



DuraLev® 600
Pumping without Bearings and Seals

Reduce Downtime & Maintenance with DuraLev® Bearingless Pumps!



No Seals, No Bearings, No Problems!

DuraLev® 600

<i>2 bar</i>	<i>(29 psi)</i>
<i>75 liters/min</i>	<i>(20 gallons/min)</i>

***DuraLev® Bearingless Pump Technology
Your Solution for Trouble-Free Pumping***

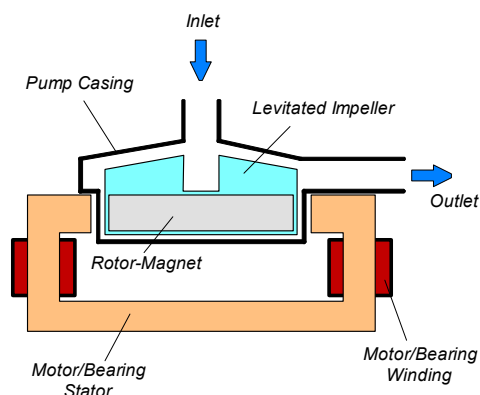


Figure 1: Schematic of the main elements of the bearingless centrifugal pump.

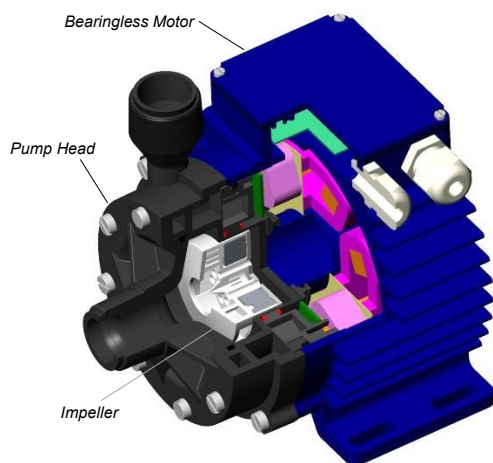


Figure 2: Cross-section of the bearingless pump motor and pump head LPP-600.5 (PP)

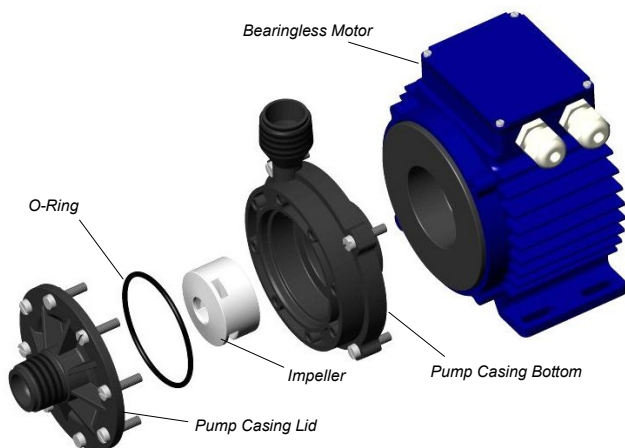


Figure 3: Disassembled pump head LPP-600.5 (PP)

REVOLUTIONARY MAGNETICALLY LEVITATED CENTRIFUGAL PUMP

The *DuraLev®* pump system is a revolutionary centrifugal pump that has no bearings to wear out or seals to break down and fail. 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 chemical-resistant fluorocarbon resins and together with the rotor magnet they make up the pump head. Fluid flow rate and pressure are precisely controlled by electronically regulating the rotor speed.

SYSTEM BENEFITS

- Increased equipment uptime and low maintenance costs by eliminating bearings and rotating seals.
- No clogging or freeze-up of bearings in gold, nickel and other plating applications.
- Improves and simplifies process control by accurately controlling both flow rate and rotor speed.
- Low shear pump design.
- Dry running capability
- Proven technology in medical and semiconductor industry (MTBF > 50 years)

APPLICATIONS

- Electronics manufacturing
- Galvanic plating
- Chemical production and handling
- Ideal for shear-sensitive liquids

STAND-ALONE SYSTEM CONFIGURATION

The stand-alone configuration of the *DuraLev® 600* pump system consists of a controller with an integrated user panel allowing the operator to set the speed manually (see *Figure 7*). 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 *DuraLev® 600* pump system (*Figure 8*) 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 the *Levitronix® Service Software*. Hence parameterization, firmware updates and failure analysis are possible.

ATEX IECEx SYSTEM CONFIGURATION

An ATEX / IECEx certified motor together with the pump head allows installation of motor and pump head within an ATEX Zone 2 area (see *Figure 9*). The certified motor (*Position 2b* in *Table 2*) comes with special connectors and relevant extension cables (*Position 4a* and *4b* in *Table 3*). An Ex conform solution is necessary for the motor cables to leave the Ex area. One option is an ATEX certified cable sealing system as listed in *Table 4* (*Position 7*).

- ATEX / IECEx certified for Category 3G and 3D (Zone 2 for Gas and Zone 22 Dust).
- Thermal classification T5 (< 100°C = 212°F) for maximum liquid temperature of 90 °C / 194 °F.
- ATEX / IECEx marking of motor with pump head:
 - CE Ex II 3G Ex nA IIC T5
 - CE Ex II 3D Ex tc IIC T100°C Dc

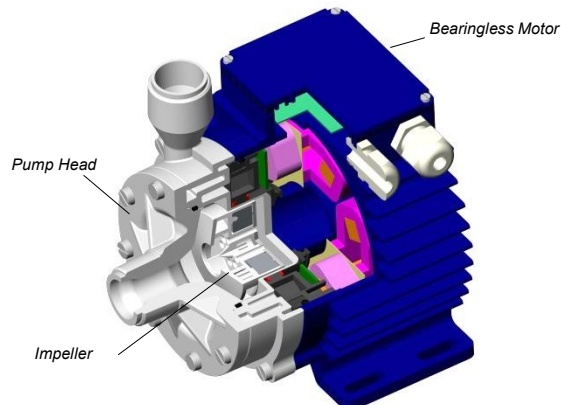


Figure 4: Cross-section of the bearingless pump motor and pump head LPP-600.13 (PVDF)

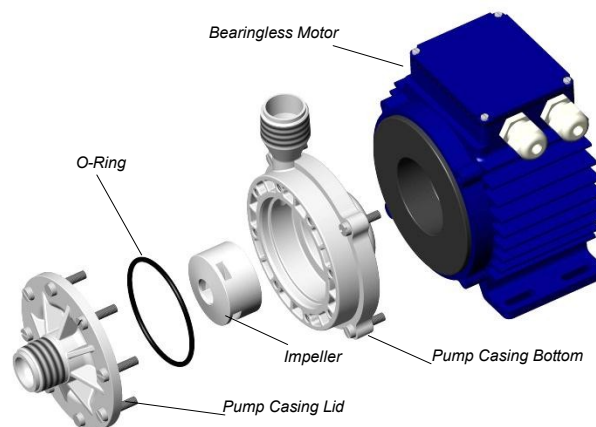


Figure 5: Disassembled pump head LPP-600.13 (PVDF)

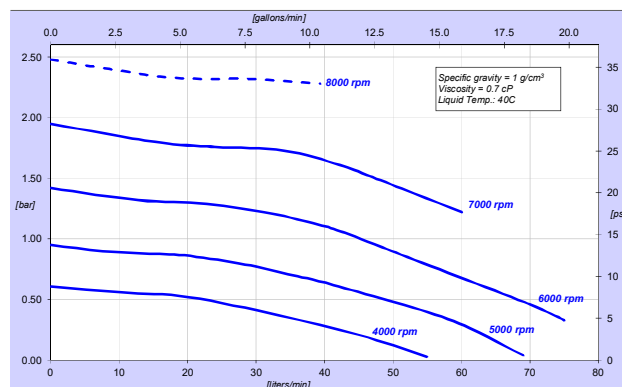


Figure 6: Pressure/flow curves (* on request)

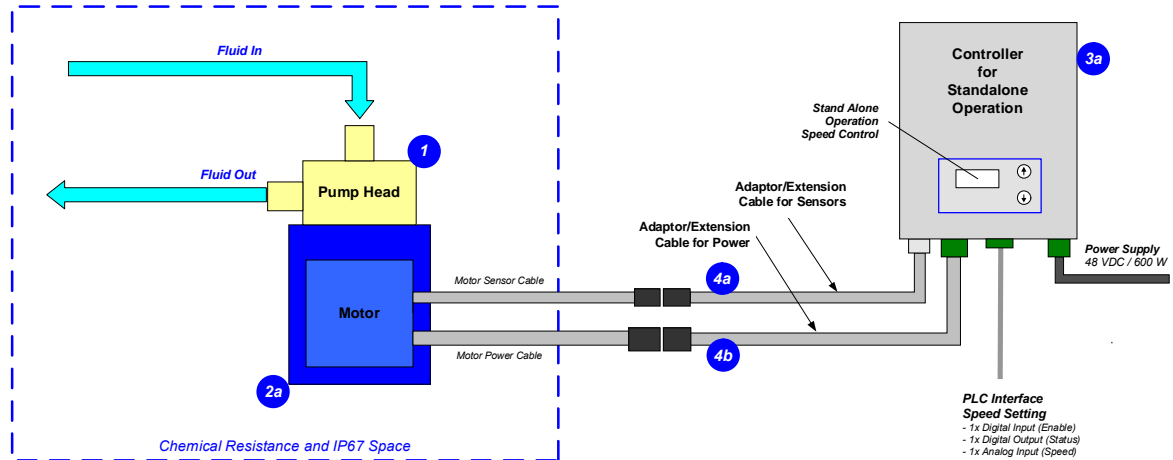


Figure 7: System configuration for standalone operation (Speed setting with integrated user panel)

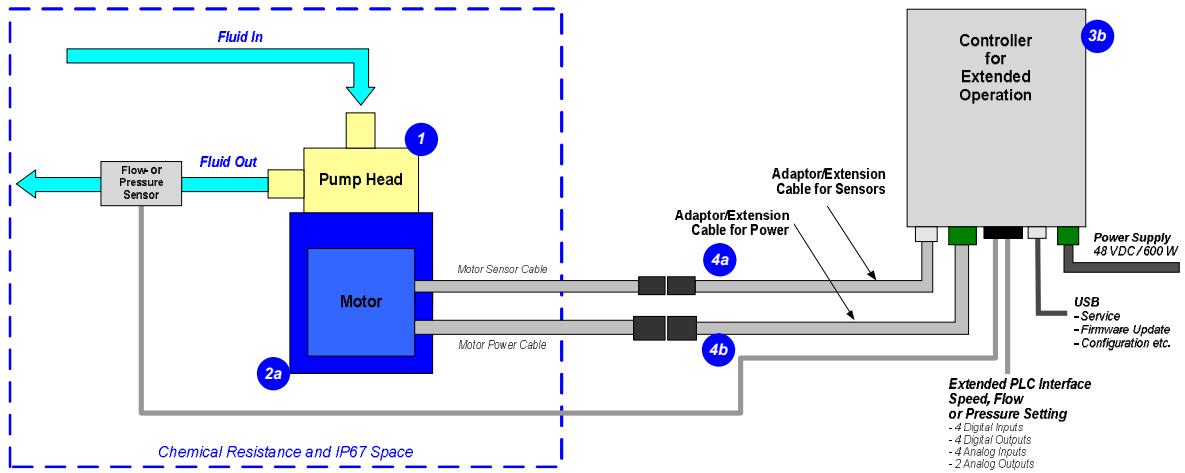


Figure 8: Extended operation (flow or pressure control) with extended controller

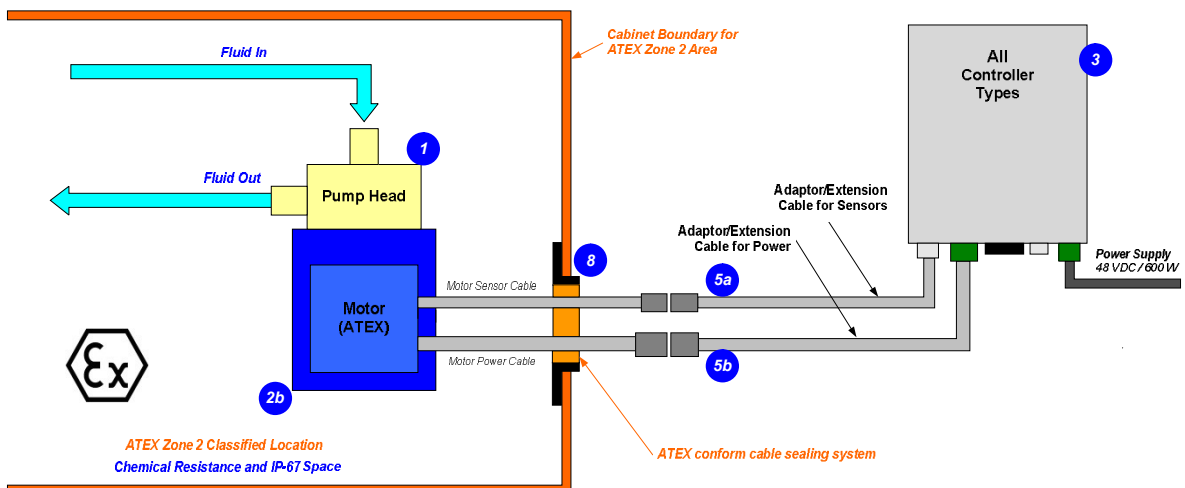


Figure 9: System Configuration for ATEX applications

DIMENSIONS OF MAIN COMPONENTS

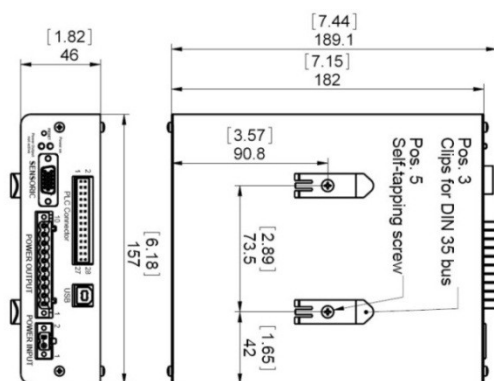


Figure 10: Dimensions of controllers LPC-600.x

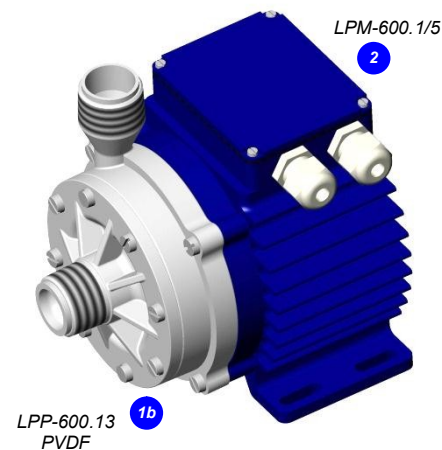
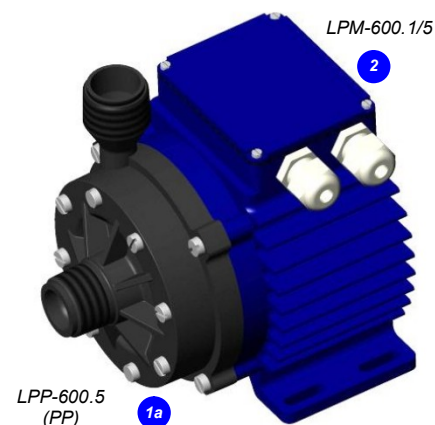
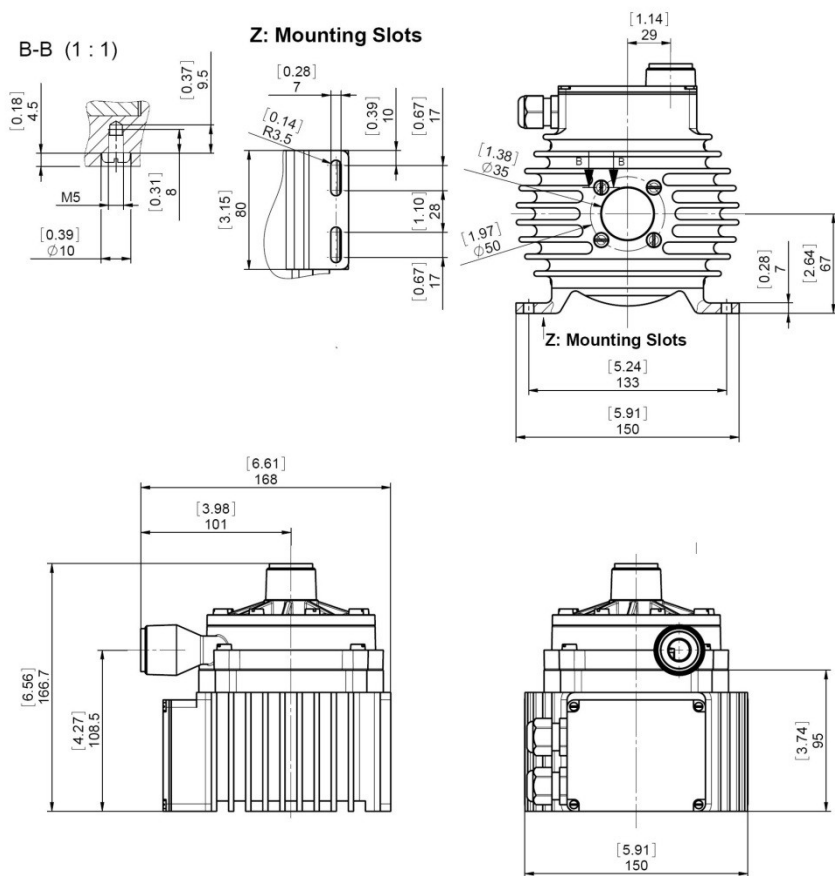


Figure 11: Dimensions of motor with pump heads LPP-600.5 (PP Housing) and LPP-600.13 (PVDF Housing)



DuraLev® 600 Pumping without Bearings and Seals

System Name	Article #	Pump Head	Motor	Controller	Note
DuraLev® 600.7	100-90187	LPP-600.5 (PP, NPT 1")	LPM-600.1	LPC-600.1 (Stand-alone)	Adaptor/Extension (0.5 - 10m) cables according to Table 3 (position 4a and 4b) have to be ordered as separate article with specified length. Certifications: CE, IECEx CB scheme, ETL (NRTL).
DuraLev® 600.8	100-90188			LPC-600.2 (PLC, USB)	
DuraLev® 600.20	100-90569	LPP-600.13 (PVDF, NPT 1")		LPC-600.1 (Stand-alone)	
DuraLev® 600.21	100-90570			LPC-600.2 (PLC, USB)	
DuraLev® 600.16 (ATEX / IECEx)	100-90354	LPP-600.5 (PP, NPT 1")	LPM-600.5 (ATEX / IECEx)	LPC-600.1 (Stand-alone)	Adaptor/Extension (0.5 - 10m) cables according to Table 3 (position 5a and 5b) have to be ordered as separate article with specified length. ATEX cable sealing system can be ordered according to Table 4 (Pos. 8) Certifications: CE, IECEx CB scheme, ETL (NRTL), ATEX and IECEx.
DuraLev® 600.17 (ATEX / IECEx)	100-90355			LPC-600.2 (PLC, USB)	
DuraLev® 600.23 (ATEX / IECEx)	100-90571	LPP-600.13 (PVDF, NPT 1")		LPC-600.1 (Stand-alone)	
DuraLev® 600.24 (ATEX / IECEx)	100-90572			LPC-600.2 (PLC, USB)	

Table 1: Standard system configurations

Pos.	Component	Article Name	Article #	Characteristics	Value / Feature
1a	Pump Head	LPP-600.5 (PP, NPT 1")	100-90261	Impeller / Pump Housing Sealing Ring / Fittings	PFA / PVDF or PP (+GF30) (all molded) FPM (FKM) / NPT 1"
1b		LPP-600.13 (PVDF, NPT 1")	100-90539	Max. Flow / Max. Diff.-Press. Max. Viscosity Max. Liquid Temp.	75 liters/min (20 gallons/min) / 2 bar (29 psi) 50 cP 90°C / 194°F
2a	Motor	LPM-600.1	100-10021	Housing Cable / Connectors	Epoxy (anticorrosive) coated ALU, IP67 without connectors 2x 3m cables with PVC jacket / 2x circular (AMP types)
2b	Motor (ATEX / IECEx)	LPM-600.5	100-10039	ATEX / IECEx Marking Cable / Connectors	CE II 3G Ex nA IIC T5 Gc CE II 3D Ex tc IIC T100°C Dc 2x 3m cables with PVC jacket / 2x circular (M23, IP67)
3a	Standalone Controller (User Panel)	LPC-600.1	100-30005 (Controller with power supply cable and Enable connector incl. in 100-90315)	Electrical Power / Voltage Interfaces for Standalone Controller Standard Firmware	600 W / 48V DC 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) D1.25
3b	Extended Controller (PLC and USB)	LPC-600.2	100-30004 (Controller with power supply cable and PLC connector incl. in 100-90314)	Interfaces for Extended Controller Standard Firmware	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 USB interface (for service and system monitoring) D1.48

Table 2: Specification of standard components

Pos.	Component	Article Name		Article #		Characteristics	Value / Feature
		Sensor Cable	Power Cable	Sensor	Power		
4a	Extension Adaptor Cable for Sensor (a) and Power (b) Wires	MCAS-600.1-05 (0.5m)	MCAP-600.1-05	190-10122	190-10118	Jacket Material Connector Types Connector Material	PVC Circular AMP to D-SUB Plastics (PA)
4b		MCAS-600.1-30 (3m)	MCAP-600.1-30	190-10123	190-10119		
		MCAS-600.1-50 (5m)	MCAP-600.1-50	190-10124	190-10120		
		MCAS-600.1-70 (7m)	MCAP-600.1-70	190-10101	190-10102		
		MCAS-600.1-100 (10m)	MCAP-600.1-100	190-10125	190-10121		
5a	Extension Adaptor Cable for Sensor (a) and Power (b) Wires	MCAS-600.3-05 (0.5m)	MCAP-600.3-05	190-10158	190-10154	Jacket Material Connector Types Connector Material	PVC Circular M23 (IP-67) to D-SUB Metallic – Nickel coated
5b		MCAS-600.3-30 (3m)	MCAP-600.3-30	190-10159	190-10155		
		MCAS-600.3-50 (5m)	MCAP-600.3-50	190-10130	190-10129		
		MCAS-600.3-70 (7m)	MCAP-600.3-70	190-10160	190-10156		
		MCAS-600.3-100 (10m)	MCAP-600.3-100	190-10161	190-10157		

Table 3: Specification of adaptor/extension cables

Pos.	Component	Article Name	Article #	Characteristics	Value / Feature
6a	Air Cooling Module	ACM-600.2	190-10140	Material Connection Port / Air Pressure	ACM-600.2: PP (+Talkum) ACM-600.3: PP EL-S (conductive for ATEX)
6b		ACM-600.3 (ATEX)	190-10410		NPT 1/4" / ~1 - 3 bar (14 - 43 psi)
7a	Fan Cooling Module	FCM-600.1	190-10401	Housing / Cable Spec. Supply Spec. / IP Rating	PP (+ 20% Talkum) white / PP jacket, 3m, circular sealed M12 connector (PP). 24 VDC, 3.4 W / IP-65 (fan is IP68 rated).
7b	Fan Cool. Module Cable	FCC-1.1-50 (5 m) FCC-1.1-100 (10 m)	190-10407 190-10408	Specification	PP cable jacket with circular M12 connector (PP) to open wires
8	ATEX Cable Sealing System	ACS-A.1 (Roxtec)	100-90292	Sleeve (A) and Gasket (B) Frame (C) Cable Module (D)	Stainless Steel and EPDM Roxylon (EPDM rubber) Roxylon (EPDM rubber) Note: Lubricant (E) and measurement plates (F) are included.
9	AC/DC Power Supply	TSP 600-148-M (M = Modified Levitronix design from Traco)	100-40013 (Traco ID Number: T1068-01A)	Voltage / Power Output Voltage Input Certification or Standards	48 VDC / 600 W 85 - 265 VAC (automatic detection) CB, UL, CSA, Semi F47

Table 4: Specification of accessories

DuraLev® Bearingless Pump Technology
Your Solution for Trouble-Free Pumping

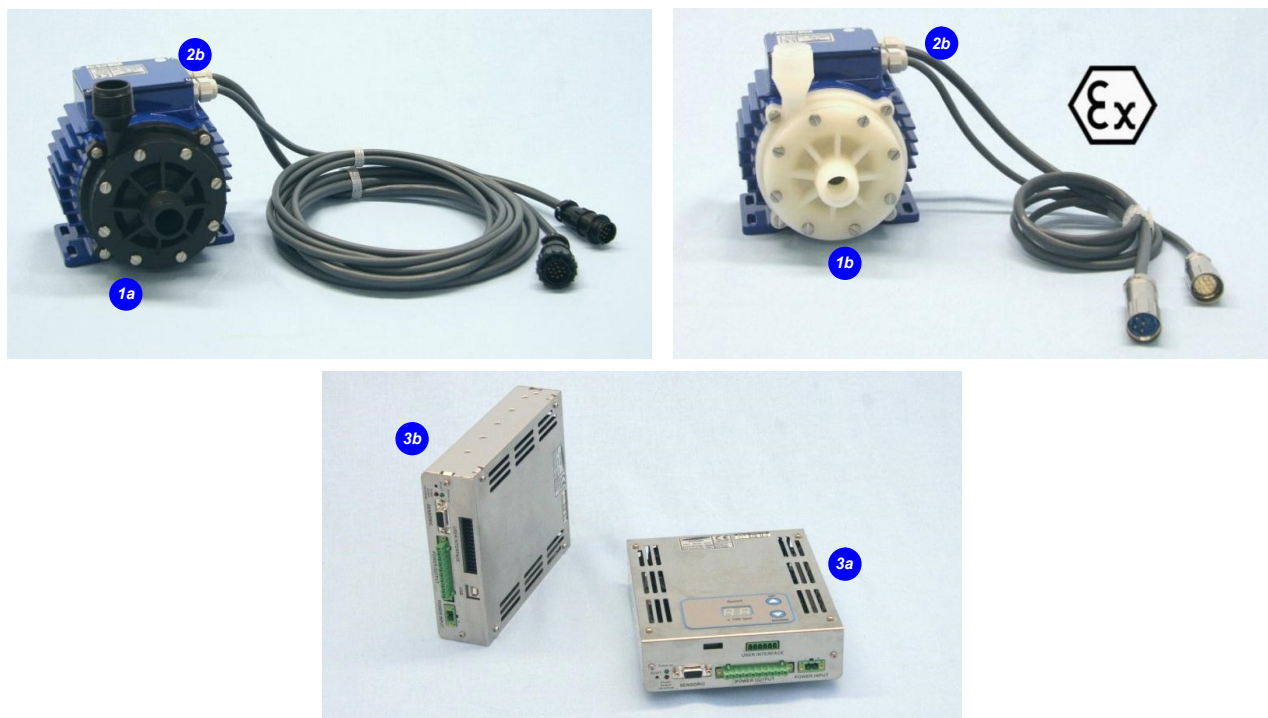


Figure 12: Basic components of DuraLev® 600 pump system



Figure 13: Accessories



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 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.



Headquarter and European Contact

Levitronix GmbH
Technoparkstr. 1
CH-8005 Zurich
Switzerland

Phone: +41 44 445 19 13
Fax: +41 44 445 19 14
E-Mail: salesEurope@levitronix.com

US Contact

Levitronix Technologies Inc.
10 Speen Street, Suite 102
Framingham, Massachusetts 01701
USA

Phone: +1 508 861 3800
Fax: +1 508 861 3837
E-Mail: salesUS@levitronix.com

Japan Contact

Levitronix Japan K.K.
Wing Eight 5floor, 4-16-4
Asakusabashi, Taito-ku
Tokyo, 111-0053 Japan

Phone: +81 3 5823 4193
Fax: +81 3 5823 4195
E-Mail: salesJapan@levitronix.com

Taiwan Contact

Levitronix Taiwan
5F, No. 251, Dong Sec. 1,
Guangming 6th Rd., Chu Pei City,
Hsin-Chu 302, Taiwan, R.O.C.

Phone: +886 3 657 6209
Fax: +886 988 321472
E-Mail: salesAsia@levitronix.com