounted power cable and bare cable ends <sup>4</sup> Flameproof motor with integrated, self-locking overcurrent and overtemperature protection for direct 230 V / 50 Hz single-phase connection  Protection class according to IEC 529  IP 52  Inlet mm small flange DN 16  Outlet mm hose nozzle DN 10  Volume of round flasks (each) ml 500  Emission sound pressure level <sup>5</sup> db(A) 50  Dimensions L x W x H ca mm 357 x 308 x 470  Weight ready for use approximately kg 25,4	Device fuse	Α	6,3 inert	
Self-locking overcurrent and overtemperature protection for direct 230 V / 50 Hz single-phase connection  Protection class according to IEC 529  Inlet  mm  mm  mall flange DN 16  Outlet  Wolume of round flasks (each)  Emission sound pressure level <sup>5</sup> Dimensions L x W x H ca  Weight ready for use approximately  self-locking overcurrent and overtemperature protection for direct 230 V / 50 Hz single-phase connection  IP 52  Inlet  mm  small flange DN 16  mm  bose nozzle DN 10  db(A)  50  Dimensions L x W x H ca  mm  357 x 308 x 470  kg  25,4	Device plug	permanently mounted power cable		
Inlet mm small flange DN 16  Outlet mm hose nozzle DN 10  Volume of round flasks (each) ml 500  Emission sound pressure level <sup>5</sup> db(A) 50  Dimensions L x W x H ca mm 357 x 308 x 470  Weight ready for use approximately kg 25,4	Motor protection		self-locking overcurrent and overtemperature protection for direct 230 V / 50 Hz single-phase	
Outlet         mm         hose nozzle DN 10           Volume of round flasks (each)         ml         500           Emission sound pressure level <sup>5</sup> db(A)         50           Dimensions L x W x H ca         mm         357 x 308 x 470           Weight ready for use approximately         kg         25,4	Protection class according to IEC 529		IP 52	
Volume of round flasks (each)ml500Emission sound pressure level5db(A)50Dimensions L x W x H camm357 x 308 x 470Weight ready for use approximatelykg25,4	Inlet	mm	small flange DN 16	
Emission sound pressure level <sup>5</sup> Dimensions L x W x H ca  Weight ready for use approximately  db(A)  mm  357 x 308 x 470  kg  25,4	Outlet	mm	hose nozzle DN 10	
Dimensions L x W x H ca mm 357 x 308 x 470  Weight ready for use approximately kg 25,4	Volume of round flasks (each)	ml	500	
Weight ready for use approximately kg 25,4	Emission sound pressure level <sup>5</sup>	db(A)	50	
	Dimensions L x W x H ca	mm	357 x 308 x 470	
Permissible Gas intake temperature °C +10 to +40	Weight ready for use approximately	kg	25,4	
	Permissible Gas intake temperature	°C	+10 to +40	

The pump must be connected to the power grid by ATEX-trained personnel via a fixed connection. Outside of ATEX zones, the power connection can also be made via professional installation of a power supply plug.
 Measurement at ultimate vacuum at 230 V / 50 Hz according to EN ISO 2151:2004 and EN ISO 3744:1995 with exhaust hose at the outlet.



# Drawing



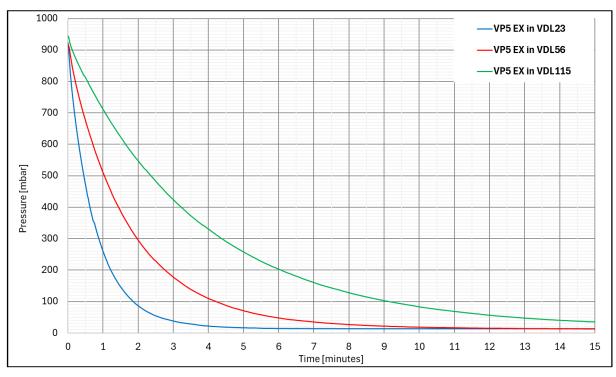
All dimensions mm

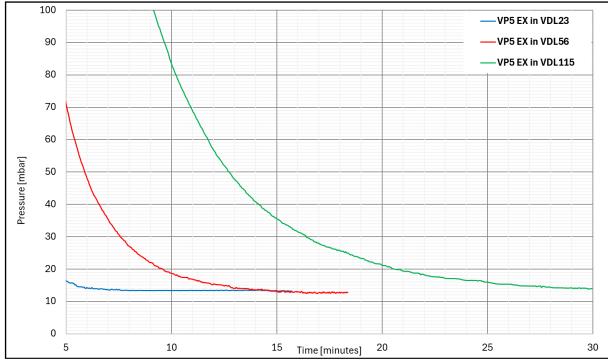
#### **List of Materials in Contact with Medium**

Component	<u>Material</u>		
Inlet	Stainless steel		
Outlet	Stainless steel / PBT		
Membrane clamping disc	ETFE carbon fiber reinforced		
Membranes	PTFE		
Valves	FFKM oder PTFE		
Tubing	PTFE, antistatic		
Screw connections	ETFE / Stainless steel		
Housing cover inner part	PTFE, carbon fiber reinforced		
Head cover	ETFE carbon fiber reinforced		
O-rings in the Head cover	FPM		
O-ring at round flask, suction side	Fluorelastomer		
Round flasks, emission condenser	Borosilicate glass		
pressure relief valve	Stainless steel; PTFE, carbon fiber reinforced; FFKM		
Separator cover plate	PTFE, carbon fiber reinforced t		



### Pump-Down Charts of VP5 with Vacuum Ovens of Series VDL



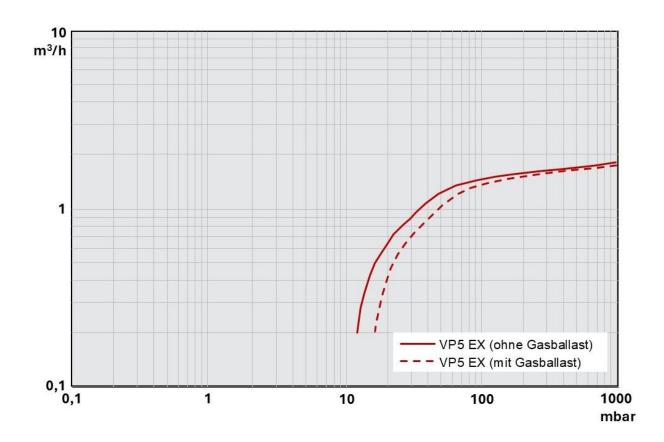


#### Note:

- curves relate to pump-down of an empty oven. When containing volatile liquid, the pressure curve will be significantly different
- temperature will affect the curves, but only to a minor effect (higher temperature → slightly faster pump-down). All curves are taken at a chamber temperature of 70°C



## **Pump Characteristic Curve**



#### **Shipment Data:**

VP5 EX is delivered on a customized pallette:

Freight dimensions on palette (L x W x H in mm): 630 x 690 x 685

Shipment weight on palette (kg): 38

## **CE Conformity:**

The product is CE compliant with the regulations and directives

- 2006/42/EG
- 2014/34/EU
- 2011/65/EU, 2015/863



# Set-Articles: vacuum pump VP1 with pump module (under cabinet) and connection kit (with flexible stainless steel hose)

For our VDL series vacuum ovens, available in size 23-liter, 56-liter, and 115-liter, we offer sets consisting of a VP5 EX vacuum pump, a pump module (under cabinet) for housing the pump, and a connection kit for connecting the pump to the vacuum oven.

The pump module raises the vacuum oven to an ergonomic working height, reduces pump noise, and protects the pump from mechanical damage.

The pump module contains a stainless steel drip tray to collect any accidentally spilled solvent (e.g., when emptying the round flask).

A 100 mm diameter exhaust port is located on the rear wall of the pump cabinet. This is used for connection to an on-site exhaust system. A suction capacity of 130 m³/h is recommended.

SET - Article			
Art.No.	Description		
8012-2628	Pump module VDL 023 + VP5 EX + connection kit (stainless steel hose)		
8012-2629	Pump module VDL 056 + VP5 EX + connection kit (stainless steel hose)		
8012-2630	Pump module VDL 115 + VP5 EX + connection kit (stainless steel hose)		



**BINDER GmbH** 

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