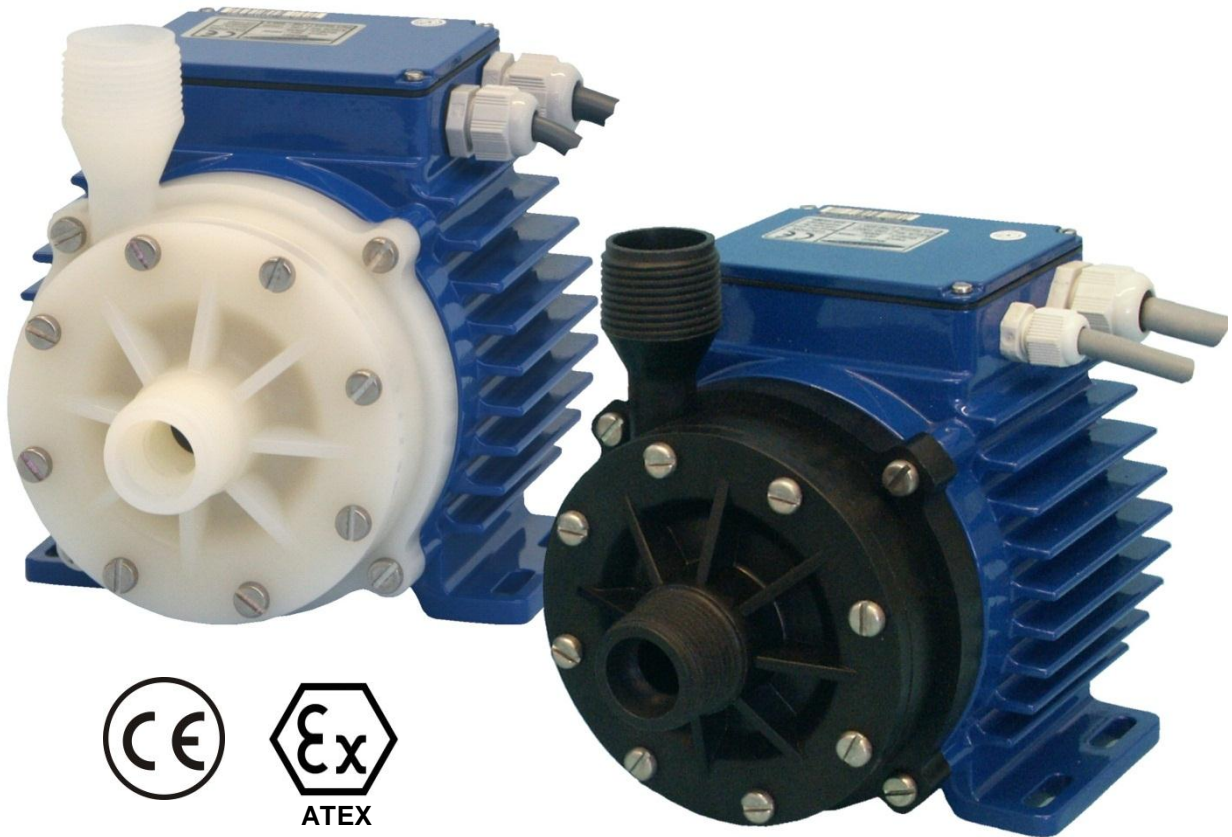


Reduce Downtime & Maintenance with DuraLev® Bearingless Pumps!



No Seals, No Bearings, No Problems!

DuraLev® 600

*2 bar (29 psi)
75 liters/min (20 gallons/min)*

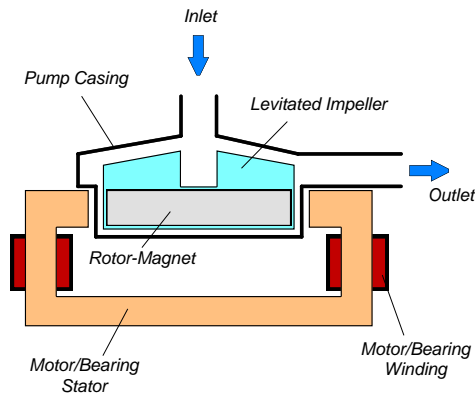


Figure 1: Schematic of the main elements of the bearingless centrifugal pump.

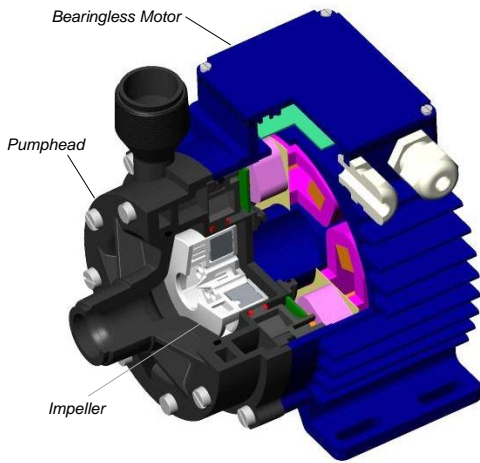


Figure 2: Cross-section of the bearingless pump motor and pump head LPP-600.5 (PP)

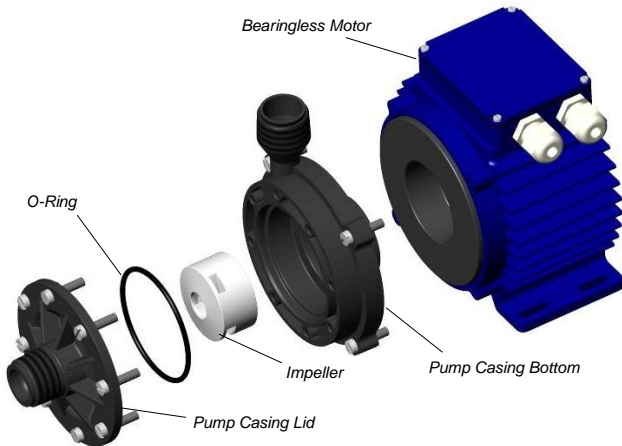


Figure 3: Disassembled pump head LPP-600.5 (PP)

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 SYSTEM CONFIGURATION

An ATEX certified motor together with the pumphead allows installation of motor and pumphead 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 ATEX conform solution is necessary for the motor cables to leave the ATEX area. One option is an ATEX certified cable sealing system as listed in Table 4 (Position 7).

- ATEX certified for Category 3G and 3D (Zone 2 for Gas and Zone 22 Dust) (Testing and certification by Electrosuisse, Switzerland, CH-8320 Fehraltorf, Swiss testing No. STS 001)
- Motor together with pump head tested according to standard EN60079-15. 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.

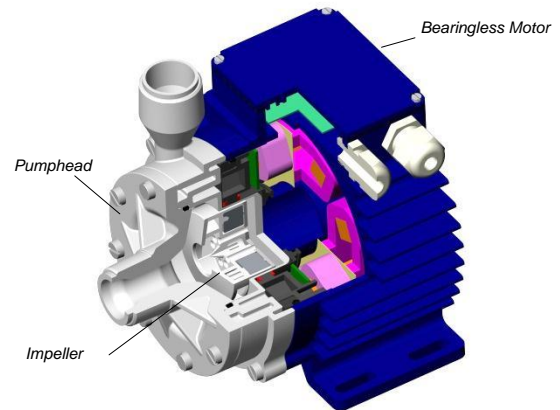


Figure 4: Cross-section of the bearingless pump motor and pump head LPP-600.13 (PVDF)

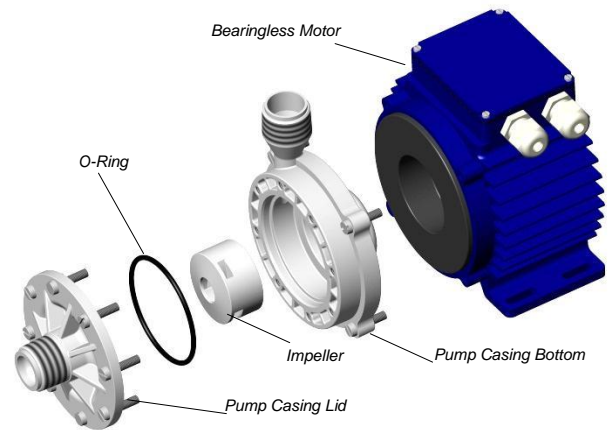


Figure 5: Disassembled pump head LPP-600.13 (PVDF)

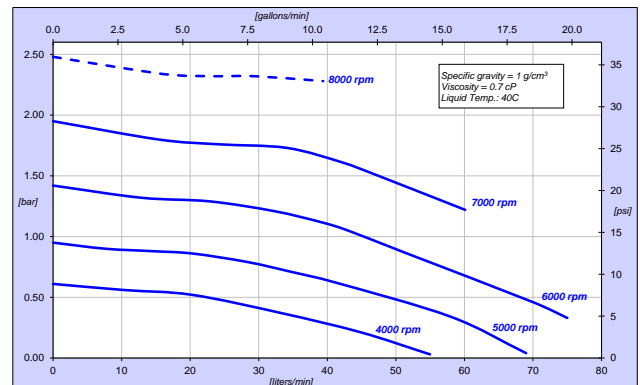


Figure 6: Pressure/flow curves (* on request)

DIMENSIONS OF MAIN COMPONENTS

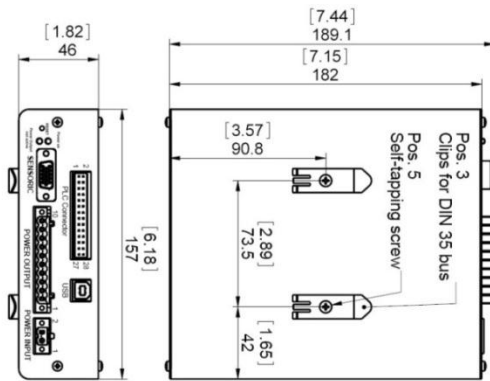


Figure 10: Dimensions of controllers LPC-600.x

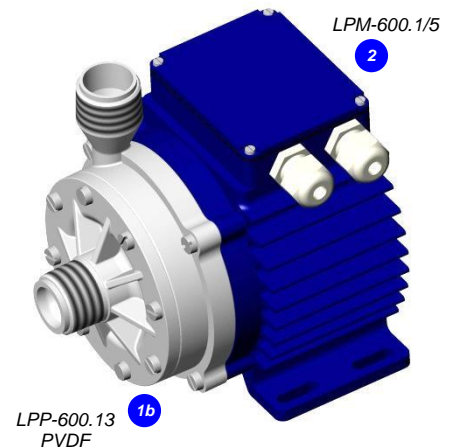
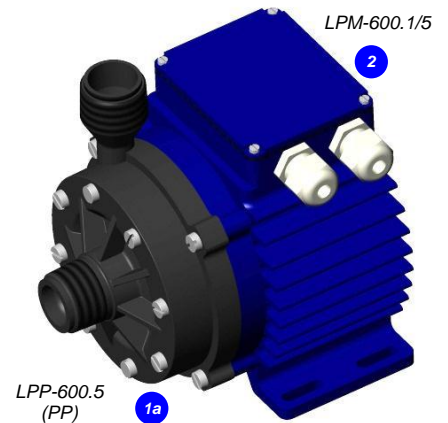
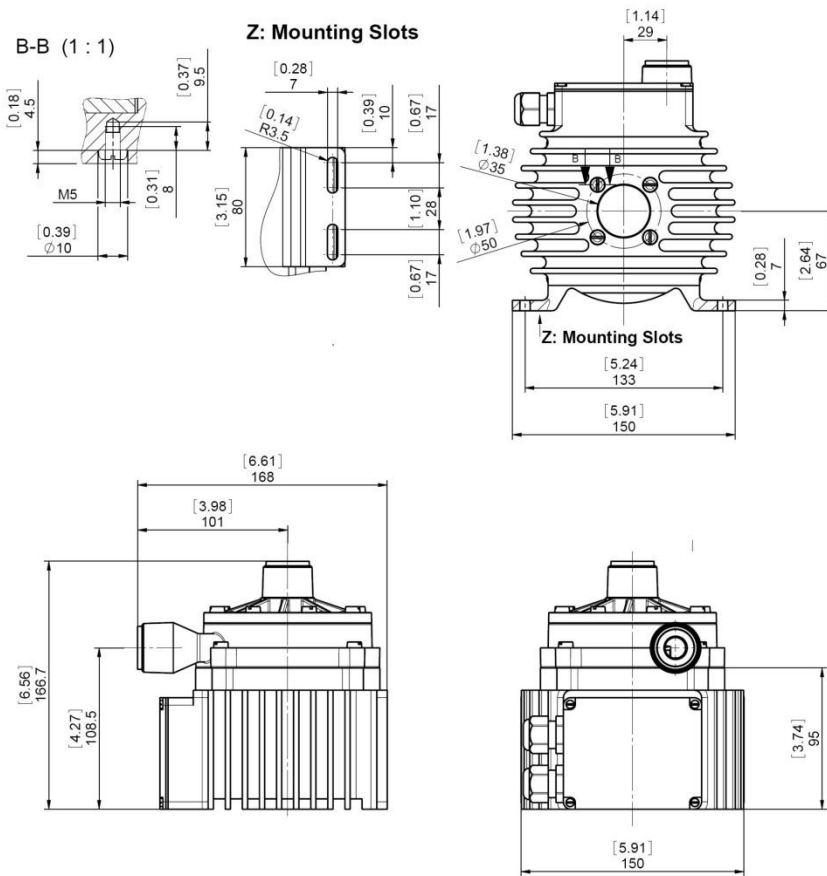


Figure 11: Dimensions of motor with pump heads LPP-600.5 (PP Housing) and LPP-600.13 (PVDF Housing)



DuraLev® 600 Pumping without Bearings and Seals

| System Name | Article # | Pumphead | 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. |
| 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) | 100-90354 | LPP-600.5 (PP, NPT 1") | LPM-600.5 (ATEX) | 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) |
| DuraLev® 600.17 (ATEX) | 100-90355 | | | LPC-600.2 (PLC, USB) | |
| DuraLev® 600.23 (ATEX) | 100-90571 | LPP-600.13 (PVDF, NPT 1") | | LPC-600.1 (Stand-alone) | |
| DuraLev® 600.24 (ATEX) | 100-90572 | | | LPC-600.2 (PLC, USB) | |

Table 1: Standard system configurations

| Pos. | Component | Article Name | Article # | Characteristics | Value / Feature |
|------|------------------------------------|---------------------------|---|---|--|
| 1a | Pumphead | 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.-Pressure 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 Aluminum waterproofed (IP67 without connectors) 2x 3m cables with PVC jacket / 2x circular (AMP types) |
| 2b | Motor (ATEX certified) | LPM-600.5 | 100-10039 | ATEX Marking Cable / Connectors | CE II 3G Ex c nAc IIC T5 CE II 3D Ex c tc IIIC T100°C IP67 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 | 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) |
| 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 | 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) |

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 |
|------|---------------------------|--|-----------|---|---|
| 6 | Air Cooling Module | ACM-600.2 | 190-10140 | Material / Connection Port Air Pressure / Consumption | PP (+ 40% Talkum) / NPT 1/4" -1 - 3 bar (14 - 43 psi) / 100 Liter/min @ 1 bar (14.5 psi) |
| 7 | 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. |
| 8 | AC/DC Power Supply | TSP 600-148-M (M = Modified Levitronix design from Traco) | 100-40013 | 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

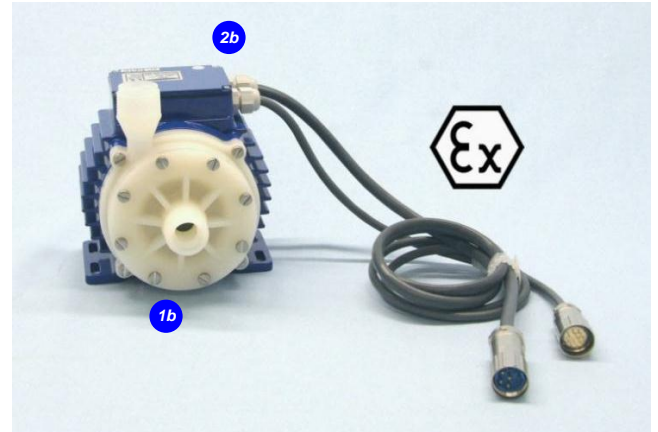
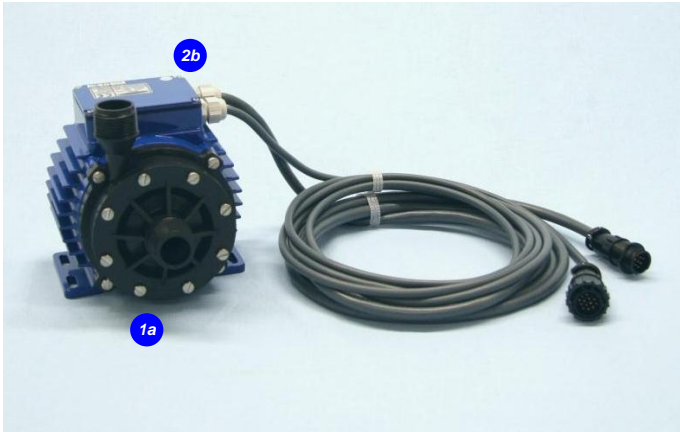


Figure 12: Basic components of DuraLev[®] 600 pump system

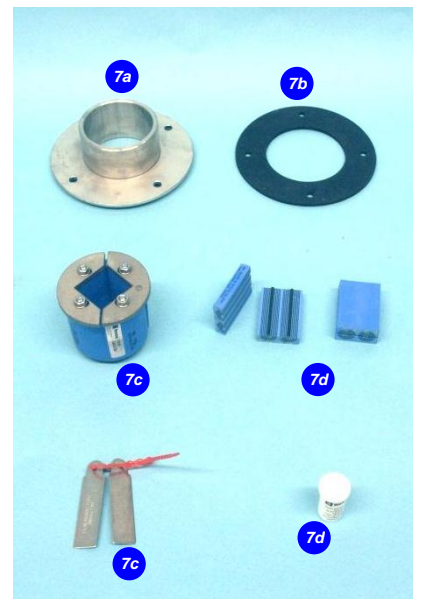


Figure 13: Accessories



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 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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