LEVITRONIX®

PuraLev®
Pump Console for Life Science Applications

LCO-600 (600 W)

For PuraLev® 200SU/MU
& PuraLev® 600SU/MU

Advanced Ultrapure Fluid Handling!

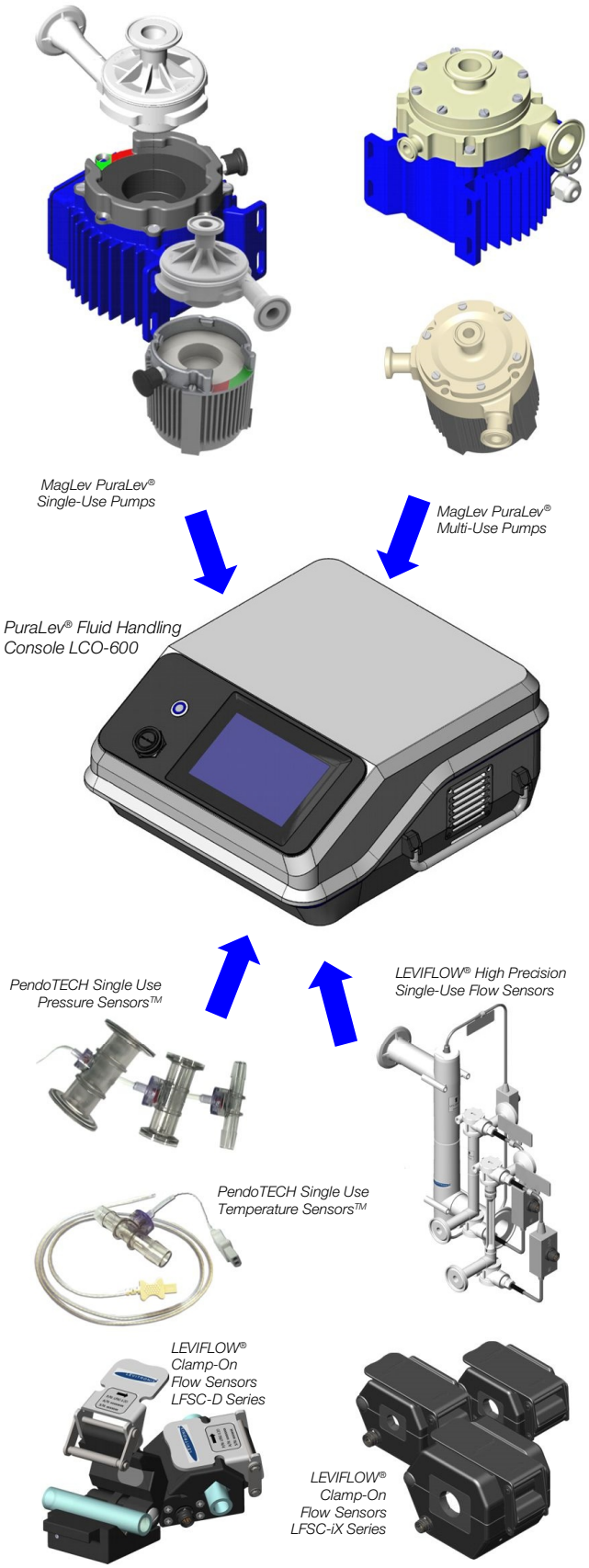


Figure 1: Component connectivity of PuraLev® fluid handling console

INTRODUCTION

The PuraLev® Console integrates Levitronix® MagLev pumps with LEVIFLOW® ultrasonic flow sensors and adds a sophisticated user interface with enhanced connectivity features. The system allows various operating modes including stand-alone pumping with flow monitoring or flow control, pressure monitoring with up to 3 pressure sensors and temperature monitoring.

The brain of the PuraLev® Console is an embedded PC with a 7" multi-touch screen and it comes with software for flow control, configuration and monitoring of various sensors. An integrated pump controller can operate a PuraLev® 600 or PuraLev® 200 pump motor. Various integrated sensor signal converter circuits allow connection of LEVIFLOW® single-use and clamp-on flow sensors, and single-use pressure and temperature sensors from suppliers such as PendoTECH.

The IP66 housing is dust tight and allows wash down with powerful water jets from any direction. All connectors come with a protective cap for at least IP66 rated sealing if unused. The console can be placed horizontally on a table or mounted vertically on a wall. The display is rotatable by software.

SYSTEM BENEFITS

- Precise flow monitoring or control.
- Integrated signal converters for pressure & temperature monitoring.
- Precise pressure limitation to avoid potential tube ruptures.
- Plug and play stand-alone functionality.
- Intuitive user interface with 7" color multi-touch.
- Data collection capabilities.
- IP66 rated housing with wash down capability.
- Easily configurable and customizable by software.

APPLICATIONS

- Fluid transfer and recirculation in upstream and downstream bioprocessing.
- Single-use and multi-use components available.
- Ideal for RG2+ agents and toxic products due to inherent maximum pressure limitation.
- Depth filtration, ultrafiltration, diafiltration, sterile filtration.
- Mixing, blending, dilution and filling.

STAND-ALONE PUMP SYSTEM CONFIGURATION

With the standard stand-alone pump system configuration, as illustrated in *Figure 5*, the speed of the pump can be set manually and the flow can be monitored with a *LEVIFLOW*® flow sensor. The mode of operation can be easily switched to a flow control setup, where the flow is set manually on the 7" multi-touch screen and is controlled by the integrated PC.

The USB interface on the front side facilitates software updates or data collection for debugging with a USB stick.

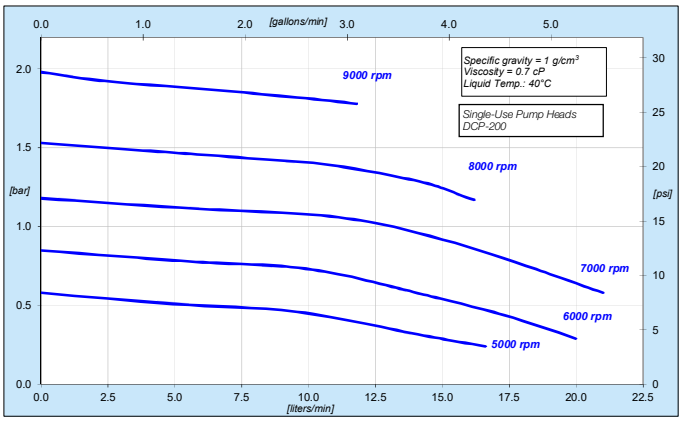
The console comes with an intuitive software, which, in combination with the touch screen, simplifies the usage, configuration and monitoring of the system.

Figure 2: *Start-up menu of touch screen*

ADVANCED FLUID HANDLING CONFIGURATION

Figure 6 illustrates the extended monitoring capabilities of the *PuraLev*® console for advanced fluid handling applications such as depth filtration, ultrafiltration, diafiltration, sterile filtration or pressure control for filling stations.

The *PuraLev*® console includes 2 flow sensor connections and gauge amplifiers for connection of up to 3 single-use pressure sensors and an additional circuit for the connection of a temperature sensor.



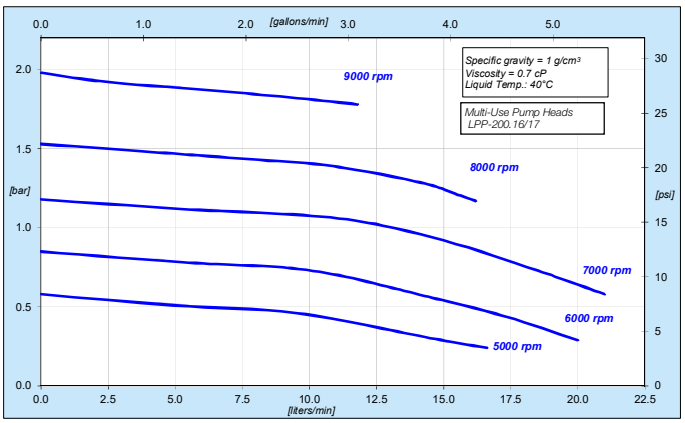
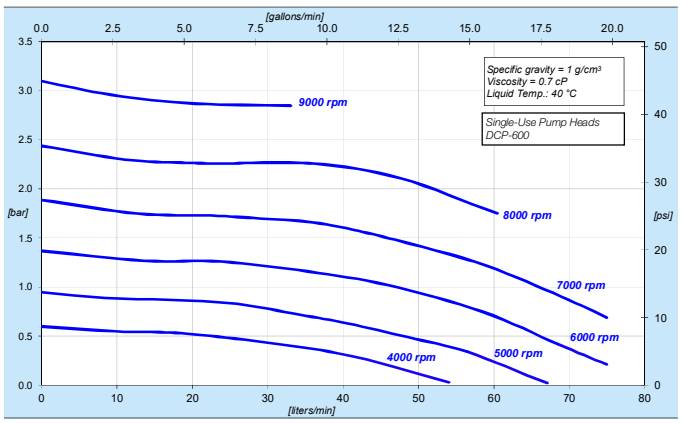


Figure 3: *Pressure/flow curves with PuraLev® 200SU/MU*



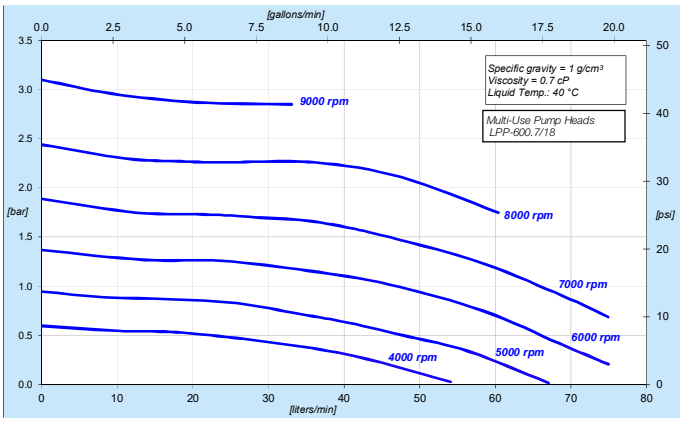


Figure 4: *Pressure/flow curves with PuraLev® 600SU/MU*

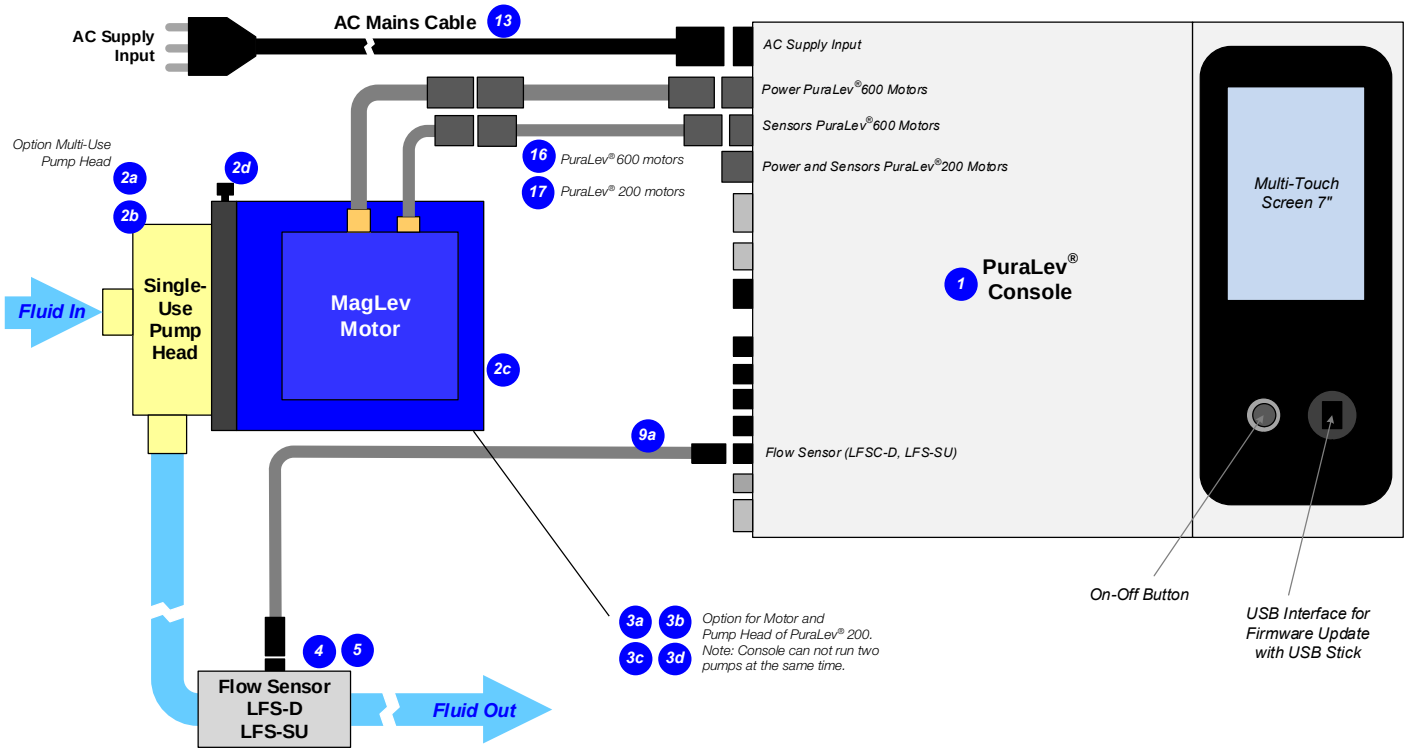


Figure 5: Stand-alone pump system configuration of LCO-600 console with flow control or flow monitoring

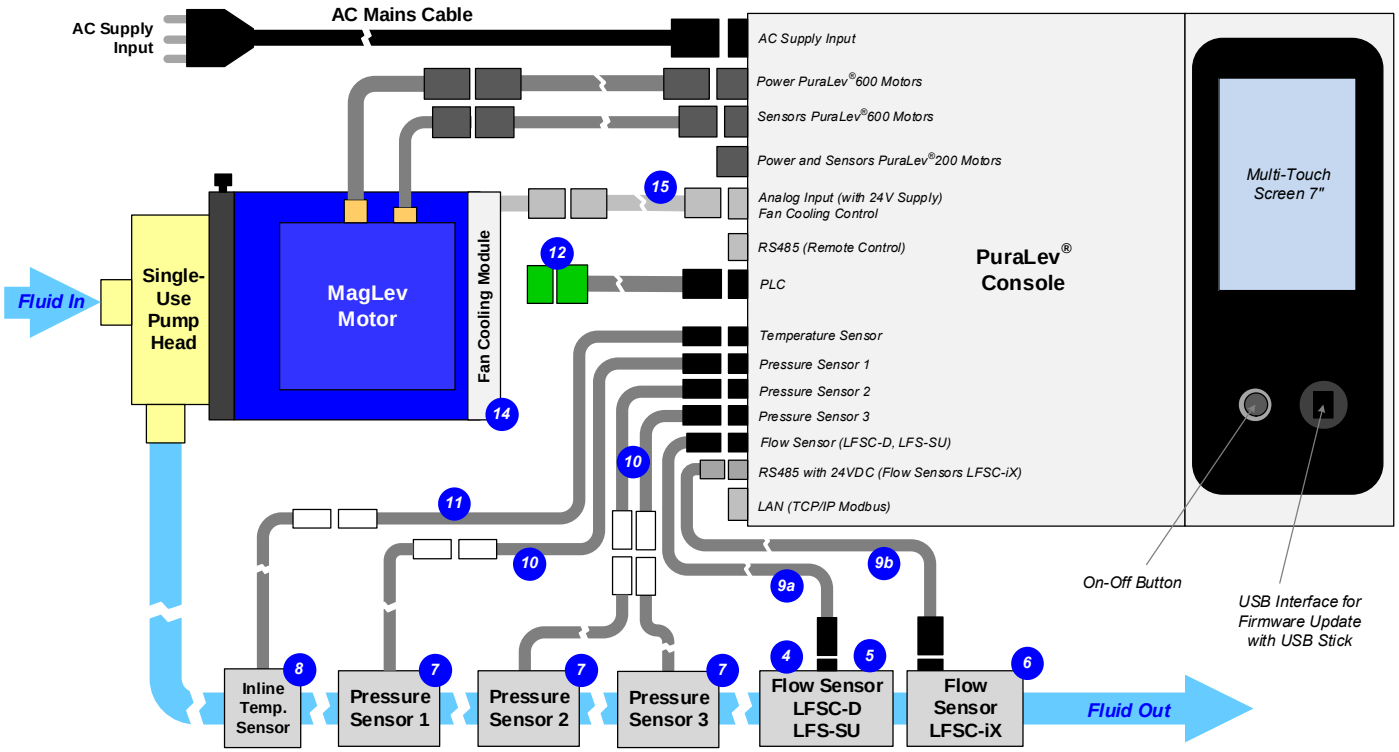


Figure 6: Extended monitoring configuration of console LCO-600 for advanced fluid handling in bioprocessing applications

DIMENSIONS AND INTERFACES

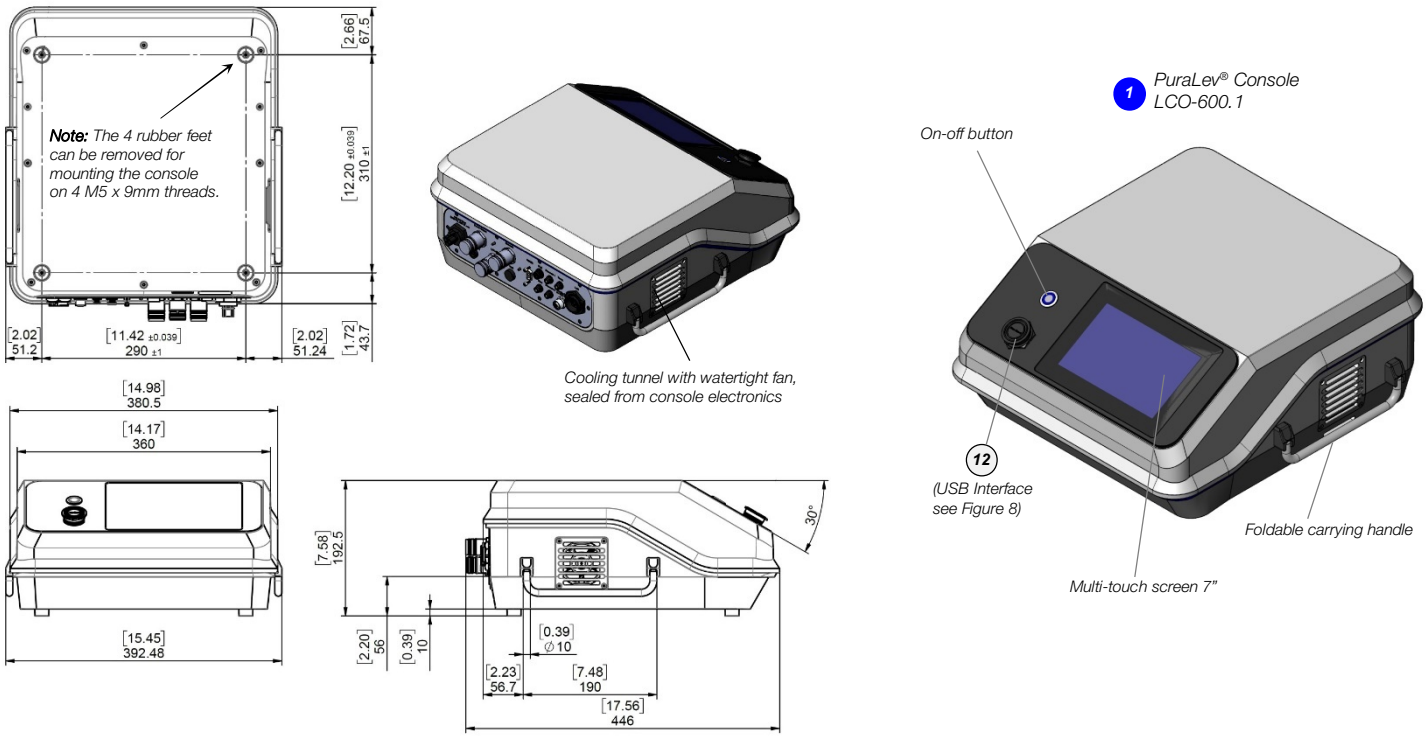


Figure 7: *Dimensions (in mm and [inch]) of PuraLev® console LCO-600.1*
(Un-tolerated dimensions are for reference only.)

Note: *All connectors come delivered with a protective cap for sealing if unused. When connected all connectors are at least IP66 rated.*

#	Interface Connector	Description	Specification/Purpose/Note
1a	AC Supply Connector	Single phase AC connection.	100–240 VAC ±10%/ 600 W 3-pin connector Software configurable Autoresume [1]
1b	Fuse	Fuse, which can be replaced from external.	Rating: 10 A, slow
2a **2b**	Motor Power/Sensor PuraLev® 600	Power/Sensor connectors for LPM-600 motors.	M23 metallic connector. M23 metallic connector.
3	Motor Sensor/Power PuraLev® 200	Combined sensor/power connector for BSM-1 motors.	M23 metallic connector. *Note: Cannot run at the same time as PuraLev® 600 motor.*
4	Remote [1]	RS485 interface	Software functionality under development.
5	PLC	Remote control. Configurable designations.	2x digital outputs (1 output software switchable to 24 VDC [1]), 2x digital inputs, 1 analog output (4-20 mA), 1x analog input (4-20mA) Note: All signals isolated.
6	Flow Sensor LEVIFLOW®	Connection of flow sensors from the *LFS-SU* and *LFSC-D* series.	Circular 6 pin snap-in connector. Purpose: Flow control or monitoring.
7a **7b** **7c**	Pressure Sensor 1 Pressure Sensor 2 Pressure Sensor 3 [1]	Connection for single-use pressure sensors 1, 2 and 3.	Needs adaptor cable (see *Table 6*). Circular 6 pin snap-in connector. Purpose: pressure monitoring and control.
8	Temperature Sensor	Connection for 1 single-use temperature sensors.	Needs adaptor cable (see *Table 6*). Circular 6 pin snap-in connector. Purpose: Temperature monitoring.
9	Analog In 24VDC Out	Multi purpose sensor input. Fan cooling module *FCM-600*.	Current input 4-20 mA, 24 VDC supply. Direct connection of *FCM-600.1* (with temperature controlled fan speed [1]).
10	RS485 24VDC Out [1]	Sensor input for new clamp-on flow sensors LFSC-iX.	RS485 bus with 24 VDC supply.
11	LAN Interface	TCP/IP Modbus	For connection to OPC devices.
12	USB Interface	Connection of USB stick.	*Connection with protective cover.* *Purpose: Data collection and software update.*

Figure 8: *Interfaces of PuraLev® console LCO-600.1*
Note 1: Not available on units older than 2018/19. Note 2: Location of connectors is different for units older than 2018/19.

ORDER INFORMATION

Pos.	Component	Article Name	Article #	Characteristics	Value / Feature
1	PuraLev® Console	LCO-600.1-01	100-30500	Supply Voltage / Power	*100–240 VAC ±10%, 47-63 Hz / 600 W*
				Housing Rating / Weight	*IP66 / 13.3 kg*
				Interfaces	*Multi-touch screen 7", 3 pressure sensors, 2 flow sensor, 1 temperature sensor PLC (2 digital in/outputs, 1 analog in/output), RS232, LAN, USB*
				Pump Motors	*PuraLev® 200 or 600 motor (Only one motor can be connected at the same time).*
				Certifications	*Certifications: CE, IECEE CB scheme, ETL (NRTL) listed.*

Table 1: *Basic specifications of standard LCO-600 console (AC mains cable for various countries to be ordered separately according to Table 6)*

Pos.	Component [2]	Article Name	Article #	Characteristics	Value / Feature
2a	Multi-Use Pump Head	LPP-600.7 (with drain port) LPP-600.18 (no drain port)	100-90287 100-90548	Wet Materials / Fittings Max. Flow / Max. Diff.-Pressure Sterilization Methods	*PVDF, PFA and EPDM (FDA, USP Class VI, BSE/TSE/animal-free) / Triclamp 1"* *75 liters/min (20 gallons/min) / 3.2 bar (46 psi)* *CIP (clean in place), SIP (steam in place), Autoclaving*
2b	Single-Use Pump Head	DCP-600.2 [1] (Needs pump head socket mounted on motor)	100-90784	Wet Materials Max. Flow / Max. Diff.-Pressure Sterilization Methods	*Polypropylene (FDA, USP Class VI, BSE/TSE/animal-free) / Triclamp 1"* *75 liters/min (20 gallons/min) / 3.1 bar (45 psi)* *Gamma radiation up to 40 kGy.*
2c	Motor	LPM-600.5	100-10039	Housing Cable / Connectors	*Epoxy (anti-corrosive) coated aluminum, waterproof (IP67)* *2x 3m cables with PVC jacket / 2x circular (M23, IP-67)*
2d	Pump Head Socket	PHS-600.1	100-90696	Mounting Type / Material	*Bayonet mount with locking pin made of anodized aluminum*
3a	Multi-Use Pump Head	LPP-200.17 (with drain port) LPP-200.16 (no drain port)	100-90864 100-90863	Wet Materials / Fittings Max. Flow / Max. Diff.-Pressure Sterilization Methods	*PVDF, PFA and EPDM (FDA, USP Class VI, BSE/TSE/animal-free) / Triclamp ½"* *21 liters/min (5.5 gallons/min) / 2.4 bar (35 psi)* *CIP (clean in place), SIP (steam in place), Autoclaving*
3b	Single-Use Pump Head	DCP-200.2 (Triclamp) [1] DCP-200.3 (Barb) [1] [3] (Needs pump head socket)	100-90734 100-90792	Wet Materials Max. Flow / Max. Diff.-Pressure Sterilization Methods	*Polypropylene (FDA, USP Class VI, BSE/TSE/animal-free) / Triclamp or Barb ½"* *21 liters/min (5.5 gallons/min) / 2 bar (29 psi)* *Gamma radiation up to 40 kGy.*
3c	Motor	BSM-1.6	100-10063	Housing Cable / Connectors	*ETFE (chemical resistant) coated aluminum, waterproof (IP67)* *2m cable with FEP jacket / 1x circular (M23, IP-67)*
3d	Pump Head Socket	PHS-200.1	100-90695	Mounting Type / Material	*Bayonet mount with locking pin made of anodized aluminum*

Table 2: *Specification of standard pump motors and single-use pump heads compatible with LCO-600 console*
Note 1: Gamma irradiated options available. Note 2: See Levitronix® technical brochures of PuraLev® 200/600SU and PuraLev® 200/600MU for more specifications. Note 3: Sterile fitting option available.

Pos.	Component	Article Name	Article #	Fitting	Wet Material	Note
4a	LEVIFLOW® Single-Us Flow Sensors	LFS-06SU-Z / -SC1 (8 lpm) [1]	100-303**77 / 94**	Triclamp 3/8"	*Polypropylene (FDA, USP Class VI, BSE/TSE/Animal free)* *Gamma stable for up to 40 kGy.*	*See Levitronix® technical brochure of LFS-SU single-use sensor series for more detailed specifications and other sizes.*
4b		LFS-10SU-Z / -SC1 (20 lpm) [1]	100-30**397 / 408**	Triclamp 1/2"		
4c		LFS-15SU-Z / -SC1 (50 lpm) [1]	100-3041**2 / 31**	Triclamp 1"		
4e		LFS-20SU.1-Z / LFS-20SU-Z-SC1 (80 lpm) [1] [3]	100-30**383 / 464**	Triclamp 1"		

Table 3: *Specification of LEVIFLOW® single-use high-precision (1% accuracy of reading) flow sensors compatible with LCO-600 console*
Note 1: Extension SC1 means calibration for wider 1% accuracy range. Note 2: Available with gamma irradiation option (see LEVIFLOW® SU product literature). Note 3: Needs console software LCO V1.04 R12 or higher.

Pos.	Component	Article Name	Article #	Calibrated Liquid	Tubing	Tube: ID x OD	Note
5a	LEVIFLOW® Clamp-On Flow Sensors LFSC-D	LFSC-12D-007 (20 lpm)	100-30390	Water @ 20°C, 37°C	Silicone	3/8" x 9/16"	*See Levitronix® technical brochure of LFSC-D or LFSC-iX of clamp-on sensor series for specifications and other sizes.* *Default activated calibration set is Silicone at 37°C liquid temperature.*
5b		LFSC-22D-005 (80 lpm)	100-30391		C-Flex® [1]	3/4" x 1"	
6a	LEVIFLOW® Clamp-On Flow Sensors LFSC-iX	LFSC-i16X-001 (20 lpm)	100-30482	Water @ 20°C, 37°C	Silicone	3/8" x 5/8"	
6b		LFSC-i19X-001 (50 lpm)	100-30479		C-Flex®	1/2" x 3/4"	
		LFSC-i25X-001 (80 lpm)	100-30480		TPE	3/4" x 1"	

Table 4: *Specification of LEVIFLOW® clamp-on flow sensors compatible with LCO-600 console*
Note 1: C-Flex® is a registered trademark of Saint Gobain Performance Plastics, 2015. All rights reserved.

Pos.	Component	Article Name	Article #	Fittings	Specification	Wet Material	Note
7a	PendoTECH Single-Use Pressure Sensor	PREPS-N-038	190-10375	3/8" Hose Barb	Pressure range: -0.48 to 5.2 bar	Polysulfone	*See PendoTECH literature for more detailed specifications.*
7b		PREPS-N-5-5	190-10373	3/4" Sanitary Clamp			
7c		PREPS-N-1-1	190-10374	1" Sanitary Clamp			
8a	Single-Use [1] Temperature Sensor	TEMPS-N-050	190-10376	1/2" Hose Barb	Temp. range: 0 – 70°C	Polysulfone Stainless steel	*See PendoTECH literature for more detailed specifications.*
8b		TEMP-S-DP	190-10378	Dip Probe			

Table 5: *Specification of single-use pressure and temperature sensors compatible with console (Note 1: Compatible to other standard Pendotech sensor size.)*

Pos.	Component	Article Name	Part #	Characteristics	Special Feature / Description
9a	LEVIFLOW® Interconnect Cable	LFI-C.1-30 (3m)	190-103**08**	Cable Jacket Material Main Purpose	*PVC* *Connection between sensor and console*
9b	IP Cable Signal 4 Wires	ICS-3.1-30 (3m)	190-10447	Cable Jacket Material Main Purpose	*PUR* *Connection between LFSC-iX flow sensors and console.*
10	Pressure Sensor Adaptor Cable	LPE-1.1-30 (3m)	190-10354	General Specifications Main Purpose	*Circular console connector, watertight on console side.* *Connection of single-use pressure sensors to console.*
11	Temperature Sensor Adaptor Cable	LTE-1.1-30 (3m)	190-10353	General Specifications Main Purpose	*Circular console connector, watertight on console side.* *Connect single-use temperature sensors to console. For barb sensors and dip probe.*
12	IPS Cable Signal 12 Wires	ICS-2.1-50 (5 m)	190-10347	Cable Material / Wires Connection In / Connection Out Main Purpose	*PVC jacket / 12x 0.14 mm² and shielding* *Connector with screw type plug for open wire connection / Circular Hirose type* *General connection to PLC of console.*
13	AC Mains Cables [1] (for Console power supply)	AMC-2.1 / AMC-2.2 AMC-2.3 / AMC-2.4 / AMC-2.5	190-103**36** / **37** 190-103**38** / **39** / **40**	Country Country Cable Specifications	*US, Canada / Germany, Denmark, Norway, Finland, Belgium, Netherland, Sweden, Austria* *Japan / Switzerland / United Kingdom* *Length = 3m, black color, watertight connector on console side*
14	Fan Cooling Module (for Motor cooling)	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).*
15	FCM Interconnect Cable	FCC-1.2-30 (3m) [1]	190-10414	Cable Material / Connectors Purpose	*PP jacket / circular to circular connector* *Cable extension of fan cooling module FCM-600.*
16	Adaptor/Extension Cable Power / Sensor	MCIP-600.1-30/MCIS-600.1-30	190-103**61** / **62** (3m)	Cable Material / Connectors Purpose	*PVC jacket / circular to circular connector* *Extension of cables of BSM-600 motors (power and sensors).*
17	Adaptor/Extension Cable Power / Sensor	MCI-1.3-**40** (4m	190-10360	Cable Material / Connectors Purpose	*PVC jacket / circular to circular connector* *Extension of cables of BSM-1 motors (hybrid cable for power and sensors).*

Table 6: *Specification of standard cables and other accessories (Note 1: Other countries on request.)*

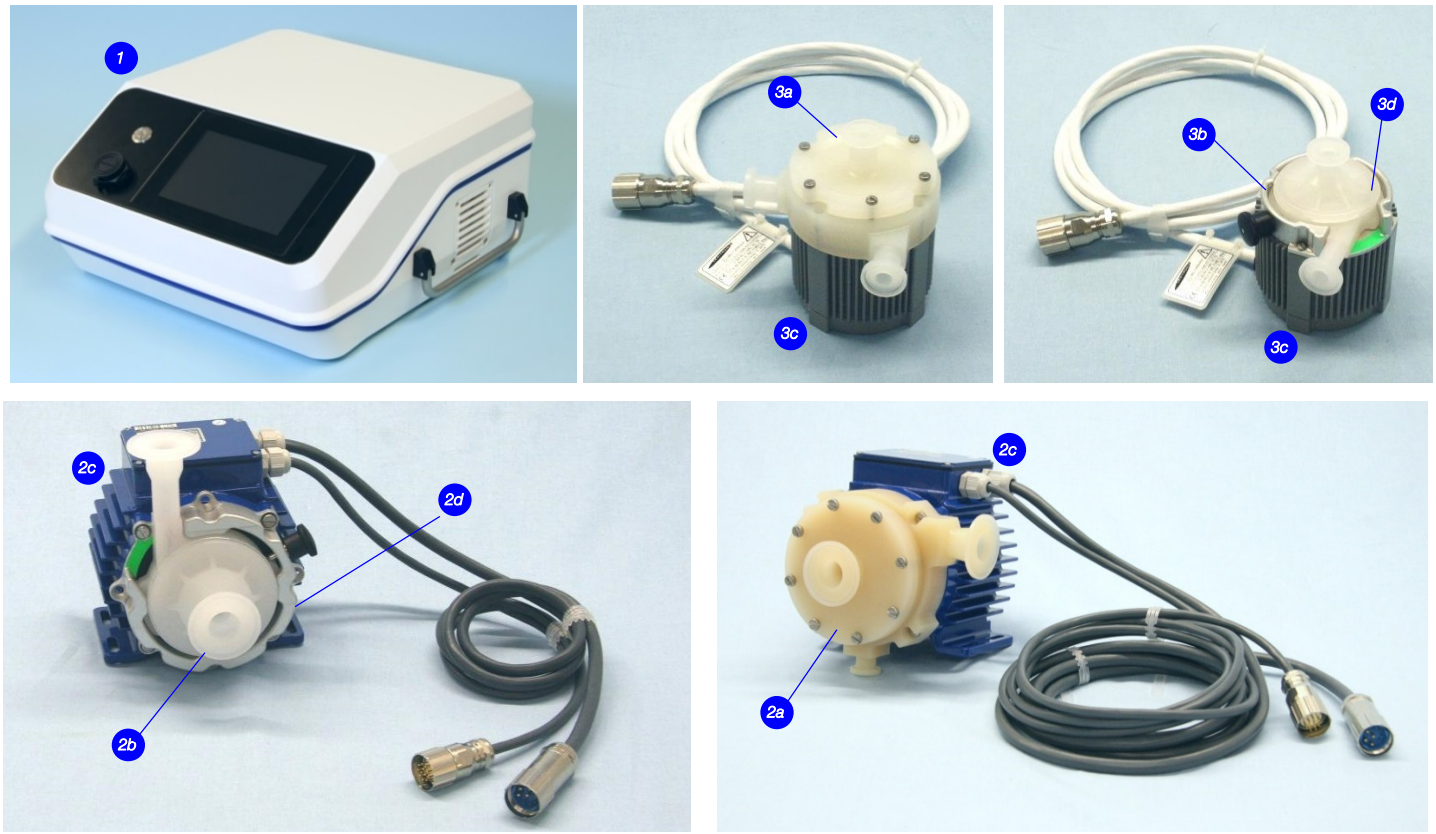


Figure 9: *LCO-600 console with compatible motors and pump heads.*

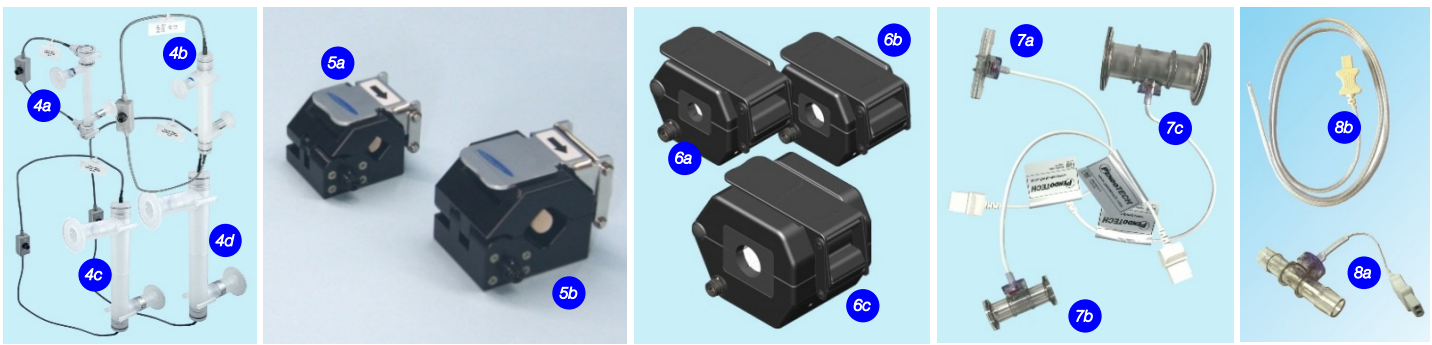


Figure 10*: Standard sensors compatible with LCO-600 console.*

Figure 11*: Standard 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 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 or the *PuraLev®* consoles to the market.

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