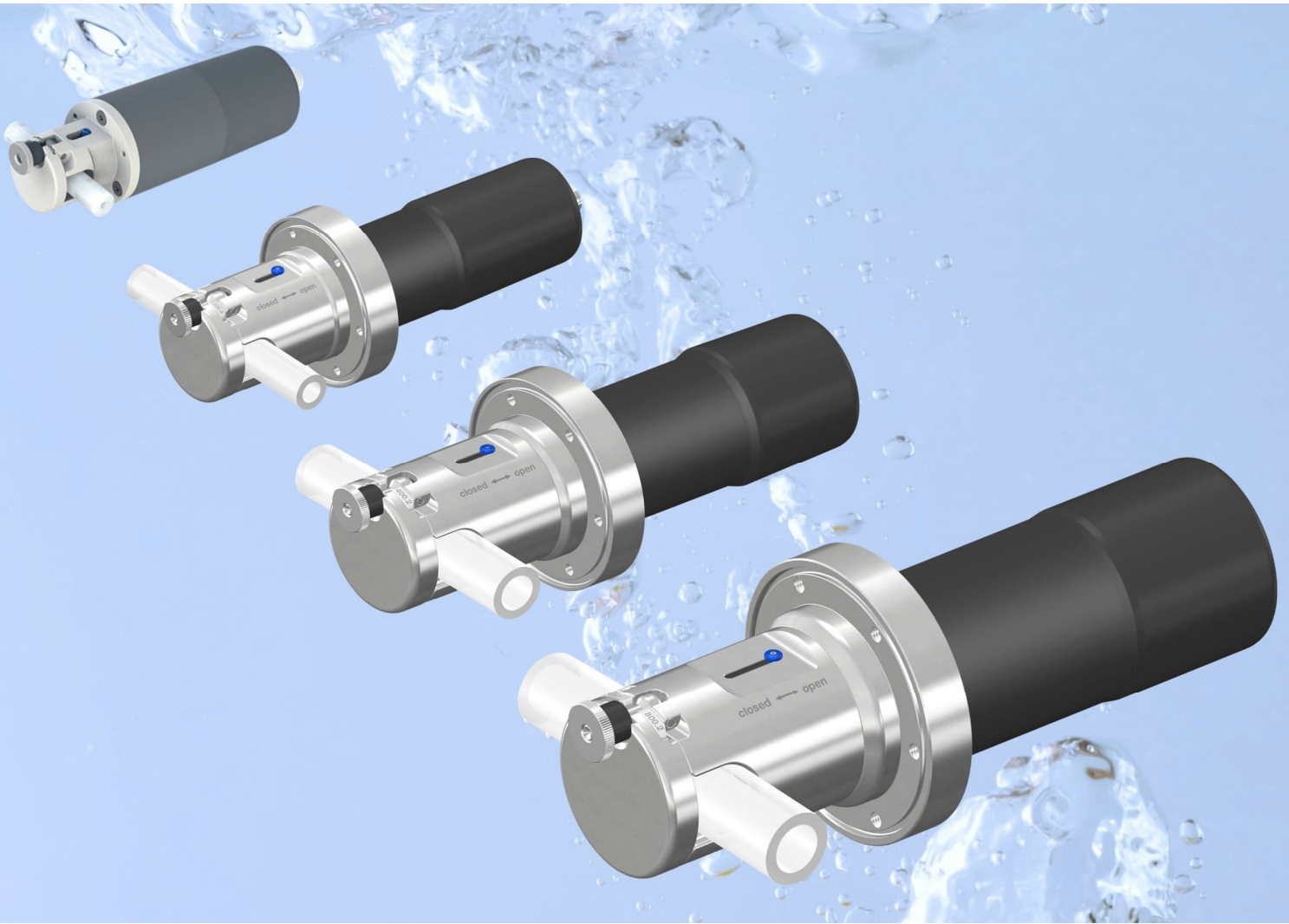


Levitronix® Electromagnetic Pinch Valves



LPVS-i Smart Pinch Valve Series

LPVS-i100

LPVS-i200

LPVS-i400(P)

LPVS-i800

Electromagnet Technology with Highest Force Density

INTRODUCTION

The electromagnetic *Levitronix*® pinch valve series *LVPS-i* is designed for high clamp forces to clamp flexible tubing (including braided versions) without the usage of pressurized air. As illustrated in *Figure 1* the pinch valve consists of an electromagnetic actuator, an integrated control electronics and a clamp head.

The actuator contains high energy density permanent magnets with a dedicated optimized electromagnetic circuit. This results in high clamp forces and low operating costs as no power is needed to keep the clamp position.

The control electronics contains capacitors, which deliver the peak energy for switching, resulting in low power demand for switching actions. During power failure the capacitors deliver the power to allow a shutdown to a defined clamp position. The default position can be configured with the *Levitronix*® *Service Software* or a dedicated user panel. A PLC (switching and feedback signal) and a fieldbus (RS485) with Modbus protocol allow sophisticated integration into processing equipment, without the need of additional components.

The clamp head has a visual feedback of the clamp position and an integrated automatic closing flap for finger protection. Various inserts allow to adapt to various tubing geometries.

SYSTEM BENEFITS

- No pressurized air is needed.
- Low power demand with low operating costs. Very small power demand for switching.
- Highest force density on the market.
- Integrated control electronics with fieldbus (Modbus protocol) and PLC.
- Visual and electrical feedback if closed or open.
- Programmable default position.
- Emergency shutdown to default position. Switches to defined position at power failure.
- Adaptable to various tubing dimensions (see inserts).
- Integrated finger protection with automatic closing.

APPLICATIONS

- Pharmaceutical manufacturing.
- Biotech processes.
- Single-use tubing disposable applications.

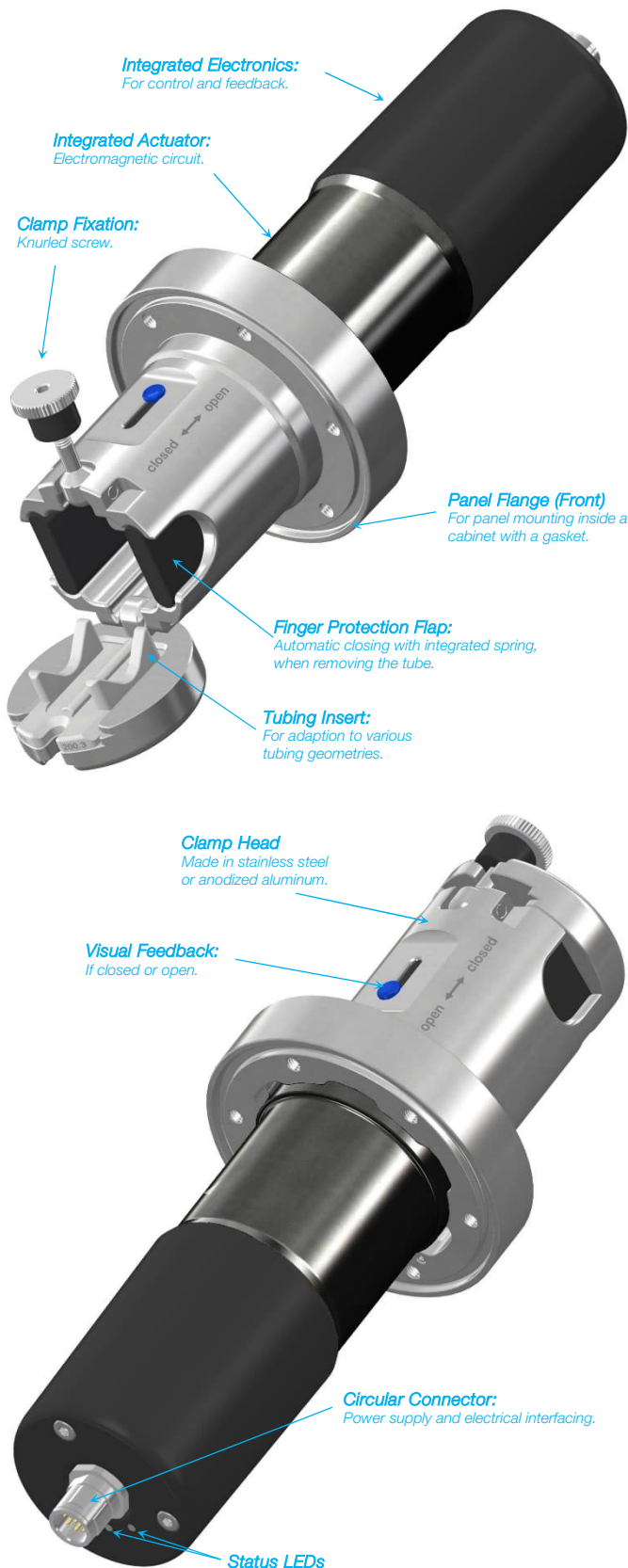


Figure 1: *Levitronix*® electromagnetic pinch valve concept

CONFIGURATIONS

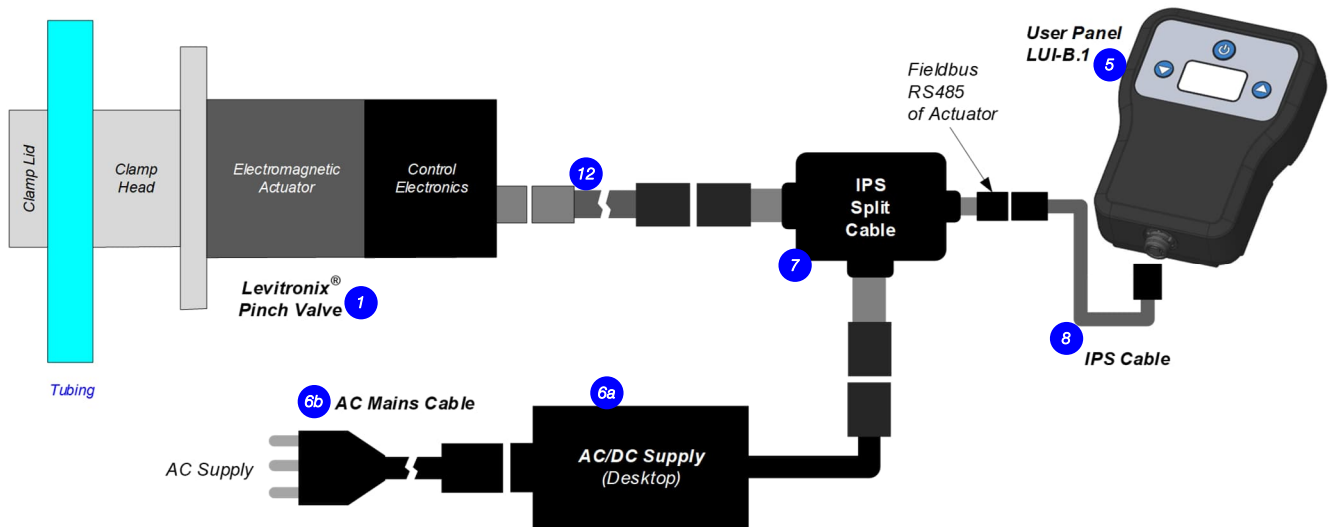


Figure 2: Stand-Alone system configuration
Note 1: See section "Order Information" for details to numbered components and other options.

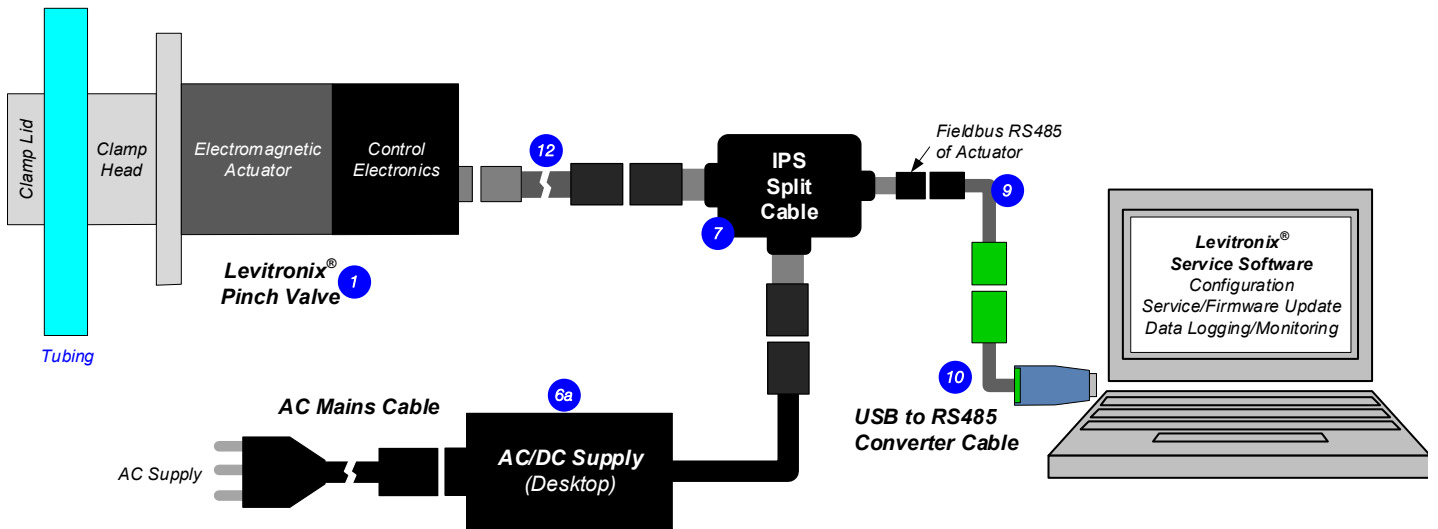
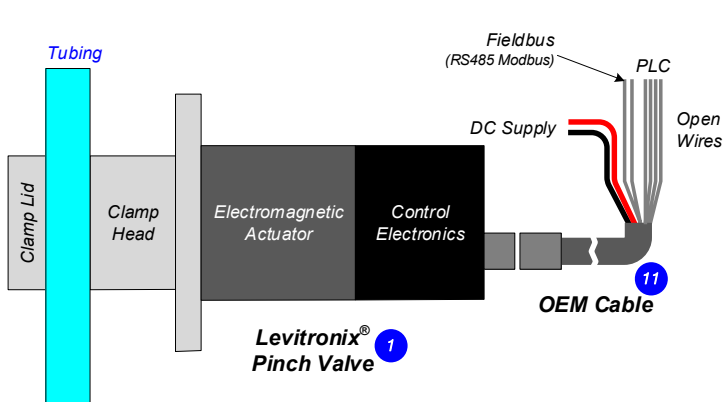


Figure 3: Configuration for PC with Levitronix® Service Software (parameter configuration, data logging and monitoring)
(See section "Order Information" for details to numbered components and other options)



Interface	Pin / Wire	Description	Standard Designation	Hardware Specification
Power Supply	1 / Brown	+ 24 VDC	Supply	Voltage: 24 VDC
	3 / Blue	Ground / Earth		
PLC	8 / Orange	Digital Input 1	Set Valve Position (Opens valve when active '1')	Galvanic separation with optocoupler 2.2 kΩ input resistance 5-24 V for active input
	4 / Black	Common Digital Input		
	2 / White	Digital Output 1	Actual Valve Position (Valve is open when active '1')	Open drain, max. 24 V, 100 mA Reference is "Ground" pin 3.
	7 / Violet	Digital Output 2	Valve Error (Active in error state)	Open drain, max. 24 V, 100 mA Reference is "Ground" pin 3.
Fieldbus	5 / Gray	RS485-	Fieldbus	Modbus protocol.
	6 / Pink	RS485+		

Figure 4: OEM system configuration

Note 1: Default configuration for "Normally Closed" mode. Can be configured with Levitronix® Service Software or LUI-B.1. Note 2: See section "Order Information" for details to numbered components and other options.

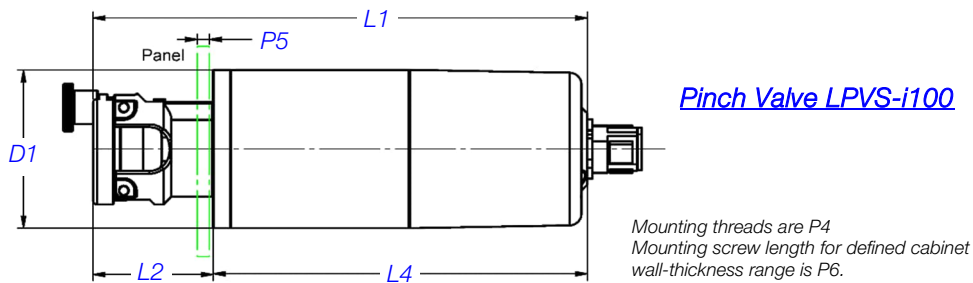
SPECIFICATIONS

Characteristics	LPVS-i100	LPVS-i200	LPVS-i400	LPVS-i400P	LPVS-i800
Supply Voltage / Inrush Current	24 VDC / 0.4 A (~0.5 sec)	24 VDC / 1.5 A (~1 sec)	24 VDC / 2 A (~2 sec)	24 VDC / 2 A (~2 sec)	24 VDC / 2.5 A (~2.5 sec)
Quiescent Current / Switch Current	<60 mA / 1.0 A, 50 ms	<60 mA / 2.0 A, 100 ms	<80 mA / 2.5 A, 200 ms	<80 mA / 2.5 A, 200 ms	<80 mA / 3.0 A, 300 ms
Weight	0.39 kg	1.5 kg	4.9 kg	3.9 kg	11 kg
Standard Tubing Range in inch (mm)	max. ID 1/4 (6.4) max. OD 3/8 (9.5)	max. ID 3/8 (9.5) max. OD 5/8 (15.9)	max. ID 5/8 (15.9) max. OD 1 (25.4)	max. ID 1 (25.4) max. OD 1.405 (35.7)	max. ID 1 (25.4) max. OD 1 1/2 (38.1)
Pinch Valve Insert with Tubing Wallthickness in inch (mm)	PVI-100.1: 0.063 (1.6) PVI-100.2: 0.125 (3.2)	PVI-200.2: 0.063 (1.6) PVI-200.3: 0.094 (2.4) PVI-200.4: 0.125 (3.2) PVI-200.5: 0.125 (3.2) ¹	PVI-400.1: 0.125 (3.2) PVI-400.2: 0.188 (4.8)	PVI-400P.1: 0.125 (3.2) PVI-400P.2: 0.188 (4.8)	PVI-800.1: WT 0.125 (3.2) PVI-800.2: WT 0.188 (4.8) PVI-800.3: WT 0.215 (5.5)
Standard Pressure Range	Hold pressure > 4 bar, closing pressure > 1 bar				
Standard Tubing Material	Silicone up to 80 Shore A, Silicone braided and double braided, TPE (others on request)				
Housing: Rating / Materials / Cleaning	IP65	/	Stainless steel, Alu. (for LPVS-i100/i400P), Polypropylene	/	Wiping with IPA or water
Ambient Temp / Humidity Range	0 – 40°C (32 – 104°F)	/	15 – 95% (non-condensing)	/	
Electrical Connector / Cables	Circular type M12	/	Various extension/adaptor cables available.	/	
Electrical Interfaces on Connector	Fieldbus RS485+ (MODBUS protocol)		1x Digital Input for position switch.		2x Digital Outputs
Visual Interfaces	Pin for visual status of position on clamp head (if closed or open), 2 status LEDs on backside.				
Configuration Parameters	Default position (normally closed or normally open), Digital Output/Input.			<i>Note: configurable Levitronix® Service</i>	
	<i>Software or LUI-B.1</i>				

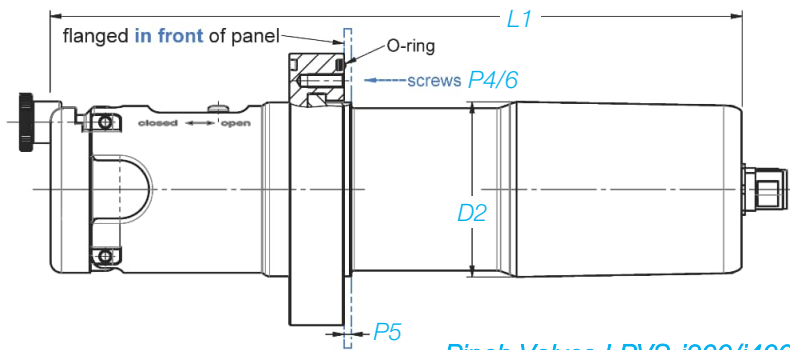
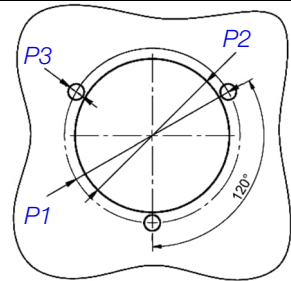
Table 1: Specifications

Note 1: Other tubing sizes and materials on request

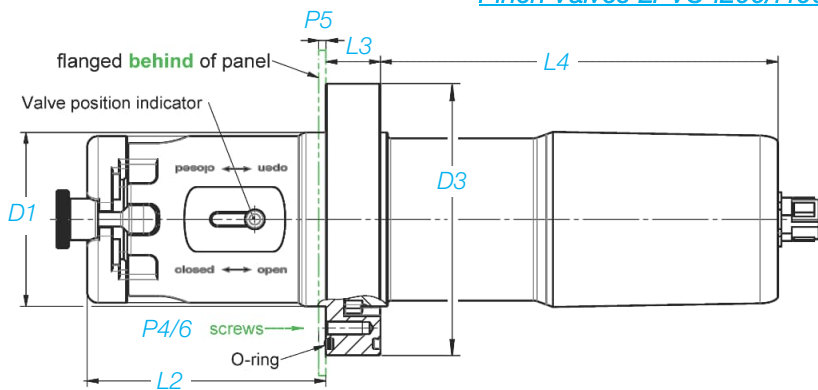
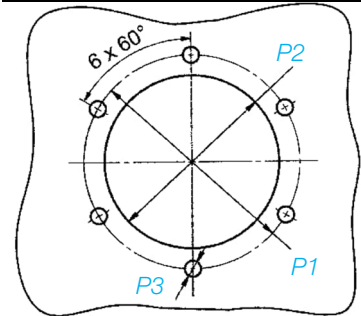
Note 2: For braided tubing only.



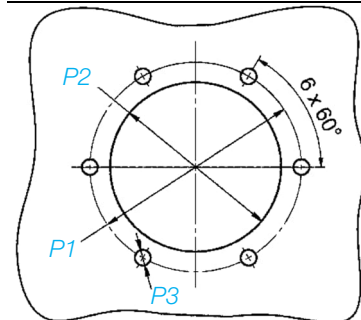
Cut-Out for Panel Mounting Frontside



Cut-Out for Panel Mounting Backside



Cut-Out for Panel Mounting Frontside



Valve Type	Length Dimensions				Diameter Dimensions			Panel Cut-Out Dimensions						O-Ring Dim.	
	L1	L2	L3	L4	D1	D2	D3	P1	P2	P3	P4	P5 ²	P6	ID	d
LPVS-i100.1	128.9	30.3	NA	98.6	Ø40	NA	NA	Ø33	min. Ø29	Ø3	M2.5x4.5	max. 3	6		
LPVS-i200.1	189.6	65.5	15	109.1	Ø48	Ø48.3	Ø75	Ø60±0.2	min. Ø48.5	Ø4.5	M4x10	2-6	10	Ø65	Ø2.5
LPVS-i400.1	272.5	104	20	148.5	74	74	112.5	Ø90±0.2	min. Ø75	Ø6.5	M6x14	3-6	14	Ø98	Ø3.5
LPVS-i400P.1	283.5	115	20	148.5	77 (81.5)	74	112.5	Ø90±0.2	min. Ø80	Ø6.5	M6x14	3-6	14	Ø98	Ø3.5
LPVS-i800.1	365.9	130	25	187.4	Ø99	Ø96	Ø145	Ø120±0.2	min. Ø100	Ø8.5	M8x18	4-6	18	Ø130	Ø4

Figure 5: Basic dimensions in [mm]

Note 1: Non-tolerated dimensions are for reference only.

Note 2: Thinner and thicker panels are possible but depend on panel strength and need according mounting screw length.

ORDER INFORMATION

Pos.	Part Name	Article #	Normal Tubing OD Range	Standard Firmware	Note
1a	LPVS-i100.1	100-30556	Up to 0.375"	P1.48x	<i>Inserts for various tubing geometries to be ordered separately according to Table 3 and Table 1.</i> <i>Default position is "normally closed" and can be changed with Levitronix® Service Software or with the user panel LUI-B.1.</i>
1b	LPVS-i200.1	100-30495	Up to 0.625"	P2.48x	
1c	LPVS-i400.1	100-30496	Up to 1"	P4.48x	
1d	LPVS-i400P.1	100-30562	Up to 1.405"	P5.48x	
1e	LPVS-i800.1	100-30497	Up to 1.5"	P8.48x	

Table 2: Standard Levitronix® pinch valve types

Pos.	Component	Article Name	Article #	Features	Special Feature / Description
2a	Pinch Valve Inserts (LPVS-i100)	PVI-100.1	190-10556	Description Purpose	<i>Anodized Aluminum with snap in feature for mounting.</i> <i>Adaption to various tubing geometries as described in Table 1.</i>
2b	Pinch Valve Inserts (LPVS-i200)	PVI-200.2/3 PVI-200.4/5	190-10513/14 190-10515/43		
2c	Pinch Valve Inserts (LPVS-i400)	PVI-400.1/2/3	190-10516/17/20		
2d	Pinch Valve Inserts (LPVS-i400P)	PVI-400P.1/2	190-10596/97		
2e	Pinch Valve Inserts (LPVS-i800)	PVI-800.1/2/3	190-10518/19/55		
3a	Panel Seal Set (LPVS-i100)	PSS-100.1	190-10557	Description Purpose	<i>FPM O-ring (A) for 3b/c/d and FPM Gasket (A) for 3a with stainless steel screws (B) for cabinet panel mounting. Wall thickness range defined in Figure 5.</i> <i>For mounting and sealing the valve to a cabinet wall.</i>
3b	Panel Seal Set (LPVS-i200)	PSS-200.1	190-10548		
3c	Panel Seal Set (LPVS-i400(P))	PSS-400.1	190-10549		
3d	Panel Seal Set (LPVS-i800)	PSS-800.1	190-10550		
4a	Valve Base Mount (LPVS-i100)	VBM-100.1	190-10558	Description Purpose	<i>Stainless steel base mount (A) delivered stainless steel mounting screws (B).</i> <i>For standalone operation, base or wall mounting.</i>
4b	Valve Base Mount (LPVS-i200)	VBM-200.1	190-10545		
4c	Valve Base Mount (LPVS-i400(P))	VBM-400.1	190-10546		
4d	Valve Base Mount (LPVS-i800)	VBM-800.1	190-10547		

Table 3: Main Levitronix® pinch valve accessories

Pos.	Component	Article Name	Article #	Features	Special Feature / Description
5	User Panel	LUI-B.1-05	100-30527	Interface IP Rating Standard Firmware	RS485 IP65 A7.00
6a	Desktop AC/DC Power Supply	GST160A24-R7B IC915	100-40020	Voltage Out / Input Basic Dimensions Safety Approvals	24 VDC, 160 W / 85 – 264 VAC, 47-63 Hz 175 x 72 x 35 mm IEC/UL/EN 62368-1
6b	AC Mains Cables (for Desktop power supply 6a)	AMC-1.1 (2 m) AMC-1.2 (2.5 m) AMC-1.3 (2.5 m) AMC-1.4 (2.5 m) AMC-1.5 (2.5 m)	190-10331 190-10332 190-10333 190-10334 190-10335	Approvals and Country Approvals and Country Approvals and Country Approvals and Country Approvals and Country Cable Specifications	UL, cUL, US, Canada CB, Germany, Denmark, Norway, Finland, Belgium, Netherlands, Sweden, Austria PSE, Japan Switzerland UKCA, United Kingdom Black color, RoHS
6c	AC/DC Power Supply	TIB 480-124	100-40030	Voltage Out / Input Basic Dimensions Safety Approvals Main Purpose	24 VDC, 480 W / 85 – 264 VAC, 45-65 Hz (certified 50/60 Hz) 124.2 x 118.6 x 82 mm IEC/UL/EN 62368-1 For multiple valves at the same time (9-24 valves depending on size) ¹
7	IPS Split Cable	ICY-2.1-02 (0.2 m)	190-10466	Description Main Purpose	PVC cable jacket with PA+GF split block, TPE sealing, circular type connectors Splits pinch valve to power supply and user panel.
8	IPS Cable Signal 6 Wires	ICS-1.1-10 (1 m) ICS-1.1-30 (3 m)	190-10344 190-10345	Description Connection In / Out Main Purpose	PVC jacket / 6x 0.08 mm ² and shielding Circular Hirose type / Circular Hirose type Interconnect cable for LUI-B.1 user panel.
9	IPS Cable Signal 6 Wires	ICS-1.3-50 (5 m)	190-10389	Description Connection In / Out Main Purpose	PVC jacket / 6x 0.08 mm ² and shielding Connector with screw type plug for open wire connection / Circular Hirose type Interconnection cable from Fieldbus of Split-Cable to USB/RS485 adaptor.
10	USB to RS485 Adaptor-TR Isolated	YN-485I-TR	100-30392	Description Purpose	USB (A) with termination resistor and cable with connector pair (B and C) for external RS485 wire connection. Isolated. Cable length is 2 m. Included is a USB space saver cable (D). Communication over fieldbus of pinch valve with PC.
11a	Adaptor Cable Signal 8 Wires	ICS-6.1-50 (5 m) (Straight Plug)	190-10522	Description Connection In/Out	PVC jacket / 8x 0.25 mm ² and shielding M12 connector female / Open wires
11b		ICS-6.2-50 (5 m) (Angle Plug)	190-10539	Main Purpose	ICS-6.1 with straight plug, ICS-6.2 with angle plug (90°). Cables for OEM configurations.
12	Adaptor Cable Signal 8 Wires	ICS-6.3-50 (5 m)	190-10542	Description Purpose	Circular to circular connector, watertight. Connection with cable splitting box.

Table 4: Accessories

Note 1: Contact Levitronix® for details to multiple valve supply configuration.

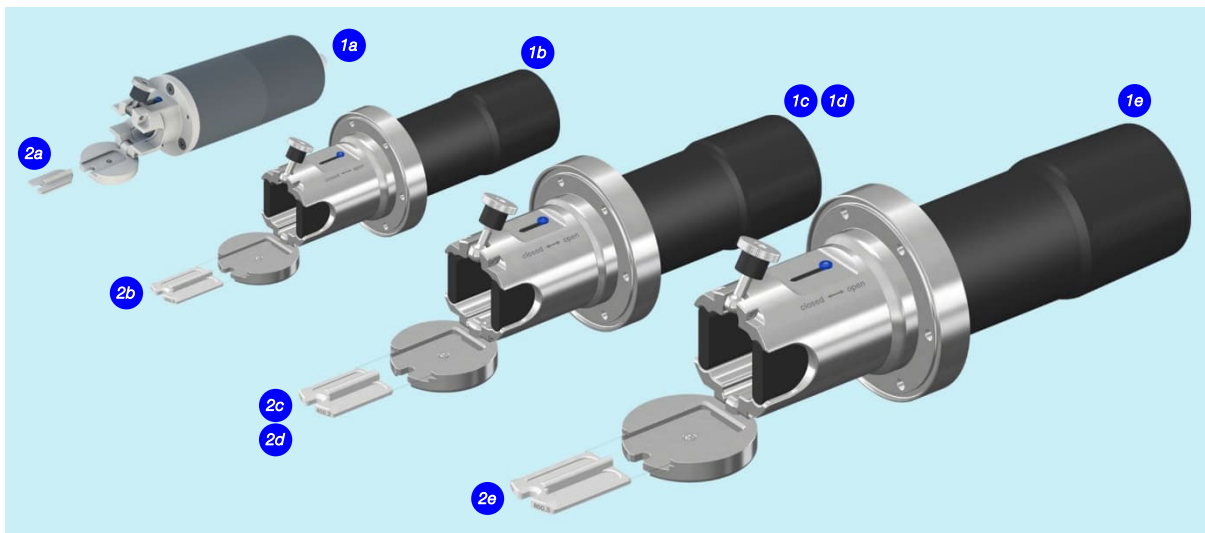


Figure 6: Main Levitronix® pinch valve components

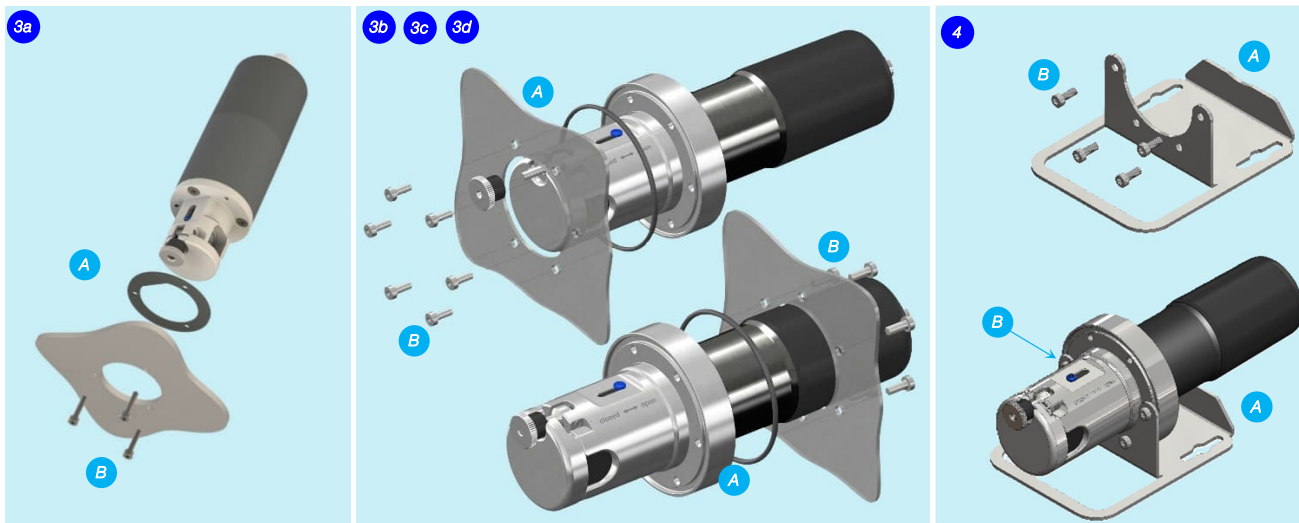


Figure 7: Main Levitronix® pinch valve accessories



Figure 8: Cables and other accessories

Levitronix® is the world-wide leader in magnetically levitated bearingless motor technology. *Levitronix®* was the first company to introduce bearingless motor technology to the Semiconductor, Medical and Lifescience markets. The company is ISO 9001 certified. Production and quality control facilities are located in Switzerland. In addition, *Levitronix®* is committed to bring other highly innovative products like the *LEVIFLOW®* flowmeter series to the market.



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