

Contamination Free Fluid Handling with Levitronix® MagLev Pumps!



No Seals, No Bearings, No Contamination!

PuraLev® 600MU (Multi-Use)

3.2 bar	(46 psi)
75 liters/min	(20 gallons/min)

**Levitronix® Bearingless Pump Technology
Your Solution for Sterile, Aseptic, Low-Shear Pumping**

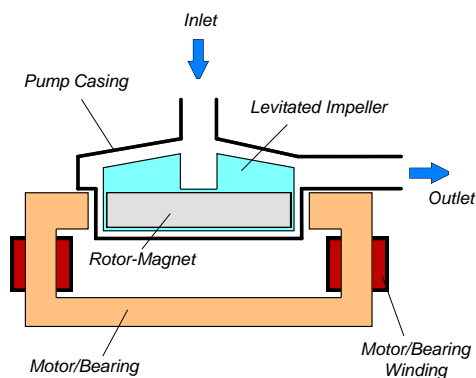


Figure 1: Schematic of the main elements of the maglev centrifugal pump

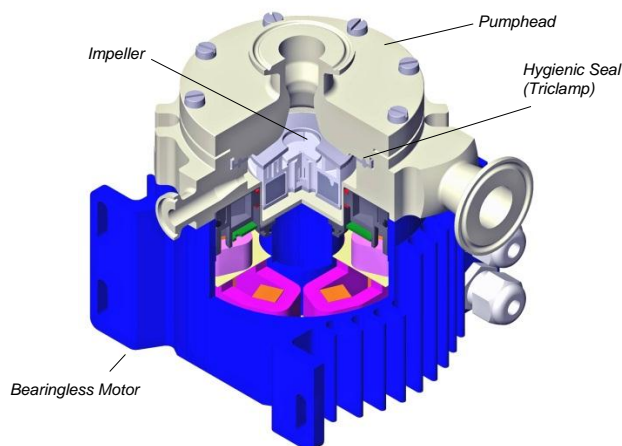


Figure 2: Cross-section of the bearingless pump motor and pump head.

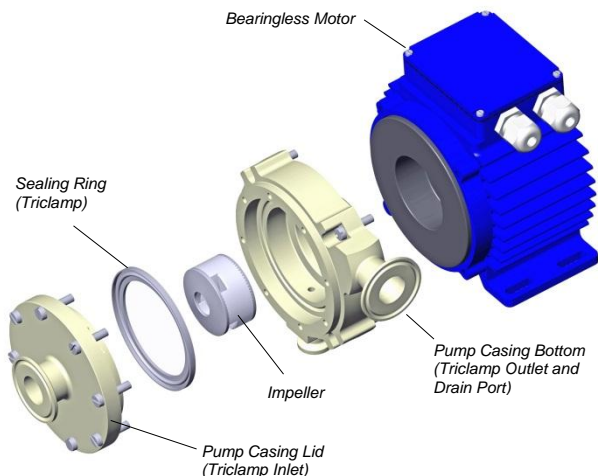


Figure 3: Disassembled pump head

REVOLUTIONARY MAGNETICALLY LEVITATED CENTRIFUGAL PUMP

Levitronix® has developed a revolutionary pump that has no bearings to wear out or seals to break. Based on the principles of magnetic levitation, the pump's impeller is suspended, contact-free, inside a sealed casing and is driven by the magnetic field of the motor (Figure 1). The impeller and casing are both fabricated from biocompatible (FDA, USP-VI, BSE/TSE free and Animal free) fluorocarbon resins and together they make up the pump head. A continuous flow rate and pressure are precisely controlled by electronically regulating the rotor speed, which eliminates any pulsation. With the lack of mechanical bearings plus the self-contained pump head design, the risk of contamination is drastically reduced. The absence of narrow gaps between the impeller and pump casing, plus the low-shear pump design also allows the gentle pumping of sensitive liquids. The pump casing is fabricated with Triclamp fittings and has an aseptic seal designs for the pump housing (Figure 5).

SYSTEM BENEFITS

- Low shear-forces
- Reduced risk of contamination due to the self-contained design with magnetic bearings
- No particle generation
- No narrow gaps between the impeller and pump casing where bacteria could be entrapped
- Pumphead multiple times steam sterilizable (multi-use)
- Biocompatibility of wet materials: FDA, USP-VI, BSE/TSE free and Animal Free
- Easy disassembling of pump casing for cleaning
- Aseptic pump casing design with Triclamp fittings and sealing technology
- Small size
- Dry running capability
- Proven technology in the medical (blood pumps) and semiconductor (high-purity pumps) industries
- Pulsation free

APPLICATIONS

- Pumping of shear-sensitive liquids
- Bioprocessing
- Recirculation in Bioreactors
- Perfusion of hollow-fiber reactors
- Sterile and aseptic flow circuits in the pharmaceutical and food industry

STAND-ALONE SYSTEM CONFIGURATION

The stand-alone configuration of the PuraLev® 600MU pump system consists of a controller with an integrated user panel allowing the operator to set the speed manually (see Figure 6). The speed is automatically stored in the internal EEPROM of the controller. As an option, the speed can also be set with an analog signal (see specification for Position 3a in Table 2).

EXTENDED SYSTEM CONFIGURATION

The extended version of the PuraLev® 600MU pump system (Figure 7) consists of a controller with an extended PLC interface. The PLC interface allows the speed to be set via an external signal, facilitating precise closed-loop flow or pressure control when either a flow or pressure sensor is integrated into the system (see specification of Position 3b in Table 2). A computer can be connected via a USB interface to allow communication with Levitronix® Service Software. Hence parameterization, firmware updates and failure analysis are possible.

ATEX SYSTEM CONFIGURATION

An ATEX certified motor together with the pumphead allows installation of motor and pump head within an ATEX Zone 2 area (see Figure 8). The ATEX motor (Pos. 2b in Table 2) comes with special connectors and relevant extension cables (Pos. 5a and 5b in Table 3). An ATEX conform solution is needed for the motor cables to leave the ATEX area. One option is an ATEX certified cable sealing system as listed in Table 4 (see Pos. 9) and shown in Figure 12.

- ATEX certified for Category 3G and 3D (Zone 2 for Gas and Zone 22 for Dust) (Testing and certification by Electrosuisse, Switzerland, CH-8320 Fehraltorf)
- Thermal classification T5 (< 100 °C = 212 °F) for maximum liquid temperature of 90 °C / 194 °F.
- ATEX marking of motor with pump head:
 CE Ex II 3G Ex c nAc IIC T5
 CE Ex II 3D Ex c tc IIIC T100°C IP67
- Explosion groups:
 Group IIA: Propane (IPA), Methane, Acetone, Acetaldehyde
 Group IIB: Ethylene, Ethylenglycol
 Group IIC: Acetylene, Hydrogen (not carbon disulphide)
- ATEX listing corresponds to UL hazardous location Class 1 Division 2.

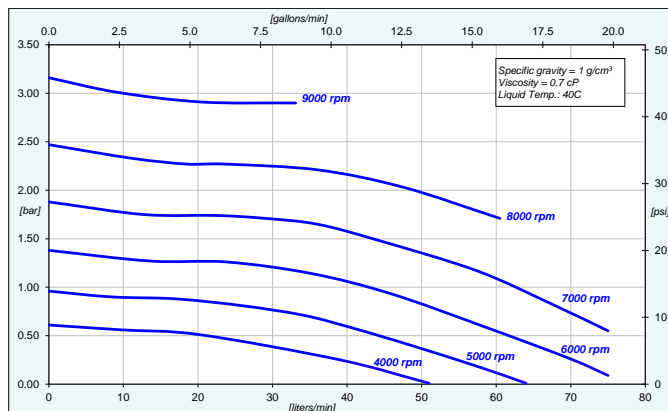


Figure 4: Pressure/flow curves (LPP-600.18 pump head)

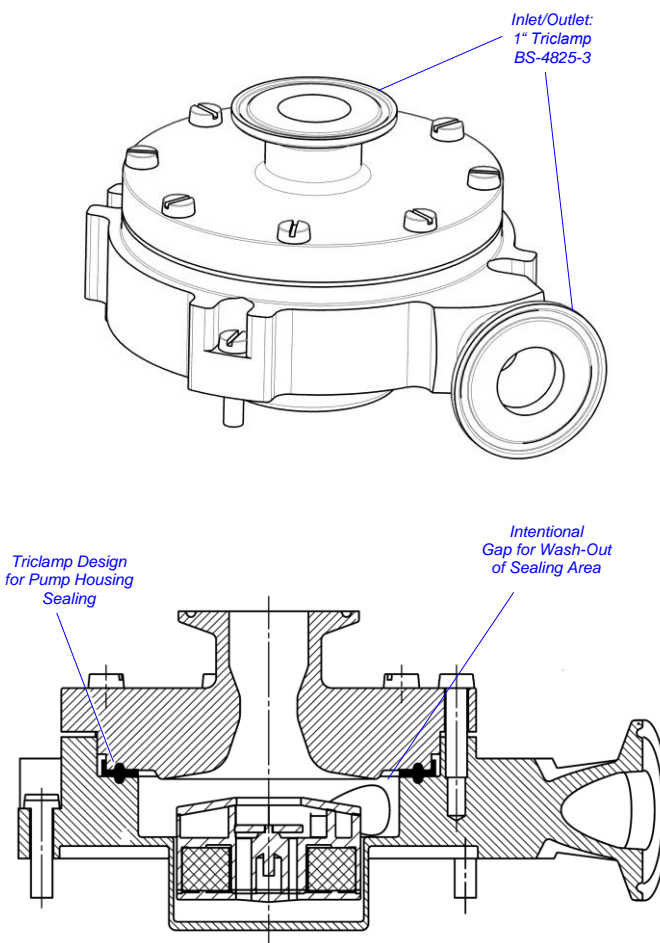
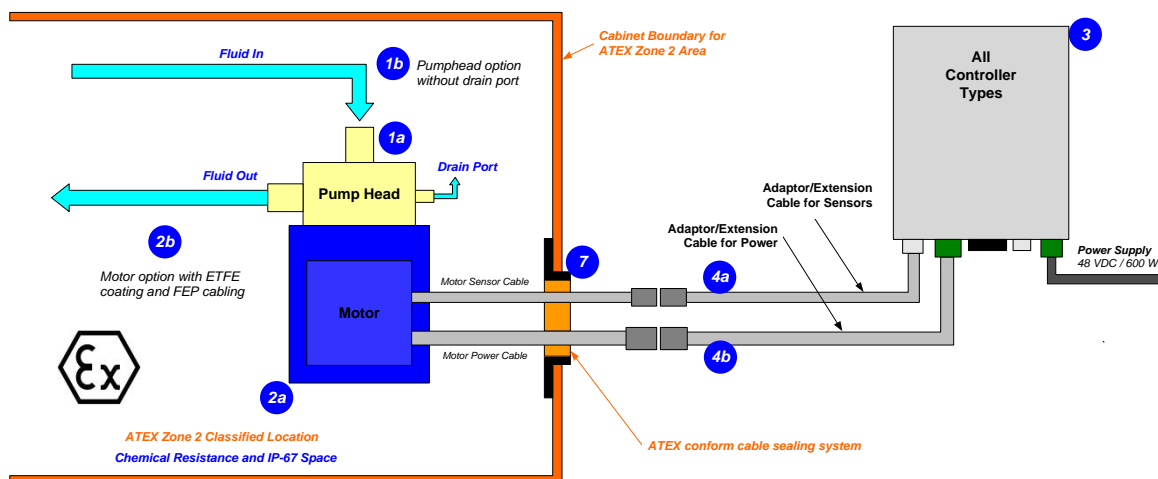
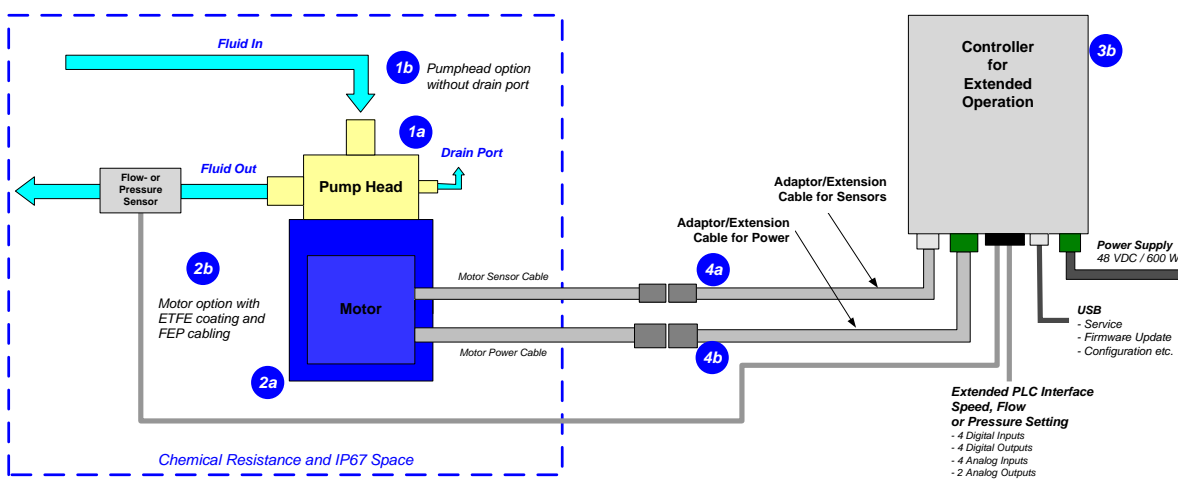
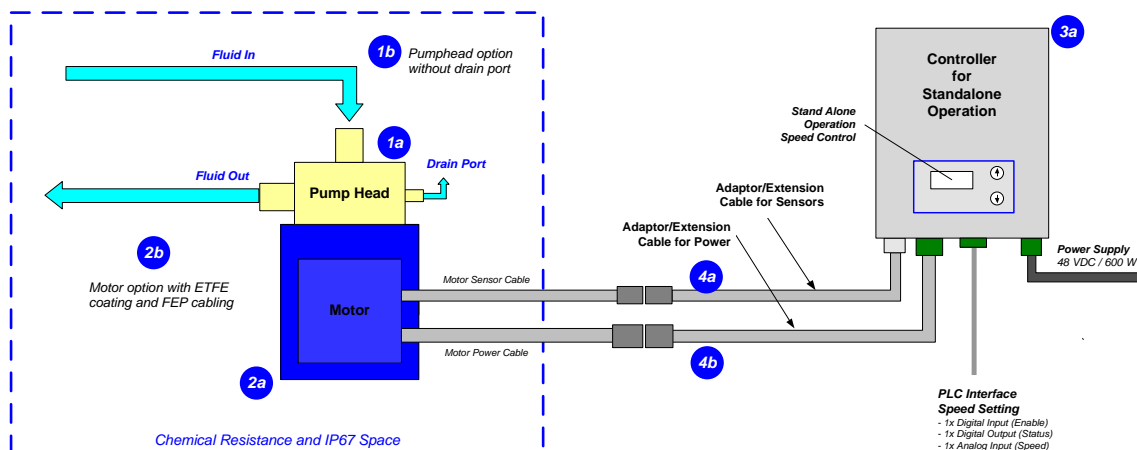


Figure 5: Aseptic design of pumphead (without drain port)



DIMENSIONS OF MAIN COMPONENTS

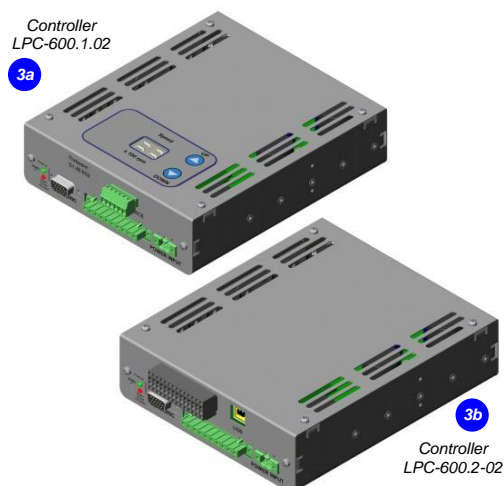
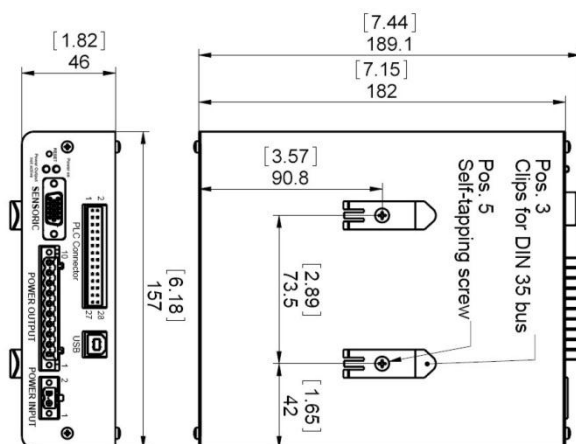


Figure 9: Dimensions of controllers LPC-600.1-02 and LPC-600.2-02

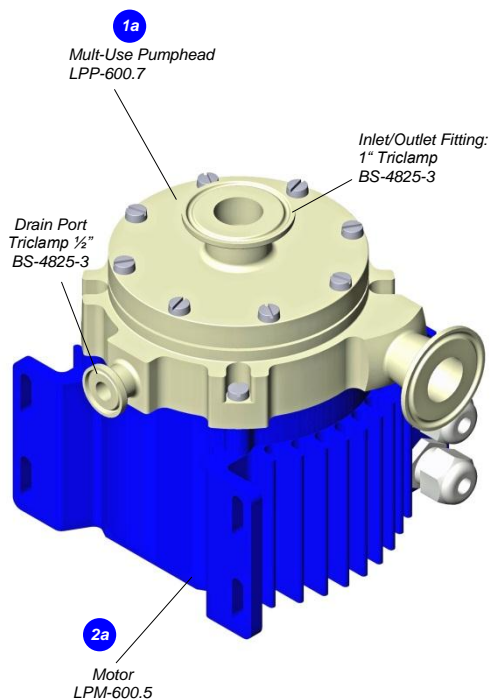
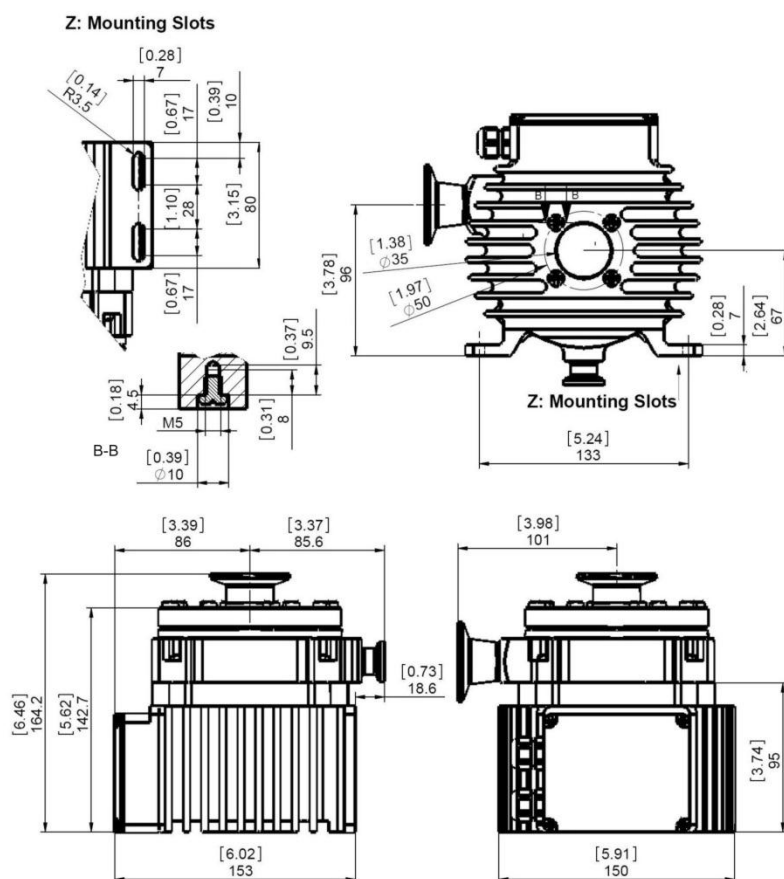


Figure 10: Dimensions of motor with pump head

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ORDER INFORMATION

System Name	Article #	Pumphead	Motor	Controller	Note
PuraLev 600MU.1	100-90590	LPP-600.7 (with drain port)	LPM-600.5	LPC-600.1-02	Adaptor/Extension (0.5 - 10m) cables according to Table 3 (Position 4a and 4b) have to be ordered as separate article with specified length. ATEX Cable Sealing System can be ordered according to Table 4 (Pos. 7)
PuraLev 600MU.2	100-90591		LPM-600.5	LPC-600.2-02	
PuraLev 600MU.4	100-90593		LPM-600.4	LPC-600.1-02	
PuraLev 600MU.5	100-90594		LPM-600.4	LPC-600.2-02	
PuraLev 600MU.7	100-90596	LPP-600.18 (without drain port)	LPM-600.5	LPC-600.1-02	
PuraLev 600MU.8	100-90597		LPM-600.5	LPC-600.2-02	
PuraLev 600MU.10	100-90599		LPM-600.4	LPC-600.1-02	
PuraLev 600MU.11	100-90632		LPM-600.4	LPC-600.2-02	

Table 1: Standard system configurations with motor, pumphead and controller

Pos.	Component	Article Name	Article #	Characteristics	Value / Feature
1a	Pumphead (non-sterile)	LPP-600.7 (with drain port)	100-90287	Impeller / Pump Housing Sealing Ring Fittings	PFA / PVDF (FDA, USP Class VI, BSE/TSE/Animal free) Silicon (FDA, USP Class VI, BSE/TSE/Animal free) Triclamp 1" for in/outlet and Triclamp ½" for drain port (Standard: BS-4825-3)
1b		LPP-600.18 (without drain port)	100-90548	Max. Flow Max. Diff.-Pressure Max. Viscosity	140 liters/min / 37 gallons/min 3.2 bar / 46 psi 50 cP
				Wet Pump Volume/Surface	160 ml / 363 cm ² (without drain port)
				Max. Liquid Temp.	90°C / 194°F
				Sterilization Methods	SIP, CIP, Autoclaving
2a	Motor (ATEX)	LPM-600.5	100-10039	Housing	Epoxy (anti-corrosive) coated Aluminum, waterproofed (IP67)
				Cable / Connectors	2x 3m cables with PVC jacket / 2x circular (M23, IP-67)
				ATEX Marking	CE II 3G Ex c nAc IIC T5 CE II 3D Ex c t IIC T100°C IP67
2b	Motor (ATEX)	LPM-600.4	100-10038	Housing	ETFE (chemical resistant) coated Aluminum, waterproofed (IP67)
				Cable / Connectors	2x 3m cables with FEP jacket / 2x circular (M23, IP-67)
				Material	Anodized Aluminum
3a	Standalone Controller (User Panel)	LPC-600.1-02	100-30033 (Power supply cable and Enable connector incl.)	Voltage / Power	48V DC / 600 W
				Interfaces for Standalone Controller	Panel to set speed (automatic storage on internal EEPROM) PLC with 1x analog input ("Speed") 4 - 20 mA 1x digital input ("Enable") 0 - 24 V (optocoupler) 1x digital output ("Status") 0 - 24 V (relais)
				Standard Firmware	D6.25
3b	Extended Controller (PLC and USB)	LPC-600.2-02	100-30034 (Power supply cable and PLC connector incl.)	Interfaces for Extended Controller	PLC with - up to 4 digital inputs 0 - 24V (optocoupler) - up to 4 digital outputs 0 - 24 V (relais) - up to 2 analog inputs 4 - 20mA - up to 2 analog inputs 0 - 10 V - up to 2 analog outputs 0 - 5 V
				Standard Firmware	D6.48

Table 2: Specification of standard components

Pos.	Component	Article Name	Article #	Characteristics	Value / Feature
4a	Extension Adaptor Cable for Sensors	MCAS-600.2-05 (0.5m)	190-10226	Jacket Material Connectors	PVC Circular Wallmountable, Metallic (IP-67) to D-SUB
		MCAS-600.2-30 (3m)	190-10238		
		MCAS-600.2-50 (5m)	190-10127		
		MCAS-600.2-70 (7m)	190-10105		
		MCAS-600.2-100 (10m)	190-10239		
4b	Extension Adaptor Cable for Power	MCAP-600.2-05	190-10227	Jacket Material Connectors	PVC Circular Wallmountable, Metallic (IP-67) to COMBICON
		MCAP-600.2-30	190-10240		
		MCAP-600.2-50	190-10126		
		MCAP-600.2-70	190-10106		
		MCAP-600.2-100	190-10241		

Table 3: Specification of adaptor/extension cables

Pos.	Component	Article Name	Article #	Characteristics	Value / Feature
5	Air Cooling Module	ACM-600.2	190-10140	Material / Connection Port	PP (+ 40% Talkum) / NPT 1/4"
				Air Pressure	~1 - 3 bar (14 - 43 psi)
6 (a - f)	ATEX Cable Sealing System	ACS-A.1 (Roxtec)	100-90292	Sleeve (a) and Gasket (b) Frame (c) 2x Cable Module (d)	Stainless Steel and EPDM Roxylon (EPDM rubber) Roxylon (EPDM rubber)
					Note: Lubricant (e) and measurement plates (f) are included.
7	AC/DC Power Supply	TSP 600-148-M (M = Modified Levitronix design from Traco)	100-40013	Voltage / Power Output Voltage Input	48 VDC / 600 W 85 - 265 VAC (automatic detection)
				Certification or Standards	CB, UL, CSA, Semi F47

Table 4: Specification of accessories

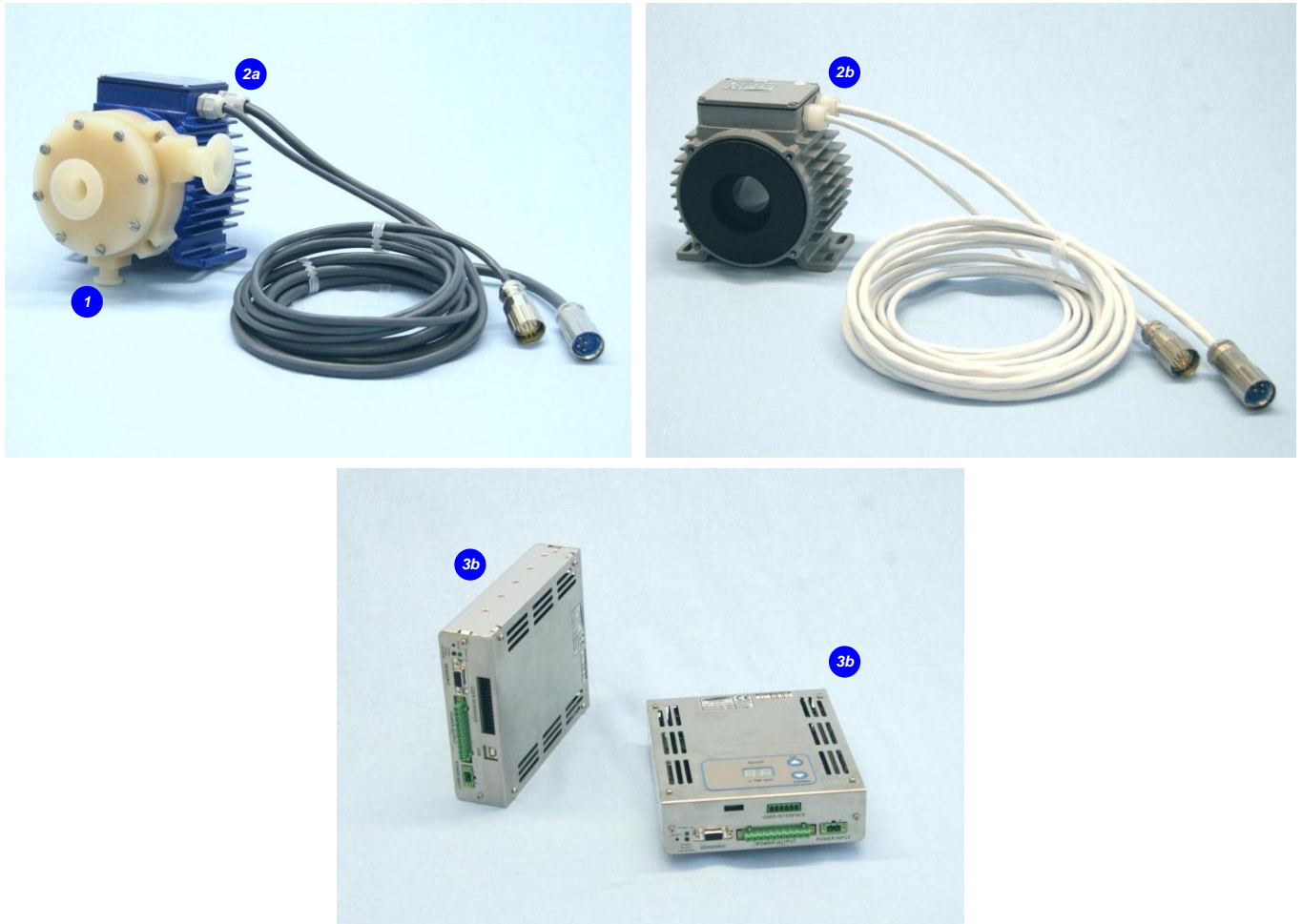


Figure 11: Pump system with standard components



Figure 12: Accessories

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LEVITRONIX® THE COMPANY

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 Life Science markets. The company is ISO 13485 and 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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