

# elab<sup>®</sup> essential

Compact User-Friendly  
Bioreactor



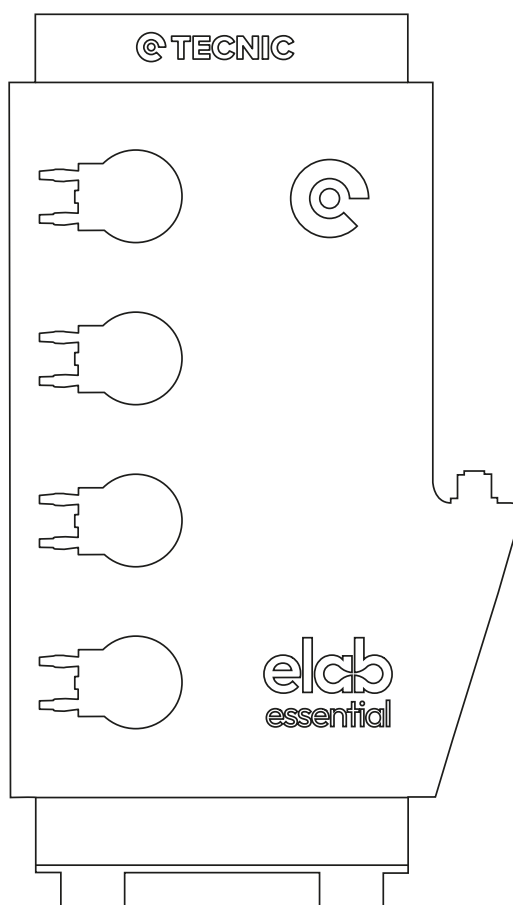
# eLAB® Essential

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The eLAB® Essential is a compact, easy-to-use bioreactor designed for carefree operation in laboratory environments. It focuses on key functionalities, ensuring high reliability and efficiency, allowing you to concentrate on research or production without distractions. It has distinctive features such as the ability to assign colors to different projects for quick identification, and a compact design that weighs less than 5 kg and is only 20 cm wide, optimising space in the lab without compromising functionality.

The eOS operating system offers an intuitive and simple user interface that integrates seamlessly with the bioreactor, making laboratory operations more efficient. Among its technical specifications, it includes 4 addition pumps for multiple solutions, a wide range of vessel volumes (from 0.5 to 5L), and is ready for use with single-use or multipurpose vessels. In addition, it provides full control over pH, temperature, agitation, foam and pO<sub>2</sub> with cascade strategies.

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## Basic configuration - Microbial

| <b>Control configuration</b>                     |  |
|--|--|
| Temperature control                              | Included                                       |
| DO control (simple cascade controller)           | Included                                       |
| Stirrer speed control                            | Included                                       |
| pH control via addition of acid or base          | Included                                       |
| Foam control                                     | Included                                       |
| Mass flow controller for air addition            | Included                                       |
| Mass flow controller for O <sub>2</sub> addition | Included                                       |
| Advanced gas performance (total gas management)  | Included                                       |
| Integrated peristaltic pumps                     | 4x for acid, base, antifoam and media addition |
| eOS software                                     | Included                                       |
| Recipes management                               | Included                                       |
| User's management                                | Included                                       |
| Screen interface                                 | Optional                                       |
| <b>Culture vessel</b>                            |  |
| Single wall vessel                               | Included                                       |
| Brushless stirrer                                | Included                                       |
| Stirrer shaft seal                               | Included                                       |
| 6-blade rushton impeller                         | Included                                       |
| Aeration filters                                 | Included                                       |
| Ring sparger                                     | Included                                       |
| 4 baffles for mixing performance                 | Included                                       |
| Exhaust condenser                                | Included                                       |
| 4 way addition port                              | Included                                       |
| Sampling kit                                     | Included                                       |
| Sampling pipe with height adjustment             | Included                                       |
| Harvest pipe with height adjustment              | Included                                       |
| pH sensor with cable                             | Included                                       |
| DO sensor with cable                             | Included                                       |
| Foam sensor with cable                           | Included                                       |
| Temperature sensor Pt100                         | Included                                       |
| Heating blanket                                  | Included                                       |
| Port adapter 19 - 12 mm                          | Included                                       |
| Starting kit of consumables                      | Included                                       |
| Weight measurement bioreactor / External bottle  | Optional                                       |
| External pump for additional feeding             | Optional                                       |
| Microsparger                                     | Optional                                       |
| Dip pipe sparger                                 | Optional                                       |
| N <sub>2</sub> MFC                               | Optional                                       |
| CO <sub>2</sub> MFC                              | Optional                                       |
| External cooling unit                            | Optional                                       |

## Basic configuration - Cellular

| <b>Control configuration</b>           |          |
|--|----------|
| Temperature control                    | Included |
| DO control (simple cascade controller) | Included |

|  |  |
|--|--|
| Stirrer speed control                                | Included                                       |
| pH control via addition of acid or base              | Included                                       |
| Foam control   | Included                                       |
| Mass flow controller for air addition                | Included                                       |
| Mass flow controller for O <sub>2</sub> addition     | Included                                       |
| Mass flow controller for N <sub>2</sub> addition     | Included                                       |
| Mass flow controller for CO <sub>2</sub> addition    | Included                                       |
| Advanced gas performance (total gas management)      | Included                                       |
| Integrated peristaltic pumps                         | 4x for acid, base, antifoam and media addition |
| eOS software   | Included                                       |
| Recipes management                                   | Included                                       |
| Advanced pO <sub>2</sub> control with N <sub>2</sub> | Included                                       |
| Advanced pH control with CO <sub>2</sub>             | Included                                       |
| User's management                                    | Included                                       |
| Screen interface                                     | Optional                                       |
| <b>Culture vessel</b>                                |  |
| Single wall vessel                                   | Included                                       |
| Brushless agitation                                  | Included                                       |
| Stirrer shaft seal                                   | Included                                       |
| Pitched blade impeller                               | Included                                       |
| Aeration filters                                     | Included                                       |
| Ring sparger   | Included                                       |
| Exhaust condenser                                    | Included                                       |
| 4 way addition port                                  | Included                                       |
| Sampling kit   | Included                                       |
| Sampling pipe with height adjustment                 | Included                                       |
| Harvest pipe with height adjustment                  | Included                                       |
| pH sensor with cable                                 | Included                                       |
| DO sensor with cable                                 | Included                                       |
| Foam sensor with cable                               | Included                                       |
| Temperature sensor Pt100                             | Included                                       |
| Heating blanket                                      | Included                                       |
| Port adapter 19 - 12 mm                              | Included                                       |
| Starting kit of consumables                          | Included                                       |
| Weight measurement Bioreactor / External bottle      | Optional                                       |
| External pump for additional feeding                 | Optional                                       |
| External cooling unit                                | Optional                                       |
| Marine impeller                                      | Optional                                       |
| Microsparger   | Optional                                       |
| Dip pipe sparger                                     | Optional                                       |

## Control unit

|                         |  |
|-------------------------|--|
| Dimensions (WxHxD) (mm) | 198 x 335 x 200                                |
| Weight approx (Kg)      | 5  |
| Power supply            | 230 VAC, 50 Hz                                 |
| Consumption             | 10 A   |
| Housing material        | Aluminium   Polycarbonate front and back panel |

|                           |  |
|---------------------------|--|
| Controller type           | Integrated microcontroller   |
| Operation / HMI Interface | eOS / Tablet (recommended size: 10.9")   |
| Electrical interfaces     | <ul style="list-style-type: none"> <li>- 2x USB-C</li> <li>- 1x USB</li> <li>- 2x modbus connections for process sensors</li> <li>- 1x digital input for level/foam sensor</li> <li>- 1x RTD connector for temperature sensor</li> </ul> |

## Utility connections

|   |  |
|---|--|
| Gases: Air, O <sub>2</sub> , CO <sub>2</sub> , N <sub>2</sub> | <ul style="list-style-type: none"> <li>* Supply pressure of 2 barg</li> <li>* Pre-treated gas: dry and oil-free,</li> <li>* Connection: pneumatic fitting Ø 6 mm</li> </ul>  |
| Tap water / Cool water  | <ul style="list-style-type: none"> <li>* Supply pressure: 2 barg</li> <li>* Return pressure: atm</li> <li>* Flow rate: 2 L/min</li> <li>* Temp: 5-15°C</li> <li>* Needed cooling capacity</li> <li>* Single 400 W</li> <li>* Connections to vessel / Condenser: quick plug non-return connector 1/8</li> </ul> |

## Culture vessel features

| Volumes                                   | 1L          | 2L  | 5L          |
|---|-------------|---|-------------|
| Total volume (L)                          | 1.6         | 3   | 6.6         |
| Working volume (L)                        | 1           | 2   | 5           |
| Minimum working volume (L)                | 0.4         | 0.6                                       | 0.6         |
| Inner diameter (mm)                       | 110         | 130                                       | 160         |
| Inner height (working volume) (mm)        | 115         | 160                                       | 255         |
| H/D ratio                                 | 1           | 1.2                                       | 1.6         |
| External dimensions (WxHxD) (mm)          | 228x527x228 | 230x542x230                               | 260x652x260 |
| Space requirement in autoclave (DxH) (mm) | 240x440     | 240x500                                   | 270x600     |
| Total weight (Kg)                         | 5           | 6   | 11          |
| Maximum stirrer speed (rpm)               |             | 2000                                      |             |
| Maximum tip speed (m/s)                   | 3.5         | 4.5                                       | 6.2         |
| Motor type                                |             | Brushless                                 |             |
| Motor power (W)                           |             | 250 W                                     |             |
| Impeller type MB / CC                     |             | 6-blade rushton turbine / 3-pitched blade |             |
| Number of impellers MB / CC               | 1 / 1       | 2 / 1                                     | 2 / 1       |
| Impeller diameter (mm) MB / CC            | 30 / 35     | 43 / 57                                   | 60 / 70     |
| Top ports 19 mm / 12 mm / 11 mm           |             | 3 / 3 / 5                                 |             |

## Gas system

| Culture vessel   | 1L              | 2L                      | 5L              |
|--|-----------------|-------------------------|-----------------|
| Number of MFCs   |                 | Up to 4 different gases |                 |
| Air aeration (NL/min) Microbial / Cellular<br>(*Flow limited by the user)            | 0-20 / 0-20     | 0-20 / 0-20             | 0-20 / 0-20     |
| O <sub>2</sub> addition (NL/min) Microbial / Cellular<br>(*Flow limited by the user) | 0-19.6 / 0-19.6 | 0-19.6 / 0-19.6         | 0-19.6 / 0-19.6 |

|   |  |                 |                 |
|---|--|-----------------|-----------------|
| N <sub>2</sub> addition (NL/min) Microbial /Cellular<br>(*Flow limited by the user)   | 0-20 / 0-20  | 0-20 / 0-20     | 0-20 / 0-20     |
| CO <sub>2</sub> addition (NL/min) Microbial / Cellular<br>(*Flow limited by the user) | 0-14.8 / 0-14.8  | 0-14.8 / 0-14.8 | 0-14.8 / 0-14.8 |
| Mass flow controller  | Factory calibration with air and corrected for each gass |                 |                 |
| Flow range  | From 0 NL/min up to 20 NL/min of Air                     |                 |                 |
| Accuracy  | +- (4% MV +1.25% FS)                                     |                 |                 |
| Maximum operating presure   | 2.5 barg   |                 |                 |
| Gas connection to culture vessel  | Pneumatic fitting Ø 6 mm                                 |                 |                 |

## Pumps

|  |  |
|--|--|
| Pump type                                  | 4 integrated fixed speed pumps   |
| Pump head                                  | For 1 mm wall thickness tubing<br>Bore: ID 0.8-4.8 mm  |
| Flow rate (ml/min)<br>*Provided by default | ID 1 mm - 14.88 ml/min<br>ID 2 mm - 50.05 ml/min *<br>ID 3 mm - 110.27 ml/min<br>ID 4 mm - 149.23 ml/min                     |
| External pump Flow rate (ml/min)           | ID 0.8 mm - 10 ml/min<br>ID 1.6 mm - 56 ml/min<br>ID 2.4 mm - 111 ml/min<br>ID 3.1 mm - 191 ml/min<br>ID 4.8 mm - 366 ml/min |

## Temperature control system

|                   |  |
|-------------------|--|
| Operation         | Cooling finger inside vessel                             |
| Heating blanket   | Heating resistance: 285 W                                |
| Cooling           | Module with automatic valve for cooling water regulation |
| Temperature range | Temperature control between 8°C - 70°C                   |
| Connection        | Quick plug connector 1/8                                 |

## Sensors

|                          |  |
|--------------------------|--|
| pH                       | Biocompatible (FDA) electrolyte filled   0 -14 pH  |
| Dissolved O <sub>2</sub> | Optical DO sensor   0-300%-sat                     |
| Temperature sensor       | Pt100   0-150°C                                    |
| Foam / Level sensor      | Conductive probe, stainless steel ceramic isolated |
| External balance         | Capacity: 0-30 Kg<br>Accuracy: 0.1 g               |

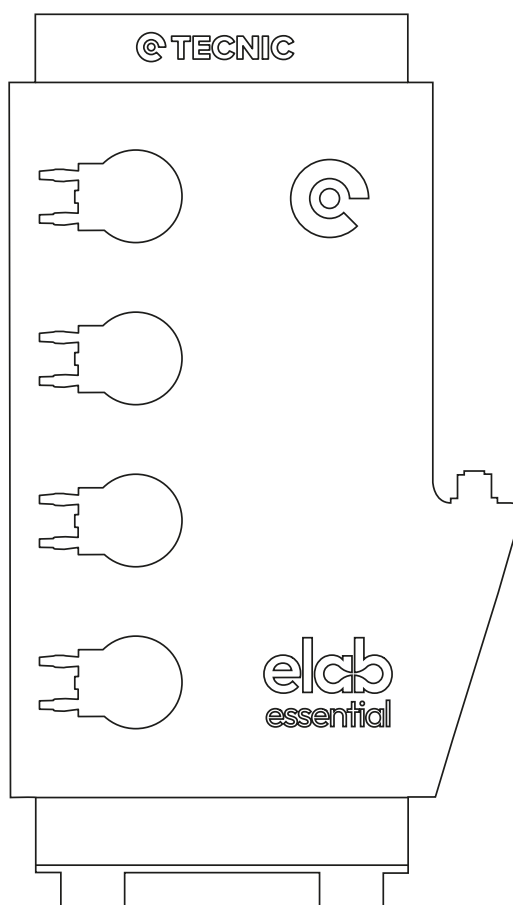
## eLAB® Essential SU

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The eLAB® Essential Single Use bioreactor is designed for seamless operation in laboratory environments, focusing on essential functionalities for reliability and efficiency. This compact system, weighing less than 5 kg and only 20 cm wide, optimizes lab space without sacrificing functionality.

The eLAB® Essential Single Use features the eOS operating system, offering an intuitive user interface that integrates smoothly with the bioreactor. It comes equipped with 4 addition pumps for multiple solutions and supports a wide range of vessel volumes from 0.5 to 5L. The bioreactor is designed for single-use applications, providing flexibility for various bioprocessing needs. It also offers comprehensive control over key parameters like pH, temperature, agitation, foam, and pO<sub>2</sub>, utilizing effective cascade strategies for optimal bioprocessing conditions.

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## Basic configuration - Microbial

| <b>Control configuration</b>                     |  |
|--|--|
| Temperature control                              | Included                                       |
| DO control (simple cascade controller)           | Included                                       |
| Stirrer speed control                            | Included                                       |
| pH control via addition of acid or base          | Included                                       |
| Foam control                                     | Included                                       |
| Mass flow controller for air addition            | Included                                       |
| Mass flow controller for O <sub>2</sub> addition | Included                                       |
| Advanced gas performance (total gas management)  | Included                                       |
| Integrated peristaltic pumps                     | 4x for acid, base, antifoam and media addition |
| eOS software                                     | Included                                       |
| Recipes management                               | Included                                       |
| User's management                                | Included                                       |
| Screen interface                                 | Optional                                       |
| <b>Culture vessel</b>                            |  |
| Single use vessel                                | Included                                       |
| Brushless stirrer                                | Included                                       |
| Stirrer shaft seal                               | Included                                       |
| 6-blade rushton impeller                         | Included                                       |
| Aeration filters                                 | Included                                       |
| Open sparger                                     | Included (2 mm hole)                           |
| Inlet air port for 6.4 ID tubing                 | Included                                       |
| Air exhaust port for 6.4 ID tubing               | Included                                       |
| 4x addition port for 3.2 ID tubing               | Included                                       |
| Sampling / Harvest port for 3.2 ID tubing        | Included                                       |
| 2x port for foam electrodes detection            | Included                                       |
| pH spot sensor with cable                        | Optional                                       |
| DO spot sensor with cable                        | Optional                                       |
| temperature sensor Pt100                         | Included                                       |
| Foam sensor with cable                           | Included                                       |
| Heating blanket                                  | Included                                       |
| Weight measurement bioreactor / External bottle  | Optional                                       |
| External pump for additional feeding             | Optional                                       |
| Sparger stone                                    | Optional                                       |
| Jet sparger                                      | Optional                                       |
| N <sub>2</sub> MFC                               | Optional                                       |
| CO <sub>2</sub> MFC                              | Optional                                       |

## Basic configuration - Cellular

| <b>Control configuration</b>                     |          |
|--|----------|
| Temperature control                              | Included |
| DO control (simple cascade controller)           | Included |
| Stirrer speed control                            | Included |
| pH control via addition of acid or base          | Included |
| Mass flow controller for air addition            | Included |
| Mass flow controller for O <sub>2</sub> addition | Included |



|  |  |
|--|--|
| Mass flow controller for N <sub>2</sub> addition     | Included                                       |
| Mass flow controller for CO <sub>2</sub> addition    | Included                                       |
| Advanced gas performance (total gas management)      | Included                                       |
| Integrated peristaltic pumps                         | 4x for acid, base, antifoam and media addition |
| eOS software   | Included                                       |
| Recipes management                                   | Included                                       |
| Advanced pO <sub>2</sub> control with N <sub>2</sub> | Included                                       |
| Advanced pH control with CO <sub>2</sub>             | Included                                       |
| User's management                                    | Included                                       |
| Screen interface                                     | Optional                                       |
| <b>Culture vessel</b>                                |  |
| Single use vessel                                    | Included                                       |
| Brushless agitation                                  | Included                                       |
| Stirrer shaft seal                                   | Included                                       |
| Pitched blade impeller                               | Included                                       |
| Aeration filters                                     | Included                                       |
| Sparger stone  | Included                                       |
| Inlet air port for 6.4 ID tubing                     | Included                                       |
| Air exhaust port for 6.4 ID tubing                   | Included                                       |
| 4x addition port for 3.2 ID tubing                   | Included                                       |
| Sampling / Harvest port for 3.2 ID tubing            | Included                                       |
| pH spot sensor with cable                            | Optional                                       |
| DO spot sensor with cable                            | Optional                                       |
| Temperature sensor Pt100                             | Included                                       |
| Heating blanket                                      | Included                                       |
| Weight measurement bioreactor / External bottle      | Optional                                       |
| External pump for additional feeding                 | Optional                                       |
| Marine impeller                                      | Optional                                       |
| Other sparger configuration                          | Optional                                       |

## Control unit

|                           |  |
|---------------------------|--|
| Dimensions (WxHxD) (mm)   | 198 x 335 x 200  |
| Weight approx (Kg)        | 5  |
| Power supply              | 230 VAC, 50 Hz   |
| Consumption               | 10 A   |
| Housing material          | Aluminium   Polycarbonate front and back panel   |
| Controller type           | Integrated microcontroller   |
| Operation / HMI Interface | eOS / Tablet (recommended size: 10.9")   |
| Electrical interfaces     | <ul style="list-style-type: none"> <li>- 2x USB-C</li> <li>- 1x USB</li> <li>- 2x Modbus connections for process sensors</li> <li>- 1x Digital input for level/foam sensor</li> <li>- 1x RTD connector for temperature sensor</li> </ul> |

## Utility connections

Gases: Air, O<sub>2</sub>, CO<sub>2</sub>, N<sub>2</sub>

\* Supply pressure of 2 barg  
 \* Pre-treated gas: dry and oil-free,  
 \* Connection: pneumatic fitting Ø 6 mm

## Culture vessel features

| Volumes                            | 0.5L                                      | 1L    | 2L    | 5L    |
|------------------------------------|---|-------|-------|-------|
| Total volume (L)                   | 0,575                                     | 1,25  | 2,5   | 6,5   |
| Working volume (L)                 | 0,5                                       | 1     | 2     | 5     |
| Minimum working volume (L)         | 0,1                                       | 0,4   | 0,6   | 0,6   |
| Inner diameter (mm)                | 75  | 100   | 125   | 170   |
| Inner height (working volume) (mm) | 110                                       | 129   | 163   | 221   |
| H/D ratio (working volume)         | 1,5                                       | 1,3   | 1,3   | 1,3   |
| Total weight (Kg)                  | 0,2                                       | 0,3   | 0,5   | 0,8   |
| Maximum stirrer speed (rpm)        | 2000                                      |       |       |       |
| Maximum tip speed (m/s)            | 2.9                                       | 3.5   | 4.5   | 6.2   |
| Motor type                         | Brushless                                 |       |       |       |
| Motor power (W)                    | 250 W                                     |       |       |       |
| Impeller type MB / CC              | 6-blade rushton turbine / 3-pitched blade |       |       |       |
| Number of impellers MB / CC        | 2 / 1                                     | 2 / 1 | 2 / 1 | 2 / 1 |
| Impeller diameter (mm) MB / CC     | 28  | 30    | 43    | 57    |

## Gas system

| Culture vessel  | 0.5L  | 1L              | 2L              | 5L              |
|---|---|-----------------|-----------------|-----------------|
| Number of MFCs  | Up to 4 different gases                                 |                 |                 |                 |
| Air aeration (NL/min) Microbial / Cellular<br>(*Flow limited by the user)             | 0-20 / 0-20   | 0-20 / 0-20     | 0-20 / 0-20     | 0-20 / 0-20     |
| O <sub>2</sub> addition (NL/min) Microbial / Cellular<br>(*Flow limited by the user)  | 0-19.6 / 0-19.6   | 0-19.6 / 0-19.6 | 0-19.6 / 0-19.6 | 0-19.6 / 0-19.6 |
| N <sub>2</sub> addition (NL/min) Microbial / Cellular<br>(*Flow limited by the user)  | 0-20 / 0-20   | 0-20 / 0-20     | 0-20 / 0-20     | 0-20 / 0-20     |
| CO <sub>2</sub> addition (NL/min) Microbial / Cellular<br>(*Flow limited by the user) | 0-14.8 / 0-14.8   | 0-14.8 / 0-14.8 | 0-14.8 / 0-14.8 | 0-14.8 / 0-14.8 |
| Mass flow controller  | Factory calibration with air and corrected for each gas |                 |                 |                 |
| Flow range  | From 0 NL/min up to 20 NL/min of Air                    |                 |                 |                 |
| Accuracy  | +- (4% MV +1.25% FS)                                    |                 |                 |                 |
| Maximum operating pressure  | 2.5 barg  |                 |                 |                 |
| Gas connection to culture vessel  | Pneumatic fitting Ø 6 mm                                |                 |                 |                 |

## Pumps

|  |  |
|--|--|
| Pump type                                  | <b>4 integrated fixed speed pumps</b>  |
| Pump head                                  | For 1 mm wall thickness tubing<br>Bore: ID 0.8-4.8 mm  |
| Flow rate (ml/min)<br>*Provided by default | ID 1 mm - 14.88 ml/min<br>ID 2 mm - 50.05 ml/min *<br>ID 3 mm - 110.27 ml/min<br>ID 4 mm - 149.23 ml/min |

|                                  |                        |
|----------------------------------|------------------------|
| External pump flow rate (ml/min) | ID 0.8 mm - 10 ml/min  |
|                                  | ID 1.6 mm - 56 ml/min  |
|                                  | ID 2.4 mm - 111 ml/min |
|                                  | ID 3.1 mm - 191 ml/min |
|                                  | ID 4.8 mm - 366 ml/min |

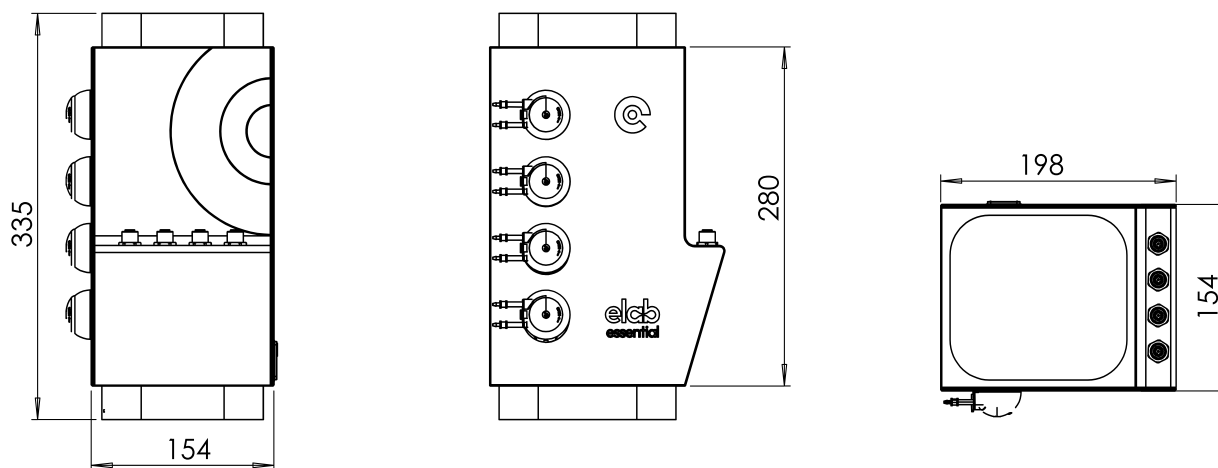
## Temperature control system

|                     |                            |
|---------------------|----------------------------|
| Heating blanket     | Heating resistance: 285 W  |
| Temperature range   | Working temperature 5-45°C |
| Storage temperature | -80 / 45°C                 |

## Sensors

|                          |   |
|--------------------------|---|
| pH                       | 5.5 - 8.5 pH                                |
| Dissolved O <sub>2</sub> | Optical DO sensor   0-2 mg/L O <sub>2</sub> |
| Temperature sensor       | Pt100   0-150°C                             |
| Foam / Level sensor      | Conductive probe, stainless steel           |
| External balance         | Capacity: 0-30 Kg<br>Accuracy: 0.1 g        |

## eLAB Essential (measurements in mm)



## Partnerships

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## Regulation

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Do you need more information?  
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