Reduce Downtime & Maintenance with DuraLev® Bearingless Pumps!

No Seals, No Bearings, No Problems!

DuraLev® 2000

4.1 bar	*(59 psi)*
140 liters/min	*(37 gallons/min)*

DuraLev® 2000 pump systems with LPC-2000 controller models shall not be used anymore for new applications. Refer to DuraLev® 2000.S product literature with LPC-2000S controllers for replacements with same fit form and function.

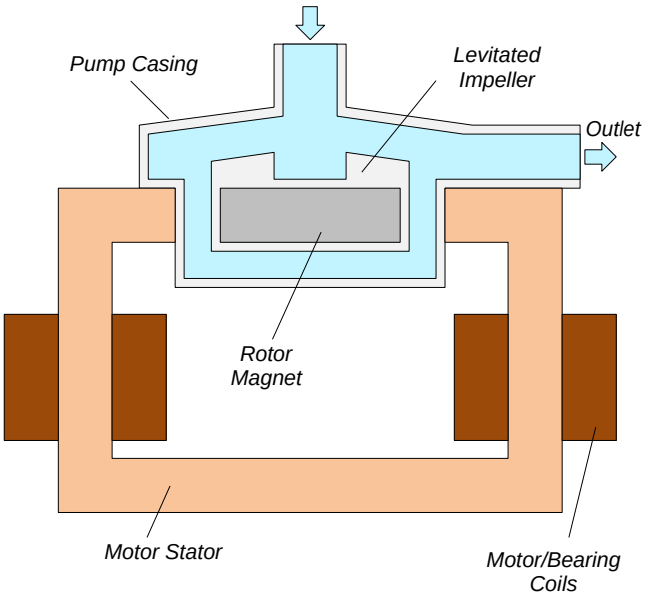

Figure 1: *Schematic of the main elements of the bearingless centrifugal pump.*

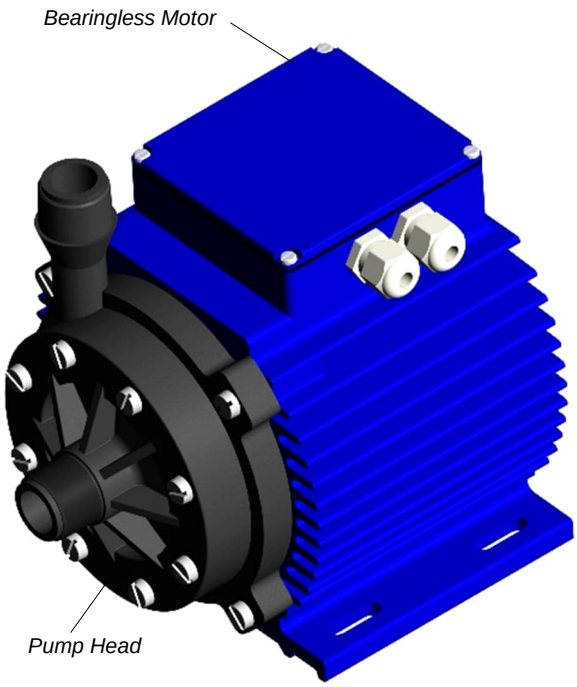

Figure 2: *Bearingless pump motor and pump head LPP-2000.2 (PP)*

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® 2000* pump system consists of a controller with an integrated user panel allowing the operator to set the speed manually (see *Figure 5*). 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® 2000* pump system (*Figure 6*) 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 pump head allows installation of motor and pump head within an ATEX Zone 2 area (see *Figure 7)*. The certified motor (*Position 2b* in *Table 2*) comes with special connectors and according 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 (Pos. 8)*.

The ATEX/IECEx motors have also a Japan and Korean Ex certification and marking.

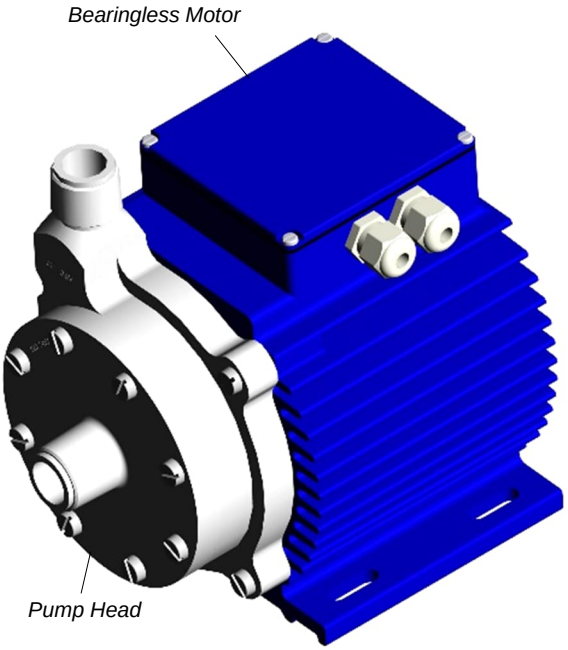

Figure 3: *Cross-section of the bearingless pump motor and pump head LPP-2000.4 (PVDF)*

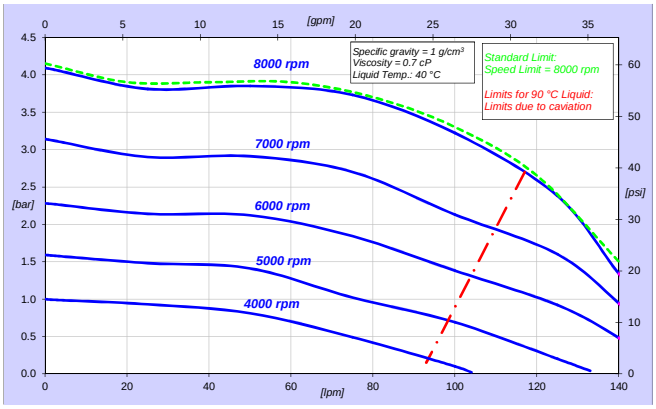

Figure 4: *Pressure/flow curves (PVDF pump head LPP-2000.4)*
(Pressure for PP pump head LPP-2000.2 is ~3% lower)

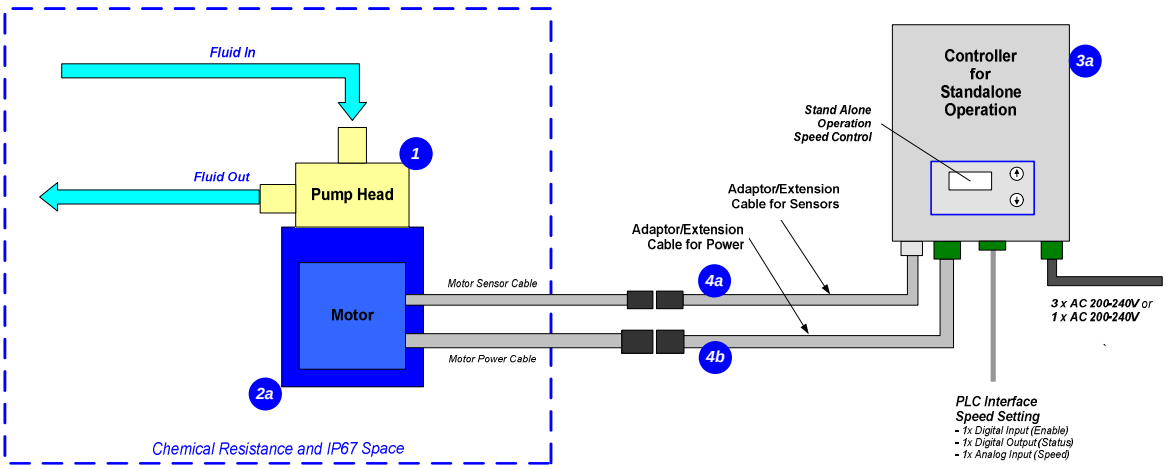

Figure 5: *System configuration for standalone operation (Speed setting with integrated user panel)*

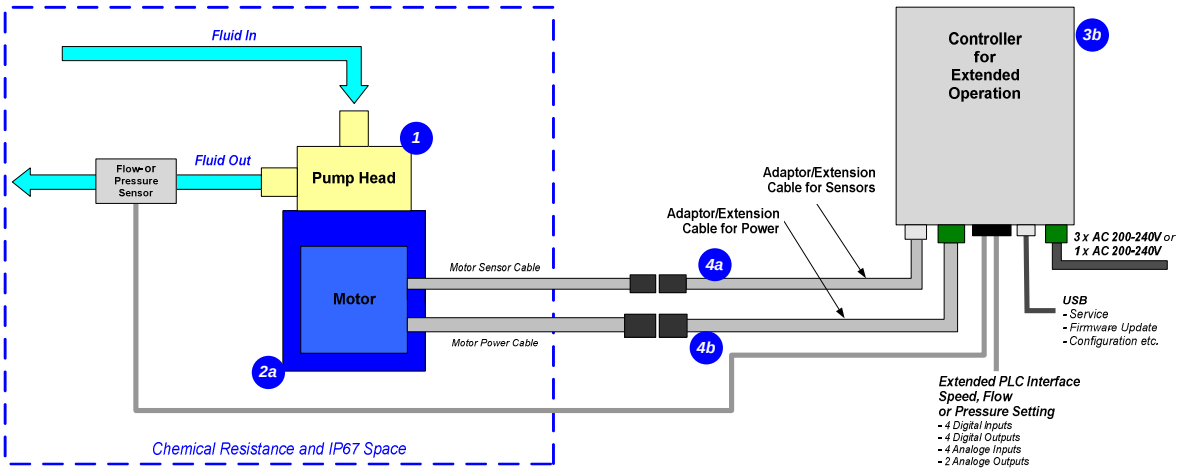

Figure 6: *Extended operation (flow or pressure control) with extended controller*

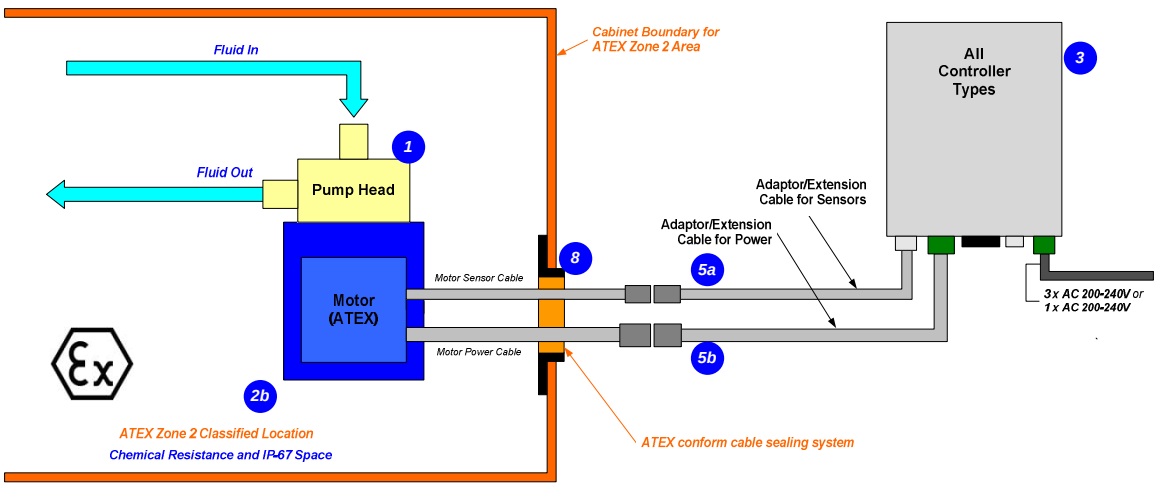

Figure 7: *System Configuration for ATEX applications*

DIMENSIONS OF MAIN COMPONENTS

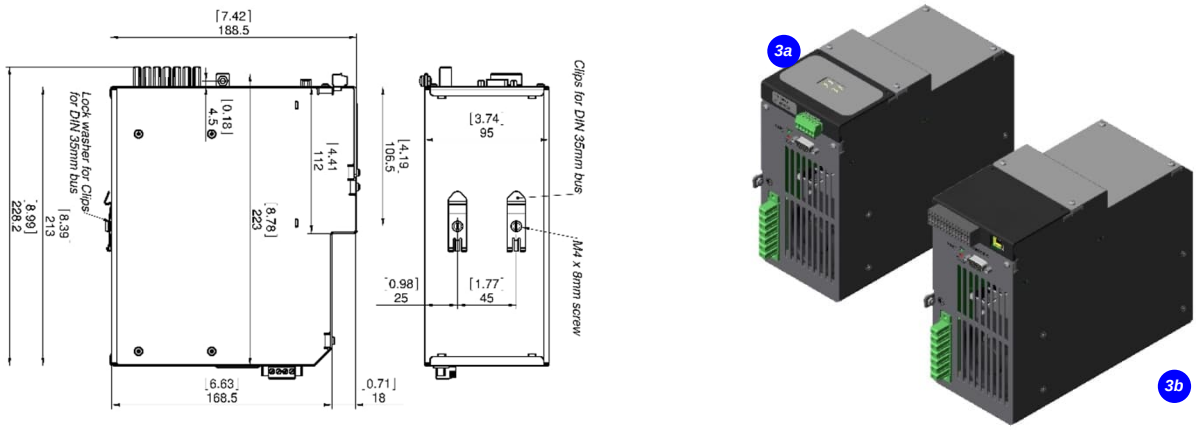

Figure 8: *Dimensions of controllers LPC-2000.x*
Note 1: Non tolerated dimensions are for reference only.

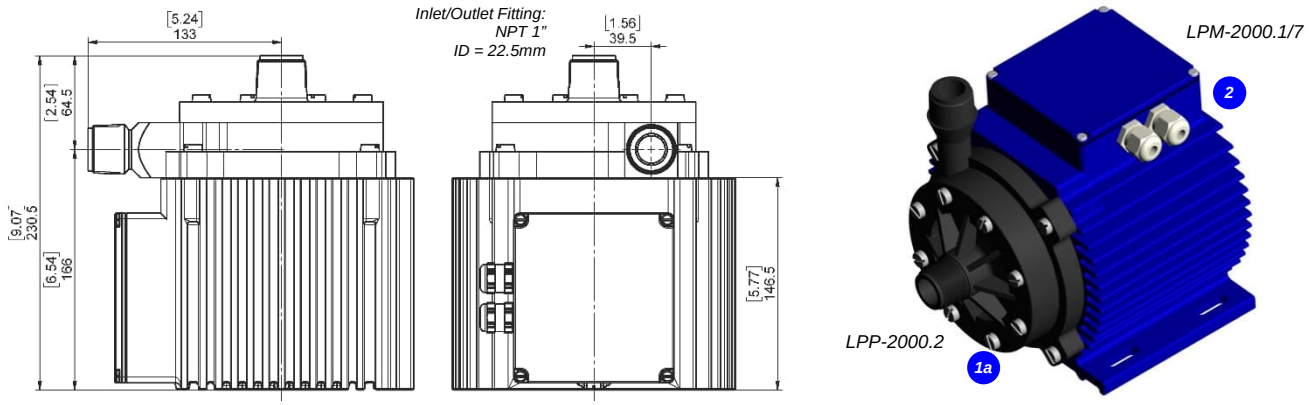

Figure 9: *Dimensions of motor with pump head LPP-2000.2 (PP+GF30 Housing, PFA Impeller)*
Note 1: Non tolerated dimensions are for reference only.

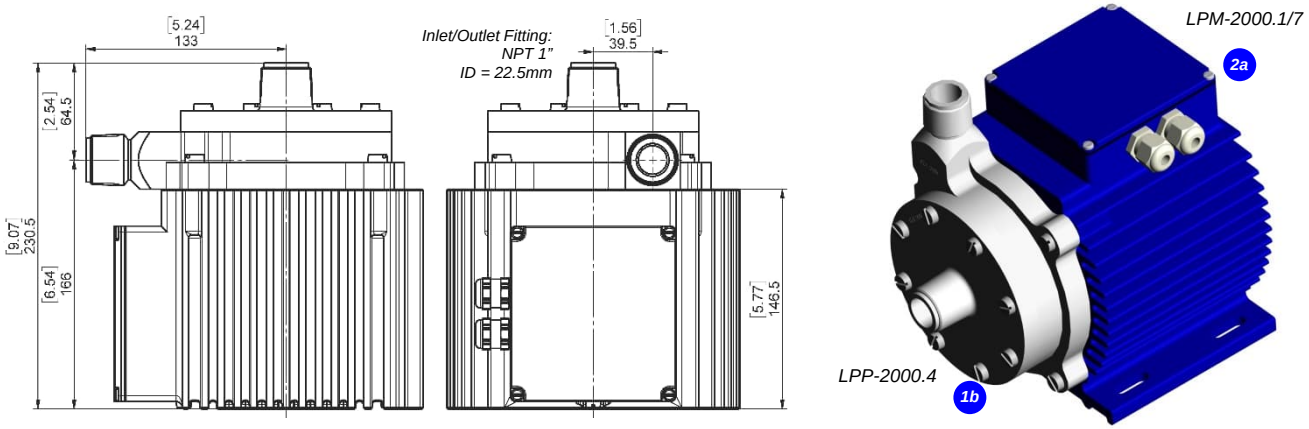

Figure 10: *Dimensions of motor with pump head LPP-2000.4 (PVDF Housing, PFA Impeller)*

System Name	Article #	Pump Head	Motor	Controller	Standard Firmware	Note
DuraLev® 2000.1 DuraLev® 2000.2 DuraLev® 2000.4 DuraLev® 2000.5	100-90491 100-90492 100-90494 100-90495	*LPP-2000.4 (PVDF, NPT 1")* *LPP-2000.4 (PVDF, NPT 1")* *LPP-2000.2 (PP, NPT 1")* *LPP-2000.2 (PP, NPT 1")*	*LPM-2000.1*	*LPC-2000.1-01 (Stand-alone)* *LPC-2000.2-01 (PLC, USB)* *LPC-2000.1-01 (Stand-alone)* *LPC-2000.2-01 (PLC, USB)*	*E1.25* *E1.48* *E1.25* *E1.48*	*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, IECEE CB scheme, ETL (NRTL).*
DuraLev® 2000.7 (ATEX) DuraLev® 2000.8 (ATEX) DuraLev® 2000.10 (ATEX) DuraLev® 2000.11 (ATEX)	100-90497 100-90498 100-90532 100-90533	*LPP-2000.4 (PVDF, NPT 1")* *LPP-2000.4 (PVDF, NPT 1")* *LPP-2000.2 (PP, NPT 1")* *LPP-2000.2 (PP, NPT 1")*	*LPM-2000.7 (ATEX)*	*LPC-2000.1-01 (Stand-alone)* *LPC-2000.2-01 (PLC, USB)* *LPC-2000.1-01 (Stand-alone)* *LPC-2000.2-01 (PLC, USB)*	*E1.25* *E1.48* *E1.25* *E1.48*	*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, IECEE CB scheme, ETL (NRTL), ATEX/IECEx, Japan and Korean Ex certification.*

Table 1: *Standard system configurations*

Pos.	Component	Article Name	Article #	Characteristics	Value / Feature
1a 1b	Pump Head	LPP-2000.2 (PP, NPT 1") LPP-2000.4 (PVDF, NPT 1")	100-90414 100-90416	Impeller Pump Housing Sealing Ring Fittings	*PFA* *PVDF or PP (+GF30)* *FPM (FKM)* *NPT 1"*
				Max. Flow Max. Diff.-Pressure Max. Viscosity / Max. Density Max. Liquid Temperature	*140 liters/min / 37 gallons/min* *4.1 bar / 59 psi (3% lower for PP pump head LPP-2000.2)* *80 cP / 1.8 g/cm³* *90°C / 194°F*
2a	Motor	LPM-2000.1	100-10049	Housing	*Epoxy (anticorrosive) coated Aluminum waterproofed (IP67 without connectors)*
				Cable / Connectors	*2x 3m cables with PVC jacket / 2x circular (AMP types)*
2b	Motor (ATEX, IECEx)	LPM-2000.7	100-10059	ATEX/IECEx Marking [1]	II 3G Ex ec h IIC T5 Gc II 3D Ex h tc IIIC T100°C Dc
				Cable / Connectors	*2x 3m cables with PVC jacket / 2x circular (M23, IP67)*
3a	Standalone Controller (User Panel)	LPC-2000.1-01 ("High Flow")	100-30018 (Supply and Enable connect-or included)	Voltage / Power Housing Rating	*1 and 3 x 200-240 V AC ±10% / 2kW @ 50/60Hz* *IP20*
				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)*
				Firmware "High Flow"	E1.25 (standard firmware for "High Flow")
3b	Extended Controller (PLC and USB)	LPC-2000.2-01 [2] ("High Flow")	100-30021 (Supply and PLC connector included)	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)
				Firmware "High Flow"	E1.48 (standard firmware for "High Flow")

Table 2: *Specification of standard components*

Note 1: ATEX/IECEx motors are also certified and marked for Japan and Korean Ex. *Note 2: LPC-2000.3 controller with RS232 instead of USB interface available.*

Pos.	Component	Article Name		Article #		Characteristics	Value / Feature
		Sensor Cable	Power Cable	Sensor	Power		
4a 4b	Extension Adaptor Cable for Sensor (a) and Power (b)	MCAS-600.1-05 (0.5m) MCAS-600.1-30 (3m) MCAS-600.1-50 (5m) MCAS-600.1-70 (7m) MCAS-600.1-100 (10m)	MCAP-2000.1-05 MCAP-2000.1-30 MCAP-2000.1-50 MCAP-2000.1-70 MCAP-2000.1-100	190-10122 190-10123 190-10124 190-10101 190-10125	190-10208 190-10210 190-10211 190-10205 190-10212	Jacket Material Connector Types Connector Material	*PVC* *Circular AMP to D-SUB* *Plastics (PA)*
5a 5b	Extension Adaptor Cable for Sensor (a) and Power (b)	MCAS-600.3-05 (0.5m) MCAS-600.3-30 (3m) MCAS-600.3-50 (5m) MCAS-600.3-70 (7m) MCAS-600.3-100 (10m)	MCAP-2000.3-05 MCAP-2000.3-30 MCAP-2000.3-50 MCAP-2000.3-70 MCAP-2000.3-100	190-10158 190-10159 190-10130 190-10160 190-10161	190-10219 190-10221 190-10222 190-10223 190-10224	Jacket Material Connector Types Connector Material	*PVC* *Circular M23 (IP-67) to D-SUB* *Metallic – Nickel coated*

Table 3: *Specification of adaptor/extension cables*

Pos.	Component	Article Name	Article #	Characteristics	Value / Feature	
6a	Air Cooling Module	ACM-4.2	190-10139	Material / Connection Port	*PP (+ 40% Talkum) / NPT 1/4"*	
6b	Air Cooling Module	ACM-4.3	190-10243	Material	*PP-EL-S with conductive additive for operation with ATEX motor*	
7a	Fan Cooling Module	FCM-2000.1	190-10390	Housing / Cable Spec. Supply Spec. / IP Rating	*PP (+ 20% Talkum) white / PP jacket, 3m, circular sealed M12 connector (PP).* *24 VDC, 33.5 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 (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.*

Table 4: *Specification of accessories*

Figure 11: *Basic components of pump system*

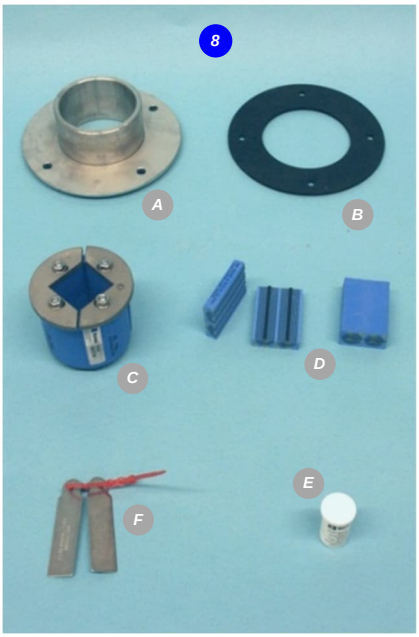

Figure 12*: Accessories*

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.

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PL-4020-01, Rev07, DCO# 25-246 First Release: 29-Aug-2011 Last Update: 26-Sep-2025