PuraLev®
Pump Console for Life Science Applications

LCO-600 (600 W)

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

Advanced Ultrapure Fluid Handling!
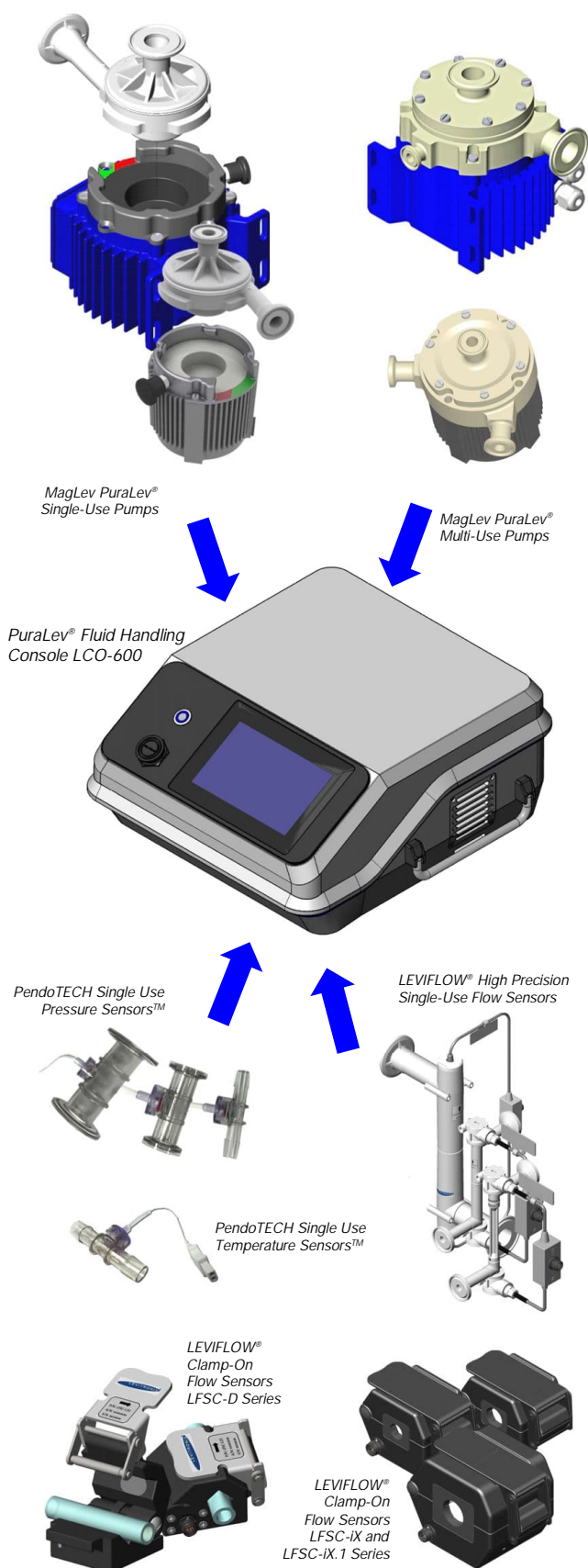
MagLev PuraLev® Single-Use Pumps

MagLev PuraLev® Multi-Use Pumps

PuraLev® Fluid Handling Console LCO-600

PendoTECH Single Use Pressure Sensors™

LEVIFLOW® High Precision Single-Use Flow Sensors

PendoTECH Single Use Temperature Sensors™

LEVIFLOW® Clamp-On Flow Sensors LFSC-D Series

LEVIFLOW® Clamp-On Flow Sensors LFSC-iX and LFSC-iX.1 Series

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.

SYSTEM CONFIGURATIONS

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.
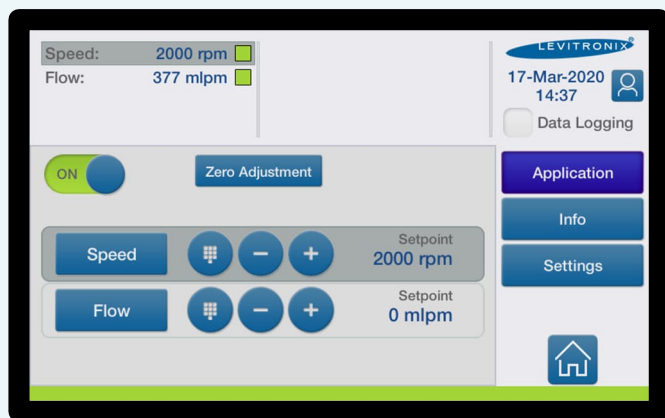
Figure 2: Start-up menu of touch screen

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.
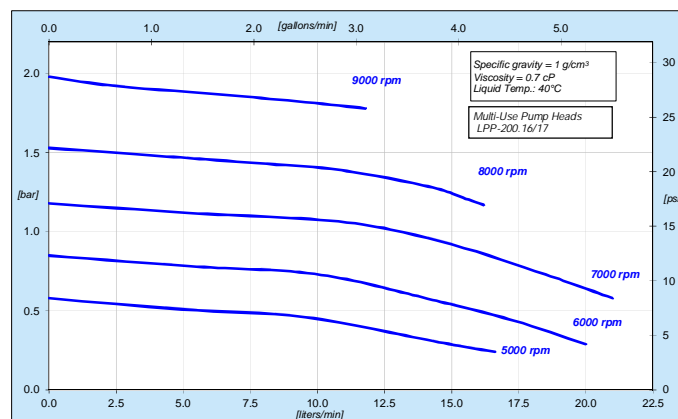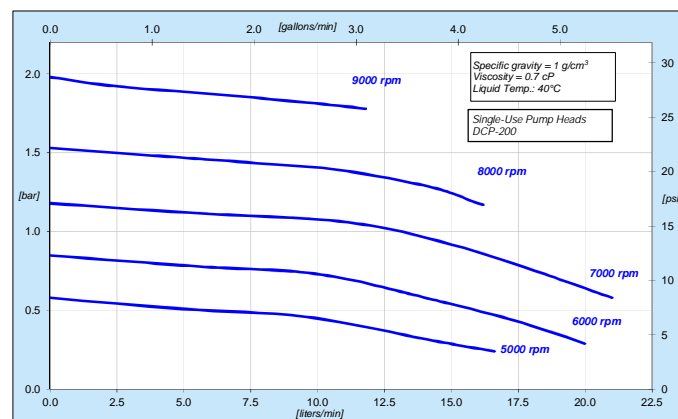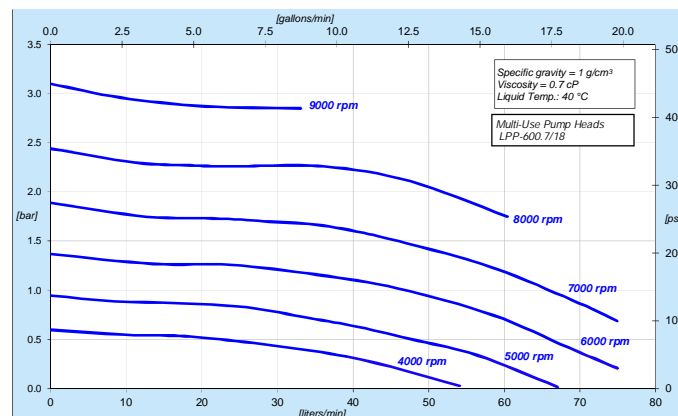
Figure 3: Pressure/flow curves with PuraLev® 200SU/MU
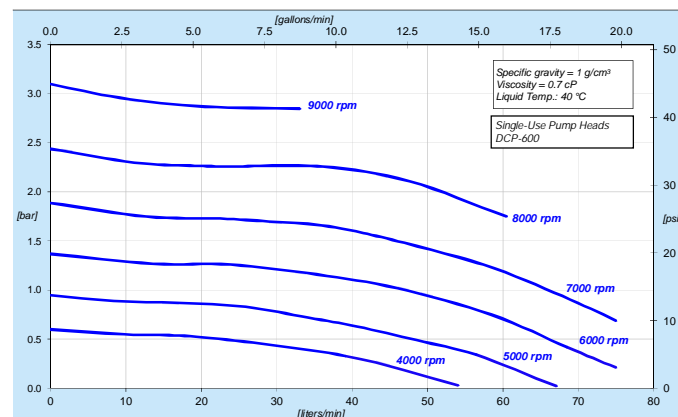
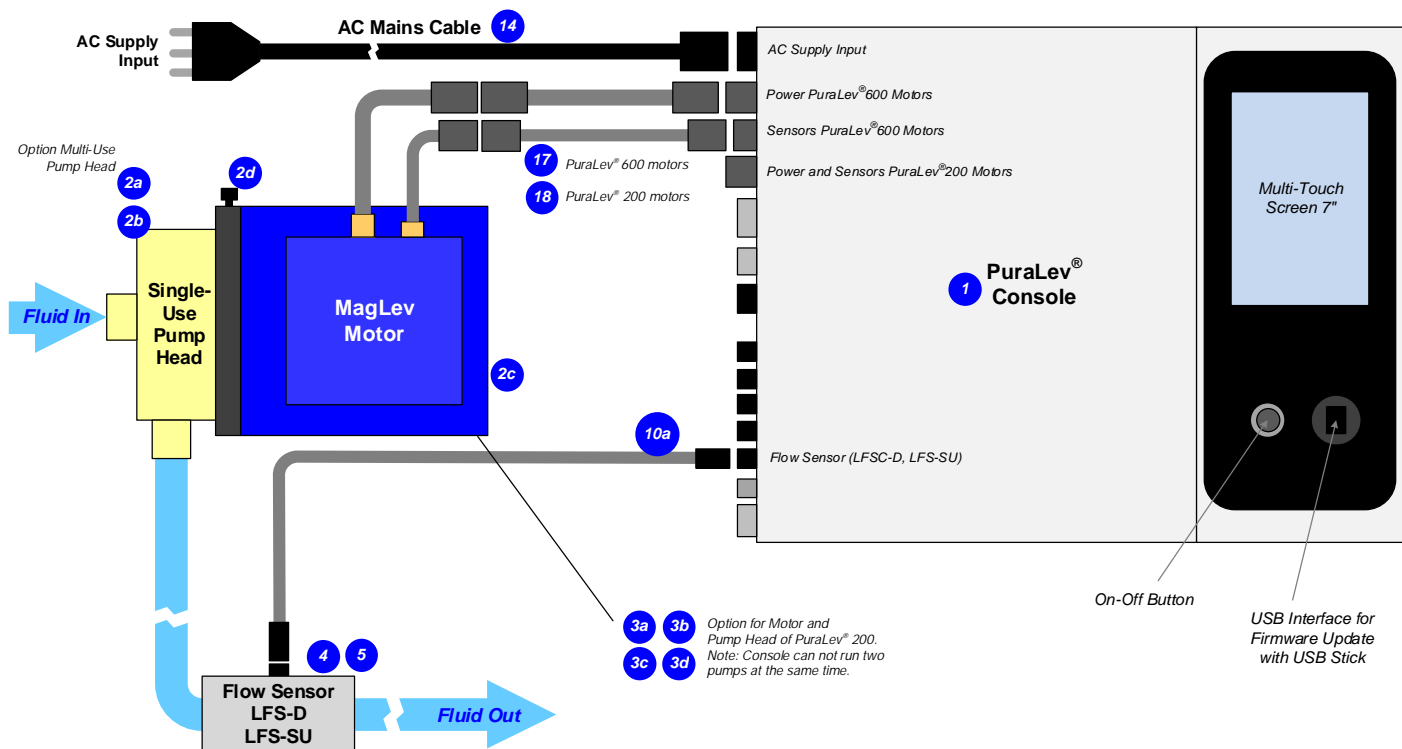*Figure 4: Pressure/flow curves with PuraLev® 600SU/MU*

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

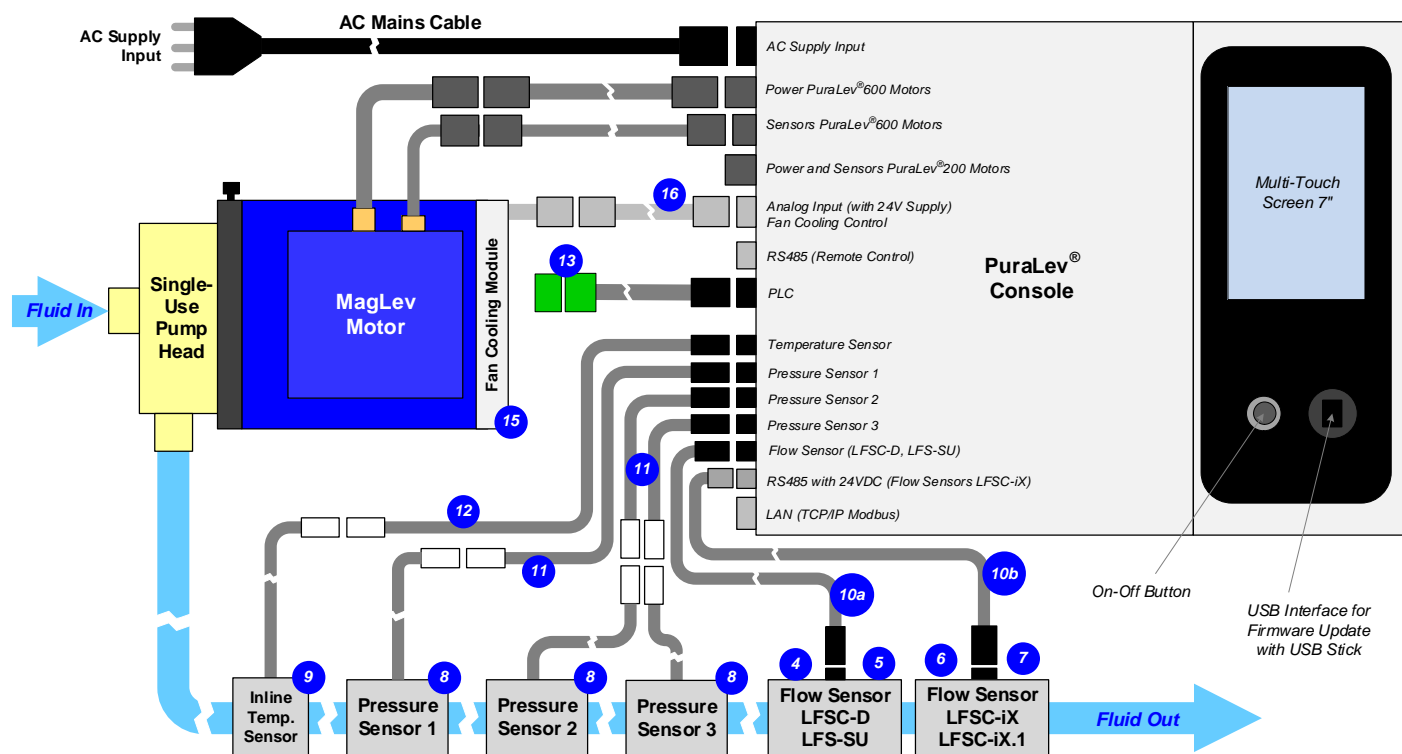**Figure 6:** *Extended monitoring configuration of console LCO-600 for advanced fluid handling in bioprocessing applications*

Note: The 4 rubber feet can be removed for mounting the console on 4 M5 x 9mm threads.

Cooling tunnel with watertight fan, sealed from console electronics

On-off button

① PuraLev® Console LCO-600.1

⑫ (USB Interface see Figure 8)
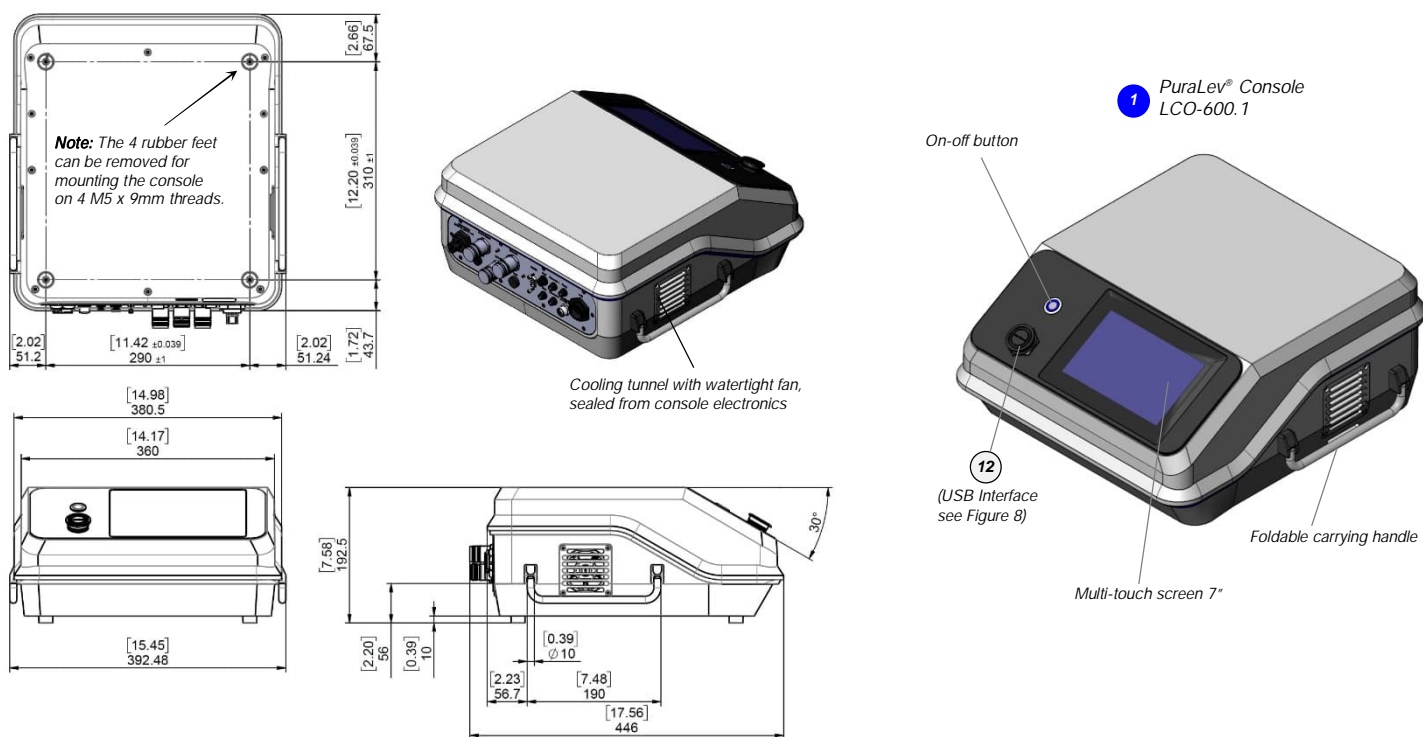
Multi-touch screen 7″

Foldable carrying handle

Figure 7: *Dimensions (in mm and [inch]) of PuraLev® console LCO-600.1*
Note 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
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	RS485 for future purposes.	Not active.
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 7*). 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 7*). 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).
10	RS485 24VDC Out	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*

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 7)

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	PVDF, PFA and EPDM (FDA, USP Class VI, BSE/TSE/animal-free) / Triclamp 1"
				Max. Flow / Max. Diff.-Pressure	75 liters/min (20 gallons/min) / 3.2 bar (46 psi)
				Sterilization Methods	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	Polypropylene (FDA, USP Class VI, BSE/TSE/animal-free) / Triclamp 1"
				Max. Flow / Max. Diff.-Pressure	75 liters/min (20 gallons/min) / 3.1 bar (45 psi)
				Sterilization Methods	Gamma radiation up to 40 kGy.
2c	Motor	LPM-600.5	100-10039	Housing	Epoxy (anti-corrosive) coated aluminum, waterproof (IP67)
				Cable / Connectors	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	PVDF, PFA and EPDM (FDA, USP Class VI, BSE/TSE/animal-free) / Triclamp ½"
				Max. Flow / Max. Diff.-Pressure	21 liters/min (5.5 gallons/min) / 2.4 bar (35 psi)
				Sterilization Methods	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	Polypropylene (FDA, USP Class VI, BSE/TSE/animal-free) / Triclamp or Barb ½"
				Max. Flow / Max. Diff.-Pressure	21 liters/min (5.5 gallons/min) / 2 bar (29 psi)
				Sterilization Methods	Gamma radiation up to 40 kGy.
3c	Motor	BSM-1.6	100-10063	Housing	ETFE (chemical resistant) coated aluminum, waterproof (IP67)
				Cable / Connectors	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.
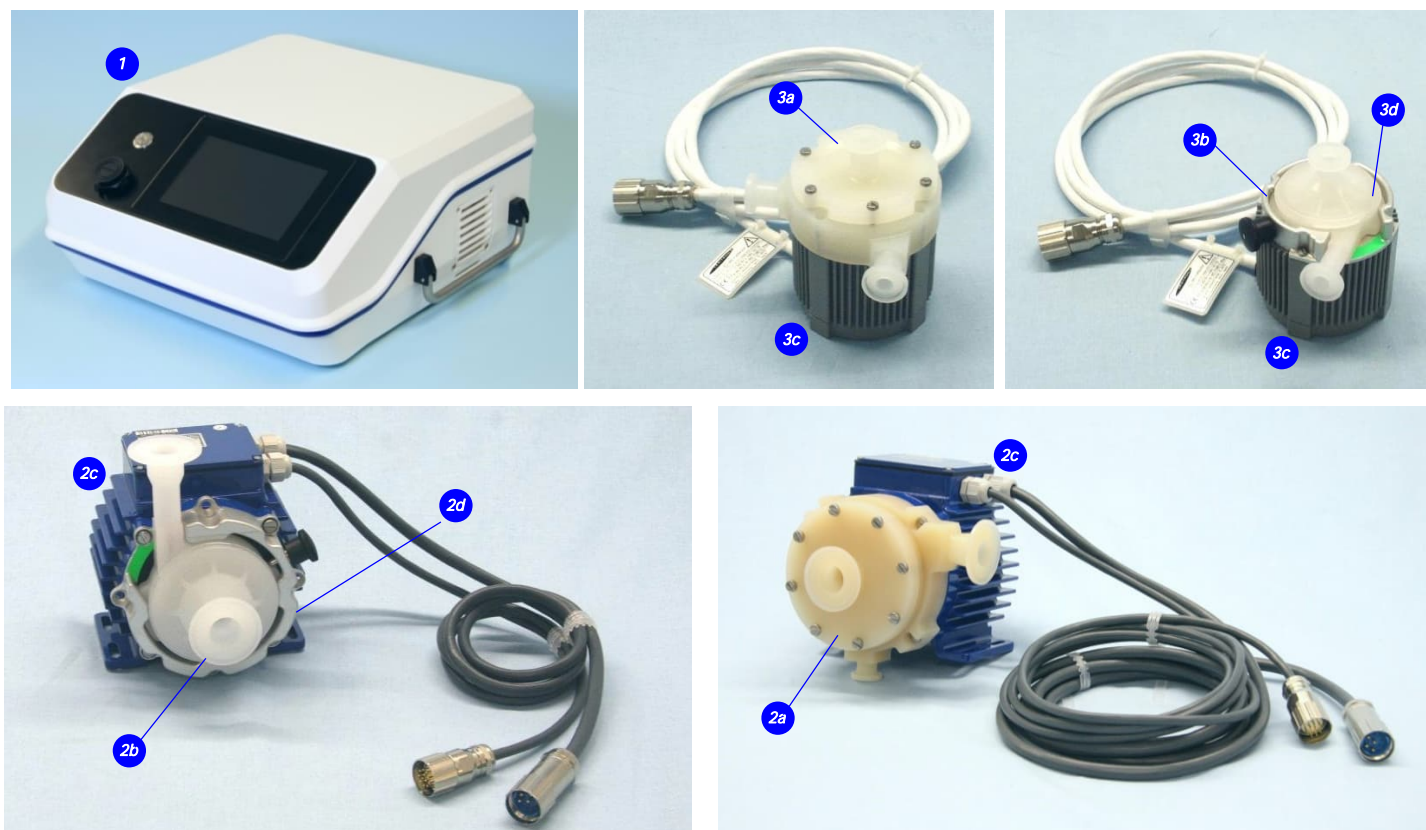

Figure 9: LCO-600 console with compatible motors and pump heads.

Pos.	Component	Article Name	Article #	Fitting	Wet Material	Note
4a		LFS-03SU-Z (0.8 lpm)	100-30375	Triclamp 3/8"		
4b		LFS-03SU-Z-SC1 (0.8 lpm) [1]	100-30418	Triclamp 3/8"		
4c		LFS-06SU-Z (8 lpm)	100-30377	Triclamp 3/8"		
4d		LFS-06SU-Z-SC1 (8 lpm) [1]	100-30394	Triclamp 3/8"	Polypropylene (FDA, USP Class VI,	See Levitronix® technical brochure of
4e	LEVIFLOW® Single-Use	LFS-10SU-Z (20 lpm)	100-30397	Triclamp 1/2"	BSE/TSE/Animal free)	LFS-SU single-use sensor series for
4f	Flow Sensors	LFS-10SU-Z-SC1 (20 lpm) [1]	100-30408	Triclamp 1/2"	Gamma stable for up to 40 kGy.	more detailed specifications and for
4g		LFS-15SU-Z (50 lpm)	100-30412	Triclamp 1"		other configurations and sensor sizes.
4h		LFS-15SU-Z-SC1 (50 lpm) [1]	100-30431	Triclamp 1"		
4i		LFS-20SU.1-Z (80 lpm)	100-30483	Triclamp 1"		
4j		LFS-20SU-Z-SC1 (80 lpm) [1]	100-30464	Triclamp 1"		

Table 3: Specification of LEVIFLOW® single-use high-precision (1% accuracy of reading) flow sensors compatible with LCO-600 console.
Note 1: Extended calibration for wider 1% accuracy range.   Note 2: All flow sensors available with gamma irradiation (see LEVIFLOW® product literature for more details).

Pos.	Component	Article Name	Article #	Calibrated Liquid	Tubing	Tube: ID x OD	Note
5a		LFSC-05D-001 (1 lpm)	100-30407			1/8" x 1/4"	
5b	LEVIFLOW® Clamp-On	LFSC-08D-001 (4 lpm)	100-30396		Silicone	1/4" x 3/8"	
5c	Flow Sensors LFSC-D	LFSC-12D-007 (20 lpm)	100-30390	Water @ 20°C/37°C	CFlex® [1]	3/8" x 9/16"	
5d		LFSC-22D-005 (80 lpm)	100-30391			3/4" x 1"	
5e		LFSC-30D-001 (160 lpm)	100-30414			1" x 13/8"	See Levitronix® technical brochures of
6a		LFSC-i06X-002 (1 lpm)	100-30485			1/8" x 1/4"	LFSC-D and LFSC-iX of clamp-on
6b		LFSC-i10X-001 (4 lpm)	100-30477		Silicone	1/4" x 3/8"	sensor series for more detailed
6c	LEVIFLOW® Clamp-On	LFSC-i16X-001 (20 lpm)	100-30482		CFlex®	3/8" x 5/8"	specifications and other sensor sizes.
6d	Flow Sensors LFSC-iX	LFSC-i19X-001 (50 lpm)	100-30479	Water @ 20°C/37°C	TPE	1/2" x 3/4"	
6e		LFSC-i25X-001 (80 lpm)	100-30480			3/4" x 1"	
6f		LFSC-i35X-001 (160 lpm)	100-30481			1" x 13/8"	

Table 4: Specification of LEVIFLOW® clamp-on flow sensors for flexible tubings compatible with LCO-i100 console.
Note 1: C-Flex® is a registered trademark of Saint Gobain Performance Plastics, 2015. All rights reserved.

Pos.	Component	Article Name	Article #	Calibrated Liquid	SU Flow Pipe	Fitting, ID	Note
7a		LFSC-i05X.1-001 (0.2/1 lpm)	100-30490		LFP-05SU / 05SU.1	Barb, 1/8"	
7b		LFSC-i09X.1-001 (4 lpm)	100-30491		LFP-09SU	Barb, 1/4"	See relevant Levitronix® technical
7c		LFSC-i13X.1-001 (20 lpm)	100-30492		LFP-13SU	Barb, 3/8"	brochures for more details on flow
7d	LEVIFLOW® Clamp-On	LFSC-i16X.1-001 (50 lpm)	100-30498	Water @ 20/37°C	LFP-16SU	Barb, 1/2"	pipes, specifications, other sensor sizes
7e	Flow Sensors LFSC-iX.1	LFSC-i20X.1-001 (80 lpm)	100-30499		LFP-20SU	Triclamp / 3/4"	and configurations.
7f		LFSC-i23X.1-001 (160 lpm)	100-30509		LFP-23SU / 23SU.1	Triclamp / 7/8+1"	
7g		LFSC-i36X.1-001 (320 lpm)	100-30487		LFP-36SU	Triclamp / 13/8"	

Table 5: Specification of LEVIFLOW® clamp-on flow converters LFSC-ixxX.1 (for single-use flow pipes of the LFP-SU series) compatible with LCO-i100 console.
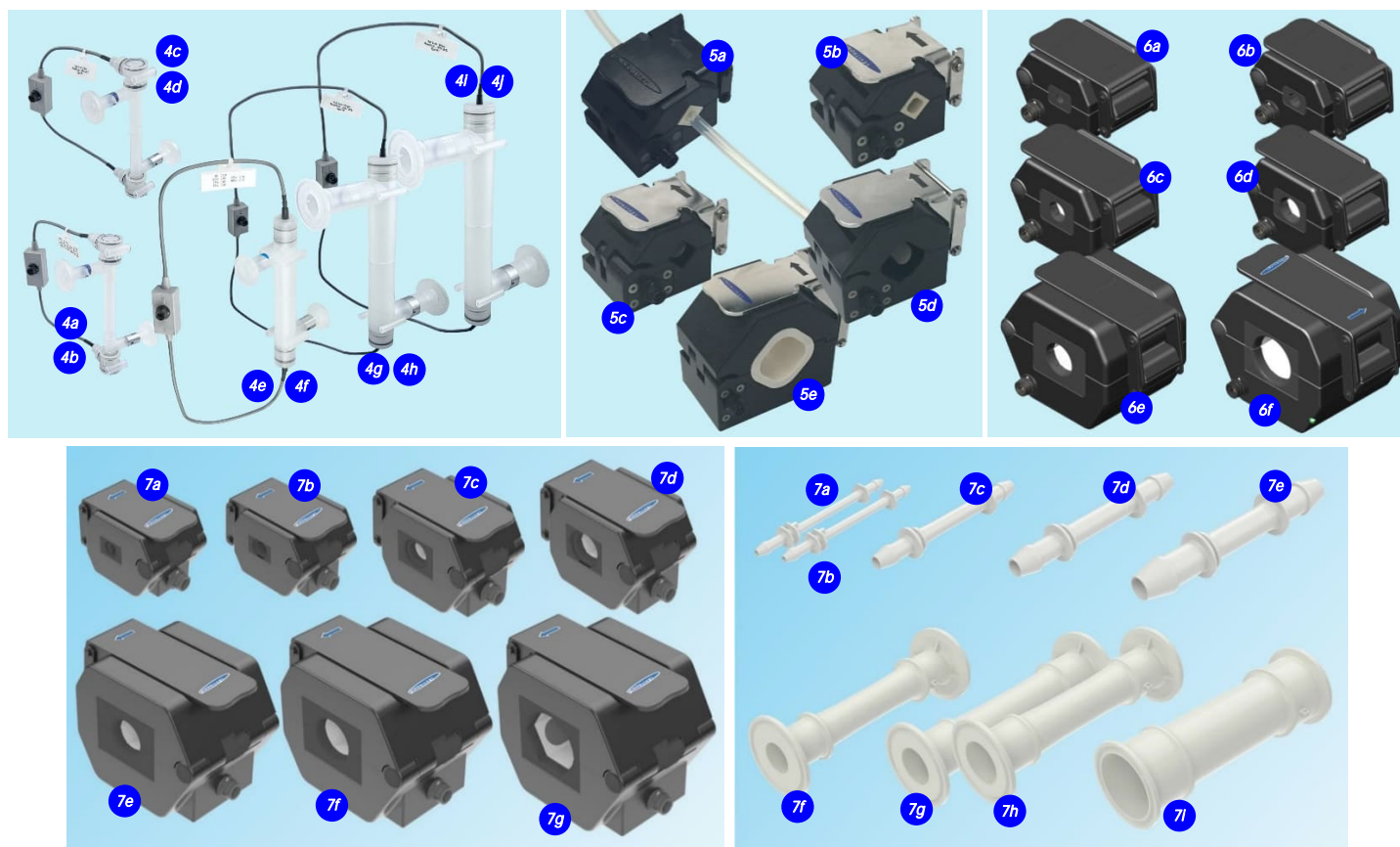

Figure 10: LEVIFLOW® flow sensors compatible with LCO-i100 console.

Pos.	Component	Article Name	Article #	Fittings	Specification	Wet Material	Note
8a 8b 8c 8d	PendoTECH Single-Use Pressure Sensors	PREPS-N-038 PREPS-N-5-5 PREPS-N-1-1 PREPS-N-15-15	190-10375 190-10373 190-10374 190-10478	3/8" Hose Barb 1/2" Sanitary Clamp 1" Sanitary Clamp 1.5" Sanitary Clamp [1]	Pressure range: -0.79 to 5.2 bar	Polysulfone	*See PendoTECH literature for more detailed specifications.*
9a 9b	Single-Use Temperature Sensor	TEMPS-N-038 TEMPS-N-050	190-10377 190-10376	3/8" Hose Barb 1/2" Hose Barb	Temp. range: 0 – 70°C	Polysulfone Stainless steel	*See PendoTECH literature for more detailed specifications.*

Table 6: *Specification of single-use pressure and temperature sensors compatible with console LCO-i100.*
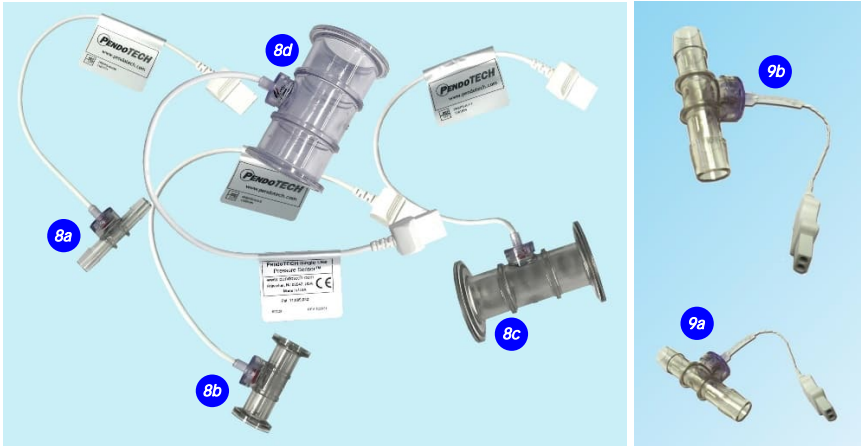*Note 1: ID is 13/8".*

Figure 11: *Pressure and temperature sensors compatible with LCO-i100 console.*

Pos.	Component	Article Name	Part #	Characteristics	Special Feature / Description
10a	LEVIFLOW® Interconnect Cable	LFI-C.1-30 (3m)	190-103**08**	Cable Jacket Material Main Purpose	*PVC* *Connection between flow sensor LFSC-D/LFS-SU and console*
10b	IP Cable Signal 4 Wires	ICS-3.1-30 (3m)	190-10447	Cable Jacket Material Main Purpose	*PUR* *Connection between LFSC-iX/iX.1 flow sensors and console.*
11	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.*
12	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.*
13	IPS Cable Signal 12 Wires	ICS-2.1-50 (5 m)	190-10347	Cable Material / Wires Connection In / Out Main Purpose	*PVC jacket / 12x 0.14 mm^2 and shielding* *Connector with screw type plug for open wire connection / Circ. Hirose* *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	190-10336 190-10337 190-10338 190-10339 190-10340	Country Country Country Country Country Cable Specifications	*US, Canada* *Germany, Denmark, Norw., Finland, Belgium, Netherland, Sweden, Austria* *Japan* *Switzerland* *United Kingdom* *Length = 3m, black color, watertight connector on console side*
15	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, circ. sealed M12 connector (PP).* *24 VDC, 3.4 W / IP-65 (fan is IP68 rated).*
16	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.*
17	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).*
18	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 7: *Specification of standard cables and other accessories*
Note 1: Other countries on request.

Figure 12: *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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