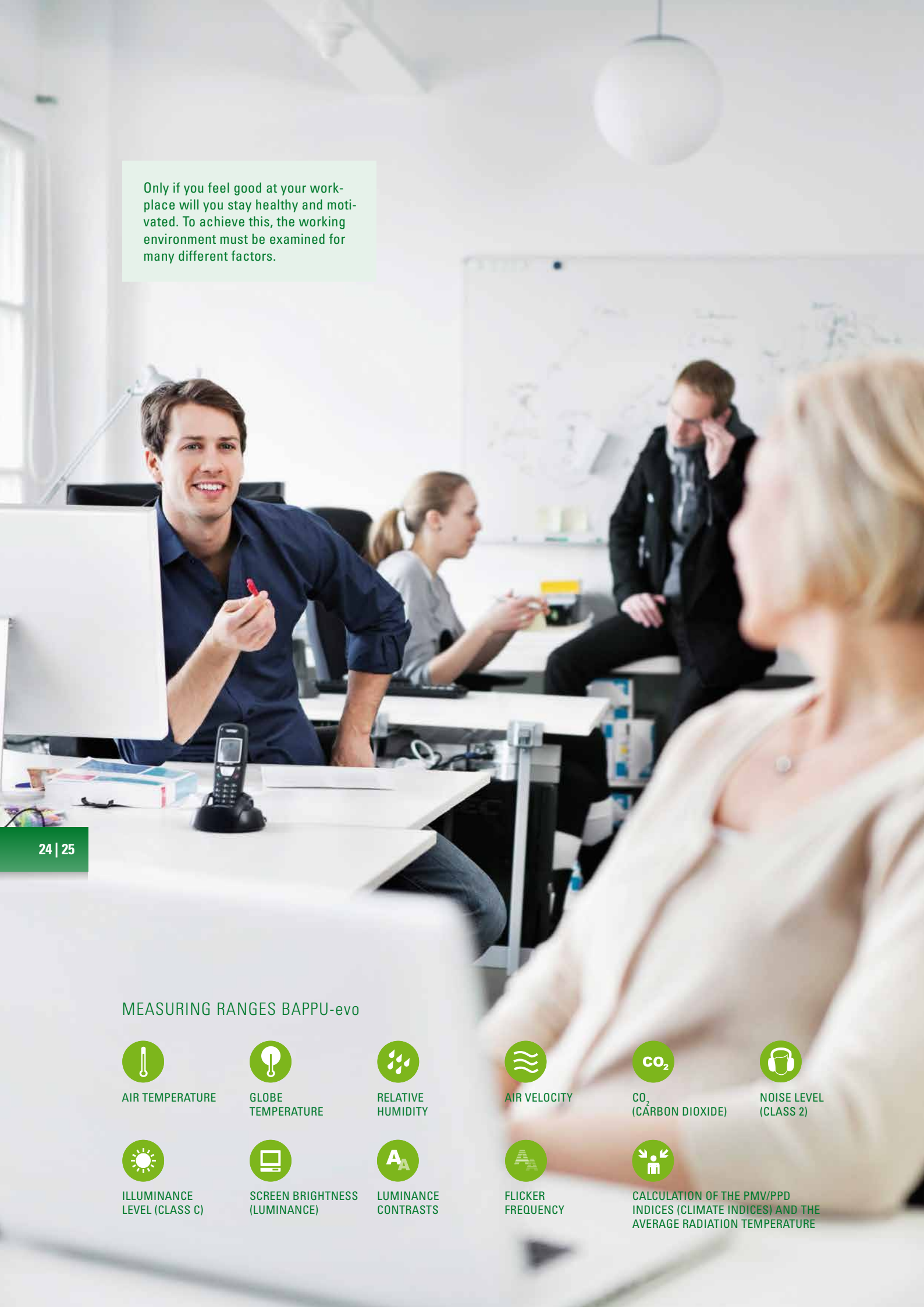
Only if you feel good at your workplace will you stay healthy and motivated. To achieve this, the working environment must be examined for many different factors.



MEASURING RANGES BAPPU-evo

- AIR TEMPERATURE
- GLOBE TEMPERATURE
- RELATIVE HUMIDITY
- AIR VELOCITY
- CO_2 (CARBON DIOXIDE)
- NOISE LEVEL (CLASS 2)
- ILLUMINANCE LEVEL (CLASS C)
- SCREEN BRIGHTNESS (LUMINANCE)
- LUMINANCE CONTRASTS
- FLICKER FREQUENCY
- CALCULATION OF THE PMV/PPD INDICES (CLIMATE INDICES) AND THE AVERAGE RADIATION TEMPERATURE

„FEELING GOOD IN THE OFFICE."

UDO LIESER, MANAGING DIRECTOR,
ZBIGNIEW SZENDERA, PROJECT MANAGEMENT MECHANICAL DEVELOPMENT

ELK GMBH, ENGINEERING OFFICE FOR ELECTRONICS
GLADBACHER STR. 232, 47805 KREFELD, GERMANY

BAPPU-evo is a comfortable multimeter for orientation measurements of health-relevant environmental characteristics at the workplace in the areas of commercial administration and industry. The device is characterised by a high level of user-friendliness and many functions to make work easier.

CUSTOMER APPLICATION

THE EVOLUTION OF A SUCCESS MODEL

As far as handling and ease of use is concerned, BAPPU-evo follows the successful conceptual design of its predecessor in all respects, but also offers state-of-the-art features. These include a USB interface, a colour display, the option of integrated continuous recording, additional CO2 measurement, classification in the measuring ranges of noise (Class 2) and illuminance (Class C) as well as the calculation of the thermal comfort indices (climate indices) PMV and PPD. This is all packed into a new, ergonomic enclosure which takes up and further develops the form of BAPPU. As previously, all values measured at the workplace, including their evaluation, are saved to a named storage location in the device. From here, they can be transferred to a PC and evaluated using the BAPPU software. The preparation of workplace analyses and long-term recording are also part of the concept. To cut a long story short: BAPPU-evo meets all of the requirements for a modern, efficient and cost-effective all-in-one device for industrial safety.

PROJECT SEQUENCE (FROM THE BEGINNING TO SERIAL PRODUCTION)

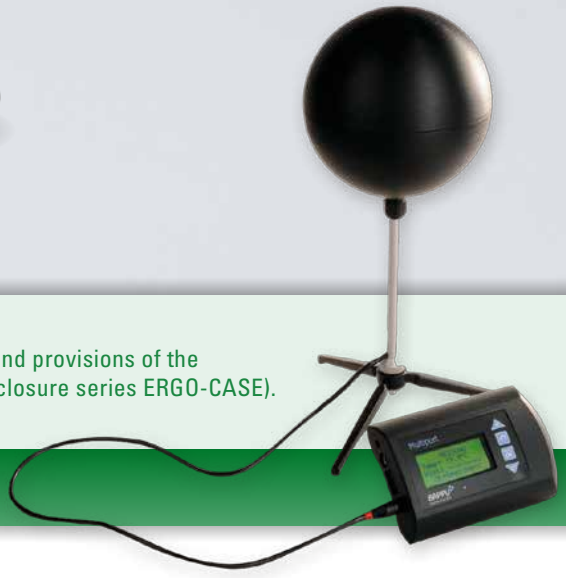
We (ELK) were faced with the task of designing and constructing a modern successor to our successful Bappu-classic multimeter.

The purely external aspect, that is, the enclosure, is of course not unimportant. A predefined requirement, on the one hand, was to take account of clear recognition elements in the design, for example the typical „blue acrylic BAPPU nose", and on the other hand to use state-of-the-art technology in order to achieve high classifications, for example. Since the enclosure shape had to be optimised for all sensors, it was a continuous development process which had to be constantly examined in theoretical calculations and in the ELK laboratory. Particularly in the field of acoustics measurement, the enclosure represents a crucial influencing factor. It was thus also a great challenge for our acoustics laboratory to harmonise the technically ideal enclosure shape with visual standards in order to achieve at least the acoustic measuring class 2.

BAPPU-evo

The BAPPU-evo multimeter allows the comprehensive and efficient analysis of workplaces. Health-relevant parameters are recorded, compared „on site" with defined target values and evaluated. PC software for preparing analyses, processing the data, long-term recording as well as optional sensors round off the system.

- 11 measuring ranges.
- Easy operation, immediate evaluation.
- Colour display with touchscreen, USB interface.
- Classification of noise and illuminance measurements.
- Software for preparation, evaluation, documentation.
- Integrated data logger for long-term recording.
- Sturdy case for all components and accessories.



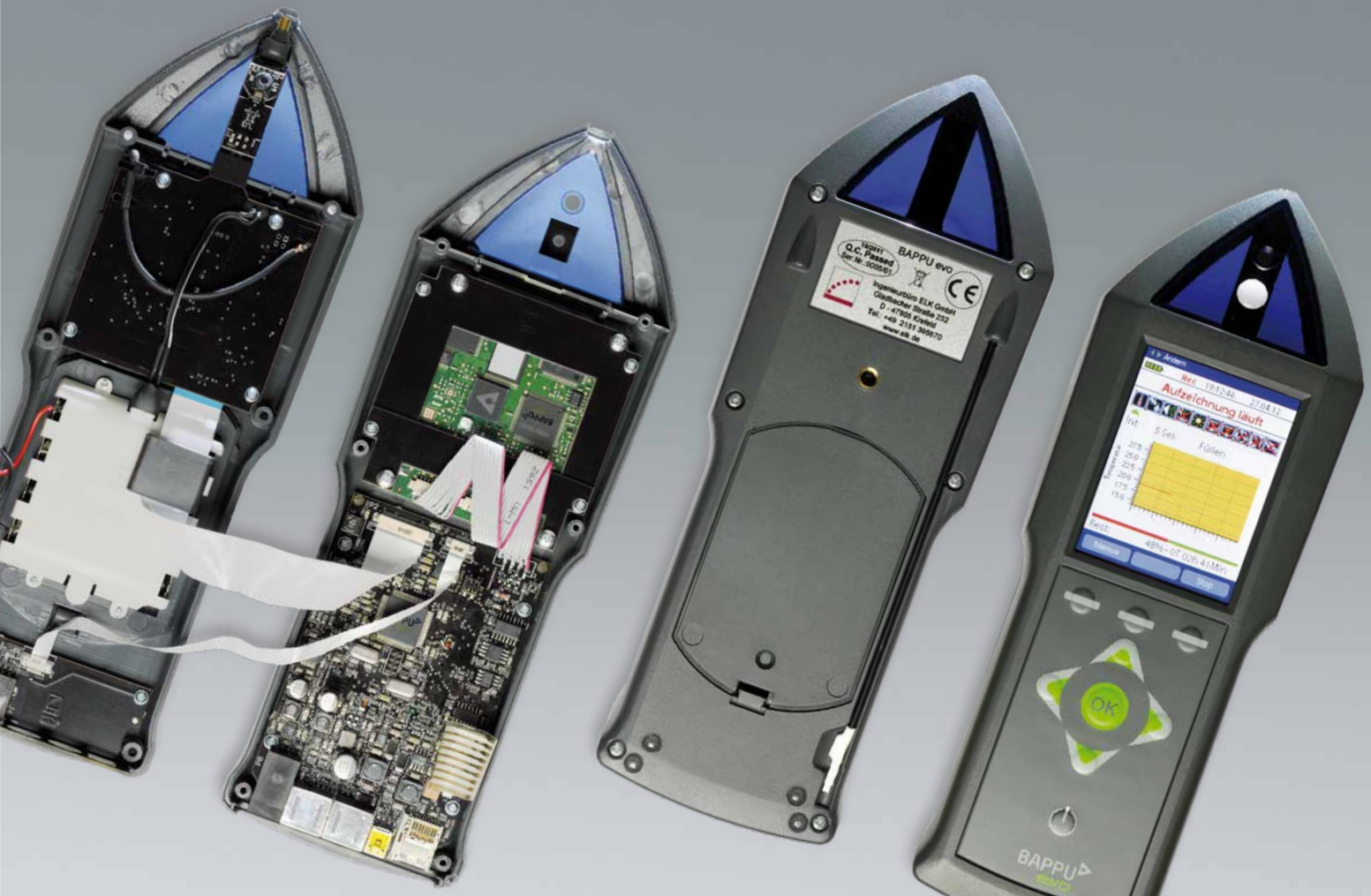
BAPPU-Globe – Bulb thermometer to measure and provisions of the „thermal comfort" with multi-port unit (OKW enclosure series ERGO-CASE).

From an ergonomic point of view a further requirement to be met by the enclosure was that the shape, feel and colour had to contribute to user-friendly operation. It soon became clear that a finished, off-the-peg enclosure already on the market would mean too many compromises. We therefore tackled the project of having our own, individual BAPPU enclosure built. Our first sketches transformed visions into possible enclosure shapes. Prototypes „carved" out of polystyrene turned these ideas into concrete forms. Different manufacturing processes by diverse companies had to be checked to see if they satisfied our wishes. At the end of this consultation process, OKW Gehäusesysteme GmbH with their planned implementation concept convinced us that they were the right partners for the „BAPPU-evo enclosure project".

Besides the expected costs, which unfortunately are very important for successful implementation, a good atmosphere for constructive cooperation was very important for us. Our ideas and wishes had to be implemented in „tangible" forms. At the same time, we have to speak the same language and have the feeling that what we say is understood. After initial talks, we had the impression that OKW fulfilled this precondition.

We had come a long way before our ideas were implemented in the form of an enclosure which we could hold in our hands. Compromises had to be made in some details, since the manufacturing process naturally entailed limitations which we did not know. It thus became a „design journey" together with OKW, characterised by creativity, understanding production technology

From the idea to prototype to finished part series.



BAPPU-evo CO_2 – Sensor for measuring carbon dioxide concentrations (CO_2) in the room air (OKW enclosure series SOFT-CASE).

and revision of our design plans. Minor setbacks and „teething troubles" had to be dealt with, and one or other idea also had to be rejected.

To be able to deal with such a process largely free of stress and on schedule, the help offered by OKW for the designers at ELK was very encouraging and constructive. A high point in this development was surely the first 3-D drawing, with the help of which ELK was able to assess and examine the enclosure from all sides, at least on the screen. For example the finished drawings of the ELK printed circuit boards were virtually inserted into the enclosure. The prototype, which was created by OKW using a 3-D printer, was then the reward for the efforts of all parties involved.

The summary of this cooperation – Thanks to the good communication between OKW and ELK, we never had the feeling that we were going down the wrong road. Mutual stimulation acted like a game of „ping-pong", but with the intention of reaching a common goal. The cooperation was characterised by all-pervasive quality awareness, competence in technology and consultation, and transparent, binding time scheduling. The cost risks were kept to a minimum through the 3-D print prototypes.

And the most important thing: Evaluation in practice has shown that in serial production, the BAPPU-evo enclosure is fully functional and satisfies not only our expectations but also those of our customers.

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