PuraLev®
Pump Console for Life Science Applications

LCO-i100

For PuraLev® i30SU/MU & PuraLev® i100SU/MU
& PuraLev® i600SU

Advanced Ultrapure Fluid Handling!

PuraLev® i600SU Pump System with Single-Use Pump Head

PuraLev® i30SU/MU Pump System with Single-Use and Multi-Use Pump Head

PuraLev® i100SU/MU Pump Systems with Single-Use and Multi-Use Pump Head

PuraLev® Fluid Handling Console LCO-i100

PendoTECH Single Use Pressure Sensors™

PendoTECH Single Use Temperature Sensors™

LEVIFLOW® Clamp-On Flow Sensors LFSC-iX Series

LEVIFLOW® Clamp-On Flow Sensors LFSC-D Series

LEVIFLOW® High Precision Single-Use Flow Sensors

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 or pressure control 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 or pressure control (or control with custom signal), system configuration and monitoring of various sensors. The console can operate the pump drivers of the PuraLev® i30, PuraLev® i100 or PuraLev® i600 pump system. 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 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-touchscreen.
- Data collection capabilities.
- Easily configurable and customizable by software.
- Custom recipe control for process automation.
- Configurable user rights.

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, microfiltration, ultrafiltration, diafiltration, sterile filtration.
- Mixing, blending, dilution and filling.
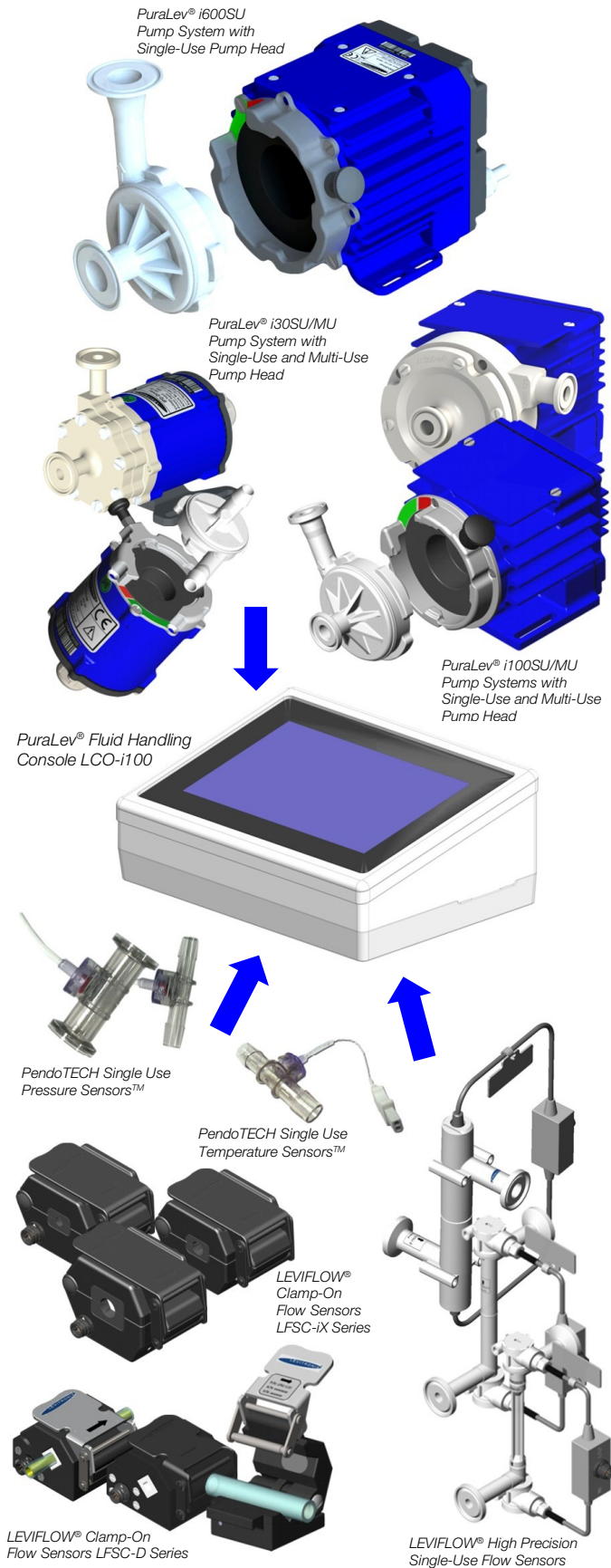- Filter integrity testing.

STAND-ALONE PUMP SYSTEM CONFIGURATION

With the standard stand-alone pump system configuration, as illustrated in *Figure 8* (for *PuraLev® i30* and *i100* pump system) and *Figure 9* (for *PuraLev® i600* pump system), 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-touchscreen and is controlled by the integrated PC.

The USB interface on the rear 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.
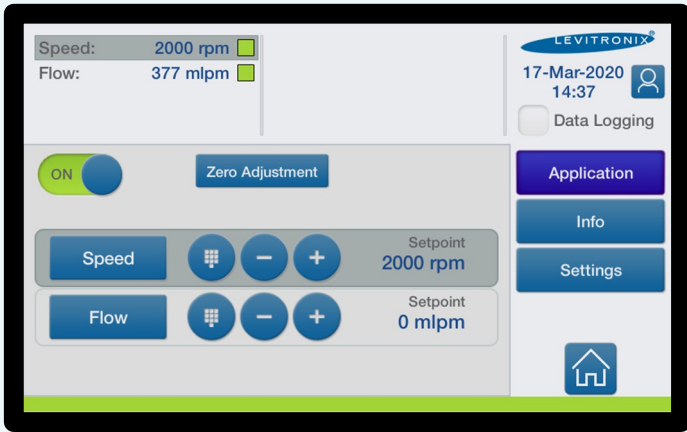
Figure 2: *Start-up menu of touch screen*

ADVANCED FLUID HANDLING CONFIGURATION

Figure 10 illustrates the extended monitoring capabilities of the *PuraLev®* console for advanced fluid handling applications such as depth filtration, microfiltration, ultrafiltration, diafiltration, tangential flow filtration (TFF), sterile filtration or pressure control for filling stations.

The *PuraLev®* console includes two flow sensor connections and gauge amplifiers for connection of up to three single-use pressure sensors and an additional circuit for the connection of a temperature sensor. Furthermore, there is a generic analog input for connection of further external signals.
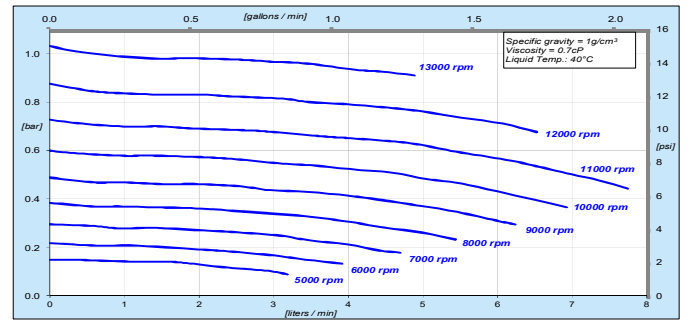
Figure 3: *Pressure/flow curves with PuraLev® i30SU (DCP-30.1/2 pump heads)*
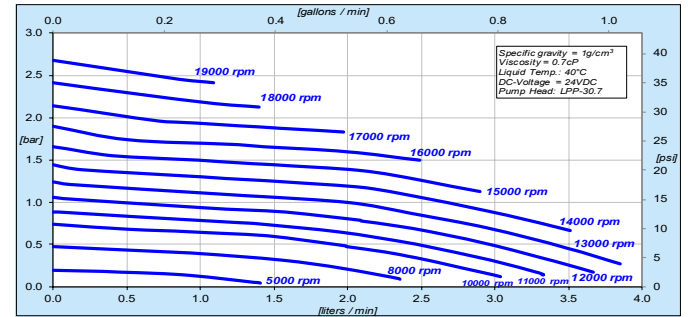
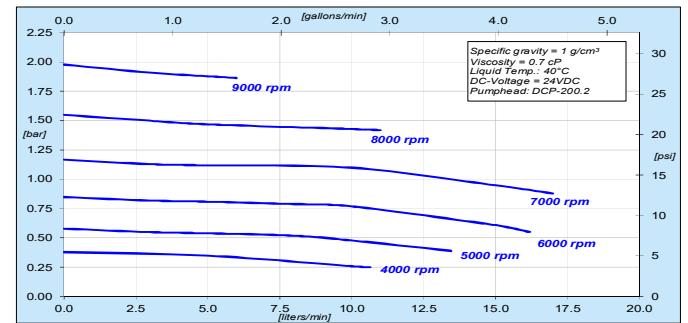**Figure 4:** *Pressure/flow curves with PuraLev® i30MU (LPP-30.7 pump head)*

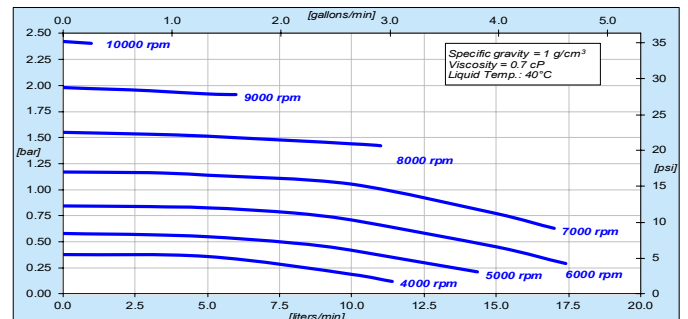**Figure 5:** *Pressure/flow curves with PuraLev® i100SU (DCP-200.2/3 pump heads)*

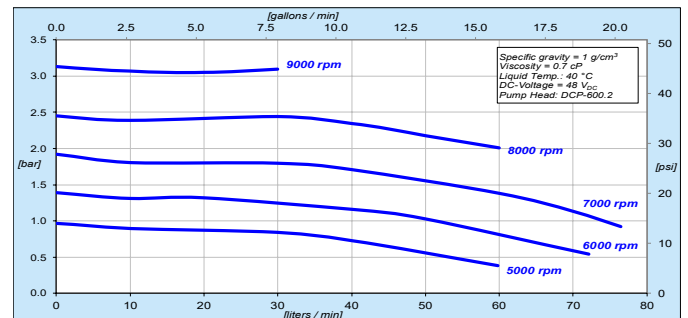**Figure 6:** *Pressure/flow curves with PuraLev® i100MU (LPP-200.16/17 pump heads)*

Figure 7: *Pressure/flow curves with PuraLev® i600SU (DCP-600.2 pump head)*

Flow Sensor LFSC-D LFS-SU

Fluid Out

5 **6**

Multi-Use pump head option for PuraLev-i30/100

3b

10a

1 **PuraLev® Console**

USB Interface for Firmware Update with USB Stick

2a

3a

Single-Use Pump Head

Flow Sensor

Fluid In

2b

3d

Note: Direct driver connection to console possible.

Integrated Pump Driver OEM Model (with Connector)

Multi-Touch Screen 7"

2c **3d**

Pump Head Socket
(Necessary for DCP single-use pump heads)

15a **15b**

13

Power to Integrated Driver

15c

AC Supply Input

AC/DC Supply

DC Supply Input

AC Mains Cable

On-Off Button

Figure 8: Stand-alone pump system configuration of LCO-i100 console and PuraLev® i30/100 pump systems with flow control or flow monitoring

Flow Sensor LFSC-D LFS-SU

Fluid Out

5 **6**

10a

1 **PuraLev® Console**

USB Interface for Firmware Update with USB Stick

4b

4a

Single-Use Pump Head

Integrated Pump Driver OEM Model (with Connector)

Flow Sensor

Fluid In

Multi-Touch Screen 7"

4c

Pump Head Socket
(Necessary for DCP single-use pump heads)

18

Power to Driver

Y-Split Box
(Integrated DC/DC Converter)

DC Supply Input (with RS485)

17

16b

On-Off Button

16a **AC/DC Supply**
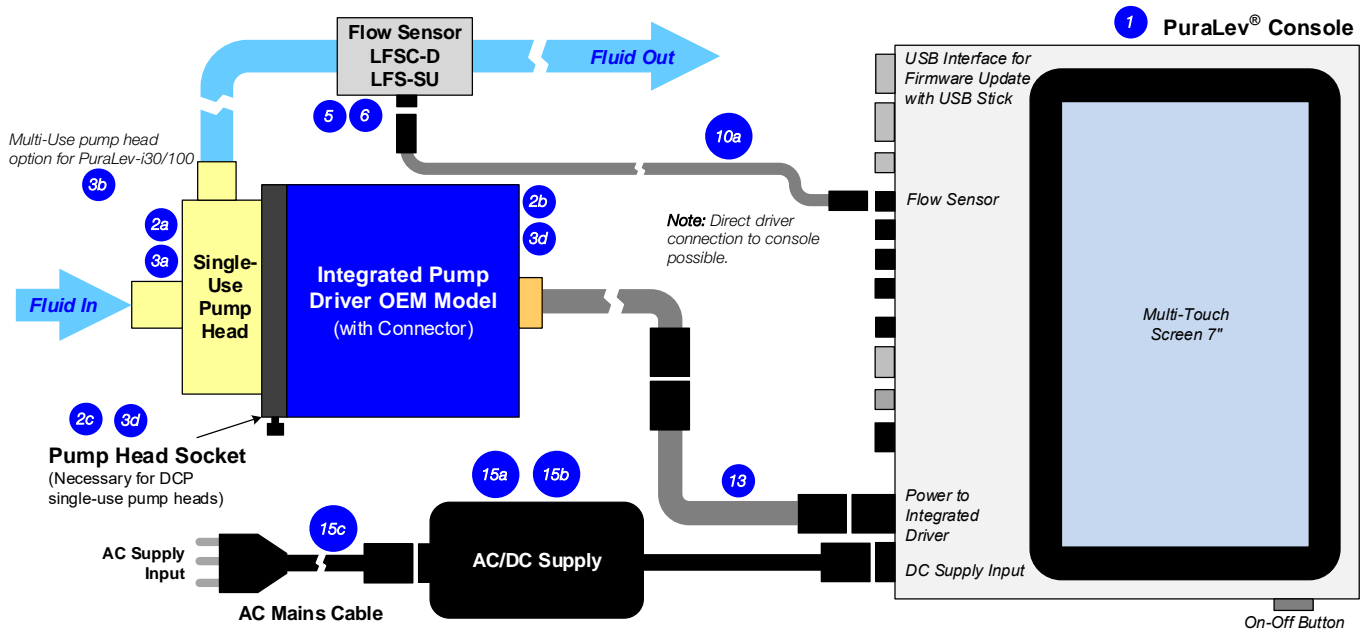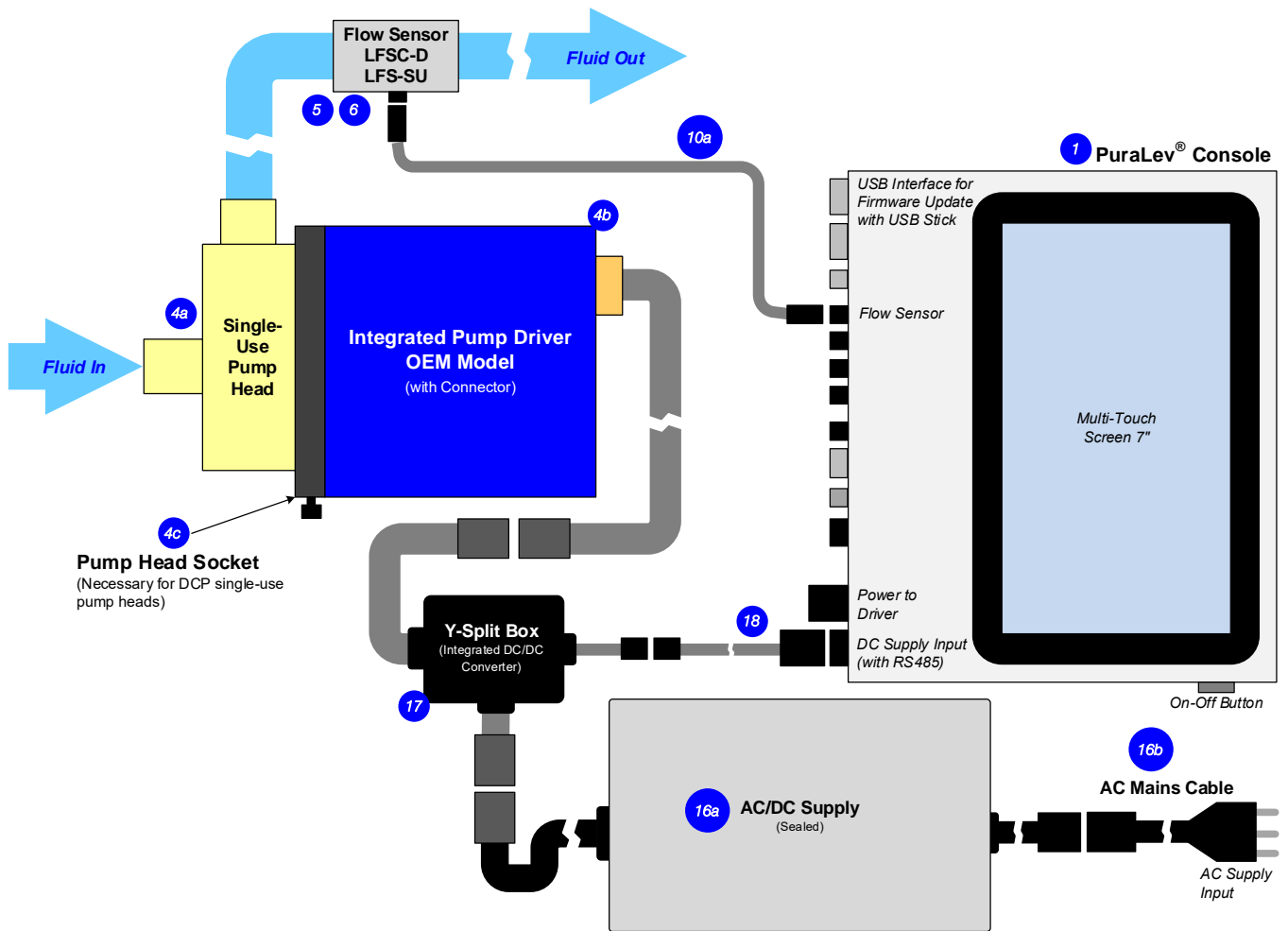(Sealed)

AC Mains Cable

AC Supply Input

Figure 9: Stand-alone pump system configuration of LCO-i100 console and PuraLev® i600 pump system with flow control or flow monitoring

Figure 10: *Extended monitoring configuration of console LCO-i100 for advanced fluid handling in bioprocessing applications*
Note 1: For PuraLev® i600 pump system the power supply and console connection concept shown in Figure 9 has to be used.

Multi-touch screen 7"
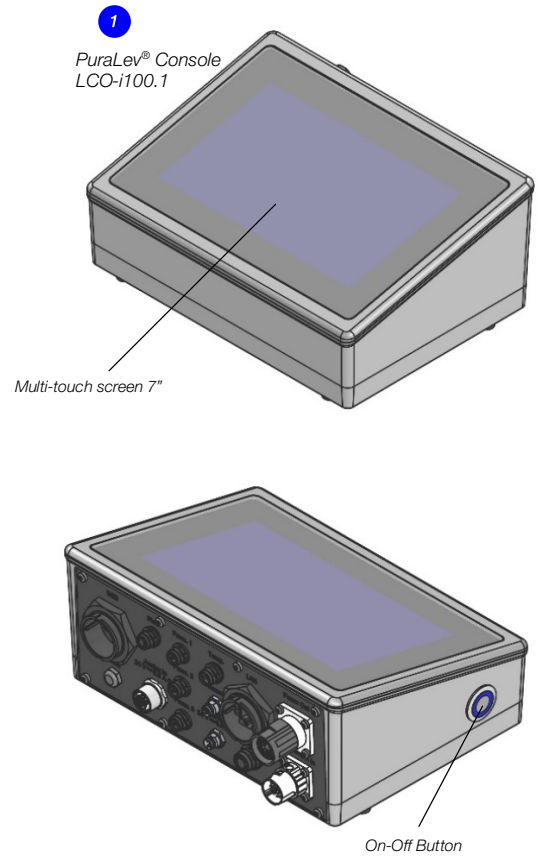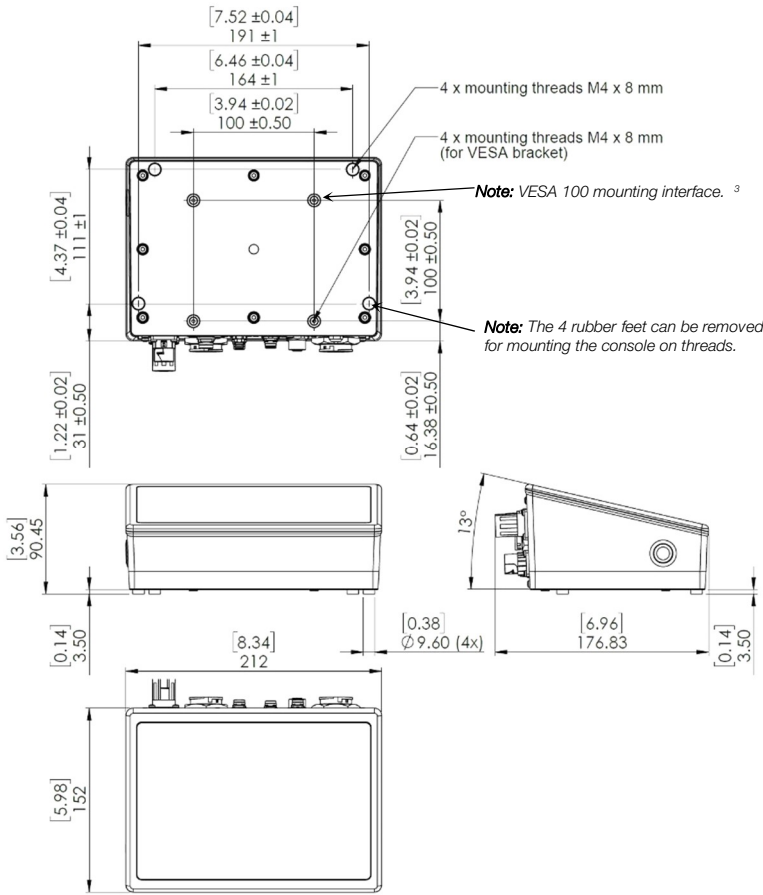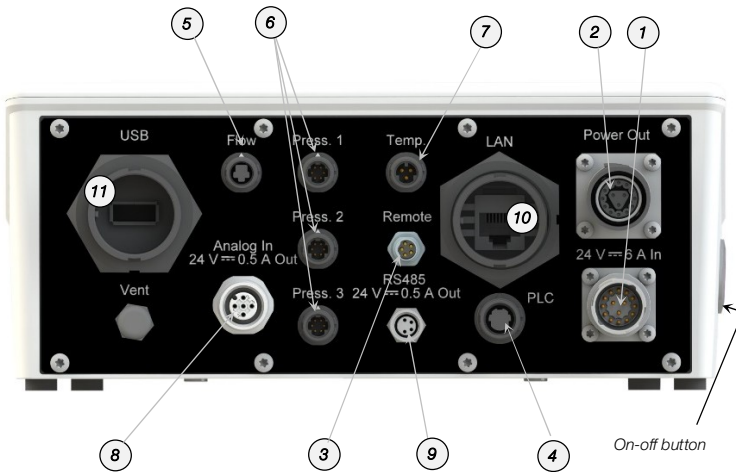
① PuraLev® Console LCO-i100.1

On-Off Button

Figure 11: *Dimensions of PuraLev® console LCO-i100.1*

Note 1: Dimensions in mm and [inch].   Note 2: Mounting holes are different for units older than 2018/19.   Note 3: Not available on units older than 2018/19.

#	Interface Connector	Description	Specification/Purpose/Note
1	DC Supply Connector	Single phase DC connection.[3]	24 VDC with external AC/DC supply. Software configurable Autoresume function. [1] *RS485 for connection of PuraLev-i600 with Y split cable..*
2	Pump Driver	Power connector for IPD-30 and IPD-100 drivers.	--
3	Remote [1]	RS485 for future purposes.	Not active.
4	PLC	Remote control. Configurable designations.	2x digital outputs (outputs software configurable to 24VDC [1]), 2x digital inputs, 1 analog output (4-20 mA), 1x analog input (4-20mA) Note: All signals isolated.
5	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.
6a 6b 6c	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.
7	Temperature Sensor	Connection for 1 single-use temperature sensor.	Needs adaptor cable (see *Table 6*). Circular 6 pin snap-in connector. Purpose: Temperature monitoring.
8	Analog In 24VDC Out	Multi purpose sensor input.	Current input 4-20 mA, 24 VDC supply.
9	RS485 24VDC Out [1]	Sensor input for new clamp-on flow sensors LFSC-iX.	RS485 bus with 24 VDC supply.
10	LAN Interface	TCP/IP Modbus	For connection to OPC devices or *Levitronix® Service Software*.
11	USB Interface	Connection of USB stick.	*Connection with protective cover. Purpose: Data collection and software update.*

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

Figure 12: *Interfaces of PuraLev® console LCO-i100.1*

Note 1: Not available on units older than 2018/19.   Note 2: Location of connectors is different for units older than 2018/19.   Note 3: Not available for units older than 2020.

ORDER INFORMATION

Pos.	Component	Article Name	Article #	Characteristics	Value / Feature
1	PuraLev® Console	LCO-i100.1-01	100-30501	Supply Voltage / Power	*24 VDC with 50 W or 160 W supply (see Table 6)*
				Housing Rating / Weight	*IP65 ² / 1.6 kg*
				Interfaces	*Multi-touch screen 7", 3 pressure sensors, 2 flow sensors, 1 temp. sensor PLC (2 digital in/outputs, 1 analog in/output), LAN, USB*
				Pump Motors	*PuraLev® i30/ i100 integrated driver. PuraLev® i600SU with relevant Y cable. ³ (Only one driver can be connected at the same time).*
				Certifications	*CE, IECEE CB scheme, ETL (NRTL) listed. ²*

Table 1: *Basic specifications of standard LCO-i100 console.*

Note 1: AC/DC power supply and AC mains cable for various countries to be ordered according to Table 6.   Note 2: Tested and designed for IP66. Not available on units older than 2018/19.
Note 3: Hardware compatibility for PuraLev-i600SU is not available for units older than 2020.

Pos.	Component ²	Article Name	Article #	Characteristics	Value / Feature
2a	Single-Use Pump Head	DCP-30.2 (Barb) ¹ ³ DCP-30.1 (Triclamp) ¹ (Needs pump head socket.)	100-90968 100-90959	Wet Materials Max. Flow / Max. Diff.-Pressure Sterilization Methods	*PP (FDA, USP Class VI, BSE/TSE/animal-free) / Barb or Triclamp 3/8"* *7.7 liters/min (2 gallons/min) / 1.0 bar (14.5 psi)* *Gamma radiation up to 40 kGy.*
2b	Multi-Use Pump Head	LPP-30.7 (no drain port)	100-91557	Wet Materials / Fittings Max. Flow / Max. Diff.-Pressure Sterilization Methods	*PEEK, PTFE and EPDM (FDA, USP Class VI, BSE/TSE/animal-free) / Triclamp 3/8")* *3.9 liters/min (1 gallons/min) / 2.7 bar (39 psi)* *CIP (clean in place), Autoclaving*
2c	Driver	IPD-30.8-03-02 (SU) IPD-30.8-03-06 (MU) (MBP-i30.1 included)	100-10104 100-10212	Housing Cable / Connectors	*Epoxy (anti-corrosive) coated aluminum, IP65 (tested for IP67)* *1 x 0.3m cable with PVC jacket / circular connector*
2d	Pump Head Socket	PHS-i30.1	100-90947	Mounting Type / Material	*Bayonet mount with locking pin made of anodized aluminum*
3a	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	*PP (FDA, USP Class VI, BSE/TSE/animal-free) / Triclamp or Barb ½"* *17.4 liters/min (4.6 gallons/min) / 2 bar (29 psi)* *Gamma radiation up to 40 kGy.*
3b	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"* *17.4 liters/min (4.6 gallons/min) / 2.4 bar (35 psi)* *CIP (clean in place), Autoclaving*
3c	Driver	IPD-100.3-03-02 (SU) IPD-100.3-03-03 (MU)	100-10105 100-10137	Housing Cable / Connectors	*Epoxy (anti-corrosive) coated aluminum, IP65 (tested for IP67)* *1x 0.3m cable with PVC jacket / circular connector*
3d	Pump Head Socket	PHS-i100.1	100-91053	Mounting Type / Material	*Bayonet mount with locking pin made of anodized aluminum*
4a	Single-Use Pump Head	DCP-600.2 (Triclamp) ¹ (Needs pump head socket.)	100-90784	Wet Materials Max. Flow / Max. Diff.-Pressure Sterilization Methods	*PP (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.*
4b	Driver	IPD-600.3-30-02	100-10197	Housing Cable / Connectors	*Epoxy (anti-corrosive) coated aluminum, IP65 (tested for IP67)* *1x 3m cable with PVC jacket / circular connector*
4c	Pump Head Socket	PHS-600.1	100-90696	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-i100 console.*

Note 1: Gamma irradiation option available.   Note 2: See Levitronix® technical brochures of PuraLev® i30SU/i30MU/100SU/i100MU/600SU for detailed specifications and other configurations.   Note 3: Sterile fitting options available.

Figure 13: *LCO-i100 console with compatible drivers and pump heads*

Pos.	Component	Article Name	Article #	Fitting	Wet Material	Note
5a		LFS-03SU-Z (0.8 lpm)	100-30375	Triclamp 3/8"		
5b		LFS-03SU-Z-SC1 (0.8 lpm) [1]	100-30418	Triclamp 3/8"		
5c		LFS-06SU-Z (8 lpm)	100-30377	Triclamp 3/8"		
5d		LFS-06SU-Z-SC1 (8 lpm) [1]	100-30394	Triclamp 3/8"	Polypropylene (FDA, USP Class VI, BSE/TSE/Animal free)	See Levitronix® technical brochure of LFS-SU single-use sensor series for more detailed specifications and for other configurations and sensor sizes.
5e	LEVIFLOW® Single-Use Flow Sensors	LFS-10SU-Z (20 lpm)	100-30397	Triclamp 1/2"	Gamma stable for up to 40 kGy.	
5f		LFS-10SU-Z-SC1 (20 lpm) [1]	100-30408	Triclamp 1/2"		
5g		LFS-15SU-Z (50 lpm)	100-30412	Triclamp 1"		
5h		LFS-15SU-Z-SC1 (50 lpm) [1]	100-30431	Triclamp 1"		
5i		LFS-20SU.1-Z (80 lpm)	100-30483	Triclamp 1"		
5j		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
6a		LFSC-05D-001 (1 lpm)	100-30407			1/8" x 1/4"	
6b	LEVIFLOW® Clamp-On	LFSC-08D-001 (4 lpm)	100-30396	Water @ 20°C/37°C	Silicone	1/4" x 3/8"	
6c	Flow Sensors LFSC-D	LFSC-12D-007 (20 lpm)	100-30390		CFlex® [1]	3/8" x 9/16"	
6d		LFSC-22D-005	100-30391			3/4" x 1"	See Levitronix® technical brochures of LFSC-D and LFSC-iX of clamp-on sensor series for more detailed specifications and other sensor sizes.
7a		LFSC-i06X-002 (1 lpm)	100-30485			1/8" x 1/4"	
7b		LFSC-i10X-001 (4 lpm)	100-30477		Silicone	1/4" x 3/8"	
7c	LEVIFLOW® Clamp-On Flow Sensors LFSC-iX	LFSC-i16X-001 (20 lpm)	100-30482	Water @ 20°C/37°C	CFlex®	3/8" x 5/8"	
7d		LFSC-i19X-001 (50 lpm)	100-30479		TPE	1/2" x 3/4"	
7e		LFSC-i25X-001 (80 lpm)	100-30480			3/4" x 1"	

Table 4: *Specification of LEVIFLOW® clamp-on flow sensors 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 #	Fittings	Specification	Wet Material	Note
8a		PREPS-N-038	190-10375	3/8" Hose Barb	Pressure range:		See PendoTECH literature for more detailed specifications.
8b	PendoTECH Single-Use Pressure Sensors	PREPS-N-5-5	190-10373	3/4" Sanitary Clamp	-0.48 to 5.2 bar	Polysulfone	
8c		PREPS-N-1-1	190-10374	1" Sanitary Clamp			
9a		TEMPS-N-038	190-10377	3/8" Hose Barb	Temp. range:	Polysulfone	See PendoTECH literature for more detailed specifications.
9b	Single-Use Temperature Sensor	TEMPS-N-050	190-10376	1/2" Hose Barb	0 – 70°C	Stainless steel	
9c		TEMP-S-DP	190-10378	Dip Probe			

Table 5: *Specification of single-use pressure and temperature sensors compatible with console LCO-i100.*
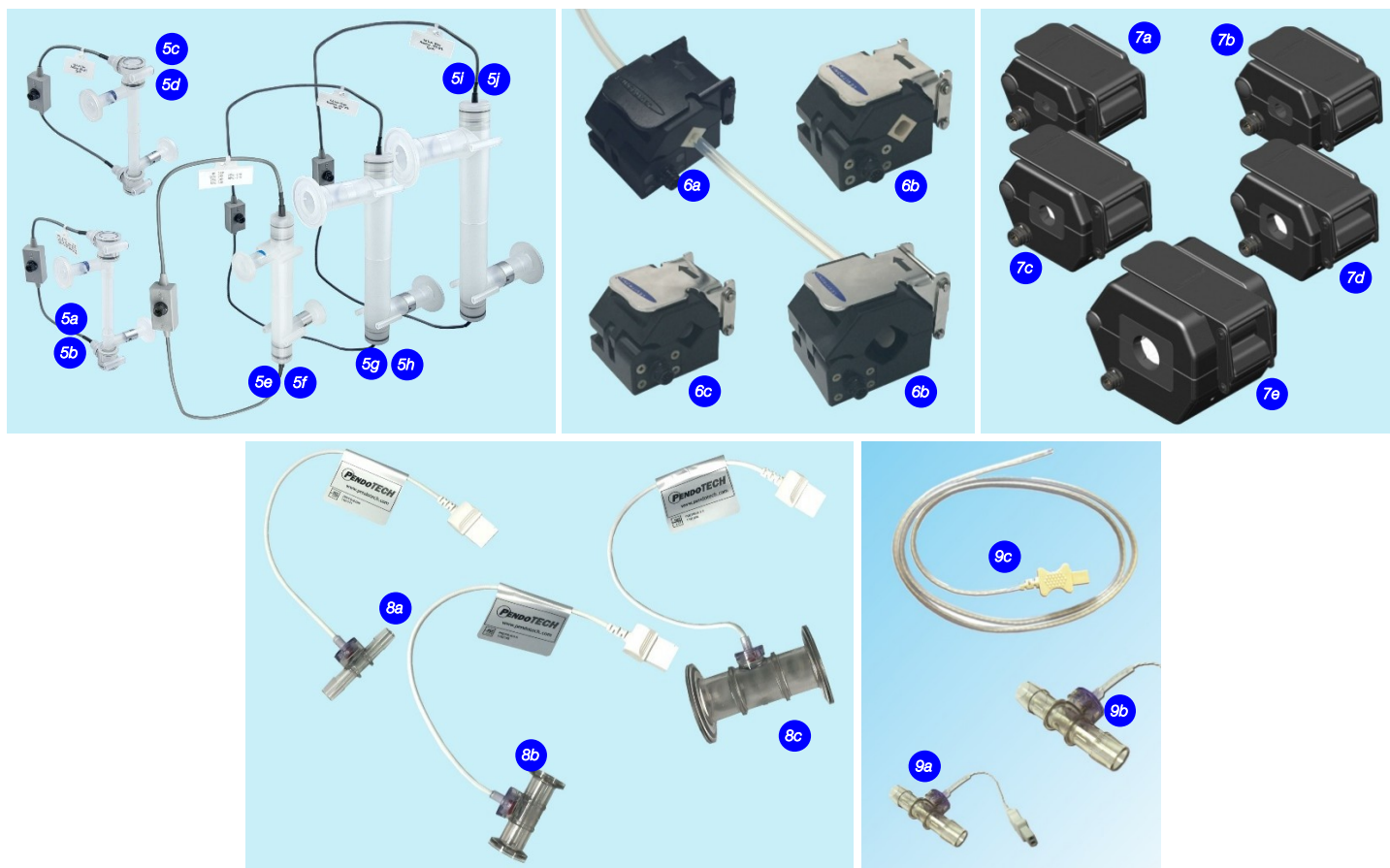

Figure 14: *Sensors compatible with LCO-i100 console.*

Pos.	Component	Article Name	Part #	Characteristics	Special Feature / Description
10a	LEVIFLOW® Interconnect Cable	LFI-C.1-30 (3m)	190-10308	Cable Jacket Material Main Purpose	PVC *Connection between LFSC-D and LFS-SU flow sensors 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 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 temp. sensors to console. For barb sensors and dip probe.*
13	IP Adaptor Cable Hybrid	ICH-1.2-30 (3m)	190-10329	General Specifications Main Purpose	*Circular console and driver side connector, watertight.* *Extend cable of drivers.*
14	IP 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 mm² and shielding* *Connector with screw type plug for open wire connection / Circular Hirose type* *General connection to PLC of console.*
15a	Desktop AC/DC Power Supply	VEC50US24 IC915	100-40019	Voltage Output / Input Basic Dimensions Certifications, Standards Note	*24VDC, 50W / 90 – 264 VAC, 47-63 Hz* *116 x 52 x 31 mm* *IEC60950-1, EN60950-1, UL/cUL60950-1* *Connector for direct connection to supply of console with cable length 1.2 m.*
15b	Desktop AC/DC Power Supply	GST160A24-R7B IC915	100-40020	Voltage Output / Input Basic Dimensions Safety Approvals Note	*24VDC, 160W / 85 – 264 VAC, 47-63 Hz* *175 x 72 x 35 mm* *UL60950-1, CSA C22.2, TUV EN60950-1* *Connector for direct connection to supply of console with cable length 1.2 m.*
15c	AC Mains Cables (for Desktop power supply)	AMC-1.1 (2m) / AMC-1.2 (2.5m) AMC-1.3 / AMC-1.4 (2.5m) AMC-1.5 (2.5m)	190-10331 / 32 190-10333 / 34 190-10335	Country Country Country	*US, Canada / Germ., Denm., Norw., Finl., Belg., Netherland, Sweden, Austria* *Japan / Switzerland* *United Kingdom*
16a	AC/DC Power Supply (for Stand-Alone configuration)	DDP-600-US48-SC	100-40026	Voltage Output / Input Basic Dimensions Certifications, Standards	*48 VDC (600 W) / 100 – 277 VAC* *250 x 125 x 60 mm / 2 x 200 mm* *CB, CSA/UL, IP65*
16b	AC Mains Cables (for power supply 15a)	AMC-2.1 / AMC-2.2 AMC-2.3 / AMC-2.4 AMC-2.5	190-10336 /37 190-10338 /39 190-10338 /40	Country Country Country Cable Specifications	*US, Canada / Germ., Denm., Norw., Finl., Belg., Netherl., Sweden, Austria* *Japan / Switzerland* *United Kingdom* *Length = 3m, black color, watertight connector on power supply side*
17	IP Y-Split Cable	ICY-4.1-02	190-10476	Specifications Main Purpose	*PVC cable jacket with PC split box, PUR sealing, circular type connectors.* *Integrated DC/DC converter for 48 VDC to 24 VDC / 20 W.* *Splits cable to connect power supply (3a) and console to driver IPD-600.*
18	IP Cable Signal 4 Wires	ICS-1.5-30 (3 m)	190-10468	Specifications Main Purpose	*PVC jacket, connectors: circular type to circular type.* *Fieldbus connection of driver from Y-split cable to console.*

Table 6: *Specification of standard cables and AC/DC desktop supplies for console.*

Figure 15: *Accessories (Cables and AC/DC supplies).*

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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