



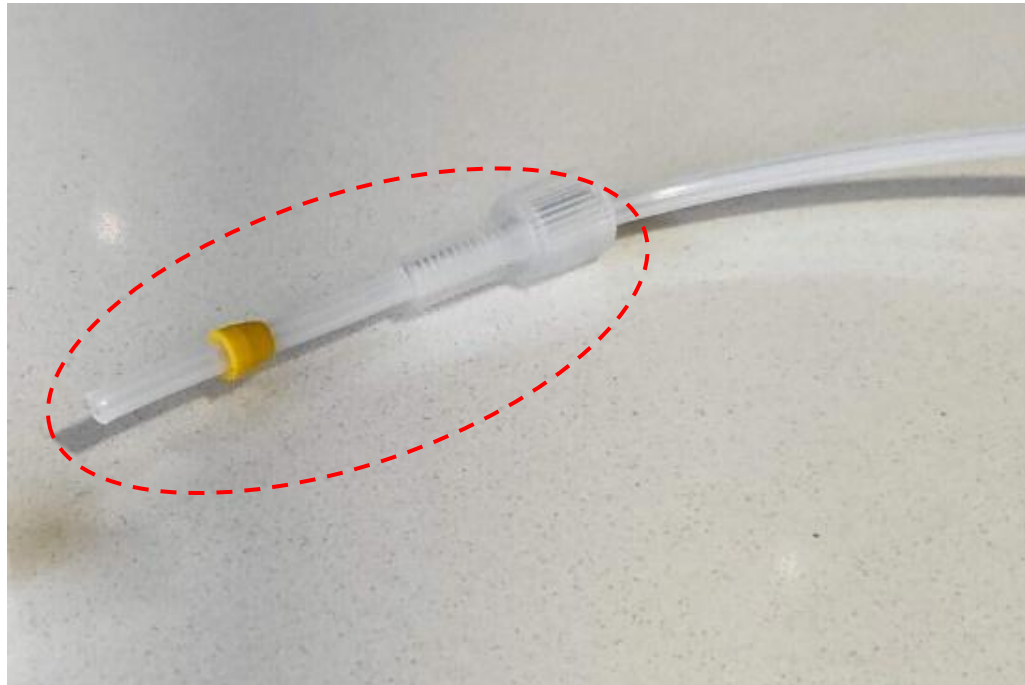
Inline Pressure Unit

Overview & Assembly Manual

Version date	March 03 – 2026
Manual version	2.0 - visit www.redox-flow.com for updated versions and spare parts
Notes	This equipment is intended for research purposes only and can be applied for different purposes. There is no guarantee on performance, corrosion or lifetime of the equipment. See https://redox-flow.com/termsandconditions/ for more information.

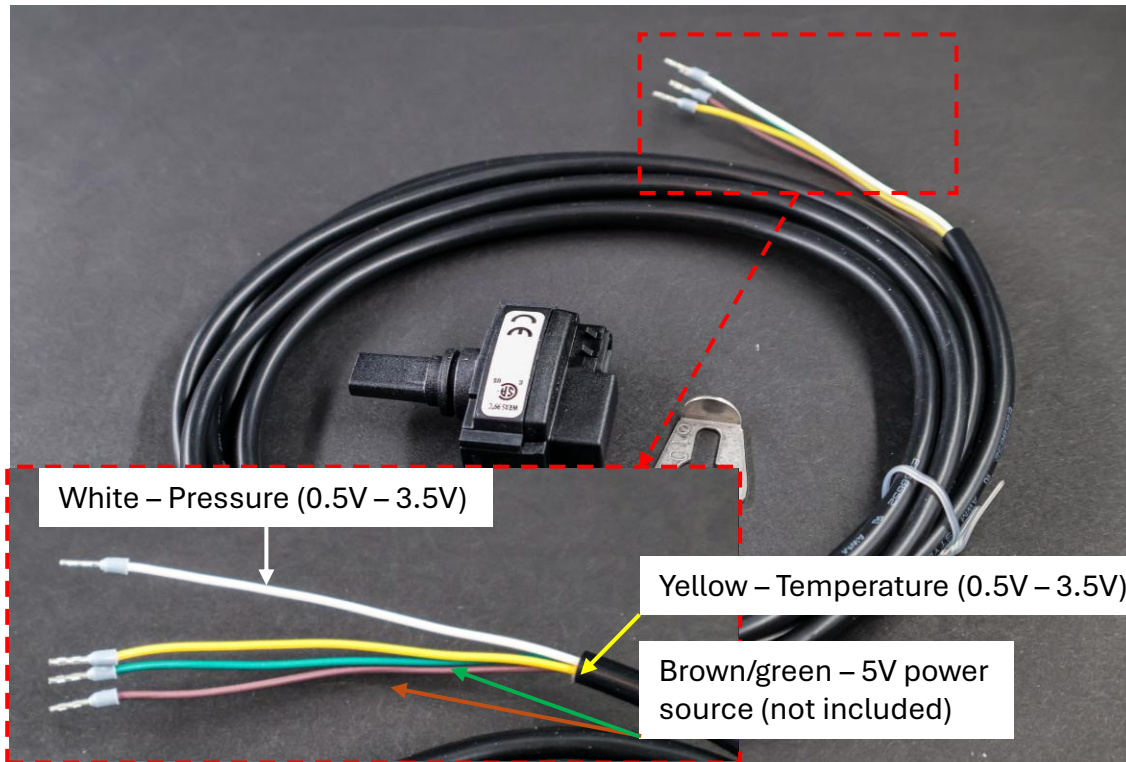
Overview & Components

IMPORTANT: When assembling the tube fitting, it is important that ferrule (yellow part) faces the 'narrow' part towards the fitting



Working principles

Electrical wiring diagram



- The datasheet for the sensors have been included in the package. There are two outputs (temperature and pressure) and in the datasheet you can see the relationship between voltage and pressure/temperature. 0.5 V corresponds to 0 bars/0 C while 3.5 V corresponds to maximum values.
- For the unit to work you need to do a little electrical assembly by yourself – *If you know a little about electrical wiring of sensors, this can be derived from the datasheet of the sensors* – You need to buy a 5 V power source, depending on how you are planning to set it up you can use a simple one like the one shown below. Just cut of the plug in the end and solder the power source onto the wires on the sensors. You can use the same power source for both sensors as they draw very little current.



- If you use > 1.5-2 mm flow field spacer (standard) the pressure loss in the outlet channel is almost negligible whereby you only need to measure the pressure on the inlet channels in order to get the 'hydraulic resistance' of the half cells. But it is probably a good idea to do a little exploring/testing in order to get a feeling of how it is working.

Working principles

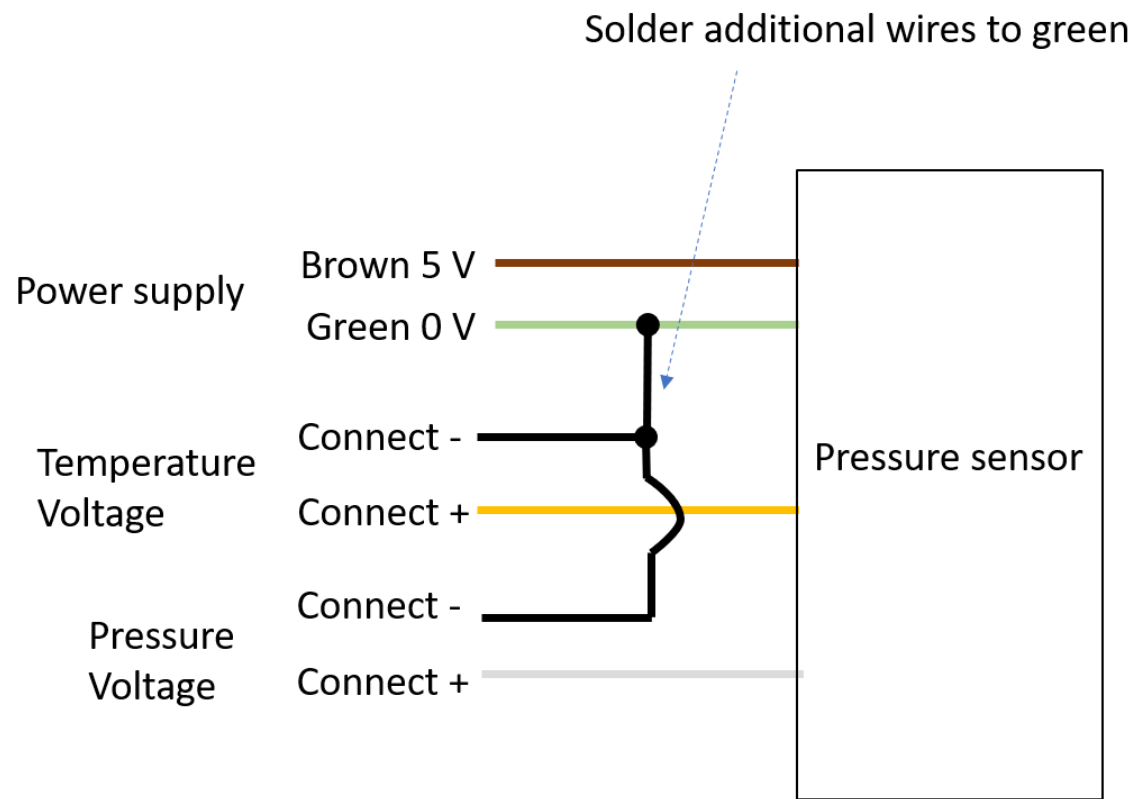
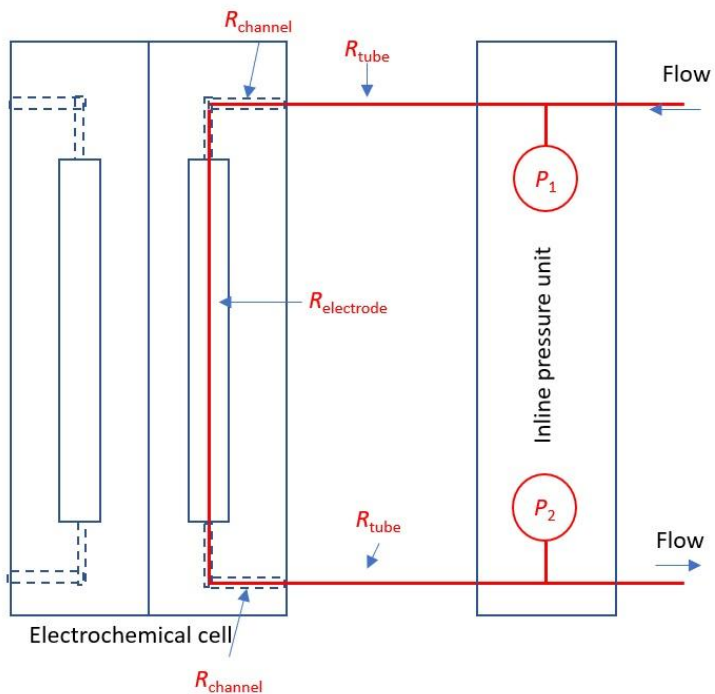


Fig. 5 Electrical connections

Pin configuration		Colour
1	Temperature signal (0.5 to 3.5 V relative to pin 3)	Yellow
2	Pressure signal (0.5 to 3.5 V relative to pin 3)	White
3	GND (0 V)	Green
4	Voltage supply (+5 VDC), PELV	Brown

Integration Possibilities

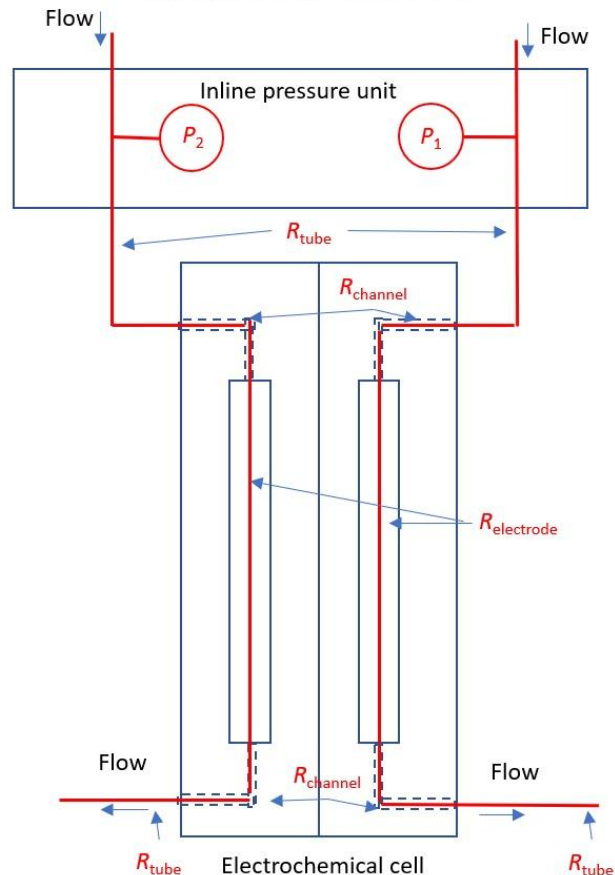
Integration possibility 1



This integration possibility can be used to determine the total hydraulic resistance including electrode ($R_{\text{electrode}} + R_{\text{tube}} + R_{\text{channel}}$). If the electrode is removed and the experiment is repeated, it will measure ($R_{\text{tube}} + R_{\text{channel}}$) and be used for calibration/determination of tube/channel resistance and subsequent accurate determination of electrode hydraulic resistance.

— Hydraulic circuit
 (P) Relative (to surroundings) pressure sensor

Integration possibility 2



Under many circumstances $R_{\text{electrode}} \gg R_{\text{tube}}, R_{\text{channel}}$ and the hydraulic resistance of the electrode ($R_{\text{electrode}}$) can be determined just by measuring the inlet pressure. In this case the 'pressure unit' can measure both sides at the same time. Generally to meet these conditions it is needed to

- Have an electrode with a relatively high hydraulic resistance
- Short tubing to the cell and with as large as possible inner tube diameters
- Flow channels inside cell with as large as possible cross-sectional area

Integration possibility 1 can be used for determination of the R_{tube} and R_{channel}

Assembly

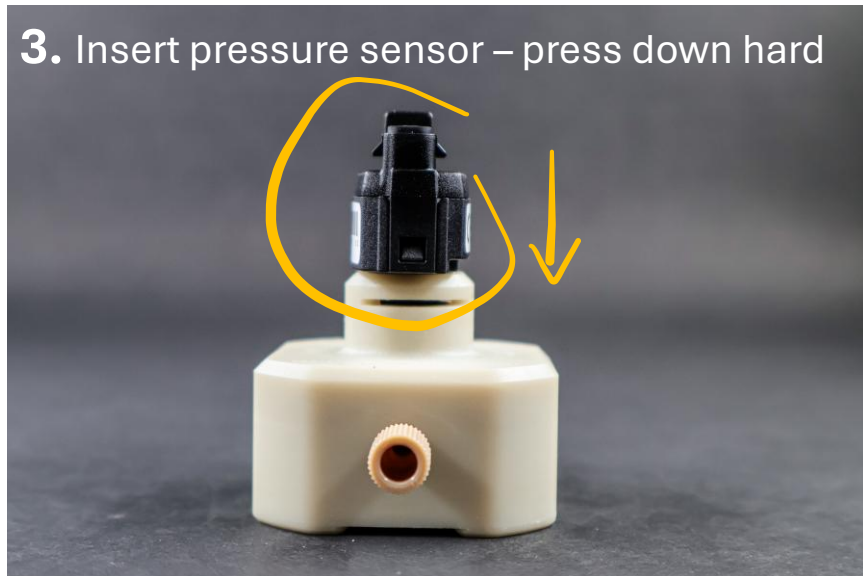
1. Place O-ring (Viton or EPDM) in PP unit



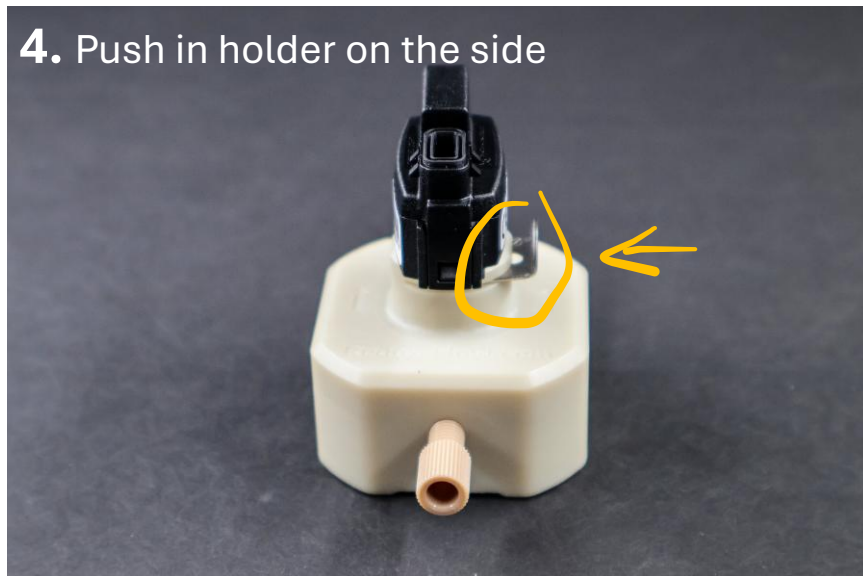
2. Ensure that O-ring is well placed in fitting



3. Insert pressure sensor – press down hard



4. Push in holder on the side





Finished assembly

