Everything is possible

Applications for the Research pro

● Loading gels/phase separation
When loading agarose or polyacrylamide gels, the best results are obtained at a slow dispensing speed using the Manual (MAN) option. This dispenses the liquid without blow-out, preventing the sample whirling up.
This application is also useful for phase separation, e.g. in organic extraction of nucleic acid or ethanol precipitation.

● Dilution series
The Serial Dilute (SDI) function is ideal for preparing dilution series of DNA samples, peptides, enzymes, antibodies etc.
In this process, pipetting is linked to a certain number of mixing cycles.
The number of mixing processes and their speed can be adapted to suit the parameters of the liquid in use.

● Pipetting very small volumes/ resuspending cells
Pipetting tiny sample quantities, for example when adding the relevant target DNA to a PCR Mastermix, is easy using the Rinse (RNS) option. In this process, the sample is automatically rinsed three times or repeated as often as required if the trigger key is kept depressed.
This function is also suitable for resuspending cells.

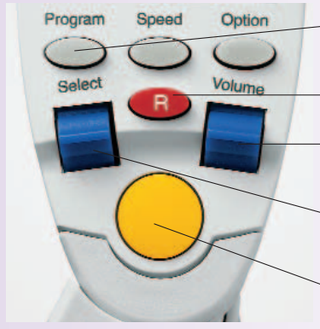
● Liquids which are difficult to dispense
Detergents and liquids containing protein are difficult to dispense, as they tend to foam. A high degree of precision is guaranteed with the aid of the Blow (BLO) option which is an additional, time-delayed dispensing step for the residual liquid.

● Molecular biology kits
Protocols for nucleic acid purification are easy to work through if the pipetting steps are stored as a program. For just a few plasmid preps, for example, the required volumes can be programmed in Fixed-Volume Pipetting (FIX) mode and simply called up at the touch of a button as you work. If 24 Minipreps are being performed in parallel, for example, the necessary volumes can also be dispensed in the Dispensing (DIS) mode or program.

● Titration
Titrations can be performed rapidly and accurately using the Manual (MAN) option in Pipetting (PIP) mode. The pipette displays the quantity of liquid currently being dispensed. The function is equally suitable for measuring unknown quantities of liquid or for removing supernatants. The aspiration speed can be set very low for this. The volume aspirated is automatically measured and displayed. Another use for this is overlaying or underlaying solutions (gradients).

Operation is refreshingly straightforward.
Application options are particularly versatile, guaranteed by logical user guidance, easy-to-understand controls and a clearly legible display.

All the functions of mechanical pipettes/dispensers can be performed according to the same tried and tested operating principle via the Sensor Actuate key. Simply follow your intuition and the user guidance in the display – no traps, no secrets.



- Select keys for programming
- Reset key
- Rocker for setting volume +/–
- Rocker for modi selection ^/v
- Sensor Actuate key

The intuitive control panel of the Research pro.
The desired volume as well as the Pipetting or Dispensing mode can be set quickly and easily using the rocker switch.

All settings are clearly legible in the large display. Flashing symbols request input and indicate the next logical operating step. With such simple guidance, you can be sure that input is always within your control.

● Simple to disassemble
The autoclavable lower part can easily be removed for decontamination purposes at a flick of your wrist.

The result is a more than convincing concept.
Each of the Research pro models forms a perfect system in combination with Eppendorf epTIPS, with or without filters. This also includes the comfort of the patented, reduced-effort tip ejector. Additionally, the Research pro, including its tip ejector, can also be used with all other common tips.

5x

Research pro, single-channel
- 0.5–10 µl
- 5–100 µl
- 20–300 µl
- 50–1,000 µl
- 100–5,000 µl

4x

Research pro, 8-channel
- 0.5–10 µl
- 5–100 µl
- 20–300 µl
- 50–1,200 µl

3x

Research pro, 12-channel
- 0.5–10 µl
- 5–100 µl
- 20–300 µl

Regardless of whether you use a single-channel or a multi-channel system, optional charging stands for one or four pipettes are available, making sure that a ready-to-use pipette is always at hand and guaranteeing that you don't lose track of things.

● **Viscous solutions**
The “reverse pipetting technique” is used to ensure that dispensing is performed with a high degree of precision. In this process, the liquid is aspirated with blow-out but dispensed without blow-out – residual liquid remains in the tip. Pipetting (PIP) mode, Reverse Pipetting (RP) option.

● **Diluting samples**
The Dilute (DIL) program can be used to dilute a concentrated sample like a DNA solution in the pipette tip. First a diluent, for example TE buffer, followed by an air bubble and then the DNA sample itself are aspirated in the same pipette tip. The entire contents of the tip are then dispensed using one of the pipetting options.

● **Filling a microtiter plate**
Antibodies for an ELISA test, for example, can be added using the Automatic Dispensing (ADS) program. Dispensing is then automatic, with aspiration and dispensing speed and dispensing frequency being preselected.

● **Tip ejector**
The ejector for reduced-effort, patented tip ejection can be set in one single rotation, by both right- and left-handed users.

It’s just a matter of the right setting.
Operation of the Research pro is controlled acoustically by two beeper functions, which can also be switched off if required. Equally simple is the calibration of the pipette for use with liquids of different viscosities, although this setting is not required for everyday routine use. Five memory slots for all common program versions enable programming of special or frequently-used pipetting processes, which allows even complicated sequences to be transferred simply, thereby ensuring exact reproducibility.

● **Charging unit**
(Alternative for charging stand)
Once connected to the main supply, the battery of the Research pro is recharged in no time at all. British, american, australian and japanese plug types are also available.

● **Pipetting techniques:** For maximum versatility processing all of the applications introduced before, the Research pro can easily be set up to perform the following techniques:
– **Pipetting with Blow-out:** A specific volume is aspirated and then dispensed. Blow-out ensures that the residual liquid in the tip is also blown out, at a time defined by the user.
– **Pipetting with Rinse:** Following pipetting, a volume is aspirated and then dispensed for rinsing or mixing purposes.
– **Dispensing:** The pipetted volume of liquid is dispensed in up to 20 defined identical partial volumes.
– **Manual Pipetting:** Liquid is aspirated or dispensed for as long as the sensor button is held down. Information on the current volume is shown in the display.
– **Reverse Pipetting:** A specific volume, including a small extra quantity of liquid, is aspirated. The predetermined volume is then dispensed exactly and the residual liquid can be discarded.
– **Fixed Volume:** Using the rocker, the most frequent volumes can be called up immediately from five stored presettings.

● **Programming:** For more complex dispensing processes, the Research pro offers expanded programming functions:
– **Sequential Pipetting:** A variety of interlinked pipetting operations are worked through in sequence.
– **Sequential Dispensing:** The total volume is dispensed in up to 20 different partial volumes.
– **Automatic Dispensing:** With the key held down, set partial volumes are dispensed in a fixed, user-defined rhythm.
– **Dilution:** Once the diluent volume and the sample volume have been aspirated, the liquid is dispensed as one.
– **Serial Dilution:** The dispensed sample is mixed with a volume of diluent. Mixing volumes and mixing cycles are also user-definable.

The Eppendorf Research® pro PhysioCare Concept pipette.

PhysioCare concept eppendorf

Technical specifications

Single-channel-model Volume range (µl)	Eppendorf epTIPS	Volume (µl)	Volume increment (µl)	Systematic error (Inaccuracy) (%)	Random error (Imprecision) (%)
0.5–10 (anthracite button)	20 µl	1	0.01	±2.5	≤1.8
		5		±1.5	≤0.8
		10		±1.0	≤0.4
5–100 (yellow button)	100 µl	10	0.1	±2.0	≤1.0
		50		±1.0	≤0.3
		100		±0.8	≤0.2
20–300 (yellow button)	300 µl	30	0.5	±2.5	≤0.7
		100		±1.0	≤0.3
		300		±0.6	≤0.2
50–1,000 (blue button)	1 ml	100	1.0	±3.0	≤0.6
		500		±1.0	≤0.2
		1,000		±0.6	≤0.2
100–5,000 (lilac button)	5 ml	500	10	±3.0	≤0.6
		2,500		±1.2	≤0.25
		5,000		±0.6	≤0.15
Multi-channel-model Volume range (µl)					
0.5–10 (anthracite button)	20 µl	1	0.01	±5.0	≤3.0
		5		±3.0	≤1.5
		10		±2.0	≤0.8
5–100 (yellow button)	100 µl	10	0.1	±2.0	≤2.0
		50		±1.0	≤0.8
		100		±0.8	≤0.25
20–300 (yellow button)	300 µl	30	0.5	±2.5	≤1.0
		150		±1.0	≤0.5
		300		±0.6	≤0.25
50–1,200 (green button)	1.25 ml	120	5.0	±6.0	≤0.9
		600		±2.7	≤0.4
		1,200		±1.2	≤0.3

* Data for imprecision and inaccuracy is valid only when Eppendorf tips are used.