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## Автоматические анализаторы газов крови COMBI LINE 2

$K^{+}$   
 $Ca^{++}$   
 $Cl^{-}$

$Na^{+}$   
 glucose  
 lactate

$Li^{+}$

compact  
 progressive

tHb

$pCO_2$

pH

$pO_2$

compact  
 progressive

The flexible and economic  
 »point of care«  
 analysing system for:

blood gases +  
 hemoglobin

electrolytes

metabolites

**ESCHWEILER combi** *line*  
 automatic analysing systems



All configurations also available  
 with the ESCHWEILER sensor for  
 hemoglobin determination.

From only 1 specimen up to 11  
 parameters are measured and  
 further 15 are calculated.

easy operation

liquid calibration

economical

# ESCHWEILER

automatic analysing systems

 $K^{+}$  $Ca^{++}$  $Cl^{-}$  $Na^{+}$ 

glucose

lactate

 $Li^{+}$ compact  
progressive

tHb

 $pCO_2$ 

pH

 $pO_2$ 

We present **combi  line** the next generation of analysing systems: compact, easy and economical.

Forget all the other systems with a number of confusing keys and technical nonsense. With clear functionality the **combi  line** is dedicated to serve you. In critical cases even seconds count. We follow this obligation. With its clear and easy handling the **combi  line** provides fast and accurate results to give the required information for your further actions.

Quality measurements are basically depending on the quality of the sensors used and the calibration technology. Since more than 55 years we develop and produce relevant quality sensors. You can rely on our experience.

With our progressive liquid calibration technology the reliability is improved significantly. No external gas supply is required. You only need a power-supply to operate the analyser wherever you like.



The unlimited flexibility of our new concept is a big advantage for you. Choose only those parameters which are of interest for you – any combination out of 11 parameters is allowed.

We save your money for unnecessary investments and costs for operation and maintenance of sensors which are not required.

Reducing running cost is a must everywhere. Our concepts for supporting you are:

Separate containers for the reagents. You can empty each container completely. With cartridges and reagentpacks you waste money as you have to replace the whole pack even if only one compartment is empty.

Choice of reusable sensors. You can easily replace the membrane at low cost. Maintenance-free sensors used by other brands are disposable parts and require to be replaced completely even if only the membrane is defective.

## Technical Data

| measured parameter                                              | range                                        | resolution                          |
|-----------------------------------------------------------------|----------------------------------------------|-------------------------------------|
| pO <sub>2</sub>                                                 | 0 - 800 mmHg (SI-units selectable)           | 0,1 mmHg                            |
| pCO <sub>2</sub>                                                | 5 - 200 mmHg (SI-units selectable)           | 0,1 mmHg                            |
| pH                                                              | 6,000 - 8,000                                | 0,001 pH                            |
| total-hemoglobin (tHb)                                          | 4 - 30 g/dl                                  | 0,1 g/dl                            |
| barometric pressure                                             | 200 - 900 mmHg (SI-units selectable)         | 1,0 mmHg                            |
| Na <sup>+</sup>                                                 | 20 - 250 mmol/l                              | 1,0 mmol/l                          |
| K <sup>+</sup>                                                  | 0 - 20 mmol/l                                | 0,1 mmol/l                          |
| Ca <sup>++</sup>                                                | 0 - 5,0 mmol/l                               | 0,01 mmol/l                         |
| Li <sup>+</sup>                                                 | 0,4 - 5,0 mmol/l                             | 0,01 mmol/l                         |
| Cl <sup>-</sup>                                                 | 20 - 250 mmol/l                              | 1,0 mmol/l                          |
| glucose                                                         | 0 - 30 mmol/l                                | 0,1 mmol/l                          |
| lactate                                                         | 0 - 20 mmol/l                                | 0,1 mmol/l                          |
| input parameter                                                 |                                              |                                     |
| patient temperature                                             | 13° - 43° C                                  | 0,1° C                              |
| hemoglobin [tHb]                                                | 0 - 30 g/dl (if not measured)                | 0,1 g/dl                            |
| fraction of inspired oxygen (FIO <sub>2</sub> )                 | 15 - 100 %                                   | only relevant for AaDO <sub>2</sub> |
| respiratory quotient (RQ)                                       | 0,7 - 1,0                                    | only relevant for AaDO <sub>2</sub> |
| calculated parameter                                            |                                              |                                     |
| hydrogen ion conc. [H <sup>+</sup> ]                            | 10-1000                                      | 0,1 nmol/l                          |
| actual bicarbonate [HCO <sub>3</sub> <sup>-</sup> -A]           | 10 - 50                                      | 0,1 mmol/l                          |
| standard bicarbonate [HCO <sub>3</sub> <sup>-</sup> -S]         | 10 - 50                                      | 0,1 mmol/l                          |
| base excess [BE]                                                | -25 - 25                                     | 0,1 mmol/l                          |
| base excess [BE act]                                            | -25 - 25                                     | 0,1 mmol/l                          |
| total CO <sub>2</sub> [TCO <sub>2</sub> ]                       | 10 - 50                                      | 0,1 mmol/l                          |
| buffer base (BB)                                                | 0 - 100                                      | 0,1 mmol/l                          |
| O <sub>2</sub> saturation of hemoglobin (O <sub>2</sub> -sat)   | 20 - 100                                     | 0,1 %                               |
| O <sub>2</sub> content or concentration (O <sub>2</sub> -CT)    | 0 - 40                                       | 0,1 %                               |
| partial O <sub>2</sub> -press. at 50% O <sub>2</sub> -sat [P50] | 10 - 50                                      | 0,01 mmHg                           |
| alveolar to arterial oxygen-tension grade (AaDO <sub>2</sub> )  | 0 - 800                                      | 0,1 mmHg                            |
| anion gap (A-GAP)                                               | 0-99                                         | 0,1 mmol/l                          |
| SHUNT                                                           | 0-50                                         | 0,1 %                               |
| acid base status                                                | relevant diagnosis recorded on printer       |                                     |
| hematocrit (Hct)                                                | 0 - 100 %                                    | 0,1 %                               |
| data output                                                     |                                              | data input                          |
| display                                                         | illuminated, 15 - lines LCD display          | keyboard                            |
| printer                                                         | fast, low-noise thermoprinter                | barcode reader                      |
| interface                                                       | RS 232                                       |                                     |
| calibration                                                     |                                              |                                     |
| automatic calibration                                           | every 90 min                                 |                                     |
| economy mode                                                    | every 240 min                                |                                     |
| specimen                                                        |                                              |                                     |
| specimen container                                              | capillary, syringe and others                |                                     |
| specimen material                                               | whole blood, serum, plasma / respiratory gas |                                     |
| electrical data                                                 |                                              |                                     |
| voltage                                                         | 115 V resp. 230 V                            |                                     |
| frequency                                                       | 50/60 Hz                                     |                                     |
| ambient temperature                                             | 12° - 32° C                                  |                                     |
| dimensions/weight                                               |                                              |                                     |
| height                                                          | 400 mm                                       |                                     |
| width                                                           | 330 mm                                       |                                     |
| depth                                                           | 440 mm                                       |                                     |
| weight                                                          | appr. 15 kg                                  |                                     |



### Sample Input

The handling of samples is simple, safe and hygienic. Using capillaries, the specimen is aspirated automatically. For syringes the specimen is injected into the system until an acoustic signal confirms the filling.

In addition to the standard assay (with all sensors in operation), the **combi line** offers specialised test programs depending on sensor configuration. These programs enable selective measurement of blood gases and electrolytes. For daily quality control tests, the **combi line** includes a QC-test program.

### Barcode Reader

- Read in coded patient data
- Read in coded calibration values



### Biosensors for glucose and lactate determination in whole blood

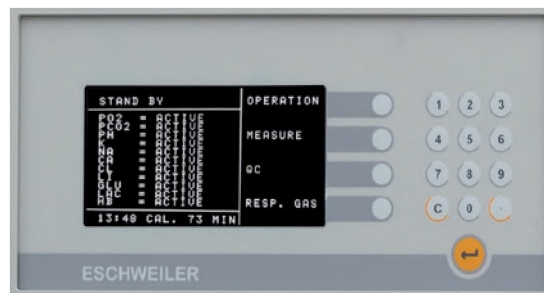
Sensor Chips based on thick-film technology combine:

- Reliable handling
- Small size
- High reproducibility
- Up to 1.000 analyses with one sensor

### Operation

An LCD with clear step-by-step instructions makes the **combi line** easy to use in daily routine operation. For standard assays, the work is reduced to the initiation of the test and the sample input.

While the test is running, the values can already be tracked on the display as a trend. After completion of the test operation, the measured and calculated parameters are printed out by the built-in thermal printer.



### Consumables

**combi line** gas calibration solutions are delivered in foil packets – easy to handle and individually replaceable. Only completely used packets and bottles are replaced. Another way to reduce operating costs. Only four calibration solutions and a rinse solution are needed to operate the **combi line** complete sensor configuration for analysis of blood gases, electrolytes and metabolites. Units with the sensor combinations »Blood Gas« or »Electrolyte« may be operated with only two calibration solutions.

### Sensors

For more than five decades, the name **ESCHWEILER** has stood for high quality and reliability in blood gas and electrolyte sensors. **ESCHWEILER** sensors are distinguished by the precision of their measurement and their durability. Reduced patient care costs, replaceable premembraned cartridges – delivering even more compelling advantages in light of reductions in operating costs.



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