erfi

enjoy your work

elneos® six

a leap ahead

The new device series for the electrical industry.

General catalog

elneos® six

The new device series for the electrical industry.

General catalog

enjoy your work!

This persists our motto – because workplaces are our passion. As the market founder of electronical laboratory equipment for industry and training assembly table systems, measuring and testing equipment, test systems for electrical safety and function and didactic systems, we represent highest standards and individual solutions.
With our new *elneos six* equipment system, we are placing a new milestone in the highest electronical equipment industry – **a leap ahead!**

Our new customer center
For more than 65 years, we have been successfully developing and manufacturing our products and components at our plant in Freudenstadt. Due to the high vertical range of manufacture in furniture construction and electronics, we have unique competences in the Industry 4.0 standard. You can experience all of this directly on site in our new customer center. In addition, we also offer interested parties the opportunity to visit the Showroom virtually via a digital twin.

We look forward to your visit!
Visit our customer center in Freudenstadt with 1,100 m² of exhibition space in conjunction with a tour through our production.

On site: You are welcome to make an appointment by calling 07441 9144-404 or sending an e-mail to: kc@erfi.de.
Or online: Click into the virtual customer centre on our homepage.

elneos® six – a leap ahead

erfi

elneos® six

a leap ahead

On more than 11,000 m², we produce all technical workplace systems, electronic devices, measuring and testing devices, test systems for electrical safety and function as well as didactical systems for you at our main site in Freudenstadt.

Our particularly great in-house production depth in furniture and electronics is a guarantee for consistent high quality standards. All manufacturing steps are subordinated to the principle of production according to the Industry 4.0 approach. Our manufacturing expertise ranges from cutting to size, edging with laser technology, CNC free-form milling and drilling as well as the entire metal construction in furniture production to circuit board assembly, device construction and the electrification of complete laboratory, workplace and test systems.

The in-house manufacturing expertise we have acquired distinguishes us considerably. We are always one step ahead in product innovation and our solutions have been recognised by prestigious design awards since 1980.

reddot design award

product design award

German Design Award

Focus Open

elneos® six

a leap ahead

The new *elneos six* electronic device system with its innovations once again defines the benchmark for the entire industry. As the successor model to the *elneos five* series, all of the *elneos six* components have been redeveloped and many details have been massively improved. In addition, new device groups such as DC high-current power supply units and AC sources significantly expand the device system to a considerable extent. This bandwidth makes it possible for the new series to be used for the first time in new industries such as battery research and electromobility.

The 8 devices of the elneos® six:

- Precision control power supplies linear up to 660 Watt
- Power arbitrary generators linear up to 660 Watt
- High current power supplies up to 3,000 Watt and up to 125 A
- Digital multimeters up to 125 A
- Power meters 1- and 3-phase
- Function generators up to 40 MHz
- Fast signal arbitrary generators
- AC sources (electronical) 1-phase up to 400 Hz
- AC sources (electromechanical) 1- and 3-phase

GERMAN DESIGN AWARD WINNER 2022

A Fascinating System …

… tactile 8-inch multi-touch display, ring jacks which light up and flash intelligently. This makes working so much safer!

… there is also supposed to be a little brother …

… a control centre in which up to 8 units can be operated simultaneously are installed and numerous others can be controlled! Fascinating!

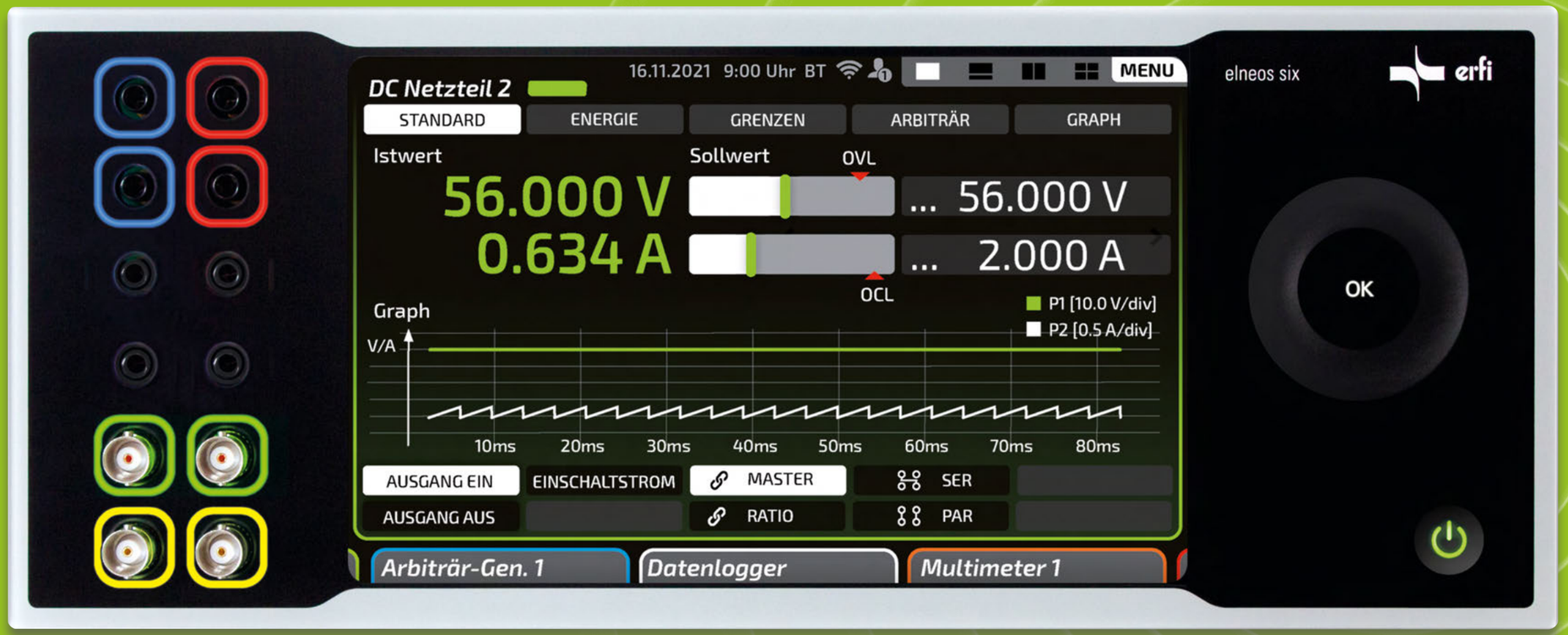
… and yet portable as a standalone … a mobile electronic laboratory!

… it can be controlled without contact … due to a brand new Airwheel, with 3D gestures and voice control …

… and it even speaks! A true benchmark of hygiene at the Workplace!

… these many features and power, even with haptic feedback on the display and an all-new tactile capacitive wheel …

… yes, and there are also splitscreens. To operate them at once you can display each device in different sizes. Truly practical!



elneos® six

The new device system for 19-inch table tops and 19-inch cockpits as well as standalone!

GERMAN DESIGN AWARD WINNER 2022

Talk to elneos® six!
With the speech package Hey erfi! *elneos six* talks to you via the integrated microphone and loudspeaker.

The intelligent voice control can also play back measurement data: With "Hey erfi!" you start a conversation. A voice command for example: "Set 5 V", *elneos six* would reply with "5 V" or to the voice command "measure current" *elneos six* would respond with "3,234 A". The built-in intelligence enables not only the control but also the processing of tasks.

Expand your flexibility!
The 8 new pairs of laboratory sockets and the 4 BNC sockets extend your flexibility for more device functions in the control centre. For example, a dual power supply, a dual power arbitrary generator, a digital multimeter, a power meter, a function generator and a fast signal arbitrary generator can be installed simultaneously in the unit.

The intelligent ring socket lighting with disappearing effect enables safe user guidance, among other things, by means of a flashing function and colour indication.

A rest for your eyes!
The new 8-inch haptic display enables a clear, free and simultaneous arrangement of devices in full-screen, half-screen, 2/3-screen and quattro-screen layouts.

Responsive feedback via the multi-touch function becomes a user experience thanks to the surface-feeding cover glass. The new anti-fingerprint coating keeps the surface clean and the displays remain precise in their presentation.

Control without touching!
The new Airwheel is more than just capacitive. The touchless operation reacts to 3D gestures such as wiping and circling finger movements and gives tangible feedback via vibration. This makes the Airwheel very comfortable to use and hygienically clean.

The new fingertip grind of the on/off button ensures that the appliance can be switched on and off safely. This prevents unintentional actuation.

elneos® six compact

The device system for compact integration into the Expand 2 extension profile of the elneos® connect furniture system.

elneos six compact in horizontal (left fig.) and in vertical version (right fig. approx. 35% of original size)

The optimum in 56 HP!
elneos six compact is the ideal supplement for laboratory benches that do not have a cockpit. This allows you to equip the laboratory table, with for example, storage boards, without having to forego instrument functions. The performance data is achieved using the same industrial computer as for *elneos six*.

elneos six compact accommodates all device groups except for AC sources and DC output stages. They are installed in TechCubes underneath the work surface. The control center of DC power supplies is accommodated in *elneos six compact*.

Gain workspace!
The compact control centre is integrated into the Expand 2 aluminium extension profile of the *elneos connect* laboratory furniture range in horizontal or vertical installation direction.

- Due to the low unit depth (79 mm), *elneos six* compact fits into the Expand 2 channel (135 mm) and takes up hardly any working space.
- In the vertically and horizontally installed state of the erfi-Bridge the working surface remains untouched.
- No 19-inch equipment superstructures or a cockpit are required.

Intelligent interfaces!
The new indication bars next to the connection sockets are equipped with a disappearing effect and thus enable a high degree of connection safety.

The units are efficiently controlled via the rotary encoder and the capacitive on-off button with fingertip grind.
In addition, *elneos six* compact offers the familiar operating convenience via the multi-touch display.

Slim 7-inch multi-touch display!
The slim shape of the display allows vertical and horizontal installation. The display aligns itself according to the installation position and can thus be used optimally in any position.

The capacitive multi-touch display offers all the essential features of *elneos six*, such as the touch gestures or the split-screen variants. The anti-fingerprint coating keeps the surface clean and the high resolution display performs data precisely.

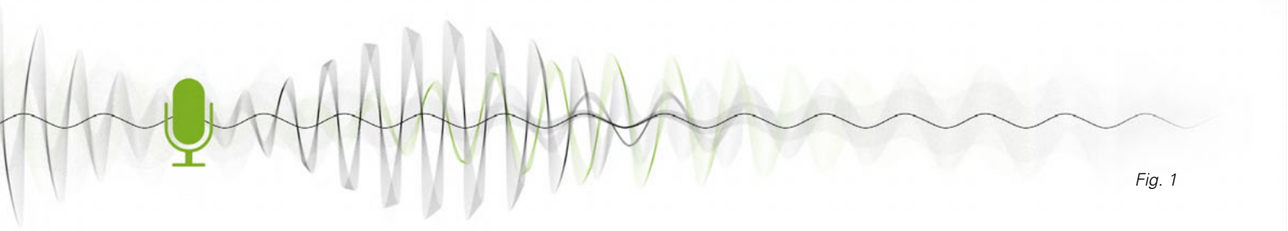


Fig. 1

elneos® six voice control
Control *elneos six* via a network-independent voice control. Several built-in microphones process your spoken words and convert them into device functions at lightning speed using specially developed speech algorithms. For example, you can have the measured values read out to you and malfunctions are prevented. By means of an integrated loudspeaker, *elneos six* provides information about measured values and device statuses in a pleasant voice (Fig. 1).

elneos® six ring socket illuminations
For the first time, a completely newly developed ring socket illumination with disappearing effect visualises safety-relevant power outputs for all device groups, including the new device groups of high-current power supplies and AC sources. Users are thus safely guided and immediately recognise the unit equipment. Different and safety-relevant unit functions are colour-indexed and thus safely guide the user during all connection work (Fig. 4).

Fig. 2: elneos six with 8-inch display and Airwheel with tactile feedback

Fig. 3: Airwheel or two optional encoders

Fig. 4: Intelligent ring socket lighting

elneos® six multi-user mode
elneos six allows simultaneous operation by several users. Additional operating elements such as a second capacitive wheel or a second mechanical rotary encoder allow several people to operate multiple devices simultaneously (Fig. 2).

elneos® six tactile wheel
With the touch-sensitive wheel, you receive immediate feedback from *elneos six*. The optional "Tactile Wheel and Display" provides tactile feedback after a touch or during a detected movement by means of vibration or a simulation of a grid on the control element (Fig.2).

elneos® six Airwheel
The new Airwheel controls most functions and the device selection completely contactless by hand gestures. With up to 7 cm in front of the surface, the device detects movement (Fig. 2 and 3).

elneos® six signal transmitter
The signal transmitter connected via the internal bus is operated manually. The operating module, which is placed separately in an additional drawer, can be installed as a single or double version (Fig. 3).

elneos® six Innovations

The *elneos six* system sets new standards in the world of electronic devices. With over 100 innovative features, the new system is unbeatable in the areas of agile operating concept, comprehensive integration capability and technical performance. Here are just a few aspects:

- 8-inch multi-touch display with fully tempered security cover glass and ceramic print on the back
- Four splitscreens for variable device display
- 3D gestures through Airwheel and tactile feedback
- Life measurement display via connection panel
- Control center to accommodate 4-fold power supply
- Voice control with built-in intelligence
- Agile ring socket illumination for increased safety

Fig. 5: elneos six in Half-screen mode

Fig. 6: elneos six in Quattro screen mode

Fig. 7: elneos six socket lighting of the AC sources

elneos® six display freedom
Arrange your screen the way you prefer to work. Regardless of whether you want to observe and operate one device or four devices at the same time. The 8-inch display makes the screen modes Full-, Half-, 2/3- or Quattro screen pleasant to read. Additionally, you can operate all units and all parameters immediately and simultaneously via Quickstart, even without selecting a unit (Fig. 5 and 6).

elneos® six socket lighting
Especially working with AC voltage, requires high safety. The provision of voltage or current from AC sources via the front panel is signalled by an active light state. The socket light is assigned a function designation and has a disappearing effect when inactive (Fig. 7).

The elneos® six Paradigm

The new *elneos six* system is triggering a long-term trend reversal in the electrical equipment industry. With its new operating concept, its performance and possibilities for integration into any working environment, *elneos six* sets a new standard*.

Operating concept for a new standard of hygiene

erfi hygienic

Communication between the user and the unit is made intuitive and hygienically clean by the 3D gestures and the voice package. As an internet-independent functional unit, the intelligent voice control is a must for all those who are enthusiastic about agile working. The variations of the wheel from touch-free operation to tactile feedback in combination with gesture control make it possible to comply with all hygiene standards. The large 8-inch multi-touch display and ceramic back-glass print make for perfect readability, even when operating up to four devices simultaneously in split-screen mode.

Performance and safety

The device performances, e.g. in the area of power supplies and AC power sources, are designed for the highest demands. The 1- and 3-phase power sources can be controlled electronically as well as electromechanically and offer a power high of up to 720 V, 415 V AC and 16 A. The DC power supplies offer programmable high-speed ramps with 24-bit measured value resolution. The intelligent feed-back system with cross-insertion function labelling with disappearing effect and the ring socket illumination increase safety. Finally, the industrial processor is unrivalled due to 24/7 operation up to +85° and 4 GB memory.

Possibility of integration and flexible working

As a system, *elneos six* can be integrated over the entire surface in cockpits and table superstructures. In this way, you achieve a glass front with continuous endless-impact cover glass. *elneos six* compact can be integrated into tables that normally offer no space for units with a standard depth. The compact unit system sits in the Expand 2 aluminium profile and thus finds its place in numerous laboratory situations. Access to data via all technical interfaces and an image-based web browser also provides access via the internet.

* More detailed information in the Technical Compendium from page 139.

elneos®six in the Laboratory

The new device system *elneos six* is integrated in the **19-inch / 3 U device cockpit** of the *elneos connect* laboratory workstation with continuous glass device front. The surface with intelligent lighting and piece contacting with disappearing effect is the perfect user guidance for maximum safety in the workplace.

elneos® six device system:

1. Rack 3 U / 56 HP for 1-phase AC source.
2. Universal plug-in units 3 U / 63 HP and 3 U / 14 HP for additional DC sources, digital multimeters, power meters, function generators and arbitrary generators that are not integrated in the control centre for space reasons.
3. Control centre for simultaneous inclusion of all units except AC sources with 8-inch multi-touch display, 3D gesture control and voice control.
4. Rack 3 U / 95 HP for 3-phase AC source with intelligent ring socket lighting incl. function labelling.
5. Connect insert plate with all device interfaces such as USB A and USB B, LAN, 10 digital outputs and 8 digital inputs.

elneos® connect laboratory table:

- erfi-Bridge (green*) equipped with *acto* unit system,
- electromotive height adjustment,
- front table edge with new Tech-edge alu-line and comprehensive laser edge with permanent zero joint,
- integrated cable flap and cable tray,
- 19-inch / 3 U unit cockpit made of aluminium,
- invisibly integrated RGB LED light and
- RGB indication light across the width of the lab bench.

* The colour green of the insert panels *acto* is an orderable option.

elneos®six in the Laboratory

The new device system *elneos six* integrates the **inclined 19-inch / 6 U device cockpit** of the *elneos connect* laboratory workstation with multifunctional drawer and continuous glass appliance front.

elneos® six device system:

1. Rack 6 U / 70 HP for powerful 1-phase AC sources.
2. Two universal plug-in units 3 U / 63 HP for additional DC sources, digital multimeters, power meters, function generators and arbitrary generators that are not integrated in the control centre for space reasons.
3. Rack 3 U / 56 HP for 1-phase AC source.
4. Slide-in unit 3 U / 14 HP for additional digital multimeters, power meters, function generators as well as arbitrary generators that are not integrated in the control centre for space reasons.
5. Control centre to accommodate all devices except AC sources with 8-inch multi-touch display, 3D gesture control and voice control.
6. Rack 3 U / 95 HP for 3-phase AC source with intelligent ring socket lighting incl. function labelling.
7. Insert plate with 2 rotary encoders (for 2nd user) as well as an insert plate with second Airwheel (for 2nd user) next to it on the right.
8. Connect insert plate with all device interfaces such as USB A and USB B, LAN, 10 digital outputs and 8 digital inputs.

elneos® connect laboratory table:

- erfi-Bridge (green*) equipped with *acto* unit system,
- electromotive height adjustment,
- front table edge with new Tech-edge alu-line and comprehensive laser edge with permanent zero joint,
- integrated supply terminal in the tabletop,
- 19-inch / 6 U unit cockpit inclined 10°,
- allrounder multifunctional pull-out (cable drawer),
- invisible RGB LED light as well as
- RGB indication light across the width of the lab bench.

* The colour green of the insert panels *acto* is an orderable option.

elneos®six in the Laboratory

The new *elneos six* equipment system integrated in the **19-inch / 6 U equipment cockpit** of the *elneos connect* laboratory workstation with continuous glass equipment front and TechCube under-table installation.

elneos® six device system:

1. Rack 6 U / 70 HP for powerful 1-phase AC sources.
2. Universal drawer 3 U / 63 HP for additional DC sources, digital multimeters, power meters, function generators and arbitrary waveform generators which are not integrated in the control centre due to lack of space.
3. 6 U / 95 HP slide-in module for 3-phase AC source with intelligent ring socket illumination incl. function labelling.
4. Insert plate with second Airwheel for additional user.
5. Control centre with 8-inch multi-touch display, 3D gesture control and voice control for simultaneous inclusion of all device groups except for AC sources.
6. Insert plate with 2 rotary encoders for additional user.

elneos® connect laboratory table:

- erfi-Bridge (orange*) equipped with *acto* unit system,
- electromotive height adjustment,
- table top with anti-fingerprint surface,
- table top in the front area with embedded *elneos six* control centre incl. power supply unit, digital multimeter and function generator,
- invisible RGB LED light,
- RGB indication light across the width of the bench and
- TechCube for extensions mounted underneath the tabletop.

Under-table installation TechCube
The TechCubes are installed under the table to accommodate very large power sources that cannot be integrated into the unit cockpit for space reasons or when only very compact unit cockpits are required. Preferably, all power modules are integrated in the control centre or in the 19" additional racks.

* The colour orange of the insert panels *acto* is an orderable option.

elneos® six compact in Vocational Training

The new device system *elneos six compact* vertically integrated in the **Expand profile 2** of the *elneos connect* training laboratory table in combination with the *acto* insert plate system.

Device system acto® in combination with elneos® six compact
Fitting of right-hand expansion profile Expand 2:

1. Socket panels (*acto*)
2. EMERGENCY STOP (*acto*)
3. Control centre *elneos six compact* vertically integrated: with 7-inch multi-touch display and voice control for simultaneous inclusion of all unit groups except AC sources. The power amplifiers of the DC power supplies and AC sources are installed in the TechCube below the table.

Compact unit design

The entire control electronics of the DC power supply units, digital multimeters, power meters, function generators and all arbitrary generators are installed as a compact unit in the control centre of the *elneos six* compact unit. A technical masterpiece in the smallest possible space makes for easy servicing and accessibility, as no additional installation space is required.

elneos® connect training laboratory table:

- Tabletop with Aluline edge at the front,
- Expand 2 extension profile (vertical) fitted with *acto* unit system (anodised insert panels) left and right below and above the table top,
- TechCube for integrating the DC and AC output stages.
- inclinable shelf incl. cable tray underneath,
- invisibly integrated RGB LED light,
- suspended pedestal with one drawer incl. electronic central locking, infinitely adjustable to the left and right,
- mobile pedestal (under wall pedestal) incl. electronic central locking system,
- one DIN-A4 experimental frame to hold the DIN-A4 teaching aids,
- LED warning light column,
- attachment plate mountable on both sides for table extension and
- one All-in-One PC with 23-inch touchscreen and monitor holder

elneos® six in Vocational Training

The new *elneos six* equipment system integrated **19-inch / 3 U table** configuration of the *elneos connect* training laboratory table in combination with *basic* equipment system.

Device system basic in combination with elneos® six

Fitting tabletop:

1. Safety gas connection fitting with shut-off device for natural gas and liquid gas (*basic*).
2. Socket panels (*basic*)
3. Control centre *elneos six* for simultaneous inclusion of all device groups except AC sources with 8-inch multi-touch display, 3D gesture control and voice control.
4. Safety and switching unit (*basic*)
5. Compressed air unit (*basic*)

elneos® connect training laboratory table:

- Tabletop with Alu-line edge at the front,
- 10° inclined 19-inch / 3 U tabletop structure,
- integrated RGB indication light across the entire width of the table,
- Expand 2 extension profile (vertical) fitted with *acto* unit system (green insert panels*), below the tabletop and above the table superstructure,
- suspended pedestals can be moved steplessly to the left and right,
- two DIN-A4 experiment frames to hold the DIN-A4 teaching aids,
- two All-in-One PCs with 23-inch touchscreen and monitor holder as well as
- room control software *highlink Power*.

* The colour green of the insert panels *acto* is an orderable option.

Safety Made of Glass!

The new glass unit fronts merge with the *elneos six* control centre to create a high-quality, homogeneous appearance that will look as good as new for decades. In addition, table superstructures and unit cockpits can be equipped with a continuous glass surface over almost the entire length of the table.

For units with live outputs, *elneos six* offers a new safety glass. The newly developed glass fronts for AC sources with intelligently backlit function labels and disappearing effect guide the user safely through trials and to the correct connection. The connections change colour depending on their status and the corresponding symbol is displayed.

The high-quality glass fronts are:
- safe due to highly insulated glass surfaces,
- scratch-resistant and impact-proof due to 3 mm thick toughened safety glass,
- absolutely vandal-proof,
- reliable operation through visual feedback and
- hygienic due to homogeneous surfaces.

Easy-to-maintain plug-in technology
Complete integration of the unit technology including output stages in the control centre and in further 19-inch additional racks with continuous glass unit front.

Clean & Clear

The continuous glass appliance front with intelligent ring socket lighting ensures high safety and outstanding hygienic properties. *erfi hygienic* – the continuous surface-etched front resists bacteria and viruses.

Additional device outputs
Additional device outputs can be installed in the erfi-Bridge (*orange) on request.

elneos® six in the worktop
The two control centres *elneos six* and *elneos six compact* can be recessed directly into the worktop.

TechCube for decentralisation
As an alternative to 19-inch plug-in technology in table-top set-ups or cockpits, power amplifiers can be integrated into easily accessible TechCubes underneath the tabletop. This makes it possible to realise superstructures with a low superstructure depth.

* The colour orange of the insert panels *acto* is an orderable option.

elneos® six Control Centres

Control centre elneos® six

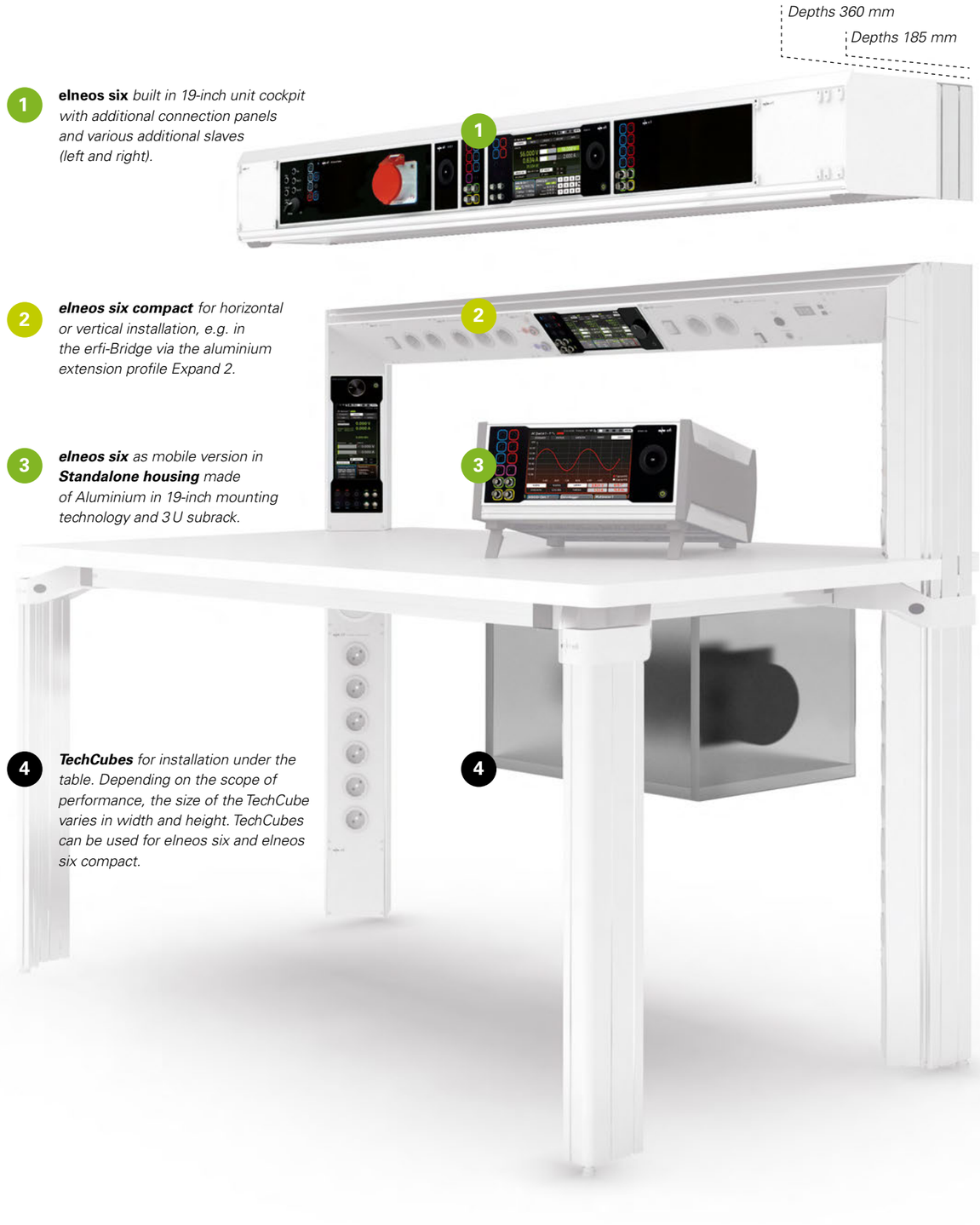
Version 1: Part insertion 3 U / 63 HP, depth 160 mm
Version 2: Part insertion 3 U / 63 HP, depth 220 mm

Version 1 can be used in table superstructures and cockpits with a small installation depth (185 mm). Power assemblies that require more installation space can be integrated into TechCubes underneath the table. Version 2 can be used in 19-inch table tops and 19-inch equipment cockpits with a large installation depth of 360 mm. When installing large AC sources or the new 3,000 watt power supply unit, TechCubes are also used underneath the table.

Control centre elneos® six compact

Horizontal: 56 HP (approx. 285 mm) wide, 113 mm high, 79 mm deep
Vertical: 56 HP (approx. 285 mm) high, 113 mm wide, 79 mm deep

Both built-in versions are installed in the Expand 2 profile of the *elneos connect* furniture system. Either in the vertical aluminium channel or horizontally into the erfi-Bridge. With *elneos six compact*, the AC and DC power amplifiers are installed in TechCubes under the table. The use of aluminium fronts realises all outputs and inputs and *elneos six compact* also controls all devices.



1 **elneos six** *built in 19-inch unit cockpit with additional connection panels and various additional slaves (left and right).*

2 ***elneos six compact*** *for horizontal or vertical installation, e.g. in the erfi-Bridge via the aluminium extension profile Expand 2.*

3 ***elneos six*** *as mobile version in* ***Standalone housing*** *made of Aluminium in 19-inch mounting technology and 3 U subrack.*

4 ***TechCubes*** *for installation under the table. Depending on the scope of performance, the size of the TechCube varies in width and height. TechCubes can be used for elneos six and elneos six compact.*

U: Height Unit, HP: Horizontal Pitch;

Installation of elneos six into a 3 U unit cockpit

Installation options elneos® six

Installation situation 1 - 19-inch table structure - 19-inch unit cockpit - in Standalone housing	**elneos® six** Control centre with built-in devices (except AC and DC sources).			
Installation situation 2 - 19-inch table structure - 19-inch unit cockpit	**elneos® six** Control centre with built-in devices (except AC and DC sources).	e-Bus	**Additional slaves** Glass or aluminium fronts if there is not enough space behind the control centre.	
Installation situation 3 - 19-inch table structure - 19-inch unit cockpit	**elneos® six** Control centre, or front with built-in units and AC and DC sources.	e-Bus	**Additional slaves** Glass or aluminium fronts if there is not enough space behind the control centre.	**TechCube** For further accommodation of power assemblies below the work surface.

Fitting elneos® six

Installation options

Version 1: Part insertion 3 U / 63 HP, depth 160 mm
Version 2: Part insertion 3 U / 63 HP, depth 220 mm

Installation with small depth (Version 1)
The installation version 1 of the control centre is used in 3 U table superstructures or unit cockpits with a small installation depth (185 mm).

This plug-in unit can be used for control power supplies up to 0-30V / 2 A, power arbitrary generators, digital multimeters, power meters, function generators and fast signal arbitrary generators.

If integrated units require more space, additional drawers or TechCubes underneath the table are used. When installing AC sources, the TechCubes are used instead. In such a case, an AC glass front is integrated into the unit cockpit with a small installation depth and the front is connected directly to the power section of the AC source in the TechCube.

Installation with greater depth (Version 2)
With installation version 2, the control centre is used in 3 U table superstructures or unit cockpits with a greater installation depth (360 mm).

All linear control power supplies up to the max. size, power arbitrary generators, DC power supplies, digital multimeters, power meters, function generators and fast signal arbitrary generators can be used in this sub-rack.

AC sources can be integrated into a 19-inch 3 U or 6 U subrack. The power modules are usually located in the 6 U subrack behind the glass front. When installing large AC sources or the new 3,000 watt power supply unit in 3 U unit cockpits, the TechCubes are used underneath the table.

19-inch/3 U equipment cockpit with elneos six, 3-phase insert plate for connecting the AC sources installed in the TechCube under the table. Additional wheel and slots for 2nd digital multimeter and power supply units.

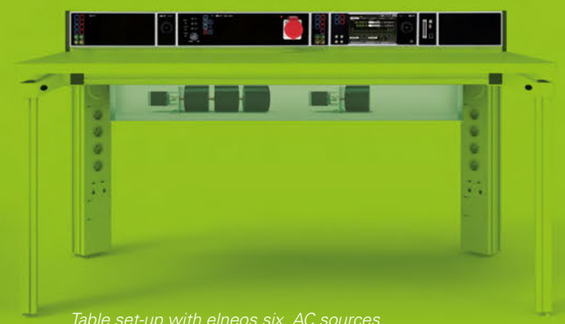
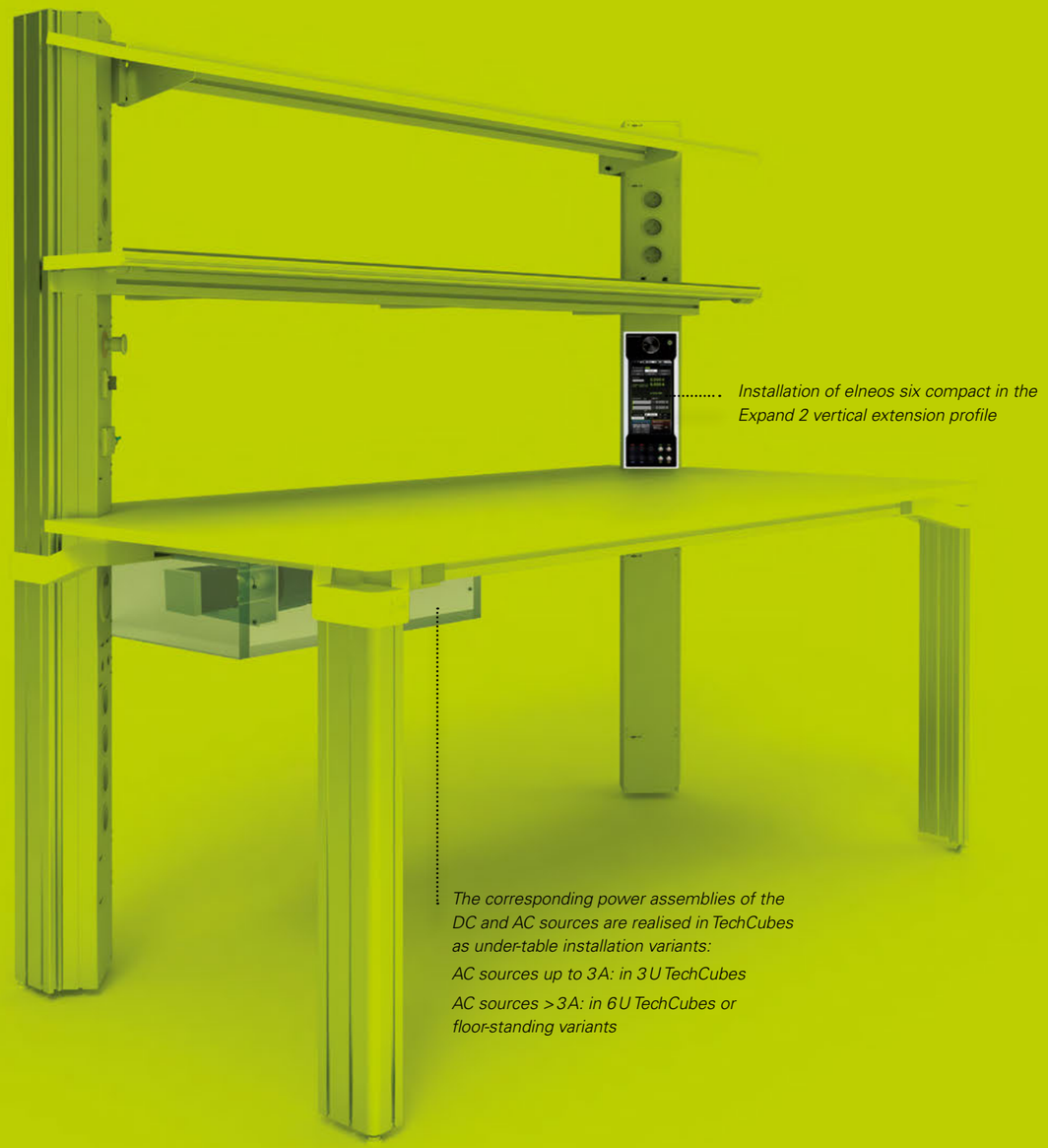


Table set-up with elneos six, AC sources, additional connection panels, additional wheel and TechCubes under the table.



Installation of elneos six compact in the Expand 2 vertical extension profile

The corresponding power assemblies of the DC and AC sources are realised in TechCubes as under-table installation variants:

AC sources up to 3 A: in 3 U TechCubes

AC sources > 3 A: in 6 U TechCubes or floor-standing variants

Einbaumöglichkeiten elneos® six compact

Installation situation 1
- Expand 2 Profile vertical
- Expand 2 Profile horizontal (erfi-Bridge)

elneos® six compact
Control centre
with built-in devices.

Installation situation 2
- Expand 2 Profile vertical
- Expand 2 Profile horizontal (erfi-Bridge)

elneos® six compact
Control centre
with built-in devices.

e-Bus

Connection panels in front panels *acto*
Aluminium fronts for all inputs and outputs and for AC and DC sources, if these of *elneos six compact* are not sufficient.

TechCube
For accommodating all devices and power modules (AC/DC) below the work surface that do not fit into the *elneos six compact* control centre.

Fitting elneos® six compact

Installation options
Horizontal: 56 HP (approx. 285 mm) width, 113 mm height, 79 mm depth
Vertical: 56 HP (approx. 285 mm) height, 113 mm width, 79 mm depth

Installation in the Expand 2 extension profile
elneos six compact is used when no table-top structure or unit cockpit is desired. In this case, the Expand 2 extension profile is always used. It can be inserted vertically or horizontally into the erfi-Bridge, whereby the erfi-Bridge is a combination of one horizontal and two vertical Expand 2 extension profiles. Depending on the installation orientation, the representation of the display is aligned.

Device mount
elneos six compact is the optimal addition for laboratory benches that do not have a cockpit. *elneos six compact* accommodates all equipment groups except for AC sources and DC power amplifiers. These are stored in TechCubes under the work surface. The control electronics of the DC power supply units also find space in the device itself.

The example shows a horizontal installation in the Expand profile 2 (erfi-Bridge) below a storage board. The power modules are built into the 3 U TechCube.

The example shows a horizontal installation in the Expand profile 2 on the work surface. All equipment is located in the control centre, except for DC power supply units with 3 kW, which are integrated in the TechCube.

Modes of elneos® six

*elneos six i*s a very powerful system that enables different operating modes. The foundation is always the control centre and from there three different modes can be selected. In single-mode operation with only one device function, in multi-mode operation with several devices and in multi-expand-mode operation with 19-inch additional plug-in units.

Single-mode operation
Each unit can be operated on its own and independently. For example, 1 digital multimeter, 1 function generator or 1 power supply unit can be integrated into the control centre.

Multi-mode operation
The main advantage of the system is its high integration capability. For example, 1 digital multimeter, 1 function generator and 2 power supply units can be integrated into one control centre or likewise up to 4 power supply units simultaneously.

Multi-expand mode operation
The control centre also allows the connection of up to 8 additional 19-inch plug-in units. Each plug-in unit allows the integration of 4 devices. In this way, compact measuring systems can be set up that fulfil several tasks at the same time.

Example of a device selection
Control centre with a device, e.g. a control power supply unit, a digital multimeter or a function generator.

Example of a device combination
Control centre with 2 control power supply units, 1 digital multimeter, 1 power meter and 1 function generator.

(1) (2) (3)

Example of a device combination with additional slaves
(1) Slave with 1-phase AC source, floating, 0-260V/3A and (2) slave for digital multimeter and power meter. (3) Control centre with 4 control power supply units (2 double control power supply units each 0-30V/2A).

Further example configurations for multi-mode
For the simultaneous integration of several device groups in a single control centre, additional control elements such as an additional wheel or a rotary encoder can be added at any installation position in the table. For example, 1 digital multimeter, 1 function generator and 2 power supplies can be combined in a single control centre with an additional slave for one or two rotary encoders to save space and energy.

Device combination
Control centre with 2 control network devices, 1 digital multimeter, 1 power meter and 1 function generator. Control via the integrated Airwheel and display incl. 3D gesture functions.

(1) (2)

Device combination with encoder
(1) Control centre with 2 devices, 1 digital multimeter, 1 power meter and 1 function generator and (2) slave on the right with 2 rotary encoders. The unit can be operated at any time by several users in parallel via Airwheel and the rotary encoders.

(1) (2)

Device combination with second Airwheel
(1) Slave for second Airwheel controlled by 3D gesture functions and used for simultaneous operation of several devices and several users. (2) Control centre with 1 digital multimeter, 1 power meter and 1 function generator.

(1) (2) (3)

Device combination with encoder + wheel
(1) Slave with second Airwheel. (2) Control centre with 4 devices and (3) slave on the right with 2 encoders. The control centre can be controlled simultaneously with 2 Airwheels and 2 encoders.

Further example configurations for the multi-expand mode

No other system is able to allow such compact complex measuring and test systems with one control centre. The control centre allows the connection of a total of 8 additional 19-inch plug-in units. Each plug-in unit allows the simultaneous integration of 4 devices of any type and is connected to the control centre via the e-bus. The slide-in unit has a bus connection that is able to address 4 internal slots by means of addressing.

The master and slave function

The control unit corresponds to the master and all other units are the so-called slaves. The master controls these slaves via commands. The slaves have processors that implement these commands and deliver the measured values on the e-bus to the master. Without placing a load on the master – *elneos six* becomes a real-time system.

(1) (2)

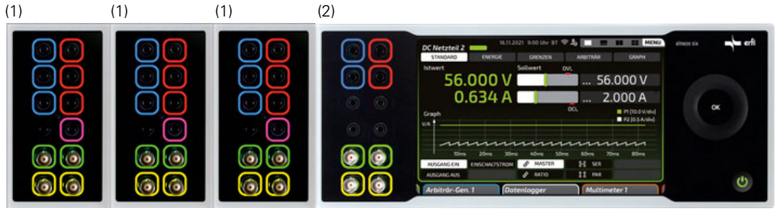
Device combination with small slave
(1) Slave on the left for 1 digital multimeter and 1 power meter. (2) Control centre with 3 devices and 1 function generator.

(1) (2) (3) (4) (5) (6) (7) (8)

Device combination with large extension
Above: (1) Slave with 3-phase AC source 0-450 V /260 V AC / 5 A, ungrounded, 2.25 kW. (2) Slave with power supply unit 0-60 V / 25 A and (3) slave with 3-phase AC source 0-450 V / 260 V AC / 2 A, not ungrounded, 900 W.

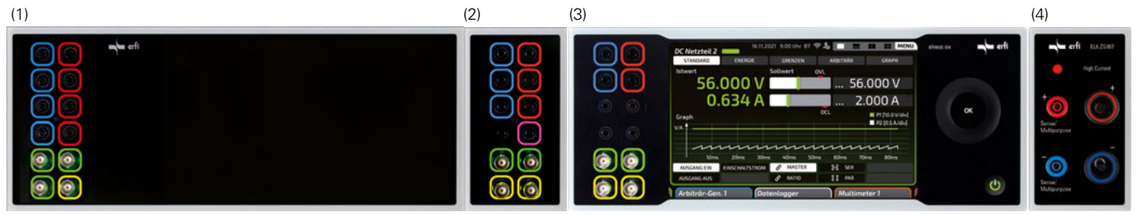
Below: (4) Slave with second Airwheel, (5) control centre with 1 control power supply unit 0-66 V / 10 A, digital multimeter with power meter and 1 function generator. (6) Slave with second digital multimeter and power meter. (7) Slave with second function generator and (8) slave with 1-phase source, ungrounded, 0-260 V / 3 A.

(1) (1) (1) (2)



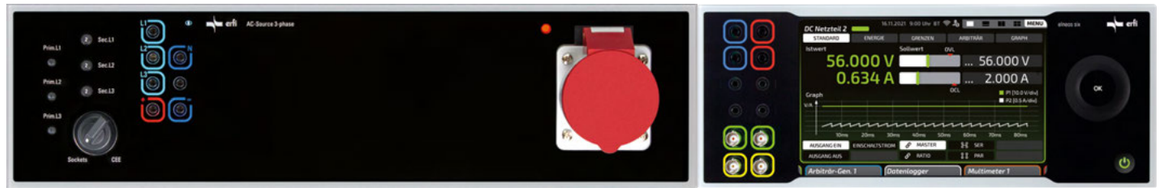
Device combination with three small slaves
(1) On the left three slaves for digital multimeters and power meters. (2) Control centre with 4 devices.

(1) (2) (3) (4)

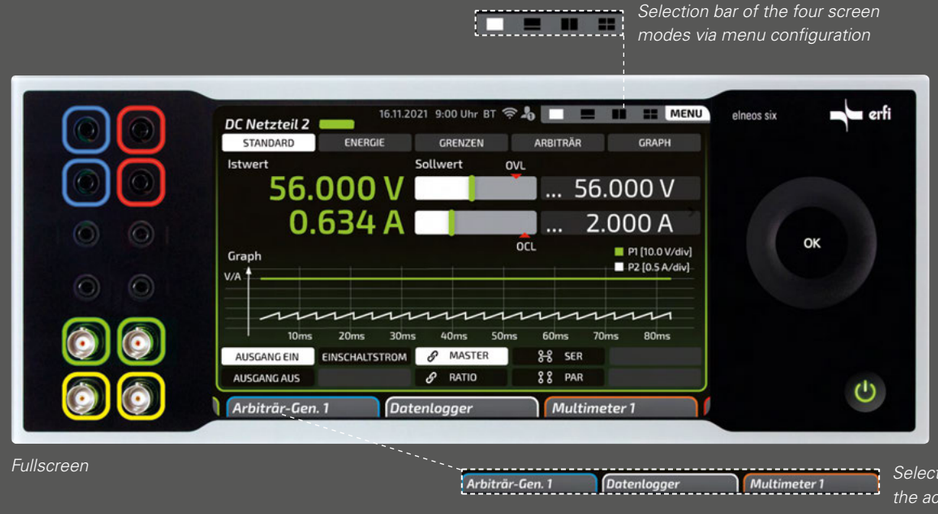


Device combination with various slaves
(1) Slave for further digital multimeter, function generator and double power supply unit 2 x 0-32 V / 2 A and (2) slave with digital multimeter and power meter. (3) Control centre with 1 power supply unit 0-32 V / 50 A and (4) slave with high-current outlet.

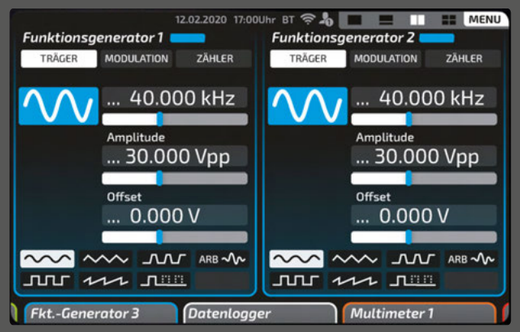
(1) (2)



Device combination with slave AC source
(1) Slave for 3-phase power meter with 3-phase AC source 0-400 V / 3 A ungrounded. (2) Control centre with 2 power supplies 0-32 V / 2 A, 1 digital multimeter with power meter and 1 function generator.



Fullscreen



Halfscreen: for optimal display of two devices side by side.

2/3 screen: the entries can also be made in the small screens.

Quattro screen: with parallel input in all 4 screens simultaneously.

Connection panel with live measured value display: the rest of the screen is dynamically scaled when the connection panel is displayed and can always be operated in parallel.

1-2-3-4 Splitscreens

Splitsceens and colour coding
The size of the 8-inch multi-touch display enables simultaneous operation of all devices in different display sizes. Four split screens are available, which are activated via selection bar:
- Fullscreen,
- Halfscreen,
- 2/3 screen and
- Quattro screen.

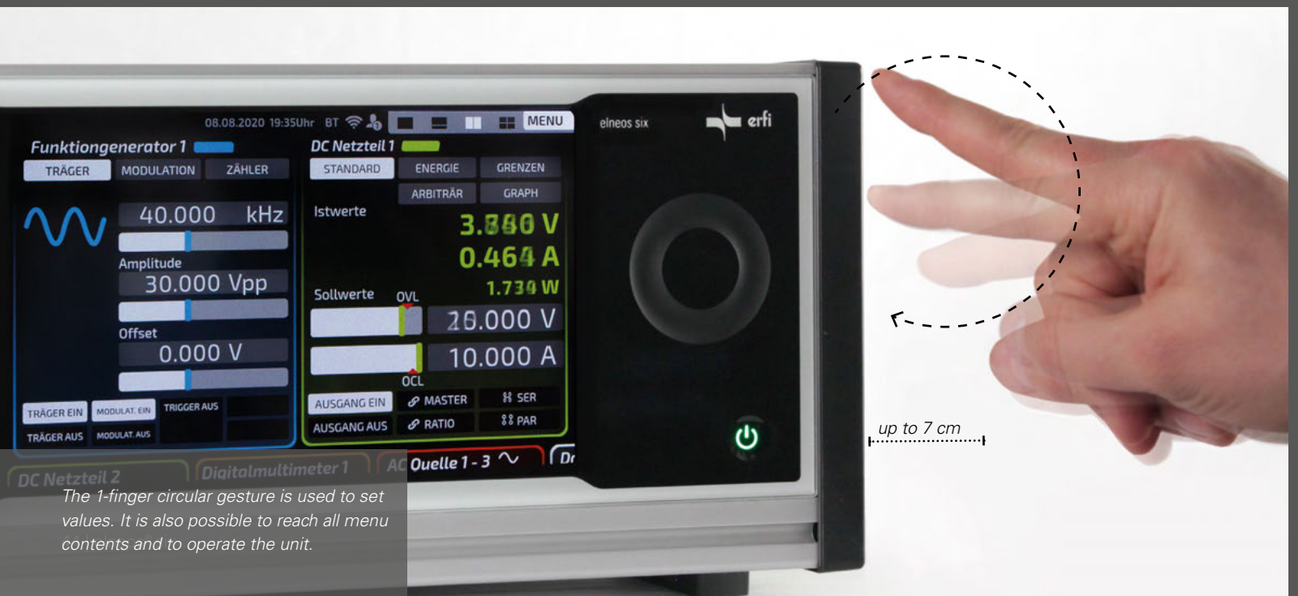
In Fullscreen, Halfscreen and Quattro screen, all active devices are shown in the lower part of the display in a reduced size. They can be scrolled horizontally and selected by swiping. In the 2/3 screen, the other active units are shown including a data display. In the Half-, 2/3- and Quattro screen as well as in each screen representing a device, you can fully operate the functions. This multi-device operating mode offers the user maximum comfort and an up-to-date device overview at all times.

Dynamic screen layout and connection panel
The simultaneous display of four devices in Quattro screen mode and the measured value display of other devices in the connection panel is dynamic. In this way, up to 8 devices can be visualised at the same time. As soon as the connection panel is displayed, all device screens automatically zoom together. All information is then still legible and no information is covered.

In all splitscreens, the values can be changed simultaneously and in the connection panel, all measured values are displayed directly at the inputs or outputs live as well as parallel to the device. The screen contents can also be switched on and off via remote control commands.

Tables are scrolled by vertically moving the hand.

The devices are scrolled by the horizontal gesture in the unit bar.



The 1-finger circular gesture is used to set values. It is also possible to reach all menu contents and to operate the unit.

Gesture Control

Hygienically clean gesture control through Airwheel
The new Airwheel offers innovative control possibilities by recognising hand gestures in space. The 3D hand and finger gestures are recognised by interpreting the X-Y-Z position data. The recognition extends to a distance of approx. 7 cm from the device and fast movements can be reliably detected. The interface is completely intuitive to use and hygienically clean.

The 3D gesture control allows completely touchless operation of the unit through all menus, including value settings. With this, *elneos six* redefines the benchmark in device operation. In combination with voice control, the device no longer needs to be touched.

Selection of some 3D gestures

1-finger circular gesture in front of the wheel:
- Fast value setting (function replica of the capacitive wheel)
- Spreading and compressing counts
- Complete menu control

Horizontal and vertical swiping motion with the hand:
- Smart scroll slide effect of the unit bar
- Digit selection and digit changes
- Scroll graphs in X and Y direction
- Scrolling tables (ramps and measured values)

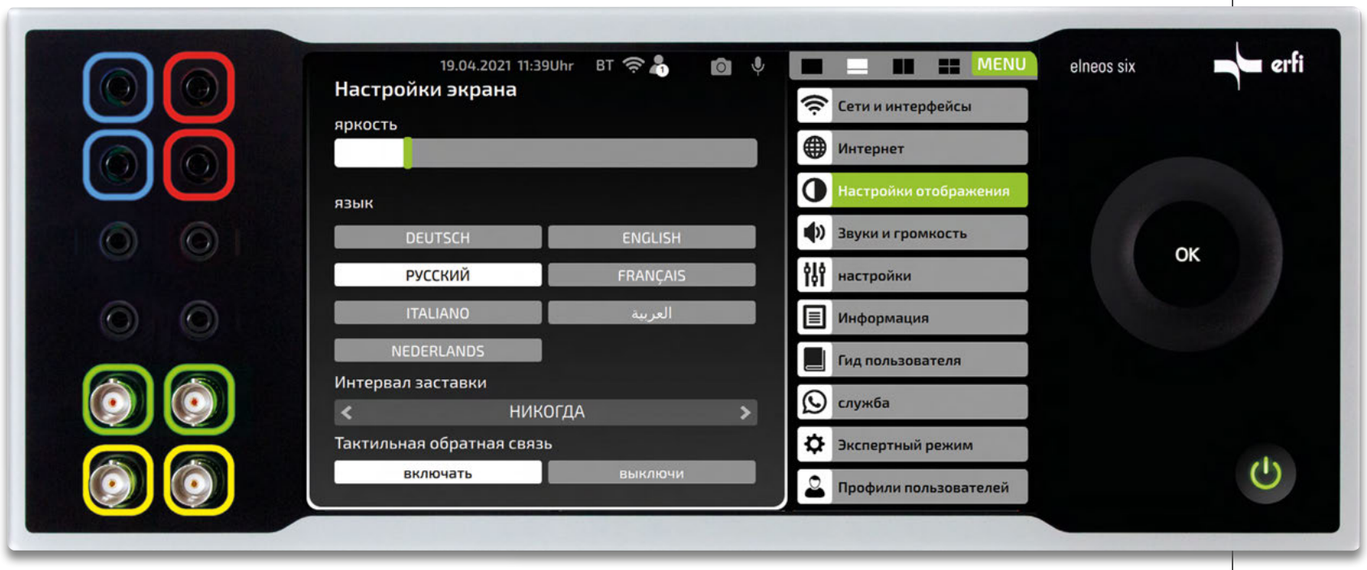
Holding gesture of the hand in front of the display:
- Activate menu control

Holding gesture of the finger in front of the wheel:
- One menu level lower
- Confirmation of the set measured value
- Exit level value setting

Note: The 3D gesture control is only supplied as standard in conjunction with the large elneos six control centre and its capacitive wheel as well as the large 8-inch display. This function is not available with the elneos six compact control centre.

elneos® six International

elneos six communicates with you in various languages and also in writing systems with non-Latin characters, such as Arabic or Cyrillic. *elneos six* is thus ideally suited for worldwide use.



Sprachwahl

elneos six bietet Ihnen die Sprachwahl zwischen Deutsch, Englisch, Franzosisch, Italienisch, Niederländisch sowie Arabisch, Russisch und weiteren Sprachen an. Unter dem Menü-Punkt «Displayeinstellungen» und «Sprache» haben Sie die Auswahl. Nach der Sprachwahl werden sofort alle Begriffe in der gewählten Sprache dargestellt. Die Standardeinstellung der Sprache legen Sie beim ersten Start des Gerätesystems fest.

Language selection

elneos six offers you the choice between German, English, French, Italian, Dutch, Arabic and Russian and many more. You select the language under the menu item "Display settings" and "Language". After the language selection, all terms are immediately displayed in the corresponding language. You set the default language when you start the device system for the first time.

Sélection de la langue

elneos six vous offre le choix de la langue entre l'allemand, l'anglais, le français, l'italien, le néerlandais, l'arabe, le russe et le comptage. Vous sélectionnez la langue désirée dans le menu «Paramètres d'affichage» puis «Langue». Après la sélection de la langue, tous les termes sont immédiatement affichés dans la langue sélectionnée. Vous définissez la langue par défaut lorsque vous démarrez le systèmes pour la première fois.

Selezione della lingua

elneos six offre la possibilità di selezionare varie lingue, come inglese, tedesco, italiano, francese, olandese, arabo, russo e molte altre. La lingua è selezionabile dal menu «Impostazioni del Display» e «Lingua». Dopo aver selezionato la lingua, verranno aggiornati i testi nella lingua selezionata. La lingua predefinita viene impostata al primo avvio dello strumento.

Taalkeuze

elneos six biedt u de taalkeuze tussen Duits, Engels, Frans, Italiaans, Nederlands, Arabisch, Russisch en andere talen. U vindt de taalkeuze in het menu onder "Beeldscherminstellingen" en "Taal". Na de taalkeuze worden alle termen direct in de geselecteerde taal weergegeven. U legt de standaard taalinstelling vast wanneer u het toestel voor de eerste keer start.

Выбор языка

elneos six предлагает вам выбор языка между немецким, английским, французским, итальянским, голландским, а также арабским и русским. Выбор осуществляется в меню "Настройки дисплея" и "Язык". После выбора языка все термины сразу же отображаются на выбранном языке. При первом запуске системы устройства задается язык по умолчанию.

اختيار اللغة

يقدم لك *elneos six* اختيار اللغة بين الألمانية و الإنجليزية و الفرنسية و الإيطالية و الهولندية و العربية و الروسية و غيرها من اللغات.تحت القائمة، عنصر إعدادات العرض ثم اللغة ، لديك الاختيار. بعد تحديد اللغة يتم عرض جميع المصطلحات على الفور باللغة المختارة. أنت تحدد إعداد اللغة الافتراضي في المرة الأولى التي يتم فيها تشغيل نظام الجهاز .

Intelligent Connections

12 illuminated ring sockets incl. disappearing effect
The RGB LEDs light up in the colours red, dark blue, violet, light blue, yellow, green and white, depending on their function. The colour coding of the sockets guides the user unerringly to the correct device connection. The eight sockets on the top can be used to control power supplies, power arbitrary generators, digital multimeters and power meters or fixed voltage sources. They are flush-mounted in the glass surface and therefore cannot be damaged.

For the first time, the 12 ring sockets enable device constellations without an additional plug-in unit in the control centre: *dual power supply unit, digital multimeter, power meter and dual function generator or 4-fold power supply unit and dual function generator.*

Additional slaves with ring sockets incl. disappearing effect
All additional slaves with glass unit fronts for additional devices now also offer the intelligent ring socket lighting.

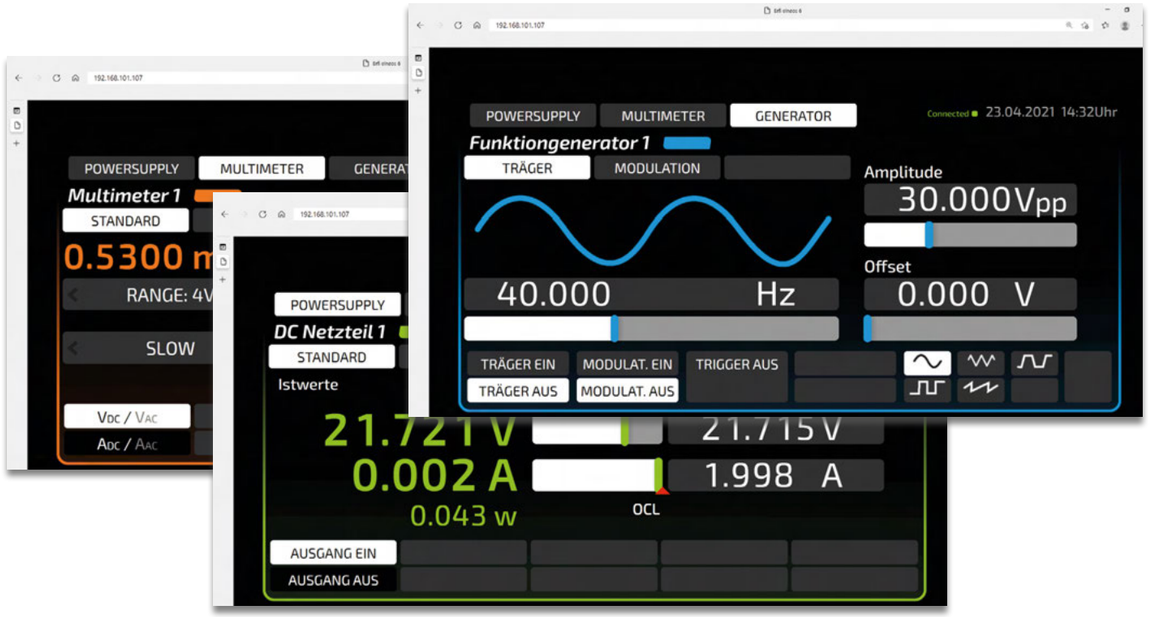
Ring lighting system for safe user guidance
The outputs of the 1- and 3-phase AC sources in additional slaves have a new type of function labelling with a disappearing effect. The power outputs L1, L2, L3, N, PE, the switchable rectifier outputs + /- as well as the sign for earth-free operation are displayed in characters with a disappearing effect. In case of inactivity, not only the ring disappears, but also the respective inscription. This flexible control of the function labelling allows all AC sources with four glass unit fronts to be displayed. The selection of the glass unit front depends only on the choice of the installation location and the power size – but not on the device function and the equipment. This task is performed by the intelligent control of the function labelling.

AC and DC sources
In the moment of switching on, in the zero-voltage passage (DC) and in dangerous situations, the ring sockets incl. function labelling flash alternately in white and in the respective socket colour. If the DC power supply units are connected in series and parallel, the ring sockets are illuminated in colour (violet / light blue). All active 1-phase and 3-phase outputs additionally light up in red including disappearing effect.

DMM, P-meter and function generator
Whenever the function changes, illumination changes as well, e.g. when changing from voltage to current measurement, the assigned sockets flash in the respective colour for the first few seconds. After that, the sockets change to continuous illumination. The outputs of the function generator are also controlled in the same way.

Web-based Control²

Due to the web server installed by standard and the remote access VCN, two control systems become true. Original screens of the *elneos six* can be run on all end devices, wide-screen monitors or whiteboards via web server. Training courses or presentations can be carried out quickly and professionally. The precise control of all device functionalities takes place via VNC access. Remote Access VNC faithfully reproduces the *elneos six* system and all control options can be used from distance – even the touch gestures by reproducing the movement with a mouse or on tablet screen.



Standard web server

With the web server, essential and basic device functions are executed immediately and remotely with hardly noticeable delays. After entering the IP address in any internet browser of an end device (tablet, smartphone or PC), the device interface of the respective device function is displayed almost true to the original, so that the user does not have to get used to it. The web browser allows very good performance in the remote control of the basic device functions of power meters, multimeters and function generators.

Changes via the internet browser are immediately forwarded to the unit and the display on the *elneos six* unit system follows almost without delay. The integrated web browser also allows the reverse direction of access through bidirectional data transmission. Inputs and changes to the *elneos six* device system are immediately visible on the internet browser of the respective end device. The entire functionality is independent to the operating system and is ideal for quick tests.

Remote Access as standard – VNC

Alternatively, the device can be fully controlled with all functions from any end device via Virtual Networking Computing (VNC). Via VNC, the screen of the device system is displayed on the end device true to the original including all technical details.

One can use all menu functions, swipe gestures and device functions at a distance using a tablet, smartphone or computer in the same way as if you were in front of the device. All graphical measured value recordings, tables and the internet browser are transferred 1:1 to the remote terminal. This means that you are always informed about the status of the unit and you can actively intervene in the process, retrieve and control data.

All original screens can be operated on the end device with full device functionality.

Web Browser

The new *elneos six* device system offers an internet browser and thus becomes a fully-fledged tablet and PC replacement. This feature is ideally suited for all educational, industrial, development and research institutions. The combination of an electronic device system with an Internet-capable terminal supports any investment in digital transformation. *elneos six* is eligible for funding as part of digitisation initiatives due to its Internet browser and web server functionality.

Up-to-date internet access
The Internet browser function shares the engine with Google Chrome and MS Edge and allows fast Internet access. The editable address line can be used for address entry and to search through the fully alphanumeric display keyboard. Alternatively, a real keyboard with mouse can be connected via the USB A interface (simultaneously via USB HUB). The arbitrary search term input enables fast interaction on the Internet.

Information-based work
The constant availability of all information automatically brings with it a considerable increase in productivity. Switching between the Internet browser and device functions takes place in a fraction of a second, and the parallel sourcing of information for daily work gives the *elneos six* device system a completely new quality.

Performative and interactive media
Speech and sound output is supported by a high-quality loudspeaker inside the unit. Educational videos can be played online and used as a didactic tool (prerequisite for sound playback is ordering the Speech Package option Hey erfi! order no. EL6.1.SP1). Thanks to a high-performance microprocessor, *elneos six* continues to work quickly in the background, unimpressed, even when using the Internet browser.

Remote availability
The Internet browser is part of the standard equipment of the *elneos six* and *elneos six* compact series and is enabled or disabled by an administrator. This functionality can also be activated and deactivated at any time by remote control. This makes it possible to control access to the Internet for research tasks, especially in the field of education.

Software Solutions by erfi

As a market founder for electronical laboratories, erfi was already able to offer software-based remote controls for electronic equipment as well as electronical laboratory rooms and test systems in the mid-1960s. Today, erfi is a leading supplier of software-based control systems for complex equipped electronical laboratories and offers various software packages for different applications.

Software use: *All software packages can be controlled via the PC on screen, via tablet or the smartphone.*

The APP for the highlink Power room and device control system is an independent application. Furthermore, teaching aids and Festo Didactic applications and components are also integrated.

Software packages from erfi

erfi offers 3 powerful and comprehensive software packages* for electronic laboratories and test systems:

- *highlink Power*
- *CANDY Power*
- *AWM Assembly Workflow Management*

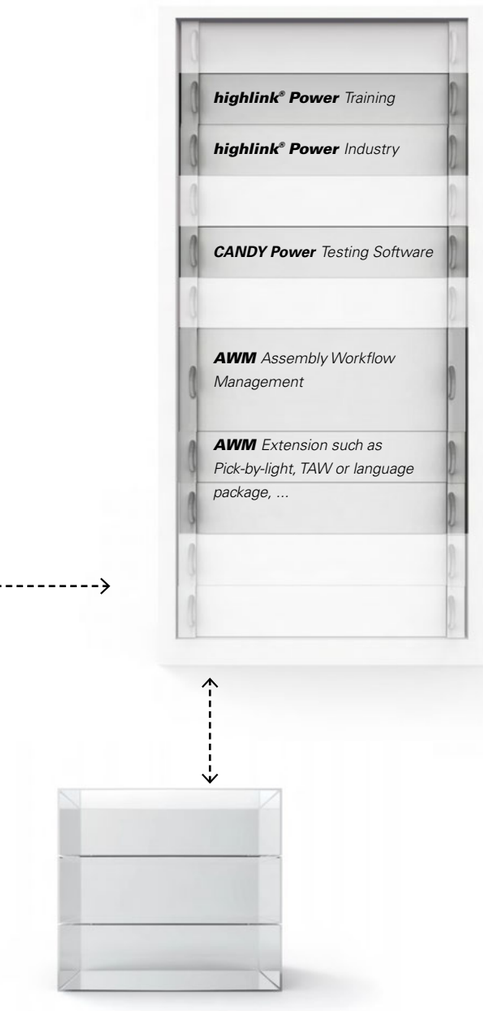
The individual packages can be ordered separately or in combination, as they are fully functional individually and yet interlock seamlessly. Each software package is available in versions for industry and for educational institutions of all kinds and optimised for the respective needs.

Data and device use

A central SQL database forms the data structure for all software packages and provides the interface between them.

The web-based applications can be used on all commercially available hardware solutions as well as on mobile devices such as tablets and smartphones with the most common operating systems (IOS, Android, Windows...). In addition, we offer individual stand-alone APPs for tablet users.

Web-based or local variants are used depending on the application and customer requirements.



Server and software: *The software packages are installed on a server. Generated data is stored in an SQL database.*

SQL database: *For control, measurement and test data from all erfi software packages. The access for use by the customer is made possible by activation.*

1. Software package highlink® Power
highlink Power controls all electronical laboratory benches, including comprehensive remote device control. *highlink Power* is ideal for educational institutions and industrial research and development laboratories.

2. Software package CANDY Power
CANDY Power enables the control of automated test sequences with test planning, test sequence, statistics and user administration. In addition, CANDY Power is used for test sequences (VDE 0701/0702) for didactic teaching in the training of basic test principles.

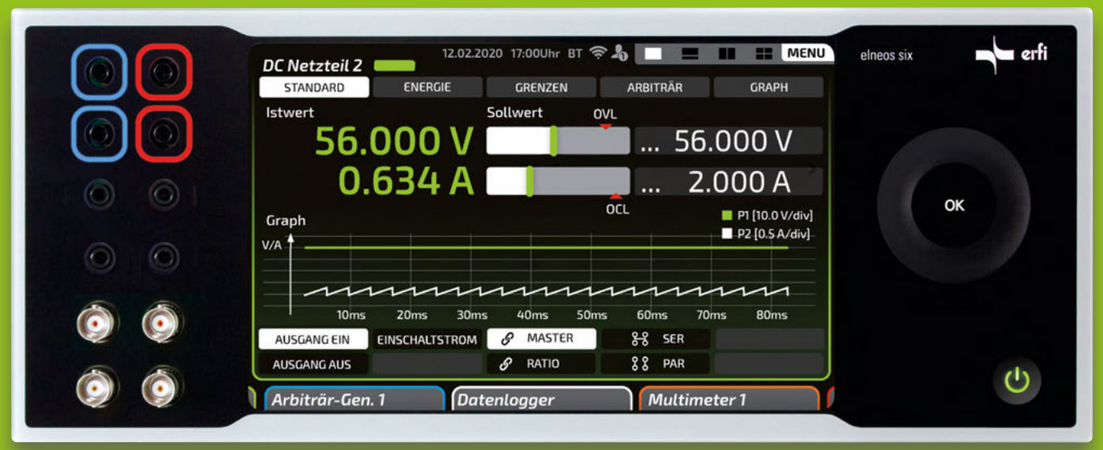
In industry, CANDY Power is used in conjunction with complex test systems for electrical safety and function tests. Extensive control of DUTs (DUT communication) and control of fully automatic processes (robotics, contact detection, etc.) is also possible.

3. Software package Assembly Workflow Management (AWM) – „Pick and Place“
The AWM software package is used to provide comprehensive support for employees in the production processes. It supports the employees during the training phase and the ongoing production process through digital visualisation of the subsequent production steps to be carried out by means of images, drawings, instructional videos and electronic parts lists, among other things.

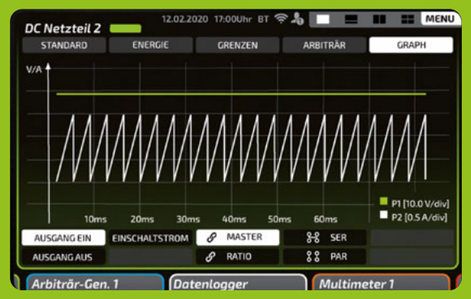
The individual operations are stored for each product and processed sequentially. In the training area or in the induction of new employees, the assembly processes can thus be taught sequentially and the trainees are introduced to the processes in a practical way.

* For details of the software packages, see order pages 120-137.

Technical Device Data



Standard view with live graphics display: *The large 8-inch display shows the measured values graphically in parallel at any time.*



Data logger and graphic display of measured values: *Visualisations and real-time recordings of freely programmable ramp functions for tracking voltage and current curves. Dynamically expandable in x/y direction by 2-finger spread gesture.*

Limiter: *The limiter allows the free monitoring of voltage and current ranges in conjunction with limits. Each state can be coupled with an acoustic signal and a freely selectable digital output.*

Ramp generator: *Owing the 8-inch display, any sequences can be entered directly without any programming. This is a decisive advantage for daily work. Alternatively, the sequences can be transferred and started via the interface.*

Energy meter: *The new control power supplies record the power graphically and numerically at any time.*

DC Precision Regulating Power Supply, linear

Oder no. EL6.LDC.032.01 to **EL6.LDC.100.06**

Dynamic control power supplies

The control units are a comprehensive innovation with the highest standards of accuracy, dynamics and quality. A powerful microprocessor system on the control card enables autonomous operation, independent of the main processor system of the control centre. This is a real-time system. The new control card of the unit has outstanding dynamics with which powerful arbitrary signals can be generated up to the kHz range.

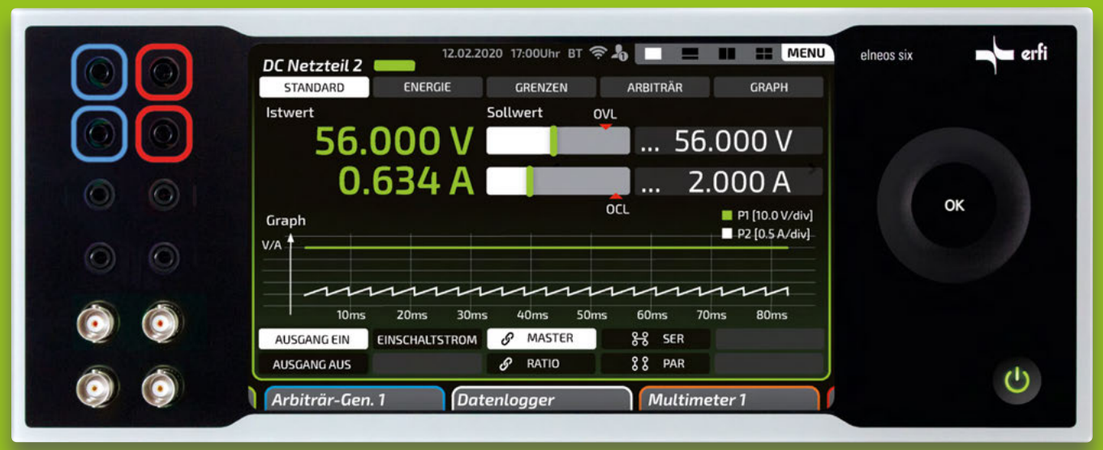
New technical control data

The measuring accuracy of 24 bit resolution, the control times of a few microseconds and the control deviations in the microampere range, now define the current benchmark in the industry. The outstanding control dynamics open up new possibilities for the generation of fast arbitrary signals. A further highlight is the square-wave generator up to 1 kHz with resistive load and up to approx. 330 Hz with 100% modulation of the signal.

Technical data and features	(order data preferred types p. 88-89 | device p. 95-96)
Editable ramp function on the 8-inch display Direct convenient input of ramp parameters on the large 8-inch multi-touch display. Input of: 1. Voltage ramps with current limitation 2. Current ramps with voltage limitation	**Constant voltage and constant current source** Automatic change of the operating modes CV and CC – *elneos six* serves as a voltage source as well as a current source. These features allow the generation of voltage as well as current ramps.
Readout of all device statuses All unit statuses can be read out via the interfaces. The states are displayed directly in the *highlink Power* control software. This query option can also be very useful in the area of test systems.	**Preset function (Output-OFF/ON)** Function for switching the output on or off. If the output is deactivated, the maximum current can be changed. After the output is switched on, the new maximum current value becomes active – the circuit no longer has to be manually disconnected.
Setting accuracy 16 Bit D/A converter (1mV, 1mA);	**Measurement accuracy** 24 Bit A/D converter (0,01 mV; 0,01 mA);
Voltage ranges 0-66 V (depending on model);	**Current ranges** 0-20 A (depending on model);
Temperature coefficient *Voltage:* 0,002%/K *Current:* 0,008%/K;	**Control deviation 1** *Voltage:* 300 µV/A, *Current:* 150 µA/V (with load change 0-100 %);
Residual ripple *Voltage:* 100 µVeff *Current:* 200 µAeff;	**Control deviation 2** *Voltage & current:* <0,01 % (10% for mains change);
Integrated square wave generator up to 1 kHz with resistive load;	**Staged pre-control** New software-controlled winding changeover with minimal heat generation; **Settling time** 12 µs Load step 0-100%;

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 148-149.



2/3 screen mode: *Control unit in the main screen, with power display and horizontal sliders for coarse adjustment.*

2/3 screen mode: *Control setting unit in small window with numeric keypad. Even in the small window, the units can be operated and setpoints can be entered.*

2/3 screen mode: *After entering the values, the device bar can be easily moved by swiping gestures on the display or by 3D gestures (Smart scroll). The devices glide elegantly horizontally across the screen.*

Menu bar and dynamic screen scaling: *When the menu bar is displayed, the screen dynamically collapses and remains completely legible and operable during the display. Disturbing cross-fades of menus are thus completely avoided.*

Connection panel and screen scaling: *When the connection panels are displayed, all screens move to the right and adapt to the size. The values in the connection panel of the current assignment are clearly visible.*

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DC Precision Regulating Power Supply, linear

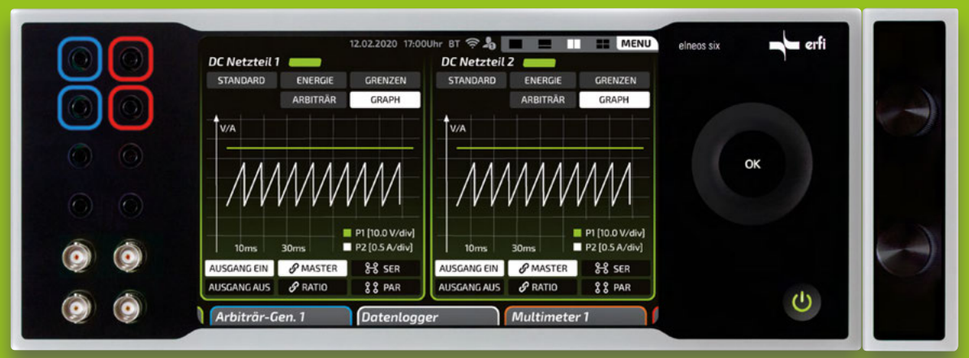
Oder no. EL6.LDC.032.01 to **EL6.LDC.100.06**

Special features	(order data preferred types p. 88-89 | device p. 95-96)
Precision setpoint setting of current and voltage through high-quality 16-bit D/A converter *Resolution:* I_{Soll} approx. 1 mA with current range 20 A U_{Soll} approx. 1 mV at voltage range 66 V	**Precision measuring device** of current and voltage through precision 24 bit A / D converter *Resolution:* I_{Ist} approx. 0.01 mA and current range 5 A U_{Ist} approx. 0.01 mV at voltage range 66 V
Fast and efficient stage pre-control The power loss is greatly reduced by a new software-based winding circuit. The multistage pre-regulation works depending on the output voltage and reduces the voltage via the series transistor. With this technology, the advantages of a power regulation power supply unit can be used with the highest accuracy and without the previous disadvantage of heat generation. The devices are therefore compact and have best temperature coefficients. The service life is increased and the environment is not affected. This means that several functions and devices can be integrated in a very small space. *Arbitrary signals up to the kHz range:* When the output is activated and a load is connected, the output is stably regulated within 12 µs. This creates the prerequisite for high-energy arbitrary signals in the kHz range.	**Value acquisition through real-time measurement** Ramp and arbitrary functions are time-critical and complex processes. *elneos six*'s circuitry enables it to process these processes autonomously within the control card, so that the transmission speed of the interface has no influence on these processes. The new measurement and control card has a high level of intrinsic intelligence and enables real-time measurements of current and voltage. *Maximum measuring speed:* Depending on the unit configuration, approx. 10 to 20 measurements per second at the highest resolution (24 bit). **Safe-Guard function (safety shutdown)** By touching with the 3-finger gesture, the unit immediately switches off all outputs. This way, dangerous situations can be avoided in time. **Safe Start function (safety start)** Through a digital interface, outputs can be switched on at a desired time.
Programmable OVL and OCL function *OVL = Over Voltage Limit* *OCL = Over Current Limit* The values can be set by entering them on the display or by remote control. The user can then only move within the specified limits.	**Data logger** An integrated data logger enables the storage of up to 100,000 measured values per channel. The 5 channels can simultaneously visualise 5 different measured values. Up to 500,000 measured values can be stored and read out via interface.
Limiter The limiter provides programmable current or voltage range limits for 10 digital outputs. The limiter allows programming below, within and above the range. This means that, e.g. any 3 outputs can be programmed for 3 states and used to control the indication light.	**Zoom function of the ramp functions** The capacitive 8-inch multi-touch display allows the X-Y graph to be dynamically zoomed in or out at the desired point in the X-Y direction using the 2-finger gesture. In addition, *elneos six* offers a repeat function of the programmed ramps from 1 to infinity.

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 148-149.

Halfscreen: *A dual power supply unit can be operated by several users at the same time through the split screen. The device selection bar at the edge of the screen allows access to other devices.*



Dual power supply with 2 encoders: *Optionally, two encoders or alternatively only one encoder, can be positioned to the left or right of the control centre, as well as an optional 2nd wheel.*

Encoders

Dual power supply with 2nd additional wheel: *The optional 2nd wheel can be positioned either to the left or right of the control centre.*

Comfort Function Multiple Control Units

Order no. EL6.CL

Convenient multiple control power supplies

One of the features of our new control power supply unit family is that up to 4 power supply units can be integrated simultaneously in the control centre. A total of up to 4 power supply units can be integrated in the control centre at the same time. 32 power supply units can be operated simultaneously in real time. Owing to the possibility of flexible screen division, up to 4 power supplies can be operated simultaneously. Optional components such as rotary encoder or wheel increase the input comfort.

Technical data and features of the comfort equipment **(order data p. 96)**

Master/slave function: Optional coupling of two control power supply units (current and voltage coupling). A slave control network device follows a master control network device in terms of current and voltage.

Due to the newly developed bidirectional master-slave function, it does not matter which power supply unit is the master and which power supply unit is the slave. As soon as a parameter (either U or I) is changed on one power supply unit, the parameter of the second power supply unit follows the first power supply unit and vice versa. This is therefore a bidirectional function with maximum flexibility.

Serial/parallel function (colour coded): The outputs are connected in series or parallel by means of an internal relay circuit. This allows either double the voltage or double the current to be drawn without having to carry out external wiring at the laboratory sockets.

Special feature for serial connection

- Possibility of taking any positive or negative voltage.
- Coloured indexing of the sum voltage by two diagonally arranged and illuminated sockets in red and blue. The other two sockets illuminate in turquoise.
- The individual voltages at the normal laboratory sockets can still be tapped in parallel.

Special feature with parallel connection

- Colour indication of masses of the socket lighting.
- Total current display of control power supply 1 and 2.
- Concatenation of both parameters of current and voltage (simultaneous change).

Ratio Function: The ratio function links the voltage channel of control network unit 1 with that of control network unit 2 and vice versa. This makes it possible to simulate asymmetrical loads.

Example: Control power supply 1 is set to +10 V.
Control power supply2 is set to +1 V.
(10% of the value of power supply 1)
If the voltage of control power supply 1 is changed to 20 V when the ratio function is activated, control power supply 2 is changed to 2 V. With the ratio function, the voltage value of the second power supply unit follows the voltage value of the first power supply unit and vice versa in a percentage manner (ratio).

Symmetrical/asymmetrical tracking: The tracking function is used to simultaneously take a negative and a positive voltage that are chained to each other. It is activated by switching on the Serial and Ratio functions simultaneously.

Symmetrical tracking function – voltages reverse sign
If the negative and positive voltages are taken symmetrically, both voltages are set to the identical value at the beginning.

Example: Control power supply 1 is set to +10 V.
Control power supply2 is set to -10 V.
If one voltage value is changed, the other voltage value follows in the same way with the opposite sign.

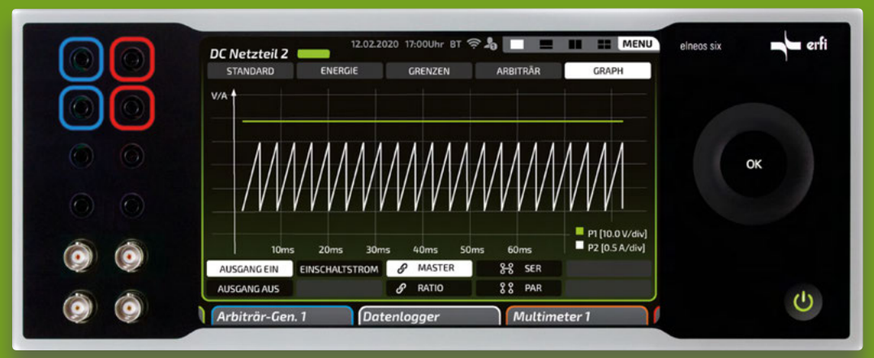
Asymmetric tracking function – voltages reverse sign
The ratio function allows asymmetrical tracking.

Example: Control power supply 1 is set to +10 V.
Control power supply2 is set to -5 V.
If the values are set to +20 V (doubling) at control supply unit 1, control supply unit 2 follows and sets itself to -10 V.

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 148-149.

Curve parameters: *Input of the different curve parameters in tabular form. AC and DC parameters are to be entered for this purpose.*



Curve shapes: *Generation of any curve shapes with the full power of the control network device by step-free processing of the curve representation.*

Independent programming: *Thanks to variable screen layout, double power arbitrary generators can be programmed independently of each other.*

Power Arbitrary Generator up to 2,5 kHz

Order no. EL6.LDC.032.01A to **EL6.LDC.100.06A**

Graphical power arbitrary generator

A table enables the input of all signal shapes and parameters. The evaluation of the curves is visualised by the data logger with recording function. Through the powerful processor, several power arbitrary generators can process and display different sequences simultaneously.

Up to five measurement curves can be visualised simultaneously. Values from other devices can also be recorded and displayed in parallel. Results can be documented quickly with the graphic display. The data logger, which works in the background, stores the data that can be read out later.

Sequencer function

Up to 400 segments per sequence can be entered or transmitted via interfaces and up to 10 different sequences can be processed. Each sequence can be assigned to any power arbitrary generator that processes the composite waveform. The sequence have different AC parameters: waveforms (sine, rectangle, triangle), period duration and amplitude. In addition, per segment DC parameters can be defined. The sequencer allows signal shapes with different frequencies to be cascaded. Frequencies of up to 2.5 kHz enable the simulation of fast and high-energy signals.

The dynamics of the new measuring card enable the simulation of almost all signal forms. Vehicle on-board voltage pulses, high-energy bursts, sudden voltage dips and many more are quickly reproduced. The sequencer is equally suitable for education and industry as a highly efficient tool.

Technical data and features	(order data preferred types p. 88-89 | device p. 95-96)

Standard waveforms: sine, square, triangle;
Duty cycle: variable;

Sequencer: allows different waveforms with different frequencies to be cascaded;

Limits: all measured value limits programmable;

Frequency: all waveforms up to 2.5 KHz;

Segments: 400 segments can be edited directly on the unit or read in via interface.
Per segment: waveform, period, amplitude, duty cycle as well as superimposed DC parameters with start and end value (U/I);

Data logger: the 5-channel operation enables a storage of 100,000 measured values per channel. The values can be visualised and read out via interface.

Measured value display: X- and Y-graph scalable by 2-finger gesture. Ideal for recording changes (long-term measurement).

Special features

- Simulation of a voltage drop in the DC supply (brown-out) for testing the reset switching of a processor.
- Several supply voltages that rise one after the other when switched on and fall one after the other when switched off (power sequencing).
- Superimposition of an artificial mains hum on the DC supply of a DUT to measure the PSRR (power supply rejection ratio). The term provides information about the extent to which the output voltage of an amplifier changes when its supply voltage changes.

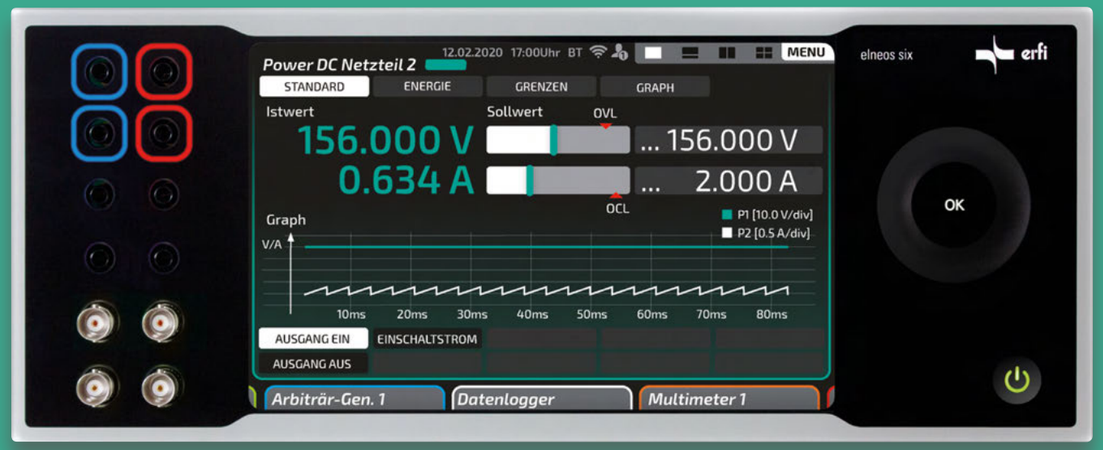
  For operational amplifiers, the term PSRR is used in the technical data sheets.
- Simulation of the on-board voltage drop of a vehicle during starting. The standard signal shapes available for this can be programmed by the user or by us on request.

Input
Start of measurement by trigger pulse of the input (edge control).

Output
A digital output is triggered when the measured values are exceeded or fallen short of.

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 149.



Bandwidth: *Voltages up to 400 V and currents up to 125 A ensure a wide range of applications. In addition, the units can be connected in series and parallel.*

Combinatorics: *Even in combination with the longitudinally regulated power supply units (here NT1), the power supply units work together without any problems.*

High-current clamps: *For devices with output currents > 32 A, a separate slave with high-current clamps is included as standard.*

Quattro screen: *The power supply can be edited and operated in the split screen simultaneously and independently of all other devices. Each unit can be moved to any position on the large 8-inch multi-touch display.*

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Switch Mode Power Supply

Order no. EL6.GDC.012.066 to **EL6.GDC.400.007** from 800 watt to 3.000 watt

Devices for high voltages and currents

The new power DC control supply devices contain high-quality AC/DC converters. The compact design enables complete integration into the modern EL6.1 control centre. Compact stand-alone units with up to 1,500 watts of power can thus be offered. Integrated fans ensure permanently high performance in this power class.

These power supplies are ideal for applications in all industrial laboratories and training facilities with high power requirements. They have all approvals and EMC tests. Voltage ranges up to 400 V and current ranges up to 125 A are possible. High efficiency ensures high reliability and long life.

Encapsulated assembly

The encapsulated power modules of the power supply units are also characterised by the fact that they can be integrated into the control centre in the 800 W and 1,500 W sizes.

Only the 3,000 W power modules must be integrated outside the control centre into the device cockpit, in the table superstructure or in the TechCube below the table surface.

Power output modules of the Power DC control supply devices: *Can be integrated in the control centre (800 W and 1,500 W models) or in the 6U TechCube or 19-inch unit cockpit (3,000 W models)*

Technical data and features (order data p. 97)

Ramp function editable on the 8-inch display
Convenient input of the ramp parameters on the display. Input of U and I ramps.

Constant voltage and constant current source
Automatic changeover between CV and CC operating modes. *elneos six* serves on the one hand as a voltage source and on the other as a current source.

Ripple
- 60 to 300 mVp depending on model (800 /1500 W)
- 750 to 2000 mVp depending on model (3000 W)

Power classes
800, 1,500 and 3,000 watts. From 15 V to 400 V output voltage and 7 A to 125 A output current.

Preset function (Output-OFF/ON)
Function for switching the output off or on. If the output is deactivated, the maximum current can be changed. The new maximum current value only becomes active after the output is switched on.

The circuit no longer has to be manually disconnected from the power supply unit.

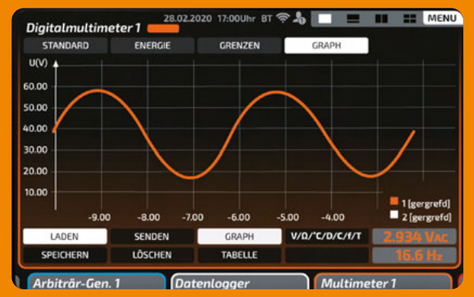
Readout of all unit statuses
All unit statuses can be read out via interfaces. The states are displayed in the *highlink Power* control software. This can also be used in test systems. The service life is increased and the environment is not affected. In this way, several functions and devices are integrated in a very small space.

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 150-151.

Dual measurement: *The digital multimeter in fullscreen view with dual measurement, power display and simultaneous graphic display of measured values incl. zoom function.*

Limiter: *Each measurand can be monitored by definable limits using tones and digital outputs. The digital outputs can be used directly for example to indicate different states by means of the erfi RGB indication light.*



Data logger: *The recording possibilities are especially valuable in combination with the new 8-inch display. Various gestures can be used to zoom curves quickly and dynamically in all directions.*

Two digital multimeters in the halfscreen: *All controls of both digital multimeters can be operated simultaneously and independently of each other. The optional dual measurement allows each digital multimeter to measure current and voltage in the AC and DC range simultaneously.*

Quattro screen: *The unit remains operable in each of the split screens. The graphical display of measured values can also be used and operated in parallel with other devices such as DC power supplies or AC sources in the smallest screen (Quattro screen).*

Precision Digital Multimeter

Order no. EL6.D and **EL6.DUI**

5¾-digit precision digital multimeter

The basic version of the digital multimeter can already measure currents up to 40 A and voltages up to 1000 V. An optional simultaneous recording of current and voltage AC/DC saves the user a second digital multimeter. Optionally available measuring amplifiers allow high-current measurements up to 125 A, which considerably extends the range of application of the unit. An integrated diode test, capacitance measurements as well as temperature and frequency measurements and the graphic display of the current and stored measured values, make the multimeter an all-rounder.

The graph can be zoomed by 2-finger gesture. The use of new TRMS converter components with significantly improved linearity and bandwidth achieves outstanding measurement accuracy with a crest factor of 5.

The new 5¾-digit digital multimeter thus enables the acquisition of non-sinusoidal signals with a previously unattained level of accuracy. Span measurements with an accuracy of ± 0.08 % and a resolution of 1 µV represent the *elneos six's* claim to highest accuracy. A fast 24-bit converter guarantees the outstanding resolution.

Technical data and features (order data preferred types p. 88-89 | device p. 98)

Voltage measurement
DC: 0 to 1000 V; 1 µV; ± 0,08 % + 5 dgt.
AC: 0 to 750 V (peak 1060 V);
1 µV; ± 0,5 % +10 dgt.

Current measurement
DC: up to 32 A continuous (to 40 A for short periods), 100 nA; ± 0,15 % + 5 dgt.
AC: bis 32 A continuous (to 40 A for short periods), 100 nA; ± 0,8 % +10 dgt.
Optional high current measurement up to 55 A or 125 A. (see order number on p. 98)

Resistance measurement
0 up to 40 MΩ, 1 mΩ; ± 0,5 % +10 dgt.

Capacity measurement
0 - 400 nF / 4 / 40 µF; 1 µF; ± 3,0 % + 10 dgt.
400 µF; 1 µF; ± 8,0 % + 10 dgt.

Diode test: display of forward voltage

Continuity test: acoustic support

Display: 5 ¾-digit, display range 400,000 dots

Digital output
Within or in case of exceeding or falling below the limits, any output active high / low can be triggered on the display and by remote control.

Input
Start of measurement by trigger pulse of the input.

Optional: Simultaneous acquisition of current and voltage (AC/DC) (EL6.DUI).

Frequency measurement
0 to 100 kHz, 1 Hz; ± 0,1 % +10 dgt
High resolution: lower measuring speed

Temperature measurement
-200 to +600 °C, dep. on sensor, resolution 0,1 °C
Accuracy: Class B acc. to EN 60751; Pt 100 sensor or Pt 1000 sensor can be connected (autom. detection)

Measuring speed
DC: Fast (10 Hz), Middle (5 Hz), Slow (1 Hz)
AC: Slow (1 Hz)

True RMS function (true effective value measurement) TRMS converter with optimised linearity and bandwidth

Crest factor: 5 for non-sinusoidal signals for error-optimised measurements with non-sinusoidal signals.

Measured value display
Graphical and tabular display of up to 5 measurement curves or value series simultaneously. Graphs can be operated with zoom and tables with scroll function.

High-speed data logger
5-channel operation for simultaneous synchronous storage of up to 100,000 measured values per channel (max. 500,000 measured values); the high-speed mode enables measured value acquisition with up to 100 Hz.

For all measured variables: AUTO-RANGE

Option high-current measurement: current measurements up to 55 A or 125 A by means of measuring amplifier (EL6.ZG007.PDMM55 or EL6.ZG007.PDMM125).

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 152-153.

Power and energy measurement: *The power and energy meter in full-screen mode with Display of all relevant energy values as well as the active energy and the crest factors for U and I incl. zoom function.*

Dynamic screen content: *When menus are displayed, the screens scale automatically without overlaying the unit displays. In this way, you always remain connected to all devices and can, for example, follow measured value progressions in parallel during parameter settings.*

Connection panel with actual value display: *The new connection panel shows all measured values at the outputs and inputs. The screen with the unit displays scales automatically. The connection panel thus represents a separate information screen that can remain permanently displayed.*

More scalable graphic measured value display: *In the upper half, the power meter displays all measurement data. At the same time, in full-creen mode, other devices can be displayed in the smart scroll bar.*

Efficient use of all equipment groups: *Even if the power meter is in the small secondary range, it is possible to switch between power measurement and digital multimeter functions.*

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Power and Energy Meters

Order no. EL6.P

1-phase power and energy meter

The power and energy meters enable the acquisition of high power and energy for 1-phase consumers up to 24 kW with exceptional accuracy. A digital output can be set if limit values are exceeded. If necessary, an external circuit can react to dangerous situations and deactivate the respective periphery.

The power is recorded via the front laboratory sockets of the digital multimeter. This means that no additional connections are required.

The unit's integrated new measurement technology thus ensures an enormous bandwidth. The power meter is integrated directly behind the laboratory sockets to save space and does not require a separate slot on the internal backplane. This means that even more additional devices can be integrated within the smallest space available.

Special emphasis was placed on the graphic display of measured values. The power meter enables the graphic display of the current and stored measured values by means of X-Y diagrams and thus ensures fast and reliable recording for each measurement.

Technical data and features	(order data preferred types p. 88-89 | device p. 99)

Display: simultaneous display of U and I as well as all power and energy values on one screen.

Active power
- 24 kW to + 24 kW at 750 V AC
- 7,5 kW to + 7,5 kW at 230 V AC, (short term 9,2 kW)
Accuracy: ± 0,2 % +10 dgt

Active energy
- 24 kWh to + 24 kWh at 750 V AC
- 7,5 kWh to +7,5kWh at 230 V AC, (short term 9,2 kWh)
Accuracy: ± 0,2 % +10 dgt

Apparent power
0 to 24 kVA at 750 V AC
- 7,5 kVA to + 7,5 kVA at 230 V AC, (short term 9,2 kVA)
Accuracy: ± 0,4 % +10 dgt

Apparent energy
0 to 24 kVAh at 750 V AC
0 to 7,5 kVAh at 230 kV AC, (short term 9,2 kVAh)
Accuracy: ± 0,4 % +10 dgt

Reactive power
- 24 kvar to + 24 kvar at 750 V AC
- 7,5 kvar to + 7,5 kvar at 230 V AC, (short term 9,2 kvar)
Accuracy: ± 0,2 % +10 dgt

Reactive energy
- 24 kvarh to + 24 kvarh at 750 V AC
- 7,5 kvarh to + 7,5 kvarh at 230 V AC, (short term 9,2 kvarh)
Accuracy: ± 0,2 % +10 dgt

Output
A digital output is triggered when the measured values are exceeded or fallen short of.

Input
Start of measurement by trigger pulse of the input (edge control).

Data logger
The 5-channel operation enables the storage of 100,000 measured values per channel. The values can be called up and read out on the display in a graphic.

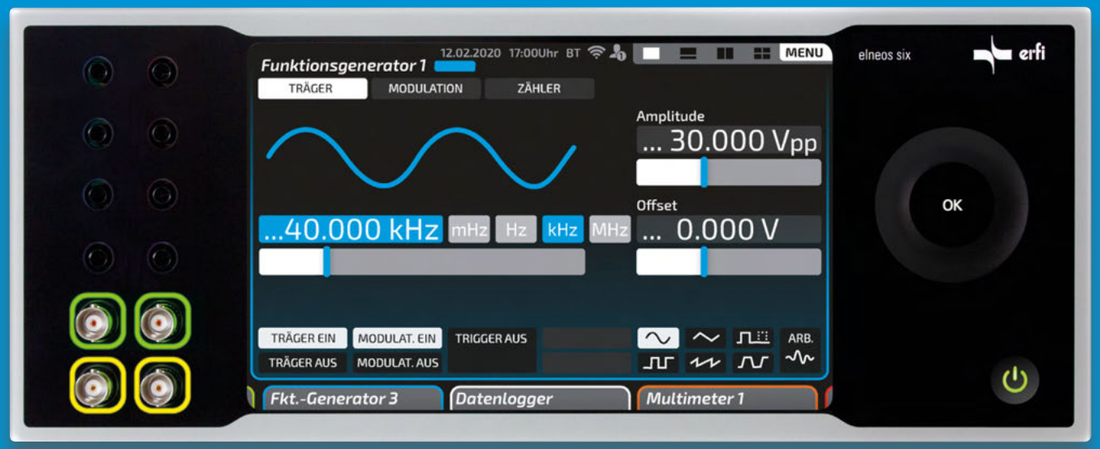
Power factor
cos phi from -1 to +1 and angle display!
Max. current (AC/DC): 32 A, (short term 40 A)
Max. voltage (AC): 750 V
Max. voltage (DC): 1.000 V

Measured value display
X and Y graph scalable by 2-finger gesture. Ideal for recording changes (long-term measurement).

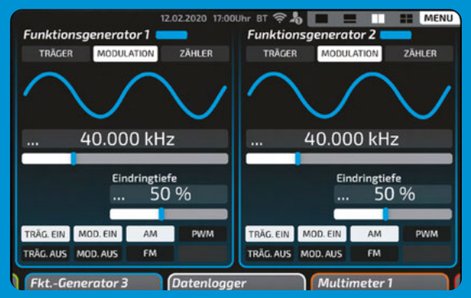
Crest factor 5: for voltage and for current
For all measured variables: AUTO-RANGE
Limits: all measured value limits programmable

Subject to technical and formal changes.

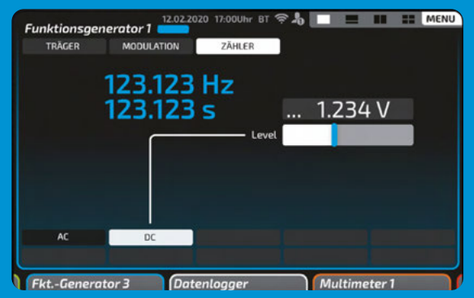
More detailed information in the Technical Compendium from page 153.



Clear representation: *The curve shapes are visualised generously. The waveform can be changed by tapping on it. Individual values can be entered via slider, wheel, airwheel, rotary encoder or keyboard.*



Modulation types: *By means of the second, internal function generator, high-frequency carrier signals can be modulated in modulated in AM, FM, PWM, ASK and FSK depending on the low-frequency wanted signals to be transmitted.*



Built-in counter: *Allows the acquisition of AC and DC signals as well as the setting of the trigger level in the DC range in the standard up to 150 MHz. Optional increase of the measuring range to 1.5 GHz.*

Comfortable access: *Even in the smallest screen, the 8-inch display allows values to be entered using the keyboard, wheel or rotary encoder.*

Splitscreen: *In the Quattro screen, too, input is implemented by means of a slider in the display. Compared to conventional 7-inch displays, the 8-inch display shows off its full size here and enables this convenience in every device.*

Dual-function Generator

Order no. EL6.F and **EL6.F1G**

Two function generators including counter

The device contains of two function generators and uses the functional principle of direct digital synthesis (DDS) with the associated advantages of frequency-stable and low-distortion signal generation. The first function generator serves as a basic function generator and feeds its signals to the outside. The second function generator is used exclusively for modulation. Its signals are modulated with the signals corresponding to the selected modulation type of the first function generator.

The maximum output frequency of up to 40 MHz and the amplitude level of 30 Vpp no-load are outstanding. In combination with an adjustable duty cycle of 0.1 to 99.9 %, *elneos six* is an all-rounder. Many functions such as sweep, an external and internal trigger for defined start conditions, programmable single and multiple pulses and much more make the function generator an all-rounder.

A standard counter up to 150 MHz (optionally up to 1.5 GHz: order no. EL6.F1G) guarantees the acquisition of fast signals. All device statuses can be read out at any time.

Note: The signal generation of the second function generator is only used for modulation and is not routed to the outside. *elneos six* can accommodate additional function generators via additional plug-in units, which operate simultaneously and independently of each other and provide a second independent hardware signal. The halfscreen allows both double generators to be operated and displayed simultaneously. These two hardware signals can be operated in a phase-stable manner via the trigger input.

Freely programmable modulation through two integrated function generators

elneos six offers special functionality with regard to modulation. The carrier signals and the useful signals (modulation signal) can be parameterised completely independently of each other due to the two function generators. The modulated signal is available at the output and a separate second external source or a second function generator is therefore no longer necessary. The device value for education and industry is enormously high, as any modulations can be realised very quickly and without additional external hardware.

The carrier signal and the useful signal can be conveniently generated in the device according to the respective ideas. The result of the modulation is immediately visible and the parameters of the signals can be adjusted very quickly to achieve the desired result.

All parameters of the carrier signals and the useful signal (modulation signal) such as signal shapes (sine, rectangle, triangle, etc.), amplitude, frequency, duty cycle are stored separately and modulated at the output. The depth of the modulation can be can be set from 0-100 %. With the freely programmable modulation, *elneos six* offers a productive tool for education and industry with a direct positive effect in the application.

Analogue and digital modulation types

In addition to the previous frequency modulation (FM), amplitude modulation (AM) and pulse width modulation (PWM), the new unit now also masters the digital modulation types amplitude shift keying (ASK), frequency shift keying (FSK).

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 154-155.

Technical data and features – Function generators (order data preferred types p. 88-89 | device p. 99)

Modulation
- Freely programmable modulation through two integrated function generators
- Freely programmable carrier signal – generator 1
- Freely programmable working signal (modulation) – generator 2
- All signal shapes, frequencies, amplitudes, etc. are freely available.

Modulation depth 0 to 100 %
0 % Modulation depth:
With AM, the modulated signal reaches the amplitude of the carrier signal at the maximum point. The amplitude level of the carrier signal is changed according to the required signal.

With FM, the modulated signal reaches the frequency of the carrier signal at the maximum point. The frequency spectrum of the carrier signal is changed according to the required signal.

With PWM, the modulated signal reaches the duty cycle 1 at the maximum point. The duty cycle is changed from 0 to 1 according to the useful signal.

x % Modulation depth:
With AM, the amplitude of the modulated signal is reduced in percentage. With FM, the frequency of the modulated signal is reduced by a percentage. With PWM, the duty cycle of the modulated signal is reduced as a percentage.

Pulse duty cycle: 0,1 to 99,9 %

Modulation types (carrier and working signal):
- Amplitude Modulation – AM
- Frequency Modulation – FM
- Pulse Width Modulation – PWM
- Amplitude Shift Keying – ASK
- Frequency Shift Keying – FSK
- Special form of FM

Setting ranges
Frequency: 100 mHz to 40 MHz!, Resolution 1 µHz
Amplitude: 0 to 30 Vss ± 0,5 dB + 1 mV from the entered value
Rectangle duty cycle: 0 to 100 % in 0,1 % steps
Offset: 0 to ± 15.000 V

Frequency characteristics
Sine: 1 µHz to 40 MHz!
Trapezoid: 1 µHz to 5 MHz
Ramp: 1 µHz to 5 MHz
Triangle: 1 µHz to 5 MHz
Sawtooth: 1 µHz to 5 MHz
Rectangle: 1 µHz to 5 MHz

Frequency counter
Measuring range: 150 MHz, optional up to 1,5 GHz
Input voltage: 100 mVeff to 5 Veff

Frequency sources
Two independently programmable function generators; one external source and one internal source for modulation.

Amplitude
Resolution for all waveforms: 14 Bit (16.384)
Output: 30 Vss, 50 Ω from 0-20 MHz, 1,8 mV resolution
Output: 20 Vss, 50 Ω from 0-40 MHz, 1,2 mV resolution

Trigger impulse
Extern: via BNC socket
Intern: via menu for defined signal start

Distortion factor
Sine: 0 MHz to 1 MHz < 0,04 %
Sine: 1 MHz to 20 MHz < 0,07 %
Sine: 20 MHz to 40 MHz < 0,5 %

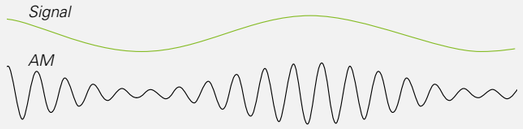
Impulse
Single pulse: Single and multiple pulses up to 999 s
Burst mode arbitrarily programmable by parameter:
Pulse and pause times: up to 999 s
Number of repetitions: 1 bis ∞

Input
Illuminated BNC lab jacks with disappearing effect
Input: counter input ext. input signals up to 150 MHz (optional up to 1,5 GHz: Order no. EL6.F1G)
Input: trigger input for defined signal start
Input sensitivity: 100 mVeff

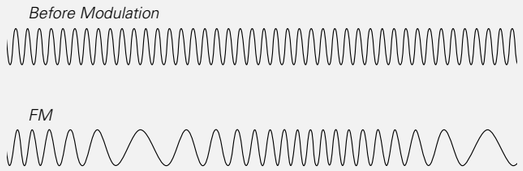
Output
Illuminated BNC lab jacks with disappearing effect
Output: up to 30 Vss idle
Output: 5 V TTL compatible

Modulation method

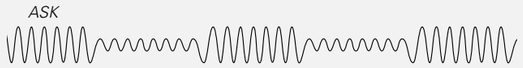
Amplitude Modulation (AM)
With amplitude modulation, the amplitude of a high-frequency carrier is modulated depending on the low-frequency useful signal to be transmitted.



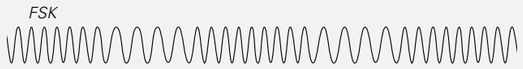
Frequency Modulation (FM)
With frequency modulation, the frequency of a high-frequency carrier is modulated depending on the low-frequency useful signal to be transmitted.



Amplitude-Shift Keying (ASK)
With the digital modulation type amplitude shift keying, the amplitude of the carriers is changed, to transmit different values.



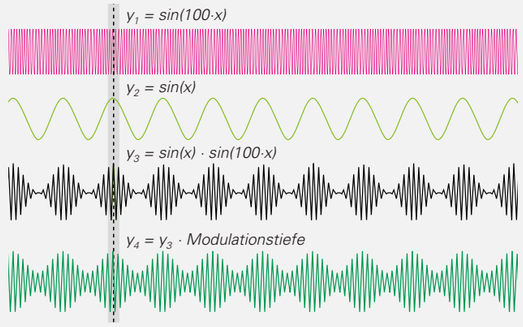
Frequency Shift Keying (FSK)
The digital modulation type frequency shift keying is used for the transmission of digital signals with, for example, a radio channel.



Analogue frequency modulation is related to it and similarly insensitive to interference. The carrier frequency of a sinusoidal oscillation is changed between a set of different frequencies. These different frequencies represent the individual transmit symbols.

During modulation, a specific transmit frequency is assigned to a transmit symbol. During demodulation, a defined frequency is detected and the symbol is output for further data processing. *elneos six* allows two transmission frequencies.

Example of amplitude modulation

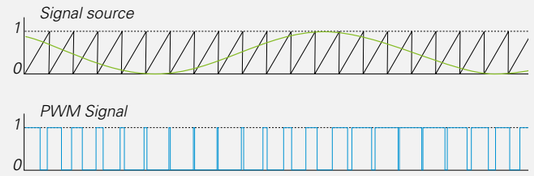


- Carrier signal (high-frequency)
- Working signal (modulating)
- Modulated signal with modulation depth 100 %
- Modulated signal with modulation depth 50 %

Pulse Width Modulation (PWM)
In pulse width modulation, a technical quantity (e.g. current) alternates between two values. The duty cycle of a rectangular pulse is modulated at a constant frequency.

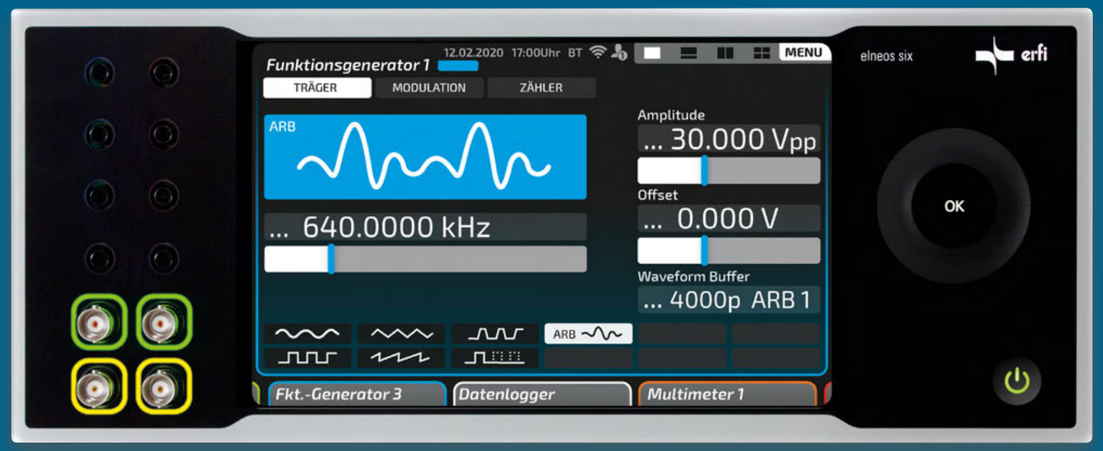
Thus, the width (wideness) of the pulse is influenced. A PWM is realised by comparing a continuously rising and falling signal with the analogue input signal. The rising or falling signal is thus above or below the input signal for a certain time.

At the intersection points, the digital output signal is switched over, resulting in the PWM signal. This signal can be transported over long distances without high energy expenditure and the PWM voltage curve has the same effect as a sinusoidal voltage on inert loads.

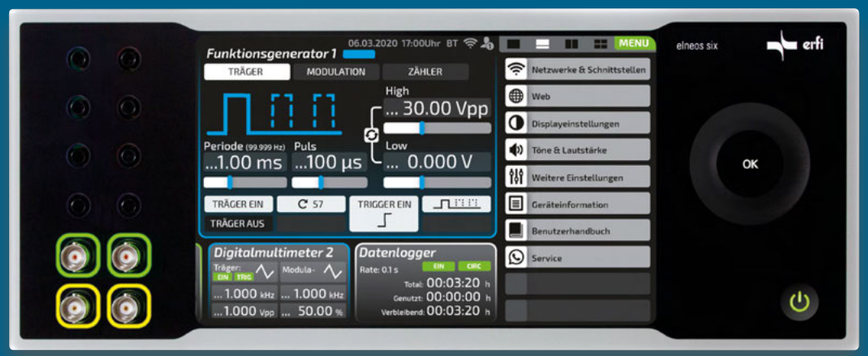


A sinusoidal curve (■) can be converted into a PWM signal (■), for example, by comparing it with a sawtooth-shaped signal (■). For each PWM pulse, the sawtooth ramp runs through the entire value range. This means that on inert loads such as motors, the PWM voltage curve acts like a sinusoidal voltage.

More detailed information in the Technical Compendium from page 154-155.



Arbitrary functionality: *Any two waveforms can be transmitted, selected and stored in the unit's memory with a maximum of 8,192 total sample points.*



Dynamic screen content: *When the menu screen is displayed in parallel, the remaining screen content is automatically scaled. All devices remain visible and operable at the same time.*

New connection panel: *The panel slides into the screen by a swipe gesture from the right and the other screen contents contract. In this way, all connections remain visible and operable when the connection panel is displayed.*

Fast Double Signal Arbitrary Generator

Order no. EL6.S

Two generators in one

With the additional arbitrary function, any waveforms can be generated in addition to the standard waveforms. For the generation of signals, 8,192 sampling points are available for each of two waveforms. Two waveforms can be stored and recalled. Via the remote control software *highlink Power*, waveforms can be generated in graphical or tabular form on the PC and transferred to the unit. The *highlink Power* software can be used to simulate complex signals of the vehicle electrical system or the rectification technology. *highlink Power* enables a signal acquired with the oscilloscope to be read in and converted, so that the points obtained can be transmitted directly to *elneos six*.

Innovative connection panel

The connection panel is called up by a swipe movement and shows the actual values of all outputs and inputs. For example, the waveform, amplitude and frequency of the function or arbitrary generator are displayed as well as the actual values of the outputs of the DC and AC voltage sources. Up to 7 units are visible at the same time and 3 of them can still be operated!

Freely programmable modulation

Using the arbitrary function as a useful signal and the freely programmable carrier signal results in further degrees of freedom. With this solution, all signal shapes can be modulated and the carrier signal can be modulated with the arbitrary signal, for example. All modulation types and properties correspond to the previously described function generator. In automotive on-board electronics or other electronics, this functionality guarantees that the desired signal shape can be reproduced.

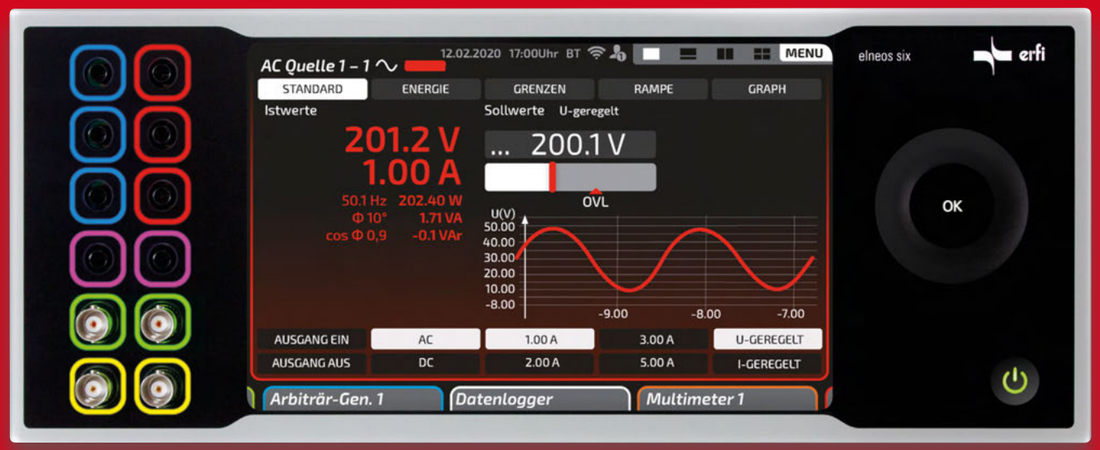
Outstanding performance potential

If this fast arbitrary function generator is combined with the power arbitrary generator for high electrical output signals of the control power supply units, all conceivable simulations, tests and measurements of the power electronics and the fast signal electronics can be carried out with a single device. If the powerful digital multimeter with power meter and one of the new AC sources are also selected, a complete measuring station can be replaced with a single measuring device. All these functionalities are essential building blocks for education and industry alike.

Technical data and features	(order data preferred types p. 88-89 | device p. 99)
Frequency characteristics *Sine:* 1 µHz to 40 MHz *Triangle:* 1 µHz to 5 MHz *Trapezoid:* 1 µHz to 5 MHz *Sawtooth:* 1 µHz to 5 MHz *Rampe:* 1 µHz to 5 MHz *Rectangle:* 1 µHz to 5 MHz *Arbitrary:* 1 µHz to 5 MHz, 2 memory locations, up to max. 8,192 sample point **Frequency sources** two independently programmable function generators; **Frequency counter** *Measuring range:* 150 MHz, optional up to 1,5 GHz (order no. EL6.F1G) *Input voltage:* 100 mVeff bis 5 Veff **Amplitude** *Resolution for all waveforms:* 14 Bit (16.384) *Output amplitude:* 30 Vss idle, 1.8 mV Resolution	**Input** Illuminated BNC lab jacks with disappearing effect *Input:* counter input ext. input signals up to 1,5 GHz *Input:* trigger input for defined signal start *Input sensitivity:* 100 mVeff **Output** Illuminated BNC lab jacks w. disappearing effect *Output:* up to 30 Vss idle / 5 V TTL compatible **Trigger impulse** *Extern:* via BNC socket *Intern:* via Menu for defined signal start **Impulse** *Individual pulse:* single & multiple pulses up to 999 s. Burst mode arbitrarily programmable by parameter. *Pulse and pause times:* bis 999 s *Number of repetitions:* 1 bis ∞

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 155.



Standard view of the 1-phase source: *The view informs about all values at any time, also in graphical form. An integrated power meter additionally evaluates the active, apparent and reactive power as well as the phase position.*

3-phase AC sources with power and energy meter: *For 3-phase AC sources, a 3-phase power and energy meter is included in the scope of delivery. The actual voltages between all phases and N are displayed simultaneously.*

Ramp generator: *The 8-inch display allows any sequences to be entered directly without any programming effort. Alternatively, the sequences can be transferred and started via the interface.*

Data logger and graphic display of measured values: *Visualisations and real-time recordings of freely programmable ramp functions for tracking voltage and current curves. The current values are always faded in. Alternatively, the data can be displayed in tabular form.*

Limiter: *The limiter allows free monitoring of voltage and current ranges in connection with limits. Each state can be coupled with an acoustic signal and a freely selectable digital output.*

AC Voltage Sources

Order no. EL6.AC1.030.04.1 to **EL6.AC3.720.03.1U** for 1- and 3-phase AC sources

Voltage sources incl. ramp function

The AC unit range includes extensive models for 1-phase and 3-phase AC power supply incl. ramp function and rectifier.The compact units are installed in a separate 19-inch subrack depending on the power and unit equipment.

The control centre communicates directly with the e-bus via the respective AC source, so up to seven AC sources can be controlled simultaneously. For single-phase units, a choice can be made between electro-mechanical AC sources and electronic AC sources. The electronic AC sources allow variable frequency adjustment up to 400 Hz.

All advantages at a glance **(order data p. 100-102)**

Display and connections

- Vandal-proof toughened safety glass.
- Highly insulating glass front panel ensures 100 % contact safety. This completely eliminates the possibility of voltage carry-over on the surface of the unit.
- The connections L1, L2, L3, N, PE, plus and minus as well as symbols for earth-free outputs and the visualisation of active output sockets are visualised by means of a disappearing effect.
- High contact reliability due to intelligent ring socket illumination with disappearing effect and illuminated socket labelling as well as flashing functions.

Slide-in technology and mechanics

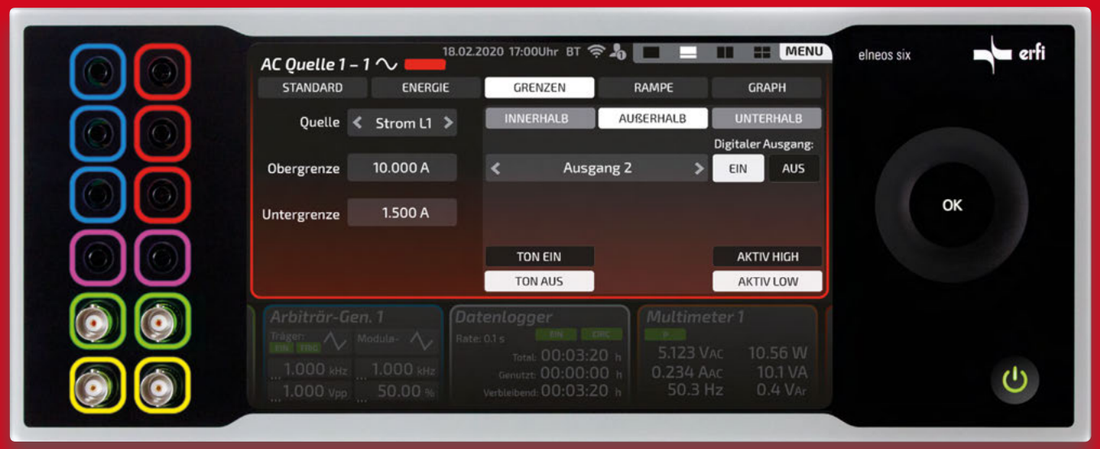
- In the 19-inch version, all connections on the glass unit front can be connected to the measurement technology with extremely short cable lengths, thus guaranteeing higher accuracy and lower susceptibility to interference from irradiation.
- Alternative aluminium fronts available depending on installation position (Expand 2 profiles vertical and horizontal, compact 19-inch superstructures).
- High ease of maintenance due to standardised 19-inch racks.
- Alternatively, the power modules can also be installed below the table surface in an energy carrier (TechCube).
- Noiseless, electromechanical control through newly developed electric motors.

Control and measurement

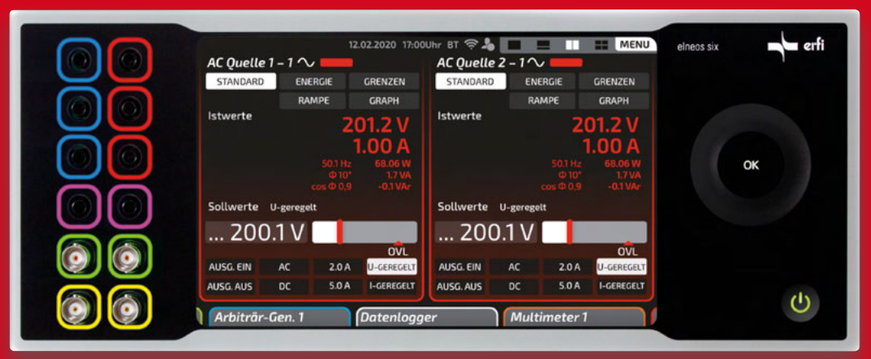
- Alternatively, very fast electronically controlling AC sources with adjustable frequency between 50, 60 and 400 Hz.
- Due to shortened and optimised cable lengths in conjunction with the 19-inch design, the use of high-quality 14-bit measuring technology with the highest measuring accuracy is made possible.
- Numerical and graphical representation of all the setpoints and actual values in the EL6.1 control centre (X-Y-graphs).
- Editable ramp generator for voltage and current ramps in the control centre.
- The *elneos six* control centre registers each bus participant through plug and play and continues to operate undisturbed if a module is removed.
- The devices can function as voltage regulators or as current regulators.
- The data logger stores all measured values, which can be called up at any time at the display and via the interface.
- To control DC loads, all 1-phase and 3-phase AC sources can be supplemented with rectifier modules built into the unit. The connected outputs "+" and "-" indicate accordingly by the ring socket lighting with disappearing effect.
- In the case of earth-free AC sources, only the active output is automatically illuminated due to the dimming effect (sockets or laboratory sockets).

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 156-157.



Limiter: *The limiter, guarantees the monitoring of current and voltage as well as the external control of other device groups and the indication light (integrated PLC function).*



Halfscreen: *Example of the simultaneous device display of two AC sources in half-screen mode. All other units remain accessible through the unit scroll bar at the bottom of the screen.*

Dynamic screen content: *The screen display adapts dynamically to all situations and even when the menu is displayed. The AC screen automatically scales itself to the correct size so that all the unit's information remains visible despite the extensive menu.*

Technical data and features

(order data p. 100-102)

Regulation
- 1- and 3-phase with electromechanical control
- 1-phase alternatively with electronic control

Type
19-inch racks for installation in device superstructures, cockpits and under-table mounting (TechCube).

Front panel and connection panel
1. ESG glass – device series elneos® six:
Scratch-resistant toughened safety glass with the highest safety function against impact and damage incl. ring bushing illumination with disappearing effect. For integration in 3 and 6 U table superstructures and equipment cockpits.

2. Aluminium – device series basic:
For integration in 3 and 6 U table superstructures and in unit cockpits.

3. Aluminium – device series acto®:
For horizontal / vertical integration into the Expand 2 aluminium extension profiles of the furniture series *elneos connect*.

Output
1-phase models with electro-mechanical / control
0 to 300 V AC / 1 A to 16 A, earthbound / earthfree

3-phase models with electro-mechanical control
0 to 720 V AC / 1 A to 14 A, earthbound / earthfree

1-phase models with electronically generated voltage
8 to 260 V AC / 3 or 5 A (780 or 1300 VA) / earthfree.
Output frequency variable between 50, 60 and 400 Hz.

Outputs for units with glass front
- All safety laboratory sockets with ring socket illumination and disappearing effect
- All sockets / CEE sockets with active indexing including disappearing effect

Note on earth-free transformers
- With earth-free transformers, the output voltage is connected by means of a contactor either to the laboratory sockets or to the socket.
- All earth-free models are clearly marked by backlit earth-free symbol.

Regulatory data –
Models with electromechanical control
Motor: noiseless drive
Accuracy: < ± 1,5 % f. s. with load change or 10 % mains fluctuation
Control time: approx. 1 sec. at 10 % mains fluctuation
Setting time: approx. 5 sec. from 2 to 260 V

Models with electromechanical control can be switched between voltage and current control.

Models with electronically generated voltage
Power factor: 0,95 %
Frequency: switchable between 50, 60 and 400 Hz.
Accuracy: < ± 0,7 % f. s. with load change from 0 to 100 %
Setting time: 0,1 seconds

Measurement accuracy
14-bit resolution and high-quality TRMS converters for current and voltage;

Display
- display via control centre EL6.1
- COS Phi and frequency
- numerical and graphical

Voltages AC: Lx-Lx [V]
Currents AC: Ix [A]

Performance:
Active power: P [W]
Apparent power: S [VA]
Reactive power: Q [VA]

Energy per phase and total energy:
Active energy: [Wh]
Apparent energy: [VAh]
Reactive energy: [varh]

Optional rectifier
Type: built into the unit (option)
1-phase: bridge rectifier RW 48 %
3-phase: three-phase bridge rectifier RW 5 %

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 156-157.

Installation Variants AC Voltage Sources

The AC power source system consists of a control centre, power modules and connection panels for the connections. The power modules are produced in 19-inch plug-in technology for installation in our 19-inch device cockpit, the tabletop structure or as a Tech Cube. The connection panels can be supplied either in ESG glass design with RGB LED ring socket lighting or in two variants made of aluminium (*basic* and *acto* device series).

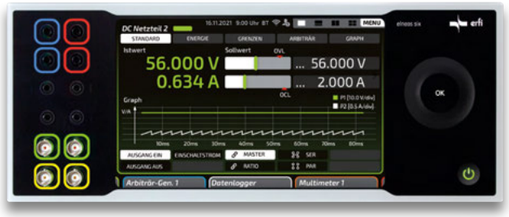
elneos® six Multi-expand mode

Control centre elneos® six
The control centre is connected to the AC power modules and the intelligent connection panels made of ESG glass via the e-bus.

Connection panel
Connection panels made of toughened safety glass incl. RGB-illuminated ring sockets and intelligent disappearing effect, alternatively made of aluminium fronts of the 19-inch unit series *basic* for integration into 19-inch device cockpits or table tops.

Connection panels of the unit series *acto* for integration into vertical and horizontal expand profiles (erfi-Bridge) from our furniture series *elneos connect*.

Power modules
The power modules can be placed in two locations depending on the space available:
- Cockpit integration
- Under-table installation (TechCubes)



Control centre elneos® six for controlling AC voltage sources
1- and 3-phase AC voltage sources including ramp function and rectifier. Version optionally with electro-mechanical control function (1- and 3-phase) or electronic voltage generation and variable frequency.

Connection panel
Depending on the overall design of the AC sources, you can choose between toughened safety glass or various aluminium fronts for the connection panels.

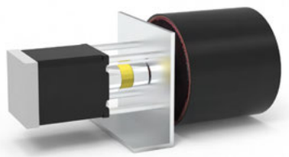
Connection panel out of aluminium, basic
For installation in 19-inch table superstructures or cockpits as an economical alternative to toughened safety glass.

Connection panel out of aluminium, acto®
For vertical or horizontal installation in the Expand profile 2 of the *elneos connect* system.

Connection panel out of safety glass elneos® six
The glass front panels are made of very high-quality toughened safety glass (ESG) with intelligent ring socket lighting and function labelling using disappearing effect. They provide safe orientation through colour coding and flashing functions of the various states during operation.

The tempered glass fronts are completely insensitive to impact, shock and pointed objects. Thanks to the highly insulating glass surfaces, the intelligently controlled glass fronts offer a high level of protection against accidental contact. The ideal equipment for educational institutions and technically demanding industrial laboratories. They are designed for installation in 19-inch device cockpits and table-top superstructures. They can also accommodate power assemblies, provided the superstructures permit this (19-inch parts insertion technology).

3-phase
AC voltage source



1-phasse
AC voltage source

Power modules
The power modules are designed as 19-inch subrack technology. For single-phase units, a choice can be made between electromechanical AC sources and electronic AC sources. The electronic AC sources additionally allow variable frequency adjustment 50, 60 and 400 Hz.

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 156-157.

Measured value display, measuring devices (DMM, P-meter) and power supplies (AC, DC): *Via the data logger, 5 different measured variables can be selected and the measuring rate and storage depth (up to 500,000 measuring points) can also be defined.*

Measured value display: *The data logger allows the simultaneous and synchronised graphic display of 5 different measured variables or devices, including X-Y zoom and scroll functions. Individual curves can also be hidden.*

Table function: *The integrated measured value table allows simultaneous display of up to 5 measured variables per measuring point incl. data storage (up to 5 synchronised measured value series of 100,000 measured values, file storage and display keyboard).*

Data Logger

(Standard equipment)

Graphic and tabular recording function
The data logger is already part of the standard equipment of every control power supply unit, power arbitrary generator, digital multimeter, power meter and all AC sources. The data logger has a memory volume for measurement data of up to 500,000 measurement points, i.e. 5 measurement curves of 100,000 measurement points each can be stored. It offers a high-speed mode with a resolution of up to 1/100 sec. resolution. Complex correlations that are difficult to explain can be visualised by synchronised measurement value recording. The data can be stored in the device or, for example, on a USB stick (using file export).

An alphanumeric display keyboard enables meaningful naming. The stored files can be loaded, exported or deleted at any time. Alternatively, the internal memory can be read out via LAN, USB, WLAN and BT and the measurement data is immediately transferred to all end devices.

Zoom and pan function
The graphs can be moved and zoomed using the 2-finger gesture and they can be spread in the X and Y direction as well as diagonally. At the same time, the airwheel can be used to zoom and slide without touching (rotating finger and wiping gestures).
The table can also be scrolled using the airwheel.

Due to the high sampling rate of the data logger (0.01 sec.) and the high display resolution of the new 8-inch multi-touch display of 800 x 1200 pixels, the measurement data can be displayed in very good quality. In the screen display "2/3 screen" and "Fullscreen", a permanent graph is shown parallel to the respective adjustable device parameters (independent of the data logger). Even in the small "Quattro screen", the graphic and tabular value display can be selected, zoomed and scrolled.

Technical data and features

Graphical and tabular display of measured values
The stored measured values as well as all current measured values can be quickly visualised in X- and Y-graphs on the large 8-inch multi-touch display. Using the 1- and 2-finger gestures (touch gestures) as well as the Airwheel (non-contact gestures by rotating the finger in the air or wiping in front of the wheel), graphs and tables can be spread or scrolled.

Up to 5 synchronised measured value series from different devices can be displayed simultaneously graphically and optionally in tabular form.
(see picture 2 and picture 3)

Curve 1: Power supply unit 1 – voltage
Curve 2: Power supply unit 1 – current
Curve 3: Power supply unit 2 – voltage
Curve 4: Power supply unit 2 – current
Curve 5: Digital multimeter – DC voltage measurement

Time display
- the available recording time
- the recording time used
- the recording time still available

Synchronous real-time measurement
Max. number of synchronised measuring signals: 5

Measured values of following devices free selectable:
- all DC and AC sources (all measurands)
- digital multimeter (all measurands)
- 1- and 3-phase power meters (all measurands)

Memory depth: max. 500,000 measured values in total, max. 100,000 measured values per measurand

Log rate: 0,01 (high-speed mode with 1 measurand)

Repetitions: 1 to ∞ (infinite)

Trigger: manually or by external trigger signal at any selectable digital input.

Flexible file storage system
- int. memory (4 GB) erasable via key function
- export function to USB (USB stick) and all other interfaces
- alphanumeric file name assignment through full display keyboard
- measured values retrievable by remote control command (SCPI command on LAN, USB, BT, WLAN)

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 143.

Ordering Information

Preconfigured Device Types

The preferred types are ready-configured combinations of devices with a single order number without the lengthy compilation of individual order numbers. Within a short time, you select your desired configuration and immediately receive a quotation within a few hours after submitting your request.

The devices can be supplied either as 19-inch racks for integration into your laboratory bench or as stand-alone units in a aluminium housing, ready for operation.

Compact design of the stand-alone devices device series elneos® six

Width: 63 HP (320 mm) as 19-inch rack or 350 mm as stand-alone
Exception: Combination units with 3- and 4-fold control power supply units, digital multimeter, power meter and function generator: 77 HP (391 mm) as a 19-inch subrack or 420 mm as a stand-alone unit
Depth: 185 mm for DC power supplies 2A (single & double power supplies), 360 mm all other models
Height: 3 HP (128.5 mm) as 19-inch rack, 170 mm as stand-alone

Standard scope of delivery

Outgoing interfaces: LAN, USB A, USB B, 8 digital inputs and 10 digital outputs on SUB-D connector; Supplies: USB 2.0 cable type A and type B 1.5 m, RJ45 cable 1.5 m.

Single Units	Order No. 19-inch rack	Order No. Stand-alone
DC Single Control Power Supplies		
DC 0-32V/2A	EL6.V.132.02	EL6.VS.132.02
DC 0-32V/5A	EL6.V.132.05	EL6.VS.132.05
DC 0-32V/10A	EL6.V.132.10	EL6.VS.132.10
DC 0-66V/5A	EL6.V.166.05	EL6.VS.166.05
DC 0-66V/10A	EL6.V.166.10	EL6.VS.166.10
DC 0-30V/50A	EL6.V.130.50	EL6.VS.130.50
DC 0-48 V/31A	EL6.V.148.31	EL6.VS.148.31
DC 0-60V/25A	EL6.V.160.25	EL6.VS.160.25
Digital Multimeter and Power Meter		
Digital multimeter (DMM)	EL6.VD	EL6.VSD
Digital multimeter (DMM) incl. power meter (P)	EL6.VP	EL6.VSP
Double Function Generator		
Double function generator (F)	EL6.VF	EL6.VSF
Fast double signal arbitrary generator (S)	EL6.VS	EL6.VSS
DC Multiple Control Power Supplies		
2 x DC 0-32V/2A	EL6.V.232.02	EL6.VS.232.02
2 x DC 0-32V/5A	EL6.V.232.05	EL6.VS.232.05
3 x DC 0-32V/2A	EL6.V.332.02	EL6.VS.332.02
4 x DC 0-32V/2A	EL6.V.432.02	EL6.VS.432.02

U: Height Unit, HP: Horizontal Pitch;

Device as 19-inch rack

Stand-alone unit with 185 mm depth

Combined Units	Order No. 19-inch rack	Order No. Stand-alone
DC Single Control Power Supplies, DMM incl. Power Meter (P)		
1 x DC 0-32V/2A, DMM incl. power meter (P)	EL6.V.132.02.P	EL6.VS.132.02.P
1 x DC 0-32V/5A, DMM incl. power meter (P)	EL6.V.132.05.P	EL6.VS.132.05.P
1 x DC 0-32V/10A, DMM incl. power meter (P)	EL6.V.132.10.P	EL6.VS.132.10.P
1 x DC 0-66V/5A, DMM incl. power meter (P)	EL6.V.166.05.P	EL6.VS.166.05.P
1 x DC 0-66V/10A, DMM incl. power meter (P)	EL6.V.166.10.P	EL6.VS.166.10.P
1 x DC 0-48V/31A, DMM incl. power meter (P)	EL6.V.148.31.P	EL6.VS.148.31.P
1 x DC 0-60V/25A, DMM incl. power meter (P)	EL6.V.160.25.P	EL6.VS.160.25.P
DC Single Control Power Supplies, DMM incl. Power Meter (P) + Double Function Generator (F)		
1 x DC 0-32V/2A, DMM incl. power meter (P) + Double function gen. (F)	EL6.V.132.02.P.F	EL6.VS.132.02.P.F
1 x DC 0-32V/5A, DMM incl. power meter (P) + Double function gen. (F)	EL6.V.132.05.P.F	EL6.VS.132.05.P.F
1 x DC 0-32V/10A, DMM incl. power meter (P) + Double function gen. (F)	EL6.V.132.10.P.F	EL6.VS.132.10.P.F
1 x DC 0-66V/5A, DMM incl. power meter (P) + Double function gen. (F)	EL6.V.166.05.P.F	EL6.VS.166.05.P.F
1 x DC 0-66V/10A, DMM incl. power meter (P) + Double function gen. (F)	EL6.V.166.10.P.F	EL6.VS.166.10.P.F
DC Dual Control Power Supplies, DMM incl. Power Meter (P)		
2 x DC 0-32V/2A, DMM incl. power meter (P)	EL6.V.232.02.P	EL6.VS.232.02.P
2 x DC 0-32V/5A, DMM incl. power meter (P)	EL6.V.232.05.P	EL6.VS.232.05.P
DC Dual Control Power Supplies, DMM incl. Power Meter (P) + Double Function Generator (F)		
2 x DC 0-32V/2A, DMM incl. power meter (P) + Double function gen. (F)	EL6.V.232.02.P.F	EL6.VS.232.02.P.F
2 x DC 0-32V/5A, DMM incl. power meter (P) + Double function gen. (F)	EL6.V.232.05.P.F	EL6.VS.232.05.P.F
DC Tripple Control Power Supplies, DMM incl. Power Meter (P)		
3 x DC 0-32V/2A, DMM incl. power meter (P)	EL6.V.332.02.P*	EL6.VS.332.02.P*
DC Tripple Control Power Supplies, DMM incl. Power Meter (P) + Double Function Generator (F)		
3 x DC 0-32V/2A, DMM incl. power meter (P) + Double function gen. (F)	EL6.V.332.02.P.F*	EL6.VS.332.02.P.F*
DC Quadruple Control Power Supplies, DMM incl. Power Meter (P)		
4 x DC 0-32V/2A, DMM incl. power meter (P)	EL6.V.432.02.P*	EL6.VS.432.02.P*

Options for Dual Control Power Supplies	Order No.
Convenience features for double DC control network units Serial/parallel function, master/slave function, ratio function and tracking function	EL6.CL

* Overall width for combination units with 3- & 4-fold control power supplies incl. power meter: 77 HP (391 mm) as 19" subrack or 420 mm as stand-alone.

elneos® six in Stand-alone Case

The *elneos six*, *basic* and *highlab* unit series can be operated anywhere as a desktop unit via a high-quality anodised aluminium extrusion case. By incorporating professional 19-inch mounting technology, 3 U racks can be optimally integrated.

Rear side with interfaces

Lateral functional handles
The lateral plastic injection-moulded elements with a recess incorporated into them enable good handling and leave a high-quality impression. The functional elements are available in the colours elneos green (RAL design system 1107070) or gray (RAL design system 5500).

Generous ventilation system
The surface perforations in the graphite-black plastic side panels guarantee a constant air conditioning. When several enclosures, table tops or cockpits are arranged in a row, special recesses open up the supply of fresh air from above and below. Due to the plastic it ensures 100% protection against accidental contact.

Indication light
All standalone enclosure models can optionally accommodate an LED RGB indication light strip. The indication light is particularly important in conjunction with the *elneos six* series of units. The units of the *elneos six* series have built-in limit value monitoring (limiter) for power supply units, power arbitrary generators, digital multimeters and power meters, which are directly coupled with digital outputs.

These outputs control the indication light and ensure maximum safety at the workplace. Whether in the laboratory for long-term experiments or in training facilities, the indication light increases occupational safety to a considerable extent.

Highly flexible modular concept
The modular enclosure concept, constructed using multi-profile technology, enables the integration of the different units through two construction depths and any widths. In addition, the extruded profile technology allows the enclosure to be used directly as an equipment support for the laboratory world. In this case, the enclosures are mounted over the entire width of the laboratory table either directly on the table surface or on the 3rd level as a self-supporting unit cockpit.

Depth 1: 185 mm / Depth 2: 360 mm
Widths up to max. 6 m available with almost no restrictions.

Scope of delivery per enclosure
- Mounting for 19-inch rack units
- Mains connection cable

Illustration shows two construction depths

Standard scope of delivery
for stand-alone units of the elneos® six series
Outgoing interfaces: LAN, USB A, USB B, 8 digital inputs and 10 digital outputs on SUB-D connector;
Supplies: USB 2.0 cable type A & B 1.5 m, RJ45 cable 1.5 m.

Stand-alone case with depth 1 = 185 mm			
Order No.	**Functional side handles**	**External dimensions (W x D x H) mm**	**19-inch size**
EL6.SA1.63.1	green RAL DESIGN 1107070	350 x 185 x 170	3 U / 63 HP
EL6.SA1.70.1	green RAL DESIGN 1107071	386 x 185 x 170	3 U / 70 HP
EL6.SA1.77.1	green RAL DESIGN 1107072	420 x 185 x 170	3 U / 77 HP
EL6.SA1.78.1	green RAL DESIGN 1107073	426 x 185 x 170	3 U / 78 HP
EL6.SA1.84.1	green RAL DESIGN 1107074	457 x 185 x 170	3 U / 84 HP
EL6.SA1.63.2	gray RAL DESIGN 5500	350 x 185 x 170	3 U / 63 HP
EL6.SA1.70.2	gray RAL DESIGN 5501	386 x 185 x 170	3 U / 70 HP
EL6.SA1.77.2	gray RAL DESIGN 5502	420 x 185 x 170	3 U / 77 HP
EL6.SA1.78.2	gray RAL DESIGN 5503	426 x 185 x 170	3 U / 78 HP
EL6.SA1.84.2	gray RAL DESIGN 5504	457 x 185 x 170	3 U / 84 HP
Stand-alone case with depth 2 = 360 mm			
Order No.	**Functional side handles**	**External dimensions (W x D x H) mm**	**19-inch size**
EL6.SA2.63.1	green RAL DESIGN 1107070	350 x 360 x 170	3 U / 63 HP
EL6.SA2.70.1	green RAL DESIGN 1107071	386 x 360 x 170	3 U / 70 HP
EL6.SA2.77.1	green RAL DESIGN 1107072	420 x 360 x 170	3 U / 77 HP
EL6.SA2.78.1	green RAL DESIGN 1107073	426 x 360 x 170	3 U / 78 HP
EL6.SA2.84.1	green RAL DESIGN 1107074	457 x 360 x 170	3 U / 84 HP
EL6.SA2.63.2	gray RAL DESIGN 5500	350 x 360 x 170	3 U / 63 HP
EL6.SA2.70.2	gray RAL DESIGN 5501	386 x 360 x 170	3 U / 70 HP
EL6.SA2.77.2	gray RAL DESIGN 5502	420 x 360 x 170	3 U / 77 HP
EL6.SA2.78.2	gray RAL DESIGN 5503	426 x 360 x 170	3 U / 78 HP
EL6.SA2.84.2	gray RAL DESIGN 5504	457 x 360 x 170	3 U / 84 HP

Indication light for Stand-alone case	In top	In front
• Independent power supply unit, built into the standalone enclosure • 1 light strip across the entire width of the standalone enclosure, optionally recessed in the top or front panel • 1 high-power RGB LED, invisibly integrated in the desk housing and wired to the digital outputs of *elneos six*	ELC.2.9.SAI1	ELC.2.9.SAI2

elneos® six Control Centre

GERMAN DESIGN AWARD WINNER 2022

Hygienically controllable with 3D gesture control and Airwheel!
To configure the *elneos six* device system, you only need to order one control centre. It is used to accommodate and control all unit types simultaneously. It is equipped with a large capacitive 8-inch multi-touch display in 3 U / 63 HP incl. split function, operable with the 5-finger gestures.

Installation case depth 160 mm
For housing single and multiple power supplies up to 60 W, DMM and function generators in very narrow 19-inch table-top units and device cockpits with an installation depth of 185 mm.
Order no. EL6.1.185

Installation case depth 220 mm
Partly plus power amplifiers depending on model approx. 90 mm. For housing all device groups in 19-inch table-top units and device cockpits with an installation depth of 360 mm.
Order no. EL6.1.360

Size: 19-inch parts insert 3 U / 63 HP
(H 128,50 mm / W 320 mm / D depending on model)

Interfaces
Standard: LAN, WLAN, BT (Bluetooth), NFC (Near Field Communication)
Optional: USB-A (keyboard, mouse, scanner), USB-B (remote control interface), 8 digital inputs, 10 digital outputs led out on rear of unit (Order no. EL6.1.S1, p. 104) or led out on insert plate (Order no. EL6.ZG006.E, p. 104)

elneos® six Interface
- Switching between Full-, Half-, 2/3- and Quattro screen
- Interruption-resistant and scratch-resistant ESG cover glass
- Anti-fingerprint surface and ceramic backglass print
- Powerful industrial microcontroller system (4 GB)
- Control of all additional slots for up to 32 devices
- Capacitive 3D airwheel ground into the glass surface
- Airwheel with 3D gesture function for touch-free operation
- Haptic wheel and display (Option EL6.1.HW, p. 94)
- On-off sensor with fingertip grinding

Data storage
Powerful data logger with graphical recording function for function of up to 5 measurement curves and 500,000 measurement points as standard.

Front connections depending on unit equipment
- 8 laboratory sockets (4 mm) with illumination and disappearing effect for DC control power supplies, DC power arbitrary generators, digital multimeters and power meters
- 4 BNC sockets for function generators and signal arbitrary generators with ring socket illumination and disappearing effect

Optional voice control
2 microphones, audio amplifier for sound and speech output and loudspeakers (Speech package Hey erfi! EL6.1.SP1, p. 94)

elneos® six compact Control Centre

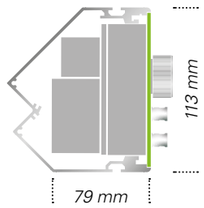
Depending on installation, horizontal or vertical screen structure

Flexible for installation in aluminium profile Expand 2 with encoder!
This design enables a table-top model without device cockpit. The control centre houses groups, including the control electronics for DC power supply units and large power output modules are integrated in TechCubes. Only one control centre needs to be ordered for the configuration. It has a 7-inch multi-touch display incl. split function and can be operated with the 5-finger gestures.

Installation in Aluminiumprofile Expand 2
Compact design in a construction depth of 79 mm as a complete system with its own control centre.
Order no. EL6.1.C

Baugröße: 19-inch parts insert 56 HP
(H 113 mm / W 284 mm / D 79 mm)

Interfaces
Standard: LAN, WLAN, BT (Bluetooth)
Optional: USB-A (keyboard, mouse, scanner), USB-B (remote control interface), 8 digital inputs, 10 digital outputs led out on rear of unit (Order no. EL6.1.S1, S. 104) or led out on insert plate *acto*, (Order no. EL6.CCA.1H or EL6.CCA.1V, p. 119)



Sectional view of the elneos six compact in the Expand 2

elneos® six compact Interface
- Switching between Full-, Half-, 2/3- and Quattro screen
- Interruption-resistant and scratch-resistant ESG cover glass
- Anti-fingerprint surface and ceramic backglass print
- Powerful industrial microcontroller system (4 GB)
- Control of all additional slots for up to 32 units
- Mechanical rotary encoder
- On-off sensor with fingertip grind

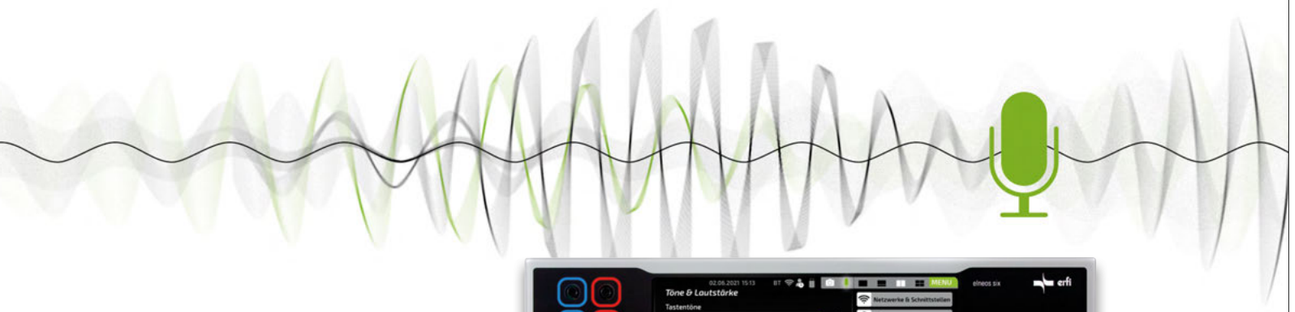
Data storage
Powerful data logger with graphical recording function for function of up to 5 measurement curves and 500,000 measurement points as standard.

Front connections depending on unit equipment
- 6 laboratory sockets (4 mm) with illumination marker and disappearing effect for DC control power supplies, DC power arbitrary generators, digital multimeters and power meters
- 4 BNC sockets for function and signal arbitrary generators with illumination marker and disappearing effect

Note: The power output stages of the AC and DC sources are located in TechCubes below the table top. All other devices such as digital multimeters, function generators or the control electronics of the DC power supplies can be placed directly behind the control centre forming a compact unit.

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 139-147.



Voice control setting for volume and tones.

erfi hygienic

Speech paket Hey erfi! (optional)
Order no. EL6.1.SP1

With the Hey erfi! speech package, it is possible for the first time to control numerous device functions by voice without an Internet connection. The intelligent voice control takes over settings and automatisms that were previously only possible through active operation on the device itself. The voice recognition has an extensive vocabulary of more than 40 commands for device and menu control.

elneos six talks to you – measured values are read out and instructions are given in a pleasant voice via the audio amplifier and built-in speakers. With this feature you can fully concentrate on your test object and receive the latest results at any time.

erfi hygienic – Due to the touch-free operation, this feature makes a decisive contribution to operating safety, work productivity and hygiene. The speech package Hey erfi! is ideally combined with the Haptic Wheel.

- 2 internal microphones for speech recognition
- 1 loudspeaker with audio amplifier for sound and speech output

Haptic wheel and display (optional)
Order no. EL6.1.HW

The haptic wheel provides haptic feedback through mechanical impulses via a vibration motor. During the rotary movement, the detent of a rotary encoder or the display operation is simulated realistically and the values can be set even more precisely.

More detailed information in the Technical Compendium from page 142-143.

DC Precision regulating power supply, linear
Max. 4 units can be integrated into the large *elneos six* control centre and max. 4 x 64 W, 3 x 96 W or 2 x 160 W and max. 2 devices for the integration into the *elneos six* compact control centre. With *elneos six compact*, the power output stage is always outsourced without restriction.

Order no.	DC Precision regulating power supply	Order no.	DC Precision regulating power supply
EL6.LDC.032.01	Regul. power supply 0-32 V / 0-1 A, 32 W	EL6.LDC.066.02	Regul. power supply 0-66 V / 0-2 A, 132 W
EL6.LDC.032.02	Regul. power supply 0-32 V / 0-2 A, 64 W	EL6.LDC.066.03	Regul. power supply 0-66 V / 0-3 A, 198 W
EL6.LDC.032.03	Regul. power supply 0-32 V / 0-3 A, 96 W	EL6.LDC.066.05	Regul. power supply 0-66 V / 0-5 A, 330 W
EL6.LDC.032.05	Regul. power supply 0-32 V / 0-5 A, 160 W	EL6.LDC.066.10	Regul. power supply 0-66 V / 0-10 A, 660 W
EL6.LDC.032.10	Regul. power supply 0-32 V / 0-10 A, 320 W	EL6.LDC.100.02	Regul. power supply 0-100 V / 0-2 A, 200 W
EL6.LDC.032.20	Regul. power supply 0-32 V / 0-20 A, 640 W	EL6.LDC.100.06	Regul. power supply 0-100 V / 0-6 A, 600 W

DC Graphical arbitrary generator incl. DC Precision regulating power supply, linear
Max. 4 devices can be integrated into the large *elneos six* control centre and max. 4 x 64 W, 3 x 96 W or 2 x 160 W and max. 2 devices can be integrated into the *elneos six* compact control centre. With *elneos six* compact, the power output stage is always outsourced without restriction. Single-quadrant operation with square wave up to 1 kHz and sine wave up to 2.5 kHz. For multiple power arbitrary generators, please specify the number of units.

Order no.	DC Graphical arbitrary generator	Order no.	DC Graphical arbitrary generator
EL6.LDC.032.01A	Arbitrary generator 0-32 V, 0-1 A, 32 W	EL6.LDC.066.02A	Arbitrary generator 0-66 V, 0-2 A, 132 W
EL6.LDC.032.02A	Arbitrary generator 0-32 V, 0-2 A, 64 W	EL6.LDC.066.03A	Arbitrary generator 0-66 V, 0-3 A, 198 W
EL6.LDC.032.03A	Arbitrary generator 0-32 V, 0-3 A, 96 W	EL6.LDC.066.05A	Arbitrary generator 0-66 V, 0-5 A, 330 W
EL6.LDC.032.05A	Arbitrary generator 0-32 V, 0-5 A, 160 W	EL6.LDC.066.10A	Arbitrary generator 0-66 V, 0-10 A, 660 W
EL6.LDC.032.10A	Arbitrary generator 0-32 V, 0-10 A, 320 W	EL6.LDC.100.02A	Arbitrary generator 0-100 V, 0-2 A, 200 W
EL6.LDC.032.20A	Arbitrary generator 0-32 V, 0-20 A, 640 W	EL6.LDC.100.06A	Arbitrary generator 0-100 V, 0-6 A, 600 W

Additional equipment for DC precision regulating power supplies, linear
Order no. EL6.L4L

Optional 4-wire technology especially useful for power supply units with higher currents. 2 additional additional sensor lines are provided per channel.

Note: Recommended accessory set control power supply units or power arbitrary generators,
Order no.EL6.ZB.001, see p.110-111.

More detailed information in the Technical Compendium from page 148-149.

Comfort equipment for double power supply units and double power arbitrary generators
Serial-/Parallel function, Master-/Slave function, Ratio function and Tracking function

Order no.	Comfort equipment for double power supply / double power arbitrary generators
EL6.CL	Comfort equipment

Master-/Slave function
Optional coupling of two power supply units (current and voltage coupling). A slave power supply unit follows a master power supply unit in terms of current and voltage.

Due to the newly developed bidirectional master-slave function, it does not matter which power supply is the master and which power supply is the slave. As soon as a parameter (either U or I) is changed on one power supply unit, the parameter of the second power supply unit follows the first power supply unit and vice versa. This is therefore a bidirectional function with maximum flexibility.

Serial-/Parallel function (color indicated):
The outputs are connected in series or parallel via an internal relay circuit. This allows either double the voltage or double the current without the need for external wiring to the laboratory sockets.

Special feature for serial connection
- Possibility of taking any positive and any negative voltage.
- Coloured display of the sum voltage by two diagonally arranged and illuminated sockets in red and blue. The other two diagonal sockets are illuminated in turquoise.
- Individual voltages at the normal laboratory sockets can still be tapped in parallel.

Special feature for parallel connection
- Colour indication of the masses by socket lighting.
- Sum current display of control power supply 1 and 2.
- Linking of both parameters of current and voltage (simultaneous change).

Ratio function
The ratio function links the voltage channel of control supply 1 with that of control supply 2 and vice versa. This enables asymmetrical loads simulation.

Example: Control power supply 1 set to +10 V
Control power supply 2 set to +1 V
(10% of the value of power supply 1)

If the voltage of control power supply 1 is changed to 20 V when activated ratio function, the control power supply 2 changes to 2 V. With the ratio function, the voltage value of the second power supply follows the voltage value of the first power supply and vice versa in a percentage manner (ratio).

Symmetric / asymmetric tracking
The tracking function is used to simultaneously take a negative and a positive voltage that are chained together. It is activated by switching on the Serial and Ratio functions simultaneously.

Symmetric tracking function –
Voltages with reversed sign
If the negative and positive voltages are taken symmetrically, both voltages are set to the identical value at the beginning.

Example: Control power supply 1 set to +10 V
Control power supply 2 set to -10 V

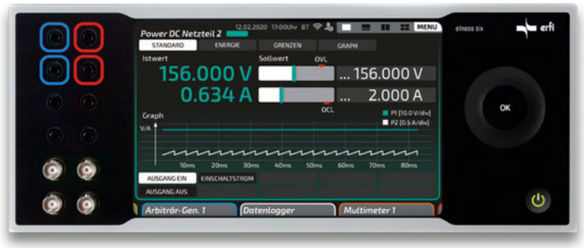
If one voltage value is changed, the other voltage value follows in the same way with with the opposite sign.

Asymmetric tracking function –
Voltages with reversed sign
The ratio function allows asymmetrical tracking.

Example: Control power supply 1 set to +10 V
Control power supply 2 set to - 5V

If values are set to +20 V (doubling) at power supply 1, power supply 2 follows and sets itself to -10 V.

More detailed information in the Technical Compendium from page 148-149.



DC power supply units 400 V and 125 A (timed)
The units are equipped with 4-wire technology. Ideal for high-current applications such as battery management applications. State-of-the-art circuit technology enables voltages up to 400 V and currents up to 125 A.

Order no.	DC Power supply 800 Watt [1]	Order no.	DC Power supply 1.500 Watt [1]
EL6.GDC.012.066	DC Power supply 0-12 V / 0-66 A[3]	EL6.GDC.012.125	DC Power supply 0-12 V / 0-125 A[3]
EL6.GDC.015.053	DC Power supply 0-15 V / 0-53 A[3]	EL6.GDC.015.100	DC Power supply 0-15 V / 0-100 A[3]
EL6.GDC.024.033	DC Power supply 0-24 V / 0-33 A[3]	EL6.GDC.024.062	DC Power supply 0-24 V / 0-62 A[3]
EL6.GDC.030.026	DC Power supply 0-30 V / 0-26 A	EL6.GDC.030.050	DC Power supply 0-30 V / 0-50 A[3]
EL6.GDC.036.022	DC Power supply 0-36 V / 0-22 A	EL6.GDC.036.041	DC Power supply 0-36 V / 0-41 A[3]
EL6.GDC.048.016	DC Power supply 0-48 V / 0-16 A	EL6.GDC.048.031	DC Power supply 0-48 V / 0-31 A
EL6.GDC.060.013	DC Power supply 0-60 V / 0-13 A	EL6.GDC.060.025	DC Power supply 0-60 V / 0-25 A

Order no.	DC Power supply 3.000 Watt [2]
EL6.GDC.150.020	DC Power supply 0-150 V / 0-20 A
EL6.GDC.200.015	DC Power supply 0-200 V / 0-15 A
EL6.GDC.250.012	DC Power supply 0-250 V / 0-12 A
EL6.GDC.300.010	DC Power supply 0-300 V / 0-10 A
EL6.GDC.400.007	DC Power supply 0-400 V / 0-7 A

Up to 1,500 watts, the models are integrated directly in the control centre. The models with 3,000 watts are installed in TechCubes below the table top or in 6 U device cockpits with the corresponding installation depth.

Note:
[1] Installation in *elneos six* control centre, 19-inch slide-in or TechCube
[2] Installation in separate 19-inch/6 U cassette in TechCube
[3] Models with outgoing currents > 32 A are wired to additional high-current outlets as standard.

Slaves for High-current outlet
Glass front 3 U / 14 HP or 63 HP

Note: Recommended accessory set control power supply units or power arbitrary generators Order no. EL6.ZB.001, see p. 110.

The 63 HP version is designed to accommodate additional 800 and 1,500 Watt DC power supplies. The 3,000 watt DC power supplies are integrated either in table superstructures, cockpits or in TechCubes (6 U) below the table top and are wired to the high-current outlets. The variant in 14 HP is installed for currents >32 A.

- two 4 mm safety laboratory sockets for 4-wire technology for error-free back measurement at high currents
- active indication with disappearing effect
- two 6/4 mm safety lab sockets for currents up to 80 A or two 6 mm safety lab sockets for currents up to 125 A

High-current outlet	Order no. 14 HP	Order no. 63 HP
High-current outlet for currents up to 80 A	EL6.ZG007.P1DC80	EL6.ZG008.P1DC80
High-current outlet for currents up to 125 A	EL6.ZG007.P1DC125	EL6.ZG008.P1DC125

More detailed information in the Technical Compendium from page 150-151.

Precision digital multimeter 5¾-digit
For 32 A AC/DC continuous current as standard with short term max. 40 A (no measuring amplifier and shunt necessary). The devices have a Crest factor of 5 and are prepared for simultaneous measurement of current and voltage.

Order no.	Digital multimeter
EL6.D	Precision digital multimeter 5¾-digit, Display scope 400.000 Digits
EL6.DUI	Additional equipment Digital multimeter; simultaneous recording of current and voltage (AC/DC)

Note: The unit is installed in the *elneos six* and *elneos six* compact control centres. You only need one control centre to operate up to 32 units.

High-current measuring Precision digital multimeter up to 125 A
Glass front slave 3 U / 14 HP
- Modern measuring amplifier wired to safety laboratory sockets (4 mm) for direct connection to the voltage input of the precision digital multimeter
- High-current shunt (class 0.5) wired to 6/4 mm (55 A) or 6 mm (125 A) safety laboratory sockets
- Active indication with disappearing effect

Order no.	High-current measuring Precision digital multimeter
EL6.ZG007.PDMM55	High-current measuring for currents up to 55 A on 6/4 mm safety sockets
EL6.ZG007.PDMM125	High-current measuring for currents up to 125 A on 6 mm safety sockets

Note: Recommended accessory set Digital multimeter and power meter, Order no. EL6.ZB.002, see p. 110.

More detailed information in the Technical Compendium from page 152-153.

Power and energy meter incl. Digital multimeter
For 1-phase loads incl. all digital multimeter functions. 32 A AC/DC continuous current as standard with short-term max. 40 A (no measuring amplifier and shunt necessary). The unit allows power measurement up to 24 KW continuous power.

Order no.	Power and energy meter
EL6.P	Power and energy meter incl. Digital multimeter

Double function generator incl. counter 150 MHz
For output frequencies up to 40 MHz and 30 Vpp. One external source and one internal source for completely free modulation.

Analog modulation: AM, FM, PWM, Sweep
Digital modulation: ASK, FSK

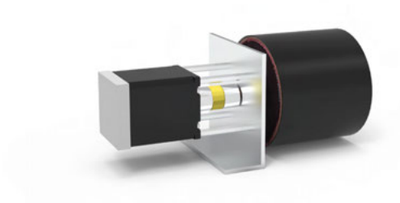
Order no.	Double function generator
EL6.F	Function generator with 2 signal sources incl. high-speed counter 150 MHz
EL6.F1G	Additional equipment Function generator from 150 MHz to 1,5 GHz

Note: Recommended accessory set Function generator and fast arbitrary generator, Order no. EL6.ZB.002, see p. 110.

Fast signal arbitrary generator incl.
Function generator and high-speed counter
With two additional memory locations for recording any two waveforms and with a total of max. 8,192 sampling points. Can be read in via interface with *highlink Power* software. Free modulation of the waveforms with 2nd internal function generator incl. all functions.

Order no.	Signal arbitrary generator
EL6.S	Fast signal arbitrary generator (S) incl. Function generator

More detailed information in the Technical Compendium from page 153-155.



AC voltage sources, 1-phase optionally with electromechanical or electronic control

The voltage sources are characterised by precision, speed and silent operation. On models with electronic control, the output frequency can be additionally switched between 50, 60 and 400 Hz.

- Full-featured power and energy meter as standard (1-phase) incl. P, S, Q, COS Phi and f display
- switchable between voltage and current regulation
- Limiter (limit value monitoring) and ramp function
- Graphic measured value display with live value display of V, A, COS Phi and f-display
- Memory loading function, OVL, OCL and fixed value definition

Select the installation position: The devices can be installed either in a 19-inch subrack with glass or aluminium front or in TechCubes below the table top. The respective connection panel such as glass front or alumium front (see p. 106-119) as well as the TechCube for under-table mounting (see p. 103) must be selected separately.

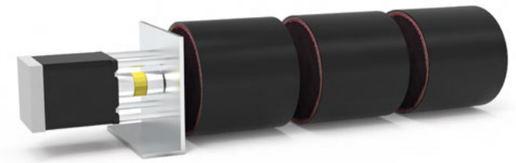
AC voltage sources 1-phase with elektromechanical control			
Installation subrack **Order no.**	Installation TechCube **Order no.**	AC voltage sources 1-phase **Elektromechanical control**	Size **Subrack**
EL6.AC1.030.04.1	EL6.AC1.030.04.1U	0-30 V / 4 A, floating, 120 W	3 U / 56 HP
EL6.AC1.030.12.1	EL6.AC1.030.12.1U	0-30 V/ 12 A, floating, 360 W	3 U / 56 HP
EL6.AC1.060.04.1	EL6.AC1.060.04.1U	0-60 V / 4 A, floating, 240 W	3 U / 56 HP
EL6.AC1.260.03.2	EL6.AC1.260.03.2U	0-260 V / 3 A, not ungrounded, 780 W	3 U / 56 HP
EL6.AC1.260.03.1	EL6.AC1.260.03.1U	0-260 V / 3 A, floating, 780 W	3 U / 56 HP
EL6.AC1.260.06.2	EL6.AC1.260.06.2U	0-260 V / 6 A, not ungrounded, 1,56 kW	6 U / 70 HP
EL6.AC1.260.06.1	EL6.AC1.260.06.1U	0-260 V / 6 A, floating, 1,56 kw	6 U / 70 HP
EL6.AC1.260.10.2	EL6.AC1.260.10.2U	0-260 V / 10 A, not ungrounded, 2,6 kW	6 U / 70 HP
EL6.AC1.260.10.1	EL6.AC1.260.10.1U	0-260 V / 10 A, floating, 2,6 kW	6 U / 70 HP
EL6.AC1.260.12.2	EL6.AC1.260.12.2U	0-260 V / 12 A, not ungrounded, 3,12 kW	6 U / 70 HP
EL6.AC1.260.12.1	EL6.AC1.260.12.1U	0-260 V / 12 A, floating, 3,12 kW	6 U / 70 HP
EL6.AC1.230.14.2	EL6.AC1.230.14.2U	0-230 V / 14 A, not ungrounded, 3,22 kW	6 U / 70 HP
EL6.AC1.230.14.1	EL6.AC1.230.14.1U	0-230 V / 14 A, floating, 3,22 kW	6 U / 70 HP
EL6.AC1.300.10.1	EL6.AC1.300.10.1U	0-300 V / 10 A, floating, 3 kW	6 U / 70 HP
EL6.AC1.300.10.2	EL6.AC1.300.10.2U	0-300 V / 10 A, not ungrounded, 3 kW	6 U / 70 HP
	EL6.AC1.270.16.1U*	0-270 V / 16 A, floating, 4,32 kW	
	EL6.AC1.300.16.1U*	0-300 V / 16 A, floating, 4,8 kW	
AC voltage sources 1-phase with electronic voltage generation and variable output frequency (50, 60 and 400 Hz)			
Installation subrack **Order no.**	Installation TechCube **Order no.**	AC voltage sources 1-phase **Elektronic control**	Size **Subrack**
EL6.AC1E.260.03.1	EL6.AC1E.260.03.1U	0-260 V / 3 A floating, 780 W	3 U / 56 HP
EL6.AC1E.260.05.1	EL6.AC1E.260.05.1U	0-260 V / 5 A floating, 1,3 kW	3 U / 56 HP

*3-phase power supply necessary

Note: Recommended accessory set for AC sources 1-phase, Order no. EL6.ZB.003, AC sources 3-phase, Order no. EL6.ZB.004, see p. 110 -111.

AC voltage sources, 3-phase with electromechanical control

Voltage sources are used for the professional supply of 3-phase test items. Standard full-fledged power and energy meter (3-phase) incl. all functions according to the 1-phase sources such as voltage and current control, ramp function, graphic measured value display, OVL, OCL, limit value monitoring and fixed value definition.



Select the installation position: The 3-phase AC voltage sources can also be installed in 19-inch subracks or in TechCubes. The respective connection panel must be selected.

AC voltage sources 3-phase with elektromechanical control			
Installation subrack **Order no.**	Installation TechCube **Order no.**	AC voltage sources 3-phase **Elektromechanic control**	Size **Subrack**
EL6.AC3.400.03.2	EL6.AC3.400.03.2U	0-400 V / 230 V AC / 3 A, not ungrounded, 1,2 kW	3 U / 95 HP
EL6.AC3.400.03.1	EL6.AC3.400.03.1U	0-400 V / 230 V AC / 3 A, floating, 1,2 kW	3 U / 95 HP
EL6.AC3.450.02.2	EL6.AC3.450.02.2U	0-450 V / 260 V AC / 2 A, not ungrounded, 900 W	3 U / 95 HP
EL6.AC3.400.05.2	EL6.AC3.400.05.2U	0-400 V / 230 V AC / 5 A, not ungrounded, 2 kW	6 U / 95 HP
EL6.AC3.400.05.1	EL6.AC3.400.05.1U	0-400 V / 230 V AC / 5 A, floating, 2 kW	6 U / 95 HP
EL6.AC3.400.08.2	EL6.AC3.400.08.2U	0-400 V / 230 V AC / 8 A, not ungrounded, 3,2 kW	6 U / 95 HP
EL6.AC3.400.08.1	EL6.AC3.400.08.1U	0-400 V / 230 V AC / 8 A, floating, 3,2 kW	6 U / 95 HP
	EL6.AC3.400.10.2U	0-400 V / 230 V AC / 10 A, not ungrounded, 4 kW	
	EL6.AC3.400.10.1U	0-400 V / 230 V AC / 10 A, floating, 4 kW	
	EL6.AC3.400.14.2U	0-400 V / 230 V AC / 14 A, not ungrounded, 5,6 kW	
	EL6.AC3.400.14.1U	0-400 V / 230 V AC / 14 A, floating, 5,6 kW	
EL6.AC3.450.05.2	EL6.AC3.450.05.2U	0-450 V / 260 V AC / 5 A, not ungrounded, 2,25 kW	6 U / 95 HP
EL6.AC3.450.05.1	EL6.AC3.450.05.1U	0-450 V / 260 V AC / 5 A, floating, 2,25 kW	6 U / 95 HP
EL6.AC3.500.04.2	EL6.AC3.500.04.2U	0-500 V / 290 V AC / 4 A, not ungrounded, 2 kW	6 U / 95 HP
EL6.AC3.500.04.1	EL6.AC3.500.04.1U	0-500 V / 290 V AC / 4 A, floating, 2 kW	6 U / 95 HP
EL6.AC3.520.07.2	EL6.AC3.520.07.2U	0-520 V / 300 V AC / 7 A, not ungrounded, 3,64 kW	6 U / 95 HP
EL6.AC3.520.07.1	EL6.AC3.520.07.1U	0-520 V / 300 V AC / 7 A, floating, 3,64 kW	6 U / 95 HP
	EL6.AC3.520.10.2U	0-520 V / 300 V AC / 10 A, not ungrounded, 5,2 kW	
	EL6.AC3.520.10.1U	0-520 V / 300 V AC / 10 A, floating, 5,2 kW	
EL6.AC3.720.03.2	EL6.AC3.720.03.2U	0-720 V / 415 V AC / 3 A, not ungrounded, 2,16 kW	6 U / 95 HP
EL6.AC3.720.03.1	EL6.AC3.720.03.1U	0-720 V / 415 V AC / 3 A, floating, 2,16 kW	6 U / 95 HP

Optional rectifier for 1- and 3-phase AC sources installation

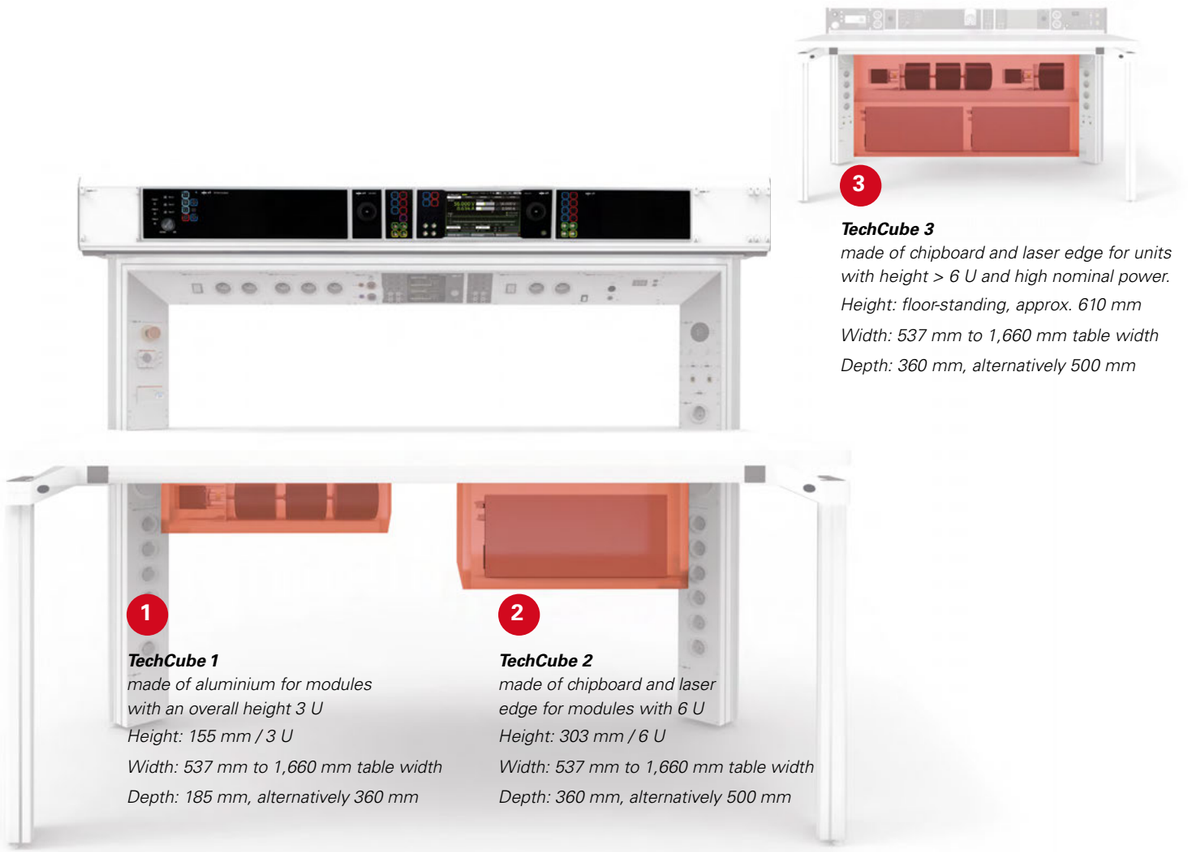
Quality 1-phase: Bridge rectifier RW 48 %
Quality 3-phase: Three-phase bridge rectifier RW 5 %

Output glass front: Illuminated laboratory sockets with disappearing effect as well as two backlit safety laboratory sockets "+" and "-".
Output Aluminium front: two safety laboratory sockets

Order no.	**Bridge rectifier**
EL6.AC1.B1	Bridge rectifier 1-phase, integrated in AC voltage source
EL6.AC3.B6	Three-phase bridge rectifier (B6), integrated in AC voltage source

Under-table Installation TechCubes

The TechCubes are a useful system component of the elneos connect furniture series and accommodate all power assemblies (AC, DC, etc.) as well as other device components that cannot be integrated into the control centre, the table superstructures, device cockpits or the erfi-Bridge, or the vertical expansion profile Expand 2 of the series *elneos connect* should or can be integrated.



1 ***TechCube 1***
made of aluminium for modules with an overall height 3 U
Height: 155 mm / 3 U
Width: 537 mm to 1,660 mm table width
Depth: 185 mm, alternatively 360 mm

2 ***TechCube 2***
made of chipboard and laser edge for modules with 6 U
Height: 303 mm / 6 U
Width: 537 mm to 1,660 mm table width
Depth: 360 mm, alternatively 500 mm

3 ***TechCube 3***
made of chipboard and laser edge for units with height > 6 U and high nominal power.
Height: floor-standing, approx. 610 mm
Width: 537 mm to 1,660 mm table width
Depth: 360 mm, alternatively 500 mm

This product family with integrated and standard-compliant 19-inch mounting mechanics are easily accessible at the front for maintenance purposes via aluminium front panels.

The TechCubes are available in different depths, heights and widths, depending on the space requirements of the respective power modules. The corps for holding 3 U power modules are made of aluminium, those for holding 6 U power modules and larger are made of chipboard and a laser edge.

TechCube for under-table mounting
Professional receptacle for power assemblies of all kinds incl. 19-inch mounting mechanism for professional encapsulation. Closed at the front with aluminium front panel or inspection door on floor-standing models.

Assembly: under-table mounting

Order no.	Size (W x D x H)	Material	for assemblies with design	Table widths
TechCube 1				
ELC4.7.1.0531	537 x 185 x 155 mm	Aluminium	3 U Height	all
ELC4.7.1.0861	860 x 185 x 155 mm	Aluminium	3 U Height	up to 1.200 mm
ELC4.7.1.1261	1.260 x 185 x 155 mm	Aluminium	3 U Height	up to 1.600 mm
ELC4.7.1.1461	1.460 x 185 x 155 mm	Aluminium	3 U Height	up to 1.800 mm
ELC4.7.1.1661	1.660 x 185 x 155 mm	Aluminium	3 U Height	up to 2.000 mm
ELC4.7.2.0533	537 x 360 x 155 mm	Aluminium	3 U Height	all
ELC4.7.2.0863	860 x 360 x 155 mm	Aluminium	3 U Height	up to 1.200 mm
ELC4.7.2.1263	1.260 x 360 x 155 mm	Aluminium	3 U Height	up to 1.600 mm
ELC4.7.2.1463	1.460 x 360 x 155 mm	Aluminium	3 U Height	up to 1.800 mm
ELC4.7.2.1663	1.660 x 360 x 155 mm	Aluminium	3 U Height	up to 2.000 mm
TechCube 2				
ELC4.7.3.0531	537 x 360 x 312 mm	Chipboard with laser edge	6 U Height	all
ELC4.7.3.0861	860 x 360 x 312 mm	Chipboard with laser edge	6 U Height	up to 1.200 mm
ELC4.7.3.1261	1.260 x 360 x 312 mm	Chipboard with laser edge	6 U Height	up to 1.600 mm
ELC4.7.3.1461	1.460 x 360 x 312 mm	Chipboard with laser edge	6 U Height	up to 1.800 mm
ELC4.7.3.1661	1.660 x 360 x 312 mm	Chipboard with laser edge	6 U Height	up to 2.000 mm
ELC4.7.3.0533	537 x 500 x 312 mm	Chipboard with laser edge	6 U Height/large depth*	all
ELC4.7.3.0863	860 x 500 x 312 mm	Chipboard with laser edge	6 U Height/large depth*	up to 1.200 mm
ELC4.7.3.1263	1.260 x 500 x 312 mm	Chipboard with laser edge	6 U Height/large depth*	up to 1.600 mm
ELC4.7.3.1463	1.460 x 500 x 312 mm	Chipboard with laser edge	6 U Height/large depth*	up to 1.800 mm
ELC4.7.3.1663	1.660 x 500 x 312 mm	Chipboard with laser edge	6 U Height/large depth*	up to 2.000 mm
TechCube 3				
ELC4.7.4.0531	537 x 360 x 610 mm	Chipboard w/ laser edge, grounded	> 6 U Height	all
ELC4.7.4.0861	860 x 360 x 610 mm	Chipboard w/ laser edge, grounded	> 6 U Height	up to 1.200 mm
ELC4.7.4.1261	1.260 x 360 x 610 mm	Chipboard w/ laser edge, grounded	> 6 U Height	up to 1.600 mm
ELC4.7.4.1461	1.460 x 360 x 610 mm	Chipboard w/ laser edge, grounded	> 6 U Height	up to 1.800 mm
ELC4.7.4.1661	1.660 x 360 x 610 mm	Chipboard w/ laser edge, grounded	> 6 U Height	up to 2.000 mm
ELC4.7.4.0533	537 x 500 x 610 mm	Chipboard w/ laser edge, grounded	> 6 U Height/large depth*	all
ELC4.7.4.0863	860 x 500 x 610 mm	Chipboard w/ laser edge, grounded	> 6 U Height/large depth*	up to 1.200 mm
ELC4.7.4.1263	1.260 x 500 x 610 mm	Chipboard w/ laser edge, grounded	> 6 U Height/large depth*	up to 1.600 mm
ELC4.7.4.1463	1.460 x 500 x 610 mm	Chipboard w/ laser edge, grounded	> 6 U Height/large depth*	up to 1.800 mm
ELC4.7.4.1663	1.660 x 500 x 610 mm	Chipboard w/ laser edge, grounded	> 6 U Height/large depth*	up to 2.000 mm

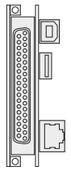
* for power modules with a large installation depth

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 156-157.

Additional optional interfaces

The two control centres *elneos six* and *elneos six* compact have the features of an integrated and freely programmable SPS/PLC as standard. The internal digital outputs and inputs, which are prepared as standard, can be implemented either on the rear of the unit or at the front on the "Connect" glass-front slave.



Interfaces on the rear of the device (optional)

Order no. EL6.1.S1

The interfaces LAN, USB A and USB B as well as the 8 digital inputs and 10 digital outputs are accessible on the back of the unit via an additional board. This becomes useful if the unit is to be wired to a LAN switch and the digital outputs are to be wired to the indication light at the same time. If the digital I/O's are not used, this option is not necessary as the LAN interface is always available for remote control.

Slave Connect
Interfaces realised at the front (optional)

Glass front 3 U / 14 HP

Order no. EL6.ZG006.E

Alternatively, the digital connections together with the LAN and USB connections can be routed to the glass front slave "Connect", which is installed in the superstructure or device cockpit. The device interfaces are wired to the glass front panel and are easy to reach.

Note: Recommended remote cable set for remote control, Order no. EL6.ZB.007 and cable set for slave Connect, Order no. EL6.ZB.008, see p. 111.

Integrated SPS-PLC function

Freely programmable on the display

elneos six has an integrated PLC function with 10 digital outputs and 8 digital inputs. These can be freely programmed directly on the display or via the remote control interface. The programming interface is displayed via a swipe gesture from the bottom edge of the screen to the top. Outputs 9 and 10 are reserved for motorised table height adjustment, provided the workstation has this option (up-down control).

Each output and input can be programmed as a button or switch on the display. The modes "active high" or "active low" can be defined. Labelling is carried out via the superimposed, fully-fledged display keyboard.

Outputs and inputs programmable via interface

Optionally programmable via LAN, USB, WLAN and BT interface. Especially in training facilities, the trainee can use the application of a PLC without complex programming and without additional hardware.

Interfaces usable through integrated limiter

The outputs and inputs can be used freely by the integrated limiter, whereby the user can enter a lower and an upper limit on the display. In addition, three states can be assigned to an output:

- below the limits e.g. output 0 = „active high“
- within the limits e.g. output 1 = „active high“
- above the limits e.g. output 2 = „active high“

If, for example, the outputs are connected to the intelligent RGB indication light from erfi, the limit values can be monitored in colour:

- below the limits = blue
- within the limits = green
- above the limits = red

More detailed information in the Technical Compendium from page 144.

Table control functions

elneos six has additional remote control functions for the intelligent integration of further table functions such as the control of the workplace lighting and the motorised table height adjustment.

Table height adjustment

Order no. EL6.TH

All motorised height-adjustable tables from erfi can be adjusted to the desired working position very quickly and elegantly by means of up and down buttons. For this purpose, a button for "raising" and one for "lowering" are displayed. Both can be conveniently operated directly on the screen. Vulnerable mechanical push buttons at the workstation itself are the past.

Workstation light control

Order no. EL6.AL

elneos six enables the remote control of the new erfi workplace luminaire with integrated Human Centric Lighting function via Bluetooth interface. The workplace lighting developed by erfi is not only completely invisible and sensor-controllable, it also has a Bluetooth interface and can thus be controlled remotely in a wide variety of ways.

A simple swipe gesture from the right edge of the screen to the left causes an input field to float into the screen and at the same time the rest of the screen dynamically shrinks so that all devices can still be operated in parallel. At the same time, the light cannot only be switched on or off by means of the display! The colours selected can be freely selected through a large colour circle. Both the white and the coloured light can be dimmed simultaneously and independently. The HCL luminaire automatically adjusts to the time of day. In the morning, the luminaire takes on a bluish colour, at noon rather a whitish colour and in the evening a reddish colour. By means of the colour circle, the user can adjust his lighting climate from warm to cool white as well as other colours, thus interrupting the HCL automatism.

Control height adjustment and the light via highlink® Power

Order no. HPANDROID1.200 or **HPIOS1.200**

Optionally, these components can also be combined with the APP *highlink Power Android,* Order no. HPANDROID1.200, with the APP *highlink Power IOS,* Order no. HPIOS1.200 (p. 127) and the software package *highlink Power* (p. 126).

More detailed information in the Technical Compendium from page 144.

Additional optional controls

The additional slaves allow you to work more comfortably, especially if you are working with several users on one device at the same time. The operating elements can be integrated in the table top or in the cockpit on the left or right, even at a distance from the control centre.

Slave second Airwheel
Glass front 3 U / 15 HP
Order no. EL6.ZG001

The additional Airwheel is available at any time as a flush-mounted installation and can be retrofitted and activated in all 19-inch device superstructures and device cockpits for optimal ergonomic operation.

Note: Must only be ordered once.

- Complete 3D gesture technology (all 3D gestures)
- Touch-free operating concept
- Wheel ground into glass surface
- Wear-free capacitive operating electronics (PCT)
- Backlit, capacitive ok-sensor
- Haptic feedback optional in combination with the Haptic Wheel (Order no. EL6.1.HW)

Slave 1 rotary encoder
Glass front 3 U / 7 HP
Order no. EL6.ZG002

Slave 1 rotary encoder
Glass front 3 U / 7 HP
Order no. EL6.ZG003

Installation in Expand 2 extension profile and all work surfaces for optimal ergonomic operation. The insert plates with one or two manual encoders are ideal for users who prefer conventional encoders. They are useful for simultaneous operation of several devices and can be retrofitted and activated at any time.

Blank glass panels for 19-inch cockpit

The blank panels made of toughened safety glass are a great choice if you want to complete the appliance cockpit or superstructure almost entirely with an indestructible glass front.

Blank panel 63
Glass front 3 U / 63 HP
Order no. EL6.ZG050.63

Blank panel 56
Glass front 3 U / 56 HP
Order no. EL6.ZG050.56

Blank panel 42
Glass front 3 U / 42 HP
Order no. EL6.ZG050.42

Blank panel 15
Glass front 3 U / 15 HP
Order no. EL6.ZG050.15

Blank panel 14
Glass front 3 U / 14 HP
Order no. EL6.ZG050.14

Blank panel 7
Glass front 3 U / 7 HP
Order no. EL6.ZG050.07

More detailed information in the Technical Compendium from page 139-140.

Additional slaves and insert plates for inputs and outputs

The additional slaves are used to accommodate further devices and have inputs and outputs for the device functions. The control centre can accommodate up to eight devices simultaneously and a maximum of seven additional slaves can be connected to the control centre with four devices each. In total, up to 32 devices can be managed per control centre (8 plug-in devices x 4 devices). Each additional slave can alternatively be ordered as connection panels without a cassette. These panels are wired into the TechCube.

Note: All additional slaves and connection panels are supplied with glass front panels incl. ring socket lighting with disappearing effect or alternatively with aluminium fronts matching the *basic* or *acto* device series.

Slave Compact
with Glass front 3 U / 14 HP
Order no.EL6.ZG004.Z

Insert Plate Compact
as Glass front 3 U / 14 HP
Order no.EL6.ZG004.E

Component with 12 illuminated ring sockets incl. disappearing effect to accommodate additional digital multimeters, power meters, function generators and fast signal arbitrary generators. Incl. power cassette with separate power supply for each device and ring socket illumination. Control by control centre via rear e-bus.

Slave Universal
with Glass front 3 U / 63 HP
Order no.EL6.ZG005.Z

Insert Plate Universal
as Glass front 3 U / 63 HP
Order no.EL6.ZG005.E

This component offers all advantages of the additional slave Compact. In contrast, up to max. four additional units can be connected. With its own backplane and power supply to accommodate the individual devices (incl. linear power supply and power supply devices up to 32 A).

Note: Please also state the order number of the unit types to be integrated into this assembly.

Slave High-current Outlet

The 63 HP version is used to completely accommodate the 800 and 1,500 watt DC power supplies. The 3,000 watt DC power supplies are integrated either in table superstructures, cockpits or in TechCubes below the table top. For DC power supplies with output currents > 32 A, an additional 14 HP slave is fitted as standard.

- Two 4 mm safety lab sockets for 4-wire technology for error-free back measurement at high currents
- Active indication with disappearing effect
- Two 6/4 mm safety lab sockets for currents up to 80 A or two 6 mm safety lab sockets for currents up to 125 A

Slave High-current outlet for DC power supplies
Glass front 3 U / 63 HP
EL6.ZG008.P1DC80 (80 A); **EL6.ZG008.P1DC125** (125 A)

Slave High-current outlet for DC power supplies
Glass front 3 U / 14 HP
EL6.ZG007.P1DC80 (80 A);
EL6.ZG007.P1DC125 (125 A)

More detailed information in the Technical Compendium from page 139-140.

Additional slaves and insert plates for 1- and 3-phase AC voltage sources

The additional plug-in units are suitable for accommodating the complete power module and can be integrated into 19-inch device superstructures and 19-inch device cockpits. The slaves are suitable for space-saving installation in narrow superstructures and device cockpits. The associated power module is integrated in the TechCube and wired to the connections of the slave.

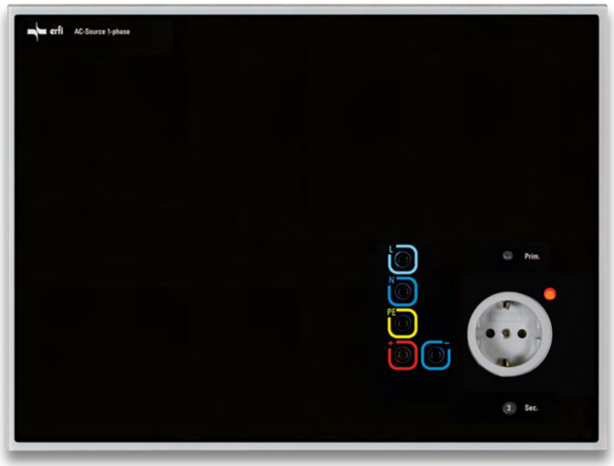
The glass front is equipped with intelligent ring socket lighting, which dynamically visualises the respective functions such as floating, rectification, 1-phase and 3-phase voltage source.

The illuminated ring sockets of the active outputs are a novelty. Depending on the function, the symbols L1, L2, L3, N, PE, +, - and earth-free output are clearly visible via the disappearing print technology. When the function is inactive, the labelling disappears and becomes completely invisible. This special effect with the new flashing function allows the highest level of contacting safety and all device models can be represented with just a few fronts.

Slave AC voltage source 1-phase
with Glass front 3 U / 56 HP
Order no. EL6.ZG100.Z

Insert plate AC voltage source 1-phase
as Glass front 3 U / 56 HP
Order no. EL6.ZG100.E

Component for accommodating single-phase AC voltage sources up to 260V / 3 A (780 W). Larger AC sources can also be installed separately and wired to the glass front.



Slave AC voltage source 1-phase
with Glass front 6 U / 70 HP
Order no. EL6.ZG101.Z

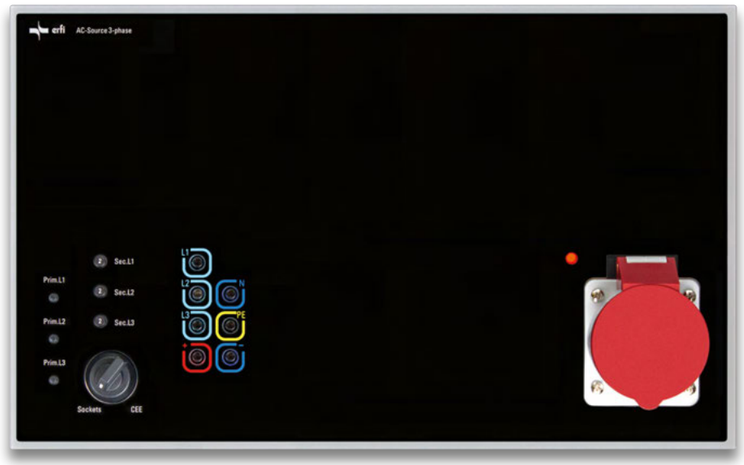
Insert plate AC voltage source 1-phase
as Glass front 6 U / 70 HP
Order no. EL6.ZG101.E

Component for accommodating single-phase AC sources up to 260 V / 12 A (3.12 kW) or 230 V / 14 A (3.22 kW). Larger AC sources can also be installed separately and wired to the glass front panel.

Slave AC voltage source 3-phase
with Glass front 3 U / 95 HP
Order no. EL6.ZG300.Z

Insert plate AC voltage source 3-phase
as Glass front 3 U / 95 HP
Order no. EL6.ZG300.E

Component for accommodating three-phase AC sources up to 0-400 V / 3 A (1.2 kW). Larger AC sources can also be installed separately and wired to the glass front.



Slave AC voltage source 3-phase
with Glass front 6 U / 95 HP
Order no. EL6.ZG301.Z

Insert plate AC voltage source 3-phase
as Glass front 6 U / 95 HP
Order no. EL6.ZG301.E

Component for accommodating three-phase AC sources up to 0-520 V / 7 A (3.64 kW). Larger AC sources can also be installed separately and wired to the glass front.

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 140.

Accessory sets

The device accessories are supplied as a complete accessory set for each device or function and can be ordered optionally via a separate ordering number.

USB A Cable

USB B Cable

LAN Cable

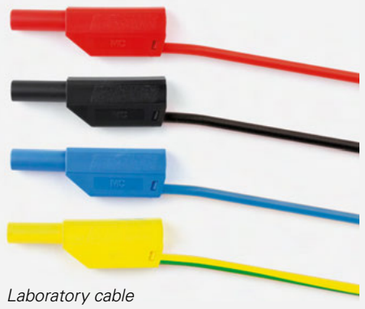
BNC Cable

Safety short-circuit bridge

Adapter BNC/4 mm laboratory sockets

Crocodile clips

High-current clamp tips with claw gripper 20 A, 1,000 V



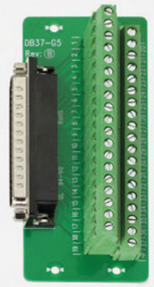
Laboratory cable

Features safety lab cable:
- highly flexible silicone cable
- -50 °C to +80 °C
- soldering iron resistant +300 °C / 10 s
- cascadable plugs on both sides
- max. 32 A continuous current
- max. 500 V Operating voltage
- 0.3 mΩ Contact resistance

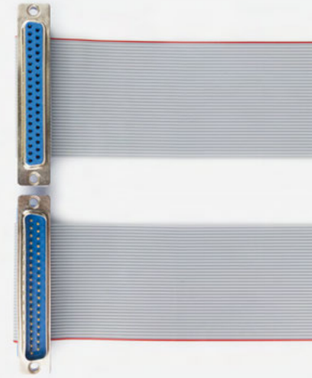
Pick-up clamps 4 mm / 15 A 1,000 V

Clamp tips with spring hook pair 1 A, 1,000 V

Test probe with l aboratory cable



Sub-D adapter 37-pin (Sub-D plug/chassis terminals)



Ribbon cable (Sub-D plug/socket)

Accessory set for control power supplies or power arbitrary generators

- 2 laboratory cables (red / black) 1.5 m
- 2 laboratory cables (red / black) 0.25 m for series and parallel connections
- 2 clamp tips with pair of spring hooks (red / black), max. 1 A, 1,000 V
- 2 high-current terminal tips with claw gripper (red / black), max. 20 A, 1,000 V
- 2 crocodile clips (red / black)

Order no. EL6.ZB.001

Accessory set for function generator and fast signal arbitrary generator

- 4 BNC cables RG 58 C/U, BNC plugs on both ends, length 1.50 m for output, TTL output, counter, trigger
- Adapter BNC / 4 mm lab jacks

Order no. EL6.ZB.005

Accessory set for digital multimeter or power meter

- 2 laboratory cables (red / black) 1.5 m
- 2Test probes (red / black) with laboratory cable 1.5 m
- 2 clamp tips with pair of spring hooks (red / black), max. 1 A, 1,000 V
- 2 high-current terminal tips with claw gripper (red / black), max. 20 A, 1,000 V
- 2 crocodile clips (red / black)

Order no. EL6.ZB.002

Safety short-circuit bridge

with rear outlets for safety plugs, 19 mm, max. 32 A

Order no. EL6.ZB.006

Accessory set for AC voltage sources 1-phase

- 3 laboratory cable (black L), (blue N), (green/yellow PE) 1.5 m for AC output
- 2 laboratory cables (red / blue for +/- bridge rectifier output)
- 2 crocodile clips (red/black)

Order no. EL6.ZB.003

Remote cable set for remote control device series elneos® six

- 1 USB cable (2 m)
- 1 LAN cable (2 m)

Order no. EL6.ZB.007

Accessory set for AC voltage sources 3-phase

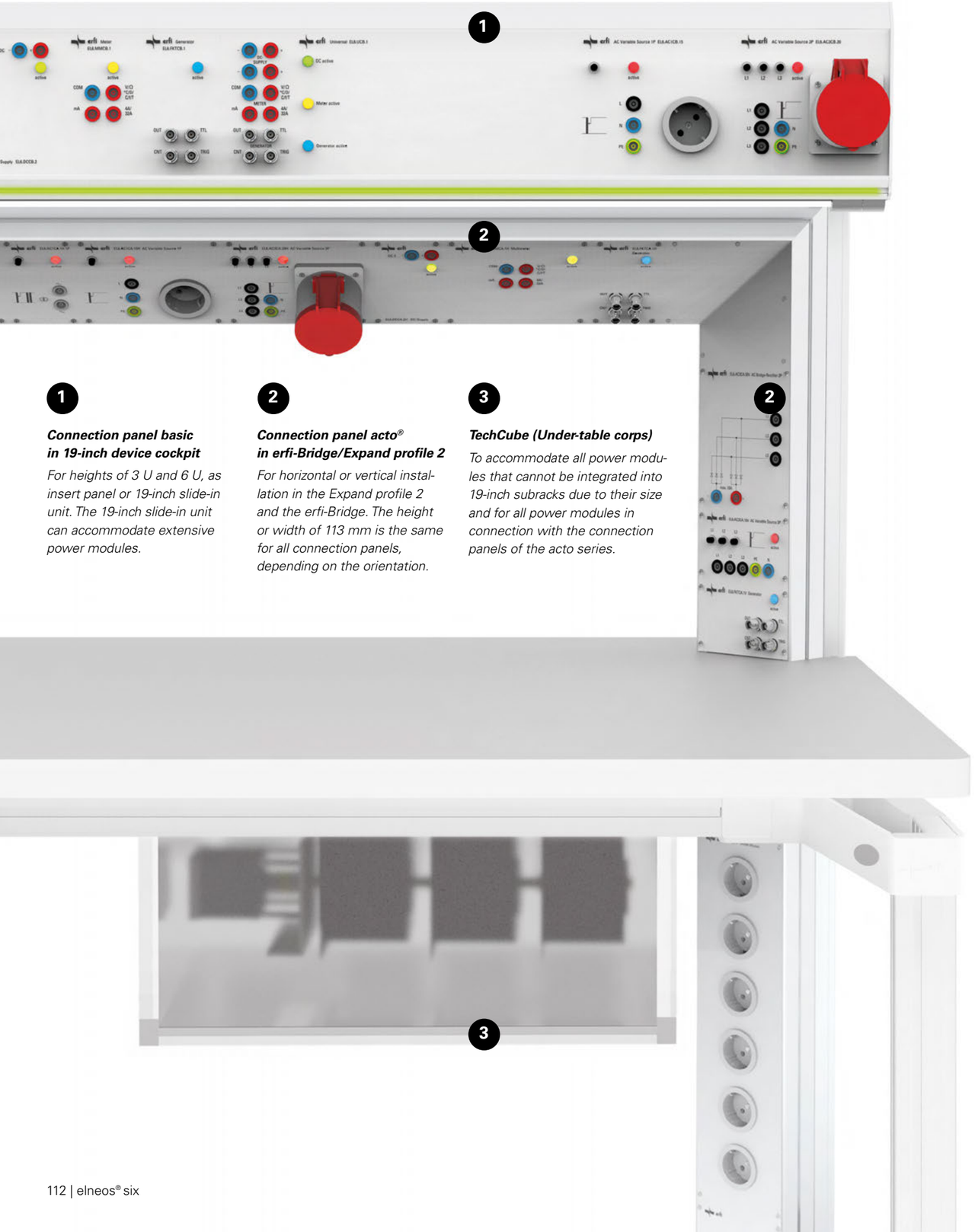
- 5 Laboratory cables (3 x black L1, L2, L3), (1 x blue N), (1 x green/yellow PE) 1.5 m for AC output
- 2 laboratory cables (red / blue for +/- bridge rectifier output)
- 5 tapping terminals 4 mm, clamping range 6 mm, 15 A, 1,000 V AC / DC (3 x black), (1 x blue)
- 2 crocodile clips (red / black)

Order no. EL6.ZB.004

Cable set for insert plate Connect

- 1 USB A cable, 1 x USB B cable, 1 x LAN cable (2 m)
- 1 ribbon cable with SUB-D plug / socket for 8 digital inputs and 10 digital outputs, length (2 m)
- 1 SUB-D adapter 37-pole with Sub-D plug 37-pole and screw terminals, pin assignment printed on. Dimensions 116 x 57 x 30 mm (L x W x H)

Order no. EL6.ZB.008



1

Connection panel basic in 19-inch device cockpit

For heights of 3 U and 6 U, as insert panel or 19-inch slide-in unit. The 19-inch slide-in unit can accommodate extensive power modules.

2

Connection panel acto® in erfi-Bridge/Expand profile 2

For horizontal or vertical installation in the Expand profile 2 and the erfi-Bridge. The height or width of 113 mm is the same for all connection panels, depending on the orientation.

3

TechCube (Under-table corps)

To accommodate all power modules that cannot be integrated into 19-inch subracks due to their size and for all power modules in connection with the connection panels of the acto series.

Connection Panels basic and acto®

As an alternative to the modern glass front with ring socket illumination and disappearing effect, the device inputs and outputs can be designed either in the aluminium device front of the 19-inch device series *basic* or in the more compact aluminium device front *acto*.

Connection panels basic for 19-inch device cockpits and 19-inch table-top units

The connection panels *basic* are used in 19-inch device cockpits or 19-inch table superstructures. Just like the glass fronts of the *elneos six* series, these can be integrated as 19-inch cassettes to hold the power modules or only as front panels or insert panels. In the latter case, the fronts can be used in very compact 19-inch device cockpits or table superstructures with a small installation depth, and the power modules are installed in undercounter corps (TechCubes). The removal of the power modules into the TechCubes creates free space on the work surface.

The large *elneos six* control centre with its capacitive 8-inch multi-touch display is the benchmark for all glass fronts and connection panels with its performance and touch-free operating philosophy using 3D gesture operation and voice control.

Connection panels acto® for erfi-Bridge or in horizontal and vertical Expand profile 2

The connection panels *acto* are used when no superstructures or cockpits are desired or when the device connections should be closer to the user. These compact connection panels are inserted into the extension profile Expand 2 or into the erfi-Bridge (horizontal and vertical Expand profile 2).

The use of the connection panels *acto* enables a new performance in the smallest space with an economic optimum at the same time. In this case, all power modules of the DC power amplifiers and AC sources are inserted into the undercounter corps (TechCubes).

The slim-design of the *elneos six compact* control centre with its 7-inch multi-touch display has the essential features of the large *elneos six* control centre and can be integrated both horizontally and vertically into the Expand profile 2. The display content automatically aligns itself either vertically or horizontally according to the installation situation. Devices such as digital multimeters, power meters, function generators, the entire control electronics of the control power supply units and arbitrary waveform generators are installed in the installation depth of 79 mm.

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 139.

Connection panels device series basic for AC voltage sources

The connection panels (insert plates) for 1-phase and 3-phase AC voltage sources in device series *basic* are connected directly to all AC power modules located in the 19-inch cockpit, in the table top structure or alternatively in a TechCube below the table.

The connection panels device series *basic* are all 128.5 mm high and are installed side by side in the 19-inch device cockpit (3HE) or in the table-top structure.

Alufront AC source 1-phase
floating, 3 U / 14 HP
Output (secured): 2 SLS[1]
Display: RGB-LED for Output *active*

Order no. EL6.AC1CB.1

Alufront AC source 1-phase
not ungrounded, 3 U / 14 HP
Output (secured): 3 SLS[1]
Display: RGB-LED for Output *active*

Order no. EL6.AC1CB.10

Alufront 1-phase bridge rectifier
3 U / 14 HP
Output: 2 SLS[1] (red+ / blue-)
Input: 2 SLS[1] (gray)

Order no. EL6.AC1CB.50

Alufront AC source 1-phase
floating, 3 U / 28 HP
Output (secured): 2 SLS[1]
Reversible to 1 earth-free socket outlet
Display: RGB-LED for Output *active*

Order no. EL6.AC1CB.5

Alufront AC source 1-phase
not ungrounded, 3 U / 28 HP
Output (secured): 3 SLS[1],
1 shockproof socket
Display: RGB-LED for Output *active*

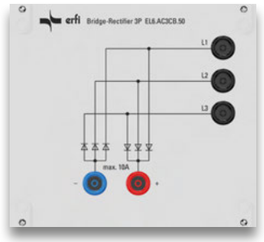
Order no. EL6.AC1CB.15

Alufront AC source 3-phase
floating, 3 U / 14 HP
Output (secured): 4 SLS[1]
Display: RGB-LED for Output *active*

Order no. EL6.AC3CB.1

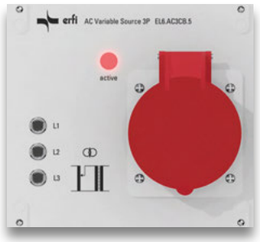
Alufront AC source 3-phase
not ungrounded, 3 U / 14 HP
Output (secured): 5 SLS[11]
Display: RGB-LED for Output *active*

Order no. EL6.AC3CB.10



Alufront 3-phase bridge rectifier
3 U / 28 HP
Output: 2 SLS[1] (red+ / blue-)
Input: 3 SLS[1] (black)

Order no. EL6.AC3CB.50



Alufront AC source 3-phase
floating, 3 U / 28 HP
Output (secured): 1 CEE socket 16 A
Display: RGB-LED for Output *active*

Order no. EL6.AC3CB.5

Alufront AC source 3-phase
not ungrounded, 3 U / 28 HP
Output (secured): 1 CEE socket 16 A
Display: RGB-LED for Output *active*

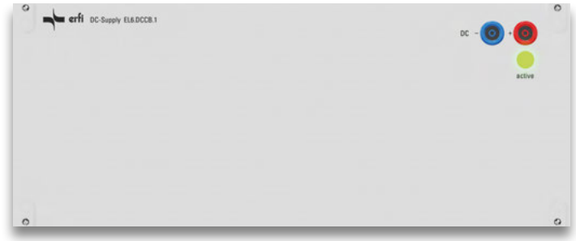
Order no. EL6.AC3CB.15

Alufront AC source 3-phase
not ungrounded, 3 U / 28 HP
Output (secured): 5 SLS[1], 1 CEE socket 16 A
Display: RGB-LED for Output *active*

Order no. EL6.AC3CB.20

Connection panels device series basic for further device groups

The connection panels can also be used as additional panels for DC power supplies, DMM, function generators, arbitrary generators and power meters in the device series *basic*. They are installed in the 19-inch device cockpit, in the table top structure or alternatively in a TechCube below the table.



Insert plates with aluminium front for linear DC sources and DC power arbitrary generators
3 U / 63 HP
For accommodating a complete DC linear power amplifier incl. power cassette with its own power supply for each device as well as its own backplane for accommodating the DC source. Control by control centre via rear e-bus.

Order no. EL6.DCCB.1

Insert plates as aluminium front for linear DC sources and DC power arbitrary generators
3 U / 14 HP
For direct connection to any DC source. Control by control centre via rear e-bus. Note: Power output stages of the power supply units either in the 19-inch unit cockpit, in the 19-inch table-top unit or in the TechCube (under-table installation).
Output: 2 SLS[1]
Display: RGB-LED for Output *active*

Order no. EL6.DCCB.2

Insert plate as aluminium front for double DC sources and DC power arbitrary generators
3 U / 14 HP
For direct connection to any two DC sources. Control by control centre via rear e-bus. Note: Power output stages of the power supply units either in the 19-inch unit cockpit, in the 19-inch table-top unit or in the TechCube (under-table installation).
Output: 4 SLS[1] (2 per DC source)
Display: RGB-LED for Output *active*

Order no. EL6.DCCB.3

Slave as aluminium front for digital multimeter and power meter
3 U / 14 HP
To accommodate 1 digital multimeter EL6.D or 1 power meter incl. digital multimeter EL6.P. Control by control centre via rear e-bus.
Input: 4 SLS[1] for all measurands
Display: RGB-LED for device *active*

Order no. EL6.MMCB.1

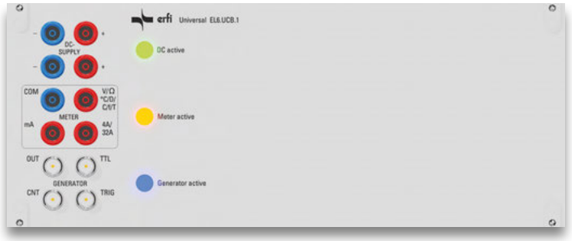
Slave as aluminium front for function generator and fast signal arbitrary generator
3 U / 14 HP
To accommodate 1 function generator EL6.F or 1 fast signal arbitrary generator incl. EL6.S function generator. Control by control centre via rear e-bus.
Input: 2 BNC sockets for counter and trigger
Output: 2 BNC sockets for OUT and TTL
Display: RGB-LED for device *active*

Order no. EL6.FKTCB.1

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 139.

[1] Safety laboratory sockets



Slave Universal as aluminium front for
- Double DC sources and DC power arbitrary generators,
- digital multimeter and power meter
- Function generator and fast signal arbitrary generator
3 U / 63 HP

Order no. EL6.UCB.1

For simultaneous mounting of
- up to 2 complete DC linear power amplifiers,
- 1 digital multimeter EL6.D or
- 1 power meter incl. digital multimeter EL6.P as well as
- 1 function generator EL6.F or
- 1 fast signal arbitrary generator incl. function generator EL6.S.

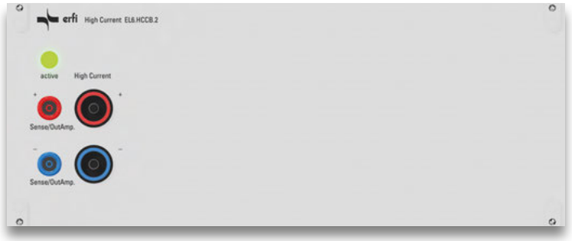
Incl. power cassette with own power supply for power supply for each unit and its own backplane to accommodate all units. Control by control centre via e-bus on the rear side.

DC source / Power arbitrary generators:
Outputs: 4 SLS[1] (2 per DC source)

Digital multimeter / Power meter:
Inputs: 4 SLS[1] for all measurands

Function generator / Fast signal arbitrary generator:
Inputs: 2 BNC sockets for counter and trigger
Outputs: 2 BNC sockets for OUT and TTL

Display: 1 RGB LED for DC *active*
1 RGB LED for Multimeter / Power meter *active*
1 RGB-LED for Function generator /
Fast signal arbitrary generator *active*



Slave as aluminium front for high-current DC sources with currents > 32 A
3 U / 63 HP
To accommodate a high-current source of up to 1,500 watts incl. power cassette. Control via rear e-bus. Power amplifiers are installed in the 19-inch device cockpit, in the 19-inch table-top unit or in the TechCube.

Output:
- 2 SLS[1] as sense cable (4-wire technology)
- 2 SLS[1] (6/4 mm) for currents up to 80 A or
- 2 SLS[1] (6 mm) for currents up to 125 A
Display: RGB-LED for Output *active*

Order no. EL6.HCCB.2.80 (80 A)
Order no. EL6.HCCB.2.125 (125 A)

Slave as aluminium front for high-current DC sources with currents > 32 A
3 U / 14 HP
For direct connection to any DC high-current source. Control by control centre via rear e-bus. Note: Power output stages of the power supplies either in the 19-inch device cockpit, in the 19-inch table-top unit or in the TechCube (under-table installation).

Outputs:
- 2 SLS[1] as sense cable (4-wire technology)
- 2 SLS[1] (6/4 mm) for currents up to 80 A or
- 2 SLS[1] (6 mm) for currents up to 125 A
Display: RGB-LED for Output *active*

Order no. EL6.HCCB.1.80 (80 A)
Order no. EL6.HCCB.1.125 (125 A)

Slave as aluminium front for all device interfaces
3 U / 14 HP
For direct connection to the *elneos six* control centre. The following interfaces are thereby led out on the front side:
- LAN
- USB A
- USB B
- 8 digital inputs
- 10 digital outputs

Order no. EL6.CCB.1

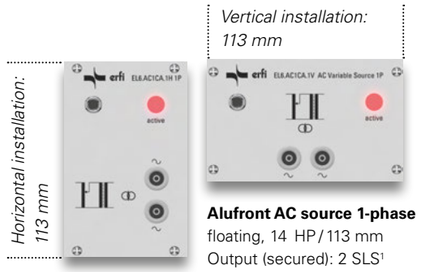
Connection panels device series acto®

Two versions are offered for the installation of connection panels in the *acto* device series – vertical and horizontal. The vertical connection panels are installed one below the other in the Expand 2 vertical extension profile and are always 113 mm wide but variable in height.

The horizontal connection panels are installed side by side in the horizontal Expand 2 profile and are always 113 mm high but variable in width.

Horizontal installation: 113 mm

Vertical installation: 113 mm

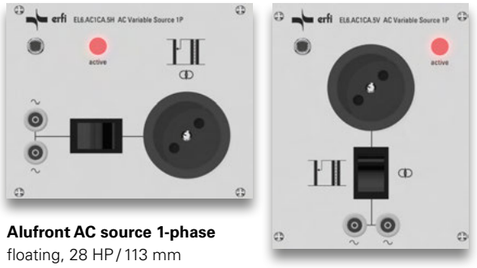


Alufront AC source 1-phase
floating, 14 HP / 113 mm
Output (secured): 2 SLS[1]
Display: RGB-LED for Output *active*

Horizontal order no. EL6.AC1CA.1H
Vertical order no. EL6.AC1CA.1V

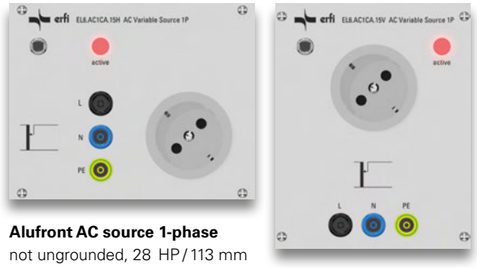
Alufront AC source 1-phase
not ungrounded, 14 HP / 113 mm
Output (secured): 3 SLS[1]
Display: RGB-LED for Output *active*

Horizontal order no. EL6.AC1CA.10H
Vertical order no. EL6.AC1CA.10V



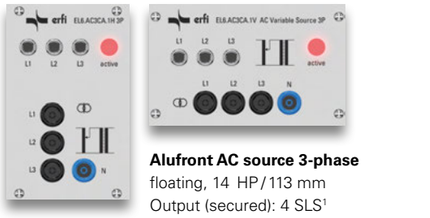
Alufront AC source 1-phase
floating, 28 HP / 113 mm
Output (secured): 2 SLS[11]
Reversible to 1 earth-free socket outlet
Display: RGB-LED for Output *active*

Horizontal order no. EL6.AC1CA.5H
Vertical order no. EL6.AC1CA.5V



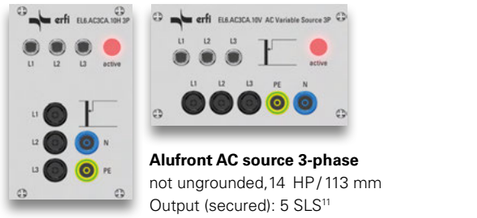
Alufront AC source 1-phase
not ungrounded, 28 HP / 113 mm
Output (secured): 3 SLS[1],
1 shockproof socket
Display: RGB-LED for Output *active*

Horizontal Order no.EL6.AC1CA.15H
Vertical Order no.EL6.AC1CA.15V



Alufront AC source 3-phase
floating, 14 HP / 113 mm
Output (secured): 4 SLS[1]
Display: RGB-LED for Output *active*

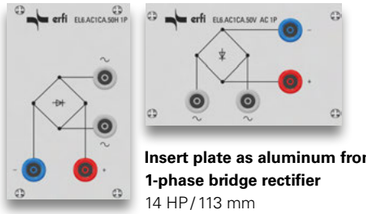
Horizontal order no. EL6.AC3CA.1H
Vertical order no. EL6.AC3CA.1V



Alufront AC source 3-phase
not ungrounded,14 HP / 113 mm
Output (secured): 5 SLS[11]
Display: RGB-LED for Output *active*

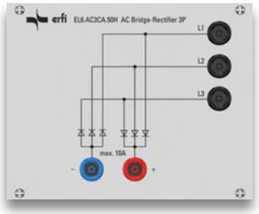
Horizontal order no. EL6.AC3CA.10H
Vertical order no. EL6.AC3CA.10V

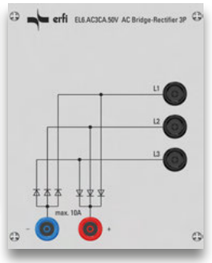
Subject to technical and formal changes. More detailed information in the Technical Compendium from page 139. [1] Safety laboratory sockets



Insert plate as aluminum front
1-phase bridge rectifier
14 HP / 113 mm
Output: 2 SLS[1] (red+ / blue-)
Input: 2 SLS[1] (gray)

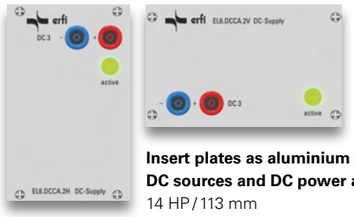
Horizontal order no. EL6.AC1CA.50H
Vertical order no. EL6.AC1CA.50V





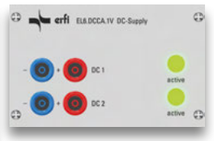
Insert plate as aluminum front
3-phase bridge rectifier
28 HP / 113 mm
Output: 2 SLS[1] (red+ / blue-)
Input: 3 SLS[1] (black)

Horizontal order no. EL6.AC3CA.50H
Vertical order no. EL6.AC3CA.50V



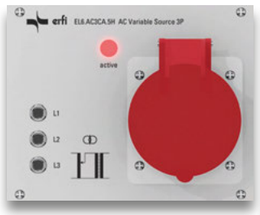
Insert plates as aluminium front for linear
DC sources and DC power arbitrary generators
14 HP / 113 mm
For direct connection to any DC source. Control by control centre via rear e-bus. Note: Power output stages of the power supply units either in the 19-inch unit cockpit, in the 19-inch table-top unit or in the TechCube (under-table installation).
Output: 2 SLS[1]
Display: RGB-LED for Output *active*

Horizontal order no. EL6.DCCA.2H
Vertical order no. EL6.DCCA.2V



Insert plate as aluminium front for double
DC sources and DC power arbitrary generators
14 HP / 113 mm
For direct connection to any two DC sources. Control by control centre via rear e-bus. Note: Power output stages of the power supply units either in the 19-inch unit cockpit, in the 19-inch table-top unit or in the TechCube (under-table installation).
Output: 4 SLS[1] (2 per DC source)
Display: RGB-LED for Output *active*

Horizontal order no. EL6.DCCA.1H
Vertical order no. EL6.DCCA.1V

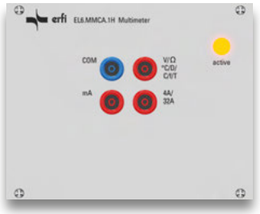


Insert plates as alufront
for AC source 3-phase
floating, 28 HP / 113 mm
Output (secured): 1 CEE socket 16 A
Display: RGB-LED for Output *active*

Horizontal order no. EL6.AC3CA.5H
Vertical order no. EL6.AC3CA.5V

Insert plates as alufront
for AC source 3-phase
not ungrounded, 28 HP / 113 mm
Output (secured): 1 CEE socket 16 A
Display: RGB-LED for Output *active*

Horizontal order no. EL6.AC3CA.15H
Vertical order no. EL6.AC3CA.15V



Insert plate as alufront for digital
multimeter and power meter
14 HP / 113 mm
To accommodate 1 digital multimeter EL6.D
or 1 power meter incl. digital multimeter EL6.P.
Control by control centre via rear e-bus.
Input: 4 SLS[1] for all measurands
Display: RGB-LED for device *active*

Horizontal order no. EL6.MMCA.1H
Vertical order no. EL6.MMCA.1V

Insert plate as aluminium front for function
generator and fast signal arbitrary generator
14 HP / 113 mm
To accommodate 1 function generator EL6.F
or 1 fast signal arbitrary generator incl. EL6.S function generator. Control by control centre via rear e-bus.
Input: 2 BNC sockets for counter and trigger
Output: 2 BNC sockets for OUT and TTL
Display: RGB-LED for device *active*

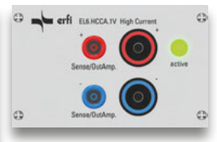
Horizontal order no. EL6.FKTCA.1H
Vertical order no. EL6.FKTCA.1V

Insert plate as aluminium front
for all device interfaces
14 HP / 113 mm
For direct connection to the *elneos six* control centre. The following interfaces are thereby led out on the front side:
- LAN
- USB A
- USB B
- 8 digitale digital inputs
- 10 digital outputs

Horizontal order no. EL6.CCA.1H
Vertical order no. EL6.CCA.1V

Insert plate as aluminium front
for manual rotary encoder
14 HP / 113 mm

Horizontal order no. EL6.DRCA.1H
Vertical Oorder no. EL6.DRCA.1V



Insert plate as aluminium front for
high-current DC sources with currents > 32 A
14 HP / 113 mm
or direct connection to any DC high-current source.
Control by control centre via rear e-bus.
Note: Power output stages of the power supplies either in the 19-inch device cockpit, in the 19-inch table top unit or in the TechCube (under-table installation).

Outputs: - 2 SLS[1] as sense cable (4-wire technology)
- 2 SLS[1] (6/4 mm) for currents up to 80 A or
- 2 SLS[1] (6 mm) for currents up to 125 A
Display: RGB-LED for Output *active*

Horizontal order no. EL6.HCCA.1.80H (80 A)
Horizontal order no. EL6.HCCA.1.125H (125 A)
Vertical order no. EL6.HCCA.1.80V (80 A)
Vertical order no. EL6.HCCA.1.125V (125 A)

Insert plates as alufront
for AC source 3-phase
not ungrounded, 28 HP / 113 mm
Output (secured): 5 SLS[1], 1 CEE socket 16 A
Display: RGB-LED for Output *active*

Horizontal order no. EL6.AC3CA.20H
Vertical order no. EL6.AC3CA.20V

Subject to technical and formal changes.

More detailed information in the Technical Compendium from page 139.

[1] Safety laboratory sockets

Room Control Software highlink® Power

erfi's own invented software package *highlink Power* has had a market presence since 1990 and since then over 3,000 licences have been sold. The software is constantly being developed further and a special feature is the visualisation of the erfi device functions and the states of the laboratory benches and rooms. The software package *highlink Power* is a modern tool which is used equally in education and industry.

Above: Status display of each table including measured value displays.

Centre right: Table configuration

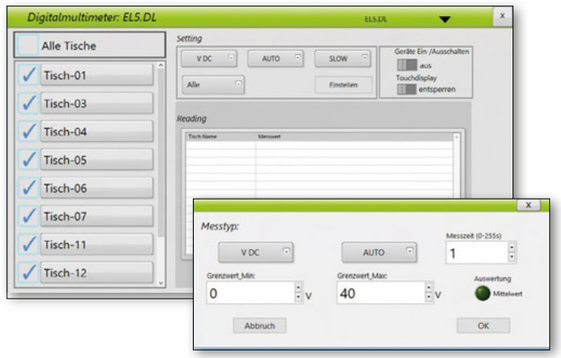
bottom right: Status display of the laboratory tables and the learn cubix in the 3D room layout.

Visualisation of the laboratory spaces

The powerful software package allows you to visualise your laboratory rooms within a very short time (see main screen image) and thus capture all conditions of the laboratory at a glance. The erfi room plan manager allows free room selection for more extensive objects. If desired, this package also allows access to rooms in other buildings.

Interfaces

- The software works web-based and alternatively locally.
- Meaningful interfaces can be created to the software packages *CANDY Power* and *Assembly Workflow Management (AWM)*.



Control and adjust digital multimeters at various laboratory benches.

highlink® Power Room and device representation

- Display of a photorealistic 3D room layout
- Background freely selectable through fade-in graphics
- Photorealistic device display
- Freely programmable graphic room layout
- Immediate status detection of all laboratory benches

highlink® Power Laboratory Room Manager

In the case of extensive object furnishings, individual room plans can be selected and remotely controlled. All necessary functions of the respective room can thus be set from the central workplace control (teacher/lab manager).

- Free room configuration with regard to names, number of tables, IP assignment and the defined devices per table
- Extensive assignment of user rights per table and unit
- Remote control of all unit groups and functions
- Password management for individual access rights
- Table grouping
- State-of-the-art network technology (LAN, WLAN, ...)
- Control and release of individual function groups:
  - General release
  - 50 V / 230 V / 400 V / PC mains etc.
  - Lowering and swivelling table
- Visualisation of all states:
  - Approval granted or not granted
  - 50 V / 230 V / 400 V release / PC network etc.
  - Position of the lowering and swivelling tables
  - Emergency stop function
- Individual control of the individual workstations from the instructor and laboratory manager workstation

highlink® Power Data management

- Professional measurement data logging with integrated reporting generator
- Measurement data display in SQL database
- Recording and playback function of measurement curves
- Simulation of expected measurement curves (target/actual)
- Limitation of the setting ranges of individual workstations
- Visualisation and transmission of individual screen contents to any number of workstations
- Automated test sequences for sequential test steps

highlink® Power Troubleshooting manager

- Detect faults and avoid operating errors

highlink® Power in the training

- Any number of experimental procedures and parameterisations can be saved and retrieved per student workstation (laboratory workstation configurator)
- Student-related evaluation for individual experiments
- Optimal lesson planning through time-controlled parameterisation of all functions (immediate start of lessons and optimal utilisation of lesson times)
- Increased learning quality
- Excellent didactic teaching characteristics

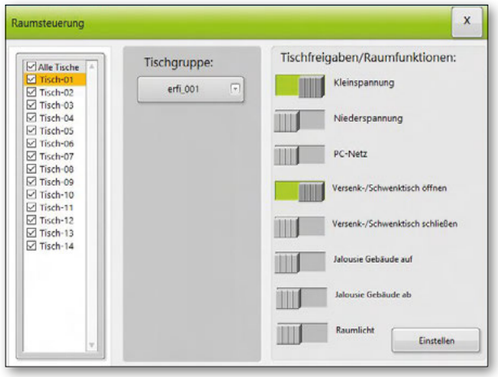
highlink® Power and erfi Didactic

Holistic concept through elegant integration of the erfi teaching aid systems from the erfi Didactic programme and the teaching aids of the *Festo Didactic SE*.

- Automation technology with Logo! and S7
- Building automation
- User administration
- Ipad integration/touch panel PC
- Test systems and statistics
- and much more

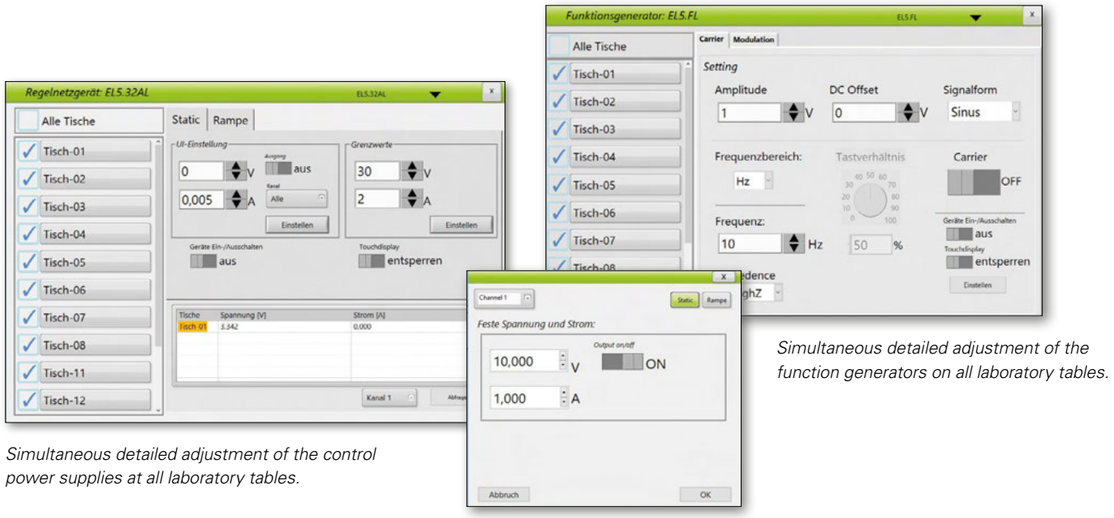
highlink® Power Examination timer

The exam timer enables the definition of a clear time limit for an exam situation. A freely editable timer and an assignable device function or voltage release enable a clear time limit. The timer counts down visibly as a countdown. Once the examination time has elapsed, the system automatically switches the laboratory benches with the selected voltage levels or deactivates the device functions and blocks access.



Room control by means of targeted release of individual laboratory tables.

Example DC source: Power supply with voltage and current limitation (U_{max} and I_{max}) and automatic measured value storage.



Simultaneous detailed adjustment of the function generators on all laboratory tables.

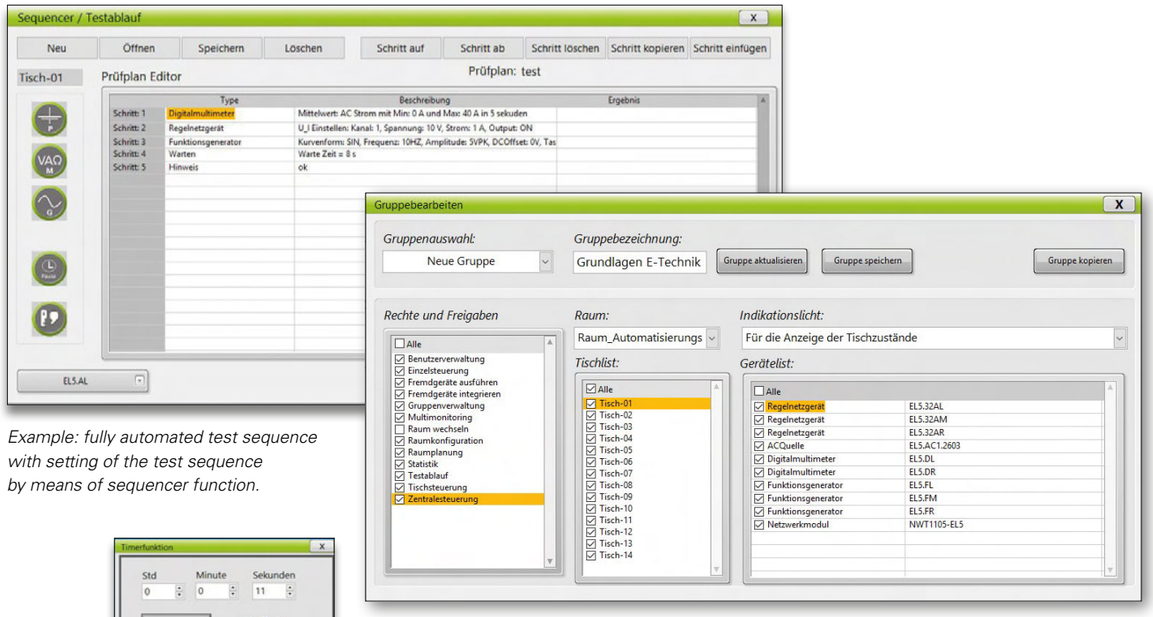
Simultaneous detailed adjustment of the control power supplies at all laboratory tables.

Activation and control

In addition to the usual 230 V and 400 V power supply, modern laboratory tables have modern DC power supplies (low voltages) and measuring devices with intelligent functions. These individual device or function groups can be elegantly controlled. The up/down movement of the lowering and swivelling tables can also be conveniently controlled from the teacher's desk at the touch of a button. At the same time, the states of the individual laboratory tables are visualised.

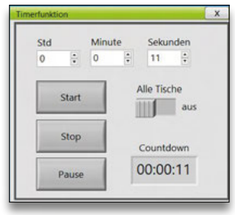
High protection through programmable limits

highlink Power guarantees that your hardware is protected at all times. The possibility of limiting the individual device parameters, such as the current limitation (output off function), ensures that the connected measuring hardware or electronics are not damaged. Lengthy repairs caused by incorrect operation are thus not necessary.



Example: fully automated test sequence with setting of the test sequence by means of sequencer function.

Example: definition of rights and groups per user and per table.



Timer function

Integration and control of modern teaching aids: detailed experiment instructions with teacher and student handouts are included with the teaching aids.

No setting times before starting a lesson

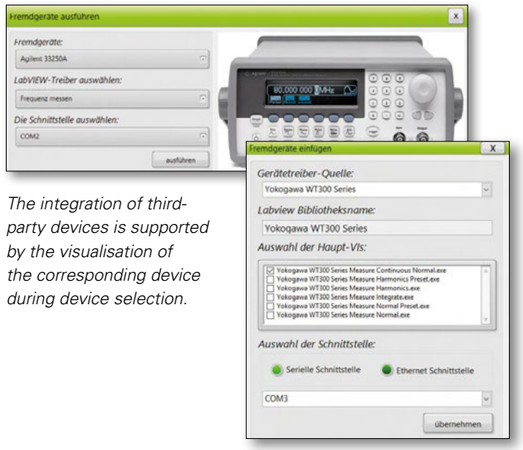
Start your lessons immediately and without wasting time. Within the framework of lesson planning, the individual device parameters can be preset per workstation and the student is linked to a clearly arranged schedule. When the time is reached, all workstations included in the planning are automatically set to the desired configuration. Lowering tables, for example, move automatically to the desired position and the power supplies are configured to the appropriate maximum currents for the experiment.

highlink Power makes it very easy to program the student workstations individually, thus enabling increased productivity in the classroom.

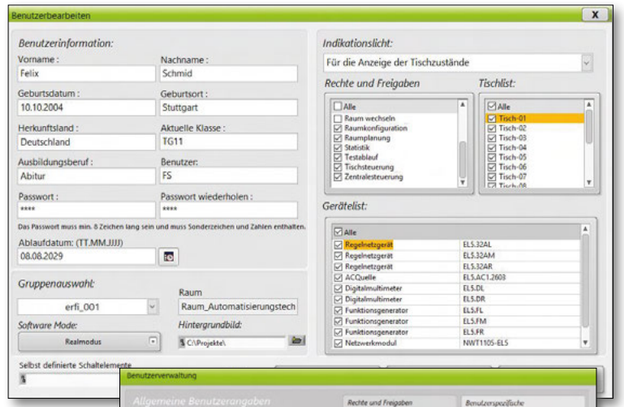
Integration of the instructional world – erfi Didactic

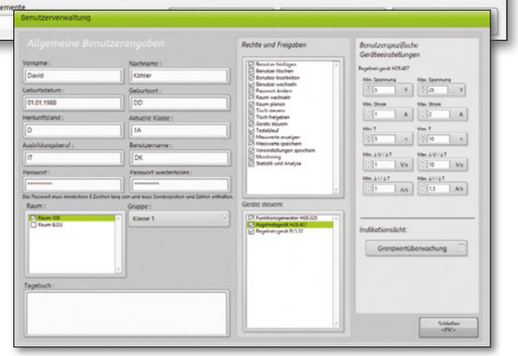
erfi Didactic is an own brand of the erfi company and comprises a modern teaching aid programme for automation technology, drive technology, building automation, fault simulators, motor simulators, installation technology and much more. Many erfi teaching devices already have an interface and thus offer the possibility to integrate the devices intelligently into the teaching design by means of *highlink Power*.

In addition to the familiar e-learning, the student is given a modern tool. The individual experiments are stored in the software and can be worked on elegantly via the interface-capable devices. The instructions for the experiments are visualised and the student is didactically guided.

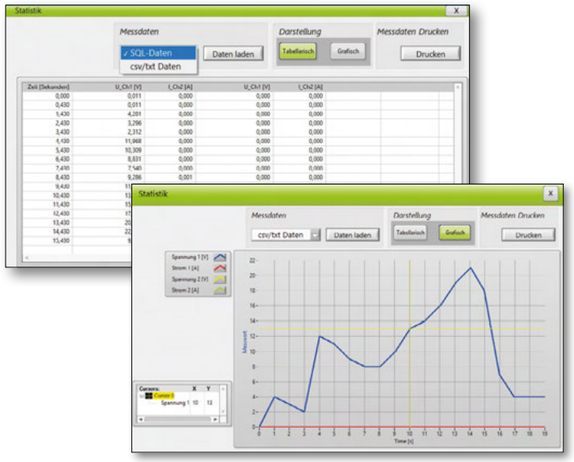


The integration of third-party devices is supported by the visualisation of the corresponding device during device selection.





Individual and general editing of user settings.



Examples of graphical and tabular display of measured values. The measurement data is visualised during the measurement in a table and simultaneously in a graphic. An HTML report for an internet browser is created via a command.

Visualisation of third-party devices

highlink Power supports the integration of third-party devices. The corresponding functions are integrated depending on the device function and customer requirements.

Reporting generator

highlink Power enables different simulations before the start of the test. Expected stress curves can be graphically displayed and later compared with the actual course. Measurement data acquisition and documentation is automated and the data is stored in a professional SQL database.

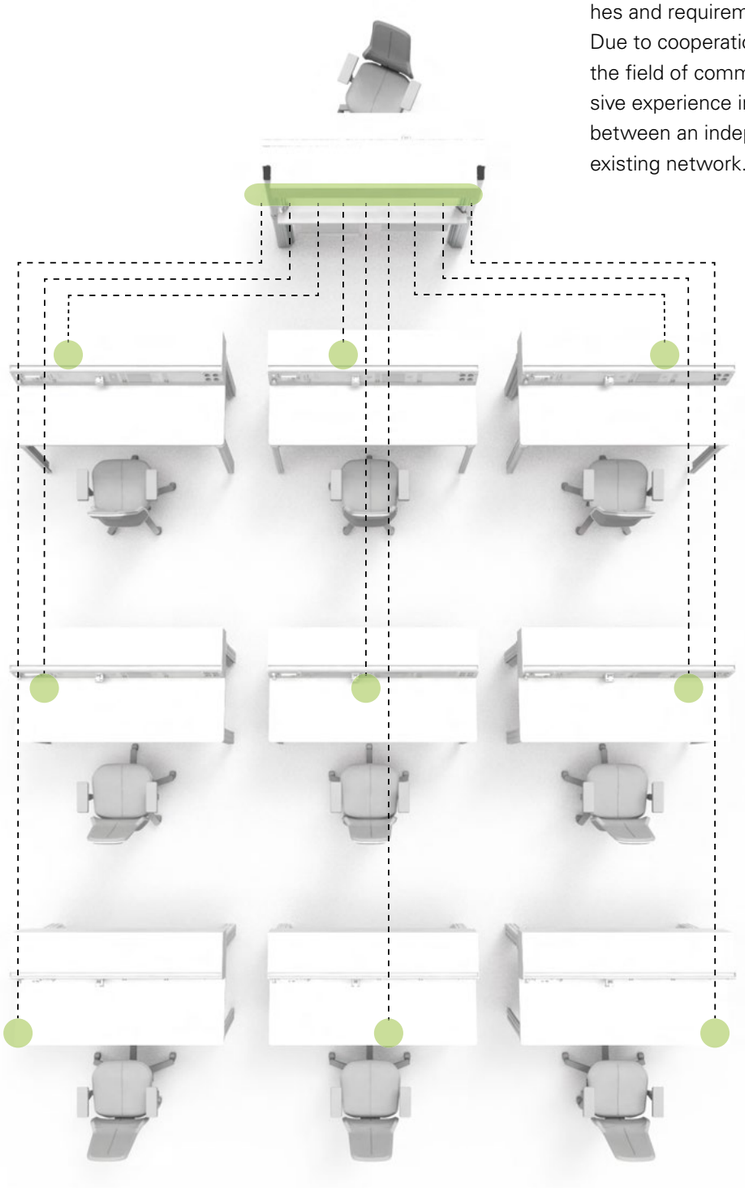
Secure password management

Through a defined administration level, user rights can be set individually for each teacher and student. In addition to the individual access control to the experiments, the programme modules device control, lesson planning, measured value analysis and documentation as well as password management, for example, are also controlled individually.

This ensures that default settings are not changed unknowingly. The many years of experience of the erfi software development team pays off here and guarantees safe and trouble-free teaching.

Experimentation network with highlink® Power

The erfi network technology consistently uses the latest Ethernet technology. Each laboratory workstation is equipped with intelligent ethernet-capable devices that can be integrated either in an independent experimental network or in the existing house network. Depending on the customer's wishes and requirements, the network is designed accordingly. Due to cooperations with well-known solution providers in the field of communication and data networks erfi has extensive experience in network technology. A distinction is made between an independent network and the integration into an existing network.



Independent network

This solution is physically separated from the rest of the network. Each PC is equipped with a second Ethernet connection (second network card). This ensures that there is no interference within the in-house network. The teacher and the pupils access the network via the 2nd network card. One switch is sufficient to network the room. Depending on the customer's request, the switch is already considered in the planning by erfi or provided by the customer.

Integration into existing network

This solution is used if the PCs cannot be equipped with a second network connection. For this purpose a virtual network is built up using a VLAN switch. Depending on the customer's request, the VLAN switch is already considered in the planning by erfi or provided by the customer.

Above: example of an independent experimentation network.

highlink® Power – Training

Trainer package

- For central control of one instructor workstation and all student workstations.
- SQL database for all measurement data and other personalised settings.
- Interface to testing software CANDY Power for test planning, test sequence and statistics
- Interface to production software AWM (Assembly Workflow Management).
- Complete package for room and device control
- For PC, tablet and smartphone applications.

highlink® Power Didactic trainer package
Software licence for the teacher per room
Order no. HPD2.100

highlink® Power Didactic web-trainer package
Web-based software licence for the teacher per room
Order no. HPDW2.100

Pupil- or student package

- For own remote control of devices at the student's workstation. The student himself can access and control the devices assigned to him through his terminal device.
- SQL database for all measurement data and other personalised settings.
- The teacher must give permission for use and can intervene and monitor in parallel.
- Interface to CANDY Power testing software for test sequences.
- Interface to production software AWM (Assembly Workflow Management).
- For PC, tablet and smartphone applications.

highlink® Power Didactic student package
Software licence for all users per room
Order no. HPD2.101

highlink® Power Didactic web-student package
Web-based software licence for all users per room
Order no. HPDW2.101

highlink® Power – Industry

Master package

- For central control of all laboratory workstations.
- SQL database for all measurement data and other personalised settings.
- Interface to CANDY Power testing software for test planning, test sequence and statistics.
- Interface to production software AWM (Assembly Workflow Management).
- Complete package for room and device control.
- For PC, tablet and smartphone applications.

highlink® Power Industry master package
Software licence for Lab Manager per room
Order no. HPI2.100

highlink® Power Industry web-master package
Web-based software licence for Lab Manager per room
Order no. HPIW2.100

Single-user licence

- For own remote device control at the laboratory workstation. The employee can access and control the devices assigned to him or her via his or her terminal device.
- SQL database for all measurement data and other personalised settings.
- The laboratory manager must give permission for use and can intervene in parallel and provide support from his workstation.
- Interface to CANDY Power testing software for test sequences.
- Interface to production software AWM (Assembly Workflow Management).
- For PC, tablet and smartphone applications.

highlink® Power Industry single-user licence
Software licence for all users per room
Order no. HPI2.101

highlink® Power Industry web-single-user licence
Web-based software licence for all users per room
Order no. HPIW2.101

Software for device control and for stand-alones

Device control highlink® elneos® basic
With this software package, all functions of the *elneos six* unit series can be controlled remotely.

- Remote unit control software for single and multiple units (limited to 3 *elneos six* units).
- Ideal for stand-alone units.
- For PC, tablet and smartphone application.
- Programme is provided as .EXE.

Order no. HPE1.200

Device control highlink® elneos® pro
With this software package, all functions of the *elneos six* series can be controlled remotely. The package is particularly suitable for laboratories where only the devices and not the laboratory tables are to be controlled remotely.

- Remote unit control software for single and multiple units (without limitation of units)
- Ideal for stand-alone units and laboratories.
- For PC, tablet and smartphone application.
- Programme is provided as .EXE.

Order no. HPE1.201

Useful extensions

highlink® Power Festo® Didactic
For the first time, didactic concepts and teaching aids from the leading teaching aid manufacturer Festo Didactic can be integrated into the new *highlink Power* software. The package enables direct access to the respective applications from Festo Didactic via the software *highlink Power*. This optional addition is integrated into the student and teacher version and provides seamless access to the didactic world of Festo Didactic.

An open interface for own integration into the software is included. The student thus learns in a playful way how to switch between the world of measurement technology devices and the didactic environment.

Examples of Festo Didactic apps which can be integrated:
- Simulation software *CIROS®*, *FluidSIM®*, *FluidLab®*
- *Robotino SIM, Robotino® View*
- *EasyVeep*, Digital learning portal *Festo LX*

Order no. HPFESTO1.100

Google play
Available on the App Store

App applications for smartphone and tablet

APP highlink® Power Android
The applications do not require a server connection and are self-sufficient. The APPs developed by erfi for your smartphone or tablet can be downloaded from the respective APP store. Independent of a web-based server platform, the application runs exclusively on Android tablets and Android smartphones.

- APP device remote control for Android operating system.
- Download from the PLAY Store.

Order no. HPANDROID1.200

APP highlink® Power IOS
Independent of a web-based server platform, the application runs exclusively on IOS tablets and IOS smartphones.

- APP remote control for operating system IOS.
- Download from the Apple Store.

Order no. HPIOS.1.200

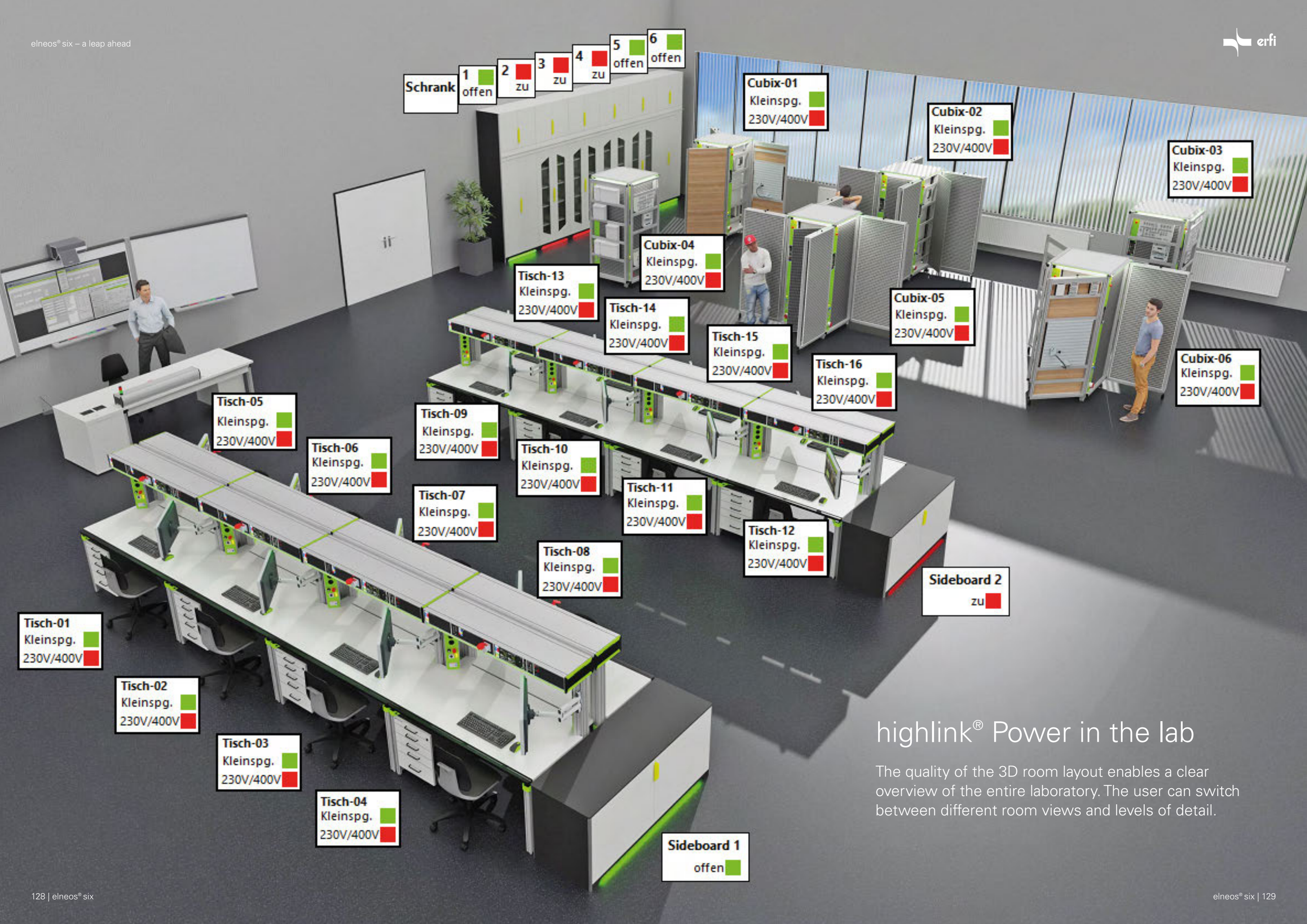
erfi network technology

24-way switch for integration into the 19-inch structure or 19-inch cockpit (networking of workstations)
Order no. NWT1.100

8-way switch for integration into the 19-inch structure or 19-inch cockpit (networking of devices per location)
Order no. NWT1.101

erfi network module (control) for control and monitoring of the individual table functions. (low and extra-low voltage, PC network, up-down movement of swivel tables, etc.)
8 digital I/O's controllable with Ethernet interface.
Order no. NWT1.104

System integration consisting of all contactors and relays for group / device enabling necessary for functionality.
Order no. NWT1.110



highlink® Power in the lab

The quality of the 3D room layout enables a clear overview of the entire laboratory. The user can switch between different room views and levels of detail.

Testing Software CANDY Power

CANDY Power is our leading software in the field of test systems and offers comprehensive tools for dynamic test planning, test procedure and statistics. With the current version, erfi made it possible to combine the industrial with the requirements of a technical training institution.

Start screen with the four main areas test planning, test procedure, test protocol and user administration.

Composite software solution

This software can be purchased separately or in combination with the *highlink Power* room control software. As a combined solution, CANDY Power can be called up directly from the room control software. This allows the industrial user to switch directly from the laboratory application to the test application without having to leave the user interface or the programme. The equipment for electrical safety and function that matches the test technology is managed by CANDY. managed by CANDY.

In the training sector, the training manager can also conveniently switch between the user interfaces and thus, for example, teach the basics of electrical safety by means of DGUV V3 tests or also tests according to DIN EN 60335 -1 VDE 0700 -1.

The data basis for both CANDY Power and *highlink Power* is the central SQL database. This means that all relevant data is managed centrally. Measurement data from the laboratory or test data from production or teaching are transparent and accessible.

Device connection

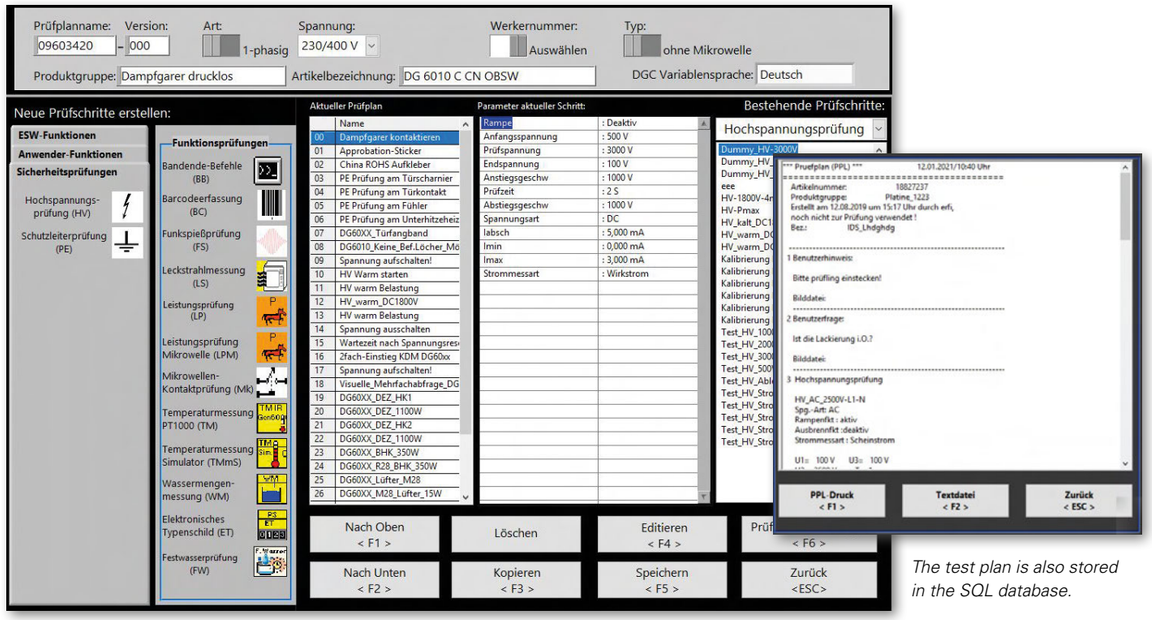
The software in-house development is based on LabVIEW (National Instruments). LabVIEW drivers are available for all devices and enable access to the erfi device world:

- *CANclass* (high-voltage, insulation, protective conductor and leakage current testers)
- *elneos six* (DC power supplies and AC sources, DMM, P-meters, function arbitrary generators)
- Instrument series *basic* or *highlab*
- VDE 0701 and 0702 testers

Testing software CANDY Power
Stand-alone licence, incl. SQL database
Order no. TS9.100

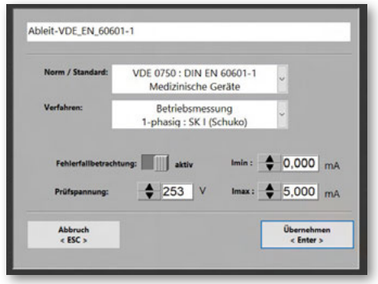
Prüfsoftware CANDY Power Link
Licence embedded in room control software *highlink Power*, incl. SQL database
Order no. TS9.100-I

Note: The use of mobile devices such as tablets and smartphones is possible. The software packages are installed on a server or local computer and can be used on all common systems.

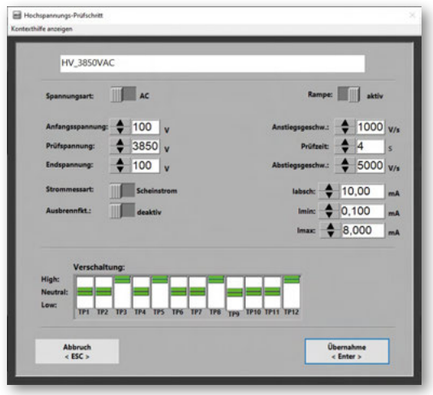


Highly variable and dynamic test planning through multiple use of individual test plans!

The test plan is also stored in the SQL database.



Test plan leakage current test for medical devices according to DIN EN 60601-1.



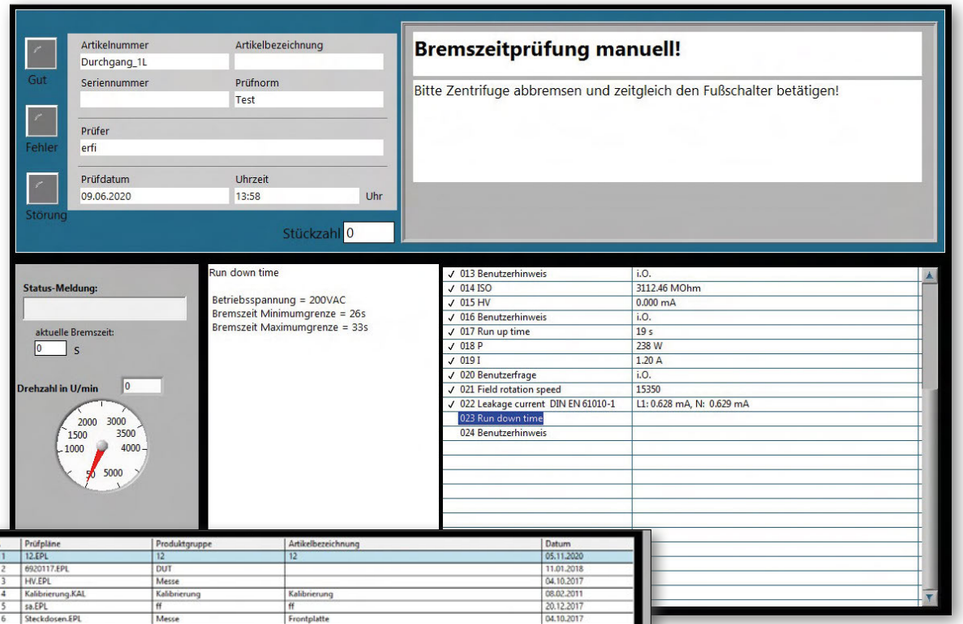
Test plan high voltage with switching matrix.

The test planning

With CANDY Power, you can efficiently create your desired inspection plan manually in the shortest possible time or have the inspection plan created automatically using ERP data. CANDY Power can do both! The standard statistics function provides you with a professional measurement data overview. The result is complete documentation and the traceability required by ISO 9001 is thus guaranteed. CANDY Power gives you the security you need for product liability law.

The partial test planning

CANDY Power guarantees efficient test planning. Individual partial tests for high-voltage, insulation, protective conductor, leakage current and functional tests can be changed in any order during test planning and used in any number of overall test plans. Changes are thus taken into account in all test plans simultaneously and without effort. In addition, CANDY Power enables the recording of freely formulated user questions and notes, in which image files can be integrated. All parameters of the individual safety and functional tests are defined in the partial test plans.



In the test sequence, the user receives all current data about the status of the test and about the test facility itself at any time.

Selection of test plans: manually, with scanner and via ERP interface.

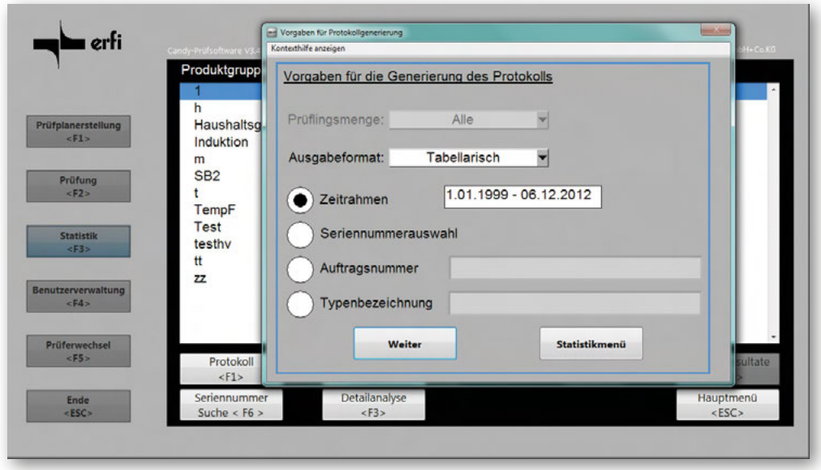
Good-fault analysis

The testing procedure

CANDY Power informs the user at any time about the current status of the test and the measurement results. The respective test parameters appear on the left half of the screen. The actual measured values are visualised accordingly. CANDY Power takes over the evaluation fully automatically. The user is constantly informed about every result and every user action.

The statistics

The good-fault analysis provides a quick overview of quality and fault type at the touch of a button. Thanks to the implemented search criteria function, every result from every test item, every order or series and every article can be located immediately. Your measurement results can be sent directly via e-mail and do not require any rework.



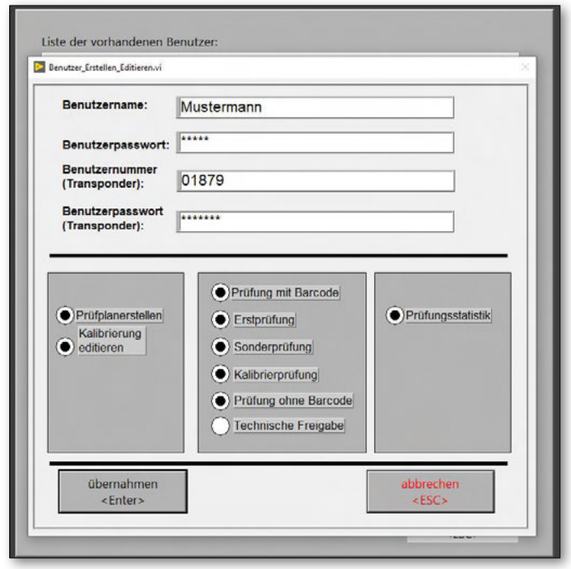
Protocol requirements

Datail analysis

The detailed analysis

The statistics package enables a detailed analysis. This makes all faulty DUTs immediately transparent. At the push of a button, all faults and weak points of the product regarding electrical safety and functional tests become clear. The intelligent data management of CANDY Power allows the fastest processing and visualisation of the measurement results. CANDY Power manages the data formats XML, SQL, d Base and Excel. Other formats are available on request.

The programme packages test planning, test sequence and statistics can be assigned to users. This makes it possible, for example, to give the person responsible for quality access to all modules. The inspector in production, however, is only given access to the initial inspection. Test planning and statistics are then blocked for this user. CANDY Power enables flexible control and thus secures your sensitive measurement data.



User administration

The user administration

The user administration module guarantees the safe handling of sensitive measurement data and test plan data. For this purpose, all users are first created. Each user can be activated for individual parts of the programme.

Assembly Workflow Management (AWM)

Modern worker assistance solution through image- and video-supported, sequential work steps. Optimal for complex and simple production steps in the learning phase as well as for permanent quality control and monitoring in the value-added process.

Flexible work plan generator
The plan generator is used for independent generation, modification and administration of the work plans incl. parts list integrator in the SQL database.

- Unlimited operations for complex products.
- Free question formulation for zero error strategy.
- Free user instructions for clear, structured and compulsory work processes.
- Language-independent assembly instructions enable consistent internationalisation
- Freely formulated questions for worker self-checking can be freely entered in the work plan generator and must be answered YES or NO by the worker in the sequencer. Pictures, PDFs, drawings and films can also be integrated.
- User instructions for worker control can be freely entered in the work plan generator. These are confirmed by the worker in the sequencer. Pictures, PDFs, drawings and films can be integrated.

Pick and Place
This feature is a graphical and image-based process. The user is informed about the respective component on the left side of the screen and the material tray in which the component is located is displayed. On the right side, the assembly step is graphically explained by digital photos. Written assembly instructions complete the assembly process. The parts list can be displayed in parallel.

- Component representation and assembly process representation through images, PDFs, technical drawings in various formats and movies in various formats
- Automatic start via barcode and 2D matrix code
- Scanner function for automatic call-up of the work plan
- Printer function for statistics and results protocols
- Label printing for product labelling

Interfaces
The software runs on all tablets, regardless of the operating system.

Traceability and profiles
It is possible to trace who processed, tested and commissioned which component and when. This secures your processes and ensures maximum safety at all levels, which you can prove at any time.

- Central administration in an SQL database for the user data, the work plans and the results of the operations carried out, and also measured values if available.
- Integrated useful time recording for post-calculations.
- 100% tracking through Productlifecyle monitoring.
- Statistics functions for assembly time evaluation and quality assurance for user questions incl. remote access for support and remote access of remote production sites.
- Worker action for image and video with installed WebCams.
- Free text input for feedback and production optimisation.
- Multiple choice
- Digital signatures
- User administration with different authorisation levels (operator, QA level, AL, PL, ...).
- Authorisation management for "work scheduler", "sequencer", "statistics" and "user administration".
- Extensive options for unlimited and modular expandability: depending on requirements and performance needs, extensive options e.g. for hardware integration, multilingualism can be integrated at a later date (see optional extensions).

Professional sequencer
The sequencer allows individual operations (from simple to complex) to be called up and processed step by step.

- Control of the sequencer by foot pedal, alternatively by swipe gestures on tablet

Basic package assembly software AWM
AWM (Assembly Workflow Management)
for PC's, tablets and smartphone application
Order no. AWM.001

Invest in Process Optimisation

Through a sensible and considered investment, you achieve sustainable efficiency, especially in production management. With AWM software, you immediately achieve an improvement in the value chain and achieve long-term efficiency.

Impact of the AWM system:

- Improvement of process reliability by up to 80%
- Increase in productivity by up to 20%
- Reduction in documentation requirements by up to 90%

Basic system for an efficient result

Without a high investment in hardware, you achieve immediate production progress. Extensive functions are already included in the basic package, so you can quickly get started with paperless production.

- Uniquely scalable worker assistance package in hardware and software.
- Ideal connection of the inspection software CANDY Power and the room control software *highlink Power* through the SQL database.
- Complete CAQ system that documents all processes transparently and securely.
- Always up-to-date work plans at all workplaces, independent of language, location and qualification.
- Increased productivity in the value-added chain through graphic process support.
- Excel and other tools for a quick project start.
- Local parallel storage of all data for backup in case of malfunctions.
- From a manual to a semi-automatic paperless production in the shortest possible time, without changing systems and lowest possible costs.
- Employees become routinised without much effort.
- Statistics with live monitoring on dashboard for:
  - completed orders,
  - defective products,
  - time evaluation,
  - evaluation of questionnaires,
  - retrieve error images, etc.

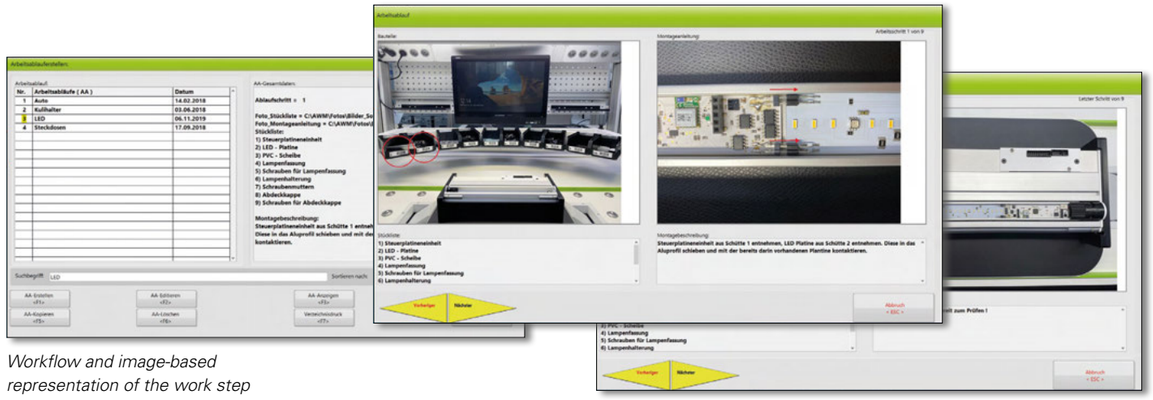
By carefully observing the work routines in the next step, you will recognise new possibilities. Desired features can be expanded modularly with hardware and further software functions. The basic AWM system is inexpensive to start with and avoids costly peripherals such as beamers, camera systems or pick-by-light systems.

Useful options

Add to your basic AWM system of production and assembly software step by step to support the employees in their routines in a meaningful way and enable long-term efficiency.

- Ideal coupling to software packages CANDY Power and *highlink Power* (option).
- Production data, test data and development data in one database, centrally managed and accessible at any time (option).
- Connection to existing ERP systems (option).
- Integration of language packages for the integration of foreign-language employees (option).
- Any tools, camera and robot systems can be integrated (option).
- Pick-by-light system can be integrated (option).
- TAW function for parts presence check (option).

Note: You can see a detailed listing of the various options on the right-hand side of the catalogue.



Workflow and image-based representation of the work step

Useful options to the basic version

Workplace system elneos® connect

Ideal for use in conjunction with a technical workplace system, such as *elneos connect*.

Order no. AWM.002

Interface to the room software highlink® Power

Development has access to production data. This connection is planned and defined on a case-by-case basis.

Order no. AWM.003

Interface to the testing software CANDY Power

Testing and assembly from a single source. The test results from the area of electrical safety and function testing are stored together with the production data in a central SQL database. In individual cases, this connection is projected and defined with you.

Order no. AWM.004

Pick-by-light

An LED light band system on the respective material trays signals the correct assigned material to the worker for each work step. In individual cases, this connection is planned and defined with you.

Order no. AWM.005

ERP-ready interface

For direct connection to ERP systems such as SAP or others. The ERP-ready interface includes the information used to start the appropriate routing and the data to be reported back to the ERP system. Simple linking with ERP orders and linking with routings. In individual cases, this connection is projected and defined with you.

Order no. AWM.006

Feedback through camera monitoring

Supplementary camera system for monitoring the intervention in the material shell. In individual cases, this connection is planned and defined with you.

Order no. AWM.007

Integration of smart tool systems

This module allows the integration of intelligent tools such as screwdriving systems with torque monitoring and positioning. In individual cases, this connection is projected and defined with you.

Order no. AWM.008

Connection to robotic system

Integration and control of robot systems for partially automated processes in which humans still have to perform manual operations. This connection is planned and defined on a case-by-case basis.

Order no. AWM.009

TAW Parts Presence

Through scanning or direct ERP information, the intelligent workplace knows that all parts are present. This module prevents a production start if not all parts are there. In individual cases, this connection is projected and defined with you.

Order no. AWM.010

Language package

Enables the administration of work plans in different national languages, so that the foreign-language worker is comfortably supported.

Order no. AWM.011

Technical Compendium elneos® six

erfi hygienic

Specifications and innovations
On the following pages, all technical data are detailed. Each component is explained and specified from scratch in several steps. Outstanding technical innovations are highlighted in green in the control centre specification.

The concept erfi hygienic
The *elneos six* device system with its touch-free operating concept sets the new standard for hygiene at the workplace. With 3D gestures, integrated voice control and comprehensive glass unit fronts made of specially etched toughened safety glass and antiviral-bacterial surface across the entire width of the workstation, users are effectively protected from viruses and bacteria. The special development of the glass surface is superior to any standard display glass in terms of hygiene, stability and scratch resistance.

Device Series elneos® six Control Centre Glass Fronts, Additional Drawers, Connection Panels and Operating Elements	
Component	**Features and advantages**
Glass front • rear ceramic printing with disappearing effect • 3 mm toughened safety glass (TSG) • antiviral & antibacterial special glass surface erfi hygienic	**New hygiene standard erfi hygienic with continuous uninterrupted glass appliance front:** • specially etched TSG front glass for all unit groups, additional operating elements and slide-in units • AC sources are additionally equipped with intelligently illuminated function labels, combined for the first time with disappearing effect. **Additional glass operating elements with backlit glass unit front incl. disappearing effect:** • second capacitive 3D wheel with o.k. sensor and optional tactile feedback function • two further manual encoders **Further additional glass fronts:** • front-sideed high-current sockets for power supplies and high-current digital multimeters up to 125 A • device interfaces at the front for LAN, USB A+B, digital I/Os • additional slots for further units (slaves) incl. ring socket lighting with disappearing effect
	A continuous glass front enables an uninterrupted, functional surface with following features: • antiviral & antibacterial due to low survival chances of viruses/bacteria on special surface • continuous and closed glass surfaces over the entire width of the workplace • vandal-proof • impact, scratch and breakage resistant • anti-fingerprint surface (permanent) prevents fingerprints to the greatest possible extent • lettering is 100% abrasion-resistant due to ceramic back-glass printing
	Display and presentation quality: • function labelling for AC sources with disappearing effect L1, L2, L3, N, PE, floating, +/- • high-resolution lettering, reverse glass printing • lifetime high quality look • triple glazing in the display area for highest impact protection • haptic feel of very high quality when touched due to special etching
Alternative aluminium front panel design except control centres (these are always equipped with glass front)	• for all unit groups in additional drawers and insert plates of the unit series *basic* and *acto* • for all additional operating elements
Size elneos six control centre with 8-inch display	• Height 3 U, width 63 HP (all unit groups can be installed in the control centre) optionally with installation depth 160 mm (Order no. EL6.1.185) or 220 mm (Order no. EL6.1.360).
Size elneos six compact control centre with 7-inch display	• Overall height 113 mm, overall width 56 HP, overall depth 79 mm. Suitable for installation in vertical & horizontal Expand 2 profile of the *elneos connect* furniture system. (All device groups except AC sources and DC output stages can be integrated into the control centre.
Size slaves and insert plates in glass and aluminium of 19-inch device series *basic*	• Height 3 U and 6 U, different widths [HP = division units, 1 HP = 5.08 mm] suitable for installation in 19-inch device cocpits, 19-inch superstructures and TechCubes.
Size insert plates device series *acto*	• Suitable for installation in vertical & horizontal Expand 2 profile of the *elneos connect* furniture system. Height 113 mm, different widths. [HP = division units, 1 HP = 5.08 mm]

Subject to technical and formal changes.

* All data apply at +23°C after 30 minutes warm-up time.

Illuminated Tester Connections with Disappearing Effect

Tester connection control centre EL6.1 • Ring bushing illumination • Disappearance effect with flashing function • 4 mm laboratory sockets • BNC sockets	Up to 8 laboratory sockets and 4 BNC sockets with 12 oval ring socket illuminators with disappearing effect for up to: • 4 power supplies integrated simultaneously or • 3 power supplies and 1 dual-function generator integrated simultaneously or • 2 power supplies, 1 digital multimeter and 1 dual-function generator integrated simultaneously
Tester connection control centre EL6.1C • Ring bushing illumination • Disappearance effect with flashing function • 4 mm laboratory sockets • BNC sockets	Up to 6 laboratory sockets and 4 BNC sockets with 10 vertical/horizontal beam socket illuminators with disappearing effect for up to: • 3 power supplies integrated simultaneously or • 2 power supplies and 1 dual-function generator integrated simultaneously or • 1 power supply, 1 digital multimeter and 1 dual-function generator integrated simultaneously
Tester connections for additional units in additional slaves (glass fronts) • Ring bushing illumination • Disappearance effect with flashing function • 4 mm laboratory sockets • BNC sockets	Other power units such as DC power supplies, multimeters, power meters and function generators, which cannot be accommodated in the control centre due to their size and number, are relocated to additional racks. These are optionally integrated in equipment superstructures or cockpits or in TechCubes below the table tops. All laboratory and BNC sockets are equipped with oval ring socket lighting with a disappearing effect. Alternatively, the additional slaves are available in the aluminium front panel design of the *basic* unit series. (see ordering information).
Tester connections for AC sources in additional slaves (glass fronts) • Ring socket illumination with function labelling and disappearing effect with flashing function • 4 mm laboratory sockets • Sockets for 1- and 3-phase, earthed and ungrounded test objects	• Up to 7 laboratory sockets with function inscriptions in the glass incl. disappearing effect. • Labelling by ceramic back-glass printing with L1, L2, L3, N, PE, earth-free and +/- for rectified AC voltages. • Output additionally with "active-LED" incl. disappearing effect.
Security and flashing function through ring socket lighting	**For large control centre elneos® six EL6.1:** Oval ring socket lighting per socket **For small control centre elneos® six compact EL6.1C:** Bar socket lighting (vertical/horizontal) per socket **For DC power supplies:** at output ON: Alternating flashing white or blue/red for a short time. The user is always guided to the correct connection. at voltage zero crossing: short white flashing, e.g. at current limitation during normal operation: blue / red (- / +) for dual power supply units: Comfort function with serial/parallel operating mode in violet / light blue. **For AC sources:** at output ON: Alternate flashing white or corresponding lab jacks for 3 seconds. The user is always guided to the correct connection and switch-on ready function: coloured flashing with colour change between white and respective socket colour. **For digital multimeter:** When the measuring function is changed, the laboratory socket to be contacted flashes briefly in the respective colour. **For dual-function generator:** When modulation with 2nd internal source, the illumination changes from green to yellow.

Capacitive Multitouch Displays

Capacitive 8-inch multitouch display for large control centre *elneos six* EL6.1 **erfi hygienic**	• outstanding hygienic properties due to surface made of special glass • 5-finger multi-touch gestures • 800 x 1280 pixel resolution, 172 x 107 mm active area • 16.7 M display colour, 85° viewing angle • screen saver function can be activated • very fast response time and haptically very pleasant due to special surface
Capacitive 7-inch multitouch display for small control centre *elneos six compact* EL6.1C **erfi hygienic**	• outstanding hygienic properties due to surface made of special glass • 5-finger multi-touch gestures • 720 x 1280 pixel resolution, 155 x 87 mm active area • 16.7 M display colour, 89° viewing angle • **installation position: horizontal and vertical possible** • **display is aligned horizontally or vertically according to the installation position** • screen saver function can be activated • very fast response time and haptically very pleasant due to special surface
Gesture functions display (touch gestures) **erfi hygienic**	**1-finger gesture:** Slide effect for each screen display (1 to 4) with SMART-SCROLL. The devices slide elegant and smooth along the smartscroll device bar at the bottom of the screen and can be placed at any position on the screen with a swipe upwards. In addition, graphs and tables of values can be scrolled. Devices that have already been placed can be moved to any desired position. **2-finger gesture:** zoom graph in X-Y direction **3-finger gesture:** safeguard = immediate switch-off of all power outputs **5-finger gesture:** display locking
Variable screen options The user can choose between 4 different screen displays. **Quickdevice function:** Simultaneous operation of up to 4 units on one display, without prior unit selection.	**Selectable screen displays:** Fullscreen (1 device visible and operable) Halfscreen (2 devices visible and operable at the same time) 2/3-Screen (4 devices visible and operable at the same time) Quattro-Screen (4 devices visible and operable at the same time) Position 1 to 4 (module area) of the respective unit can be freely assigned on the screen. The SMART-SCROLL device bar at the bottom of the screen can be operated in all 4 screen displays. Note on 2/3 screen: In connection with the Connection Panel, up to 8 units can be viewed simultaneously and 3 can be operated simultaneously with this screen setting.
Tactile feedback for display surface (Option Order No EL6.1.HW) Note: This function is only available for the large control centre *elneos six* EL6.1.	The option provides the user with real (tactile) feedback of their actions through vibration in the area of all functional surfaces on the display (slider and buttons) as well as on the capacitive 3D wheel. The ease of use and safety are thus considerably increased once again. A high-quality electric motor with unbalance transmits the vibration to the display front and thus simulates the rastering of the respective control element (display or wheel). In parallel, an acoustic click tone reinforces the haptic effect so that the feeling of a mechanical rotary encoder is simulated. (In combination with the speech package Hey erfi! only.)
Connection panel with actual-value display	The connection panel is displayed with a swipe movement from left to right. The connection panel shows the exact connection position of all device outputs and inputs from the control centre and the additional plug-in units. This graphic support guides the user safely to the correct connection socket. The current colour indexing of the ring sockets is also displayed in the connection panel. **Display function:** The actual values of the units are displayed directly in the connection panel, thus providing the option of making good use of the remaining screen for displaying additional units. The connection panel can be used as a compact display and thus creates free space for other tasks as well as an even better unit overview and control.
Dynamic screen adjustment when the Connection panel and menu selection functions	When the connection panel and the menu selection functions are displayed, the screen automatically scales to the correct size without covering existing unit displays. This feature ensures that all unit functions can be operated and read at all times. This means that when the connection panel is shown, other units are also shown in the rest of the display and the number of units visible at the same time is increased. (max. 8 units simultaneously visible on one screen with their respective actual values) All actual values are displayed in parallel in the connection panel. When the menu functions are displayed, all displayed units can still be operated.
Screen remote functions	The display can be darkened or locked (frozen) for operation by remote control. ON / OFF: Switching the display off or on. **Locking:** Surface of the display is locked or unlocked (Clean and Protect function) Ideal for educational institutions and long-term industrial trials!

Subject to technical and formal changes.

* All data apply at +23°C after 30 minutes warm-up time.

Capacitive and Wear-free Input Sensor Technology

Capacitive on-off sensor with backlit fingertip grind and disappearing effect **erfi hygienic**	• 100% wear-free switching function and vandal-proof due to capacitive sensor • high safety due to fingertip grind and accidental on/off switching is prevented • backlit with coloured safety indication • fingertip grind increases safety by preventing accidental on/off switching • switch-on ready function – white pulsing • ON-function – green continuous light • Safeguard function – red pulsing (3-finger grip quick switch-off) • Locking function – blue pulsing (5-finger grip: locking for continuous testing and cleaning) • Calibration mode – red, yellow, white, blue pulsing • 3D gesture control, hand detection – purple pulsing
Capacitive Wheel with backlit OK confirmation sensor and disappearing effect **erfi hygienic** Note: Only with large control centre EL6.1	• 100% wear-free and superior to any mechanical input unit • absolutely vandal-proof, as snagging or breaking of encoders is avoided • capacitive input unit • planar ground wheel • allows fast, comfortable and highly precise value input with up to 5 digits behind the decimal point • can be operated with fingertip for the first time
Airwheel with 3D-gesture function for contactless input and control electronics **erfi hygienic** Notes: 1. Included as standard with the large *elneos six* EL6.1 control centre. 2. This function is not available for the small control centre *elneos six compact* EL6.1C. 3. Ideal in combination with voice control function "Hey erfi" EL6.SP1. 4. 3D-airwheel function can be activated or deactivated in the menu at any time.	The Airwheel responds to 3D gestures and enables touchless operation of all functions. • for hygienically clean, fast, convenient and safe value and device setting • up to approx. 5 cm distance With only a few 3D gestures, the device can be controlled completely without touching it. A revolution in device operation! You no longer have to touch the device at any time. The 3D-gestures: **Circling finger:** • Scrolling through all menu functions in no time at all • Value setting (simulation of capac. wheel in the air) • Zoom in / out of graphs **Standstill finger:** • After 1.5 seconds of standstill, you automatically move down one level or to the value setting. **Horizontal wiping motion with hand:** • SMART-SCROLL of device bar • Scroll graphs • Digit selection **Vertical wiping motion with hand:** • Scrolling tables, • Change values (up + and down -) **Move hand to device:** • Waking up the unit from sleep mode / screen saver **Holding movement of the hand:** • Locking display by second approach
Tactile deedback for capacitive wheel (Option Order no. EL6.1.HW) Note: This function is only available for the large control centre *elneos six* EL6.1.	When the capacitive wheel is touched, the user receives a haptic feedback (latching function) haptic feedback (latching function). A high-quality, unbalanced electric motor transmits the vibration to the the vibration to the respective capacitive wheel and conveys an even better haptic.
Additional input module 2nd wheel (Option Order no. EL6.ZG001) **erfi hygienic**	**Multi-user function:** A second, independent capacitive wheel allows simultaneous operation by multiple users. It is another glass front with identical features to the wheel in the control centre as the wheel in the control centre. It is equipped as standard with the 3D airwheel function and optionally with tactile feedback. Connected to the control centre via e-bus. Positioning anywhere in the 19-inch desk layout or 19-inch unit cockpit for optimal assignment to the user.
Additional input module encoder 1 mechanical encoder (not capacitive) or 2 mechanical encoder (not capacitive) (Option Order no. EL6.ZG003) additional to standard 3D-wheel of control centre.	This additional input module also allows simultaneous operation by several users. It is another glass front with 1 or 2 rotary encoders incl. print function. Connected to the control centre via e-bus. Positioning as desired and ideally assigned to the respective user. For users who want to combine the modern device technology of *elneos six* with a conventional input technology.
SMART-SCROLL device strip works with all screen views Fullscreen (1 device visible and operable) Halfscreen (2 devices simultaneously operable) 2/3-Screen (4 devices simultaneously operable) Quattro-Screen (4 dev. simultaneously operable)	At the bottom of the screen there is always a movable device bar with all the device names. This allows immediate access to each unit. The SMART-SCROLL device bar can be scrolled horizontally as required to select the desired device or data logger (can also be operated with a 3D gesture). By simply swiping, the selected device can be freely placed at the desired screen position.

Speech Control with Speech Output Function Speech Package Hey erfi!

Intuitive offline voice control **and voice output module** (Option Order no. EL6.SP1) Includes voice-controlled remote control of very many unit functions as well as voice output of measured values and many user instructions. Internal audio process through "Convert speach to text to command" and "Convert value/instruction to speach". **erfi hygienic** Note: Ideally complements the touch-free operation and the standard 3D airwheel of the large EL6.1 control centre. After a spoken command, every lower menu item can be easily reached and set by the circling gesture of the finger. For the large control centre *elneos six* order no. EL6.1 and the compact version *elneos six compact* order no. EL6.1.C available.	For all device groups (DC power supplies, digital multimeters, power meters, function generators, AC sources). Fully functional without internet due to integrated speech recognition software (erfi in-house development), fast evaluation and implementation of spoken commands. **Included additional hardware:** • 2 built-in special microphones • 1 audio amplifier • 1 high-quality loudspeaker for voice output With voice output, for example, the current measured values or user instructions are read out. The user keeps his hands free for other important tasks and his eyes on the circuit or the oscilloscope. Additional acoustic support of the wheel's and airwheel's corresponding clicks. **Intelligence:** The device is able to provide special assistance. Predefined and formulated audio files support the user, e.g. when connecting the test item and during the performance of a measurement. Example: "Please connect lines to the flashing sockets!" "Attention limit exceeded!" Greeting text when switching on: "Good morning Peter!" Activation by "Push-to-Talk Button" and alternatively by speaking "Hey erfi!" Through this touch-free operation, this module makes a decisive contribution to increasing operating safety, work productivity and hygiene at the workplace.

Data Logger

Data logger with graph display Suitable for simultaneous recording of up to 5 independent readings (standard).	Measured values from control power supply units (linear), power supply units, 1- and 3-phase AC sources with 1- and 3-phase power meter, digital multimeters and 1-phase power meter
Large storage capacity	• Synchronous real-time measurement through 5-channel measurement module. This enables simultaneous measurement and storage of up to 100,000 measured values each. • Total memory up to 500,000 measured values
	Recording function: Number of cycles: 1 to infinite, recording of the time range Trigger: manual or by external trigger signal at selectable digital input (0 to 7) Log rate: adjustable from 10 ms to 999 seconds Storage depth: up to 100,000 measurement points per curve Storage of measured value files with alphanumeric file names, are editable by full display keyboard.
	Time display: • Available recording time • Recording time used • Recording time still available
Graphic recording function	**Autoscale Graph:** • up to 5 measurement curves can be displayed simultaneously (one colour per curve) • individual measurement curves can be deselected • X-Y zoom function by 2 finger gestures and 3D gesture in all 4 displays • high-quality curve display due to high resolution
Tabular recording	The unit records the measured values in tables. • Measured value tables can be displayed and scrolled, also by 3D gestures. • Data dump to USB stick at the touch of a button or by voice command
Retrievable measured values (file system)	The stored measured value files can be loaded at any time: • be loaded by the file names • be displayed in tabular and graphical form
Inrush current function	When activated, the inrush current of the respectively selected power supply unit is measured, recorded graphically and in tabular form. This useful function allows the inrush current to be checked at the moment of inrush without complex laboratory set-ups. The unit takes over the trigger function and at the same time the energy is stored at the moment of inrush.
Data export	USB stick: The data can be saved to a USB stick at the touch of a button or by voice command. Remote: The data can be read out via the LAN, USB-B, WLAN and BT interfaces.
Screen shot via screen button	Each current screen can be saved as a screenshot and transferred to a USB stick. (Prerequisite: The Connection panel was also ordered).

Subject to technical and formal changes.

* All data apply at +23°C after 30 minutes warm-up time.

Computer Technology Industry Standard and Connectivity

DUAL-CORE Industrial computer with fast-booting Linux operating system – after initial boot-up, immediate functional readiness when switched on and off again. Note: In order to achieve fast availability after switching on, great importance was attached to boot optimisation during development. This makes this Linux system one of the fastest systems on the market and it starts up very quickly after each reboot.	**Professioneller Industrierechner:** • dual-core processor, 1 GHz per core • data memory for up to 500,000 measuring points (data logger) • 4 GB flash and 1 GB RAM for high-end application • designed for long-term and permanent measuring function • 24 hours / 7 days continuous operation • vibration certified according to EN 60068-2-6:2008 • shock certified according to EN 60068-2-27:2009 • high temperature range from -20° C to +85° C • long-term availability = safe investment in the future • renowned processor manufacturer with professional support
	The Speech Package option Hey erfi! (Order no. EL6.1SP1) is additionally equipped with: • 2 high-quality microphones for professional audio signal evaluation (speech control) • audio amplifier for speech output incl. loudspeaker invisibly built into the unit Ideal for automated and complex measuring tasks as well as for school training for increased safety (limit value monitoring and measured value announcement) and at the same time high hygiene function at the workplace.
Interfaces all remote functions with SCPI command sequences Note: Existing drivers used for devices with SCPI commands can still be used in connection with the *elneos six* device system. without any costs in connection with the *elneos six* device system.	**Wireless interfaces:** • WLAN for remote control of the unit with mobile terminals (SCPI command sequences) • BT LE 2.0 streaming data for audio applications (headset) for remote control of the unit with mobile terminals (SCPI command sequences) • NFC (Near Field Communication) - reading of valuable data/information from the unit to the smartphone/tablet - display of type plate with model (integr. device functions, serial number, firmware no. [3], ...) - calibration date, next due calibration date - licence key for release of further device functions such as dual measurements with DMM etc. - operating hours counter **Wired interfaces:** • LAN, RJ45 for remote control of the unit (SCPI command sequences) **Optional wired interfaces:** • on rear of unit Order no. EL6.1.S1 • on the front of the unit as a separate glass front Order no. EL6.ZG006.E, each: - USB-A (for keyboard, mouse, scanner): Simultaneous connection possible via USB hub. - USB-B for remote control of the unit (SCPI command sequences) - Trigger and control interface (PLC function) with 8 digital inputs, 10 digital outputs (see description of digital I/Os). Expandable to up to 16 additional inputs and 24 additional outputs.
Optional interfaces: • on the rear of the unit (Order no. EL6.1.S1) • on the front of the unit as a separate glass front (Order no. EL6.ZG006.E)	• USB-A (for keyboard, mouse, scanner): Simultaneous connection possible through USB hub. • USB-B for remote control of the complete unit (SCPI command sequences). • Trigger and control interface (PLC function) with 8 digital inputs, 10 digital outputs (see description of digital I/Os). Expandable to up to 16 additional inputs and 24 additional outputs.

Limiter with Trigger and Control Interface, Monitor Limits

Digital I/O´s with SPS/PLC function (included when ordering the optional interfaces EL6.1.S1 or EL6.ZG006.E) ideally suited for automation and control tasks. Note: Included with the optional interfaces EL6.1.S1 and EL6.ZG006.E. See also p.105 table control functions: • Table height adjustment EL6.TH • Workstation light control EL6.AL	Freely programmable digital inputs and outputs can be used in 3 different ways: **1. control with the limiter and limit value monitoring** (programmable on the display). Within freely definable value ranges, a measured value from DC power supplies, AC sources, digital multimeters or power meters can be monitored and linked with a logical switching function. A digital output with a corresponding active high/low edge can be assigned to each value range. Ideal in conjunction with the indication light of the *elneos connect* furniture system. **2. remote control** The digital inputs and outputs can be freely programmed via all interfaces using an SCPI command set via all interfaces. **3. direct control and table control** (height adjustment and light control) Each output and input can be freely programmed or edited directly on the display. • all outputs are represented by operable buttons • free naming of each button (e.g. light, motor, low/low voltage, up/down etc.) • selection between push-button or switch function • level selection active high or active low or active high and low

Web Server and Remote Access VNC

Web server with 1:1 screen display	The original device user interface is displayed on every end device (PC, laptop, tablet, smartphone). and is independent of the operating system. This means that the unit can be conveniently controlled comfortably in remote control mode without any training time.
Remote access VNC	Alternatively, the unit can be fully controlled with all functions by Virtual Networking Computing (VNC) from any terminal device. All unit functions can be controlled without software installation.

Web Browser

Internet access with fast web browser	The modern web browser shares the engine with Google Chrome and MS Edge. It allows fast and complete access to the Internet. Incl. editable address line in the browser and full display keyboard for address input. Alternatively, a keyboard and mouse can be used via the USB-A interface (simultaneously via USB-HUB). Internet access can be deactivated in the menu and via remote control command.

Updates and Calibration

Firmware update / remote maintenance	Through the LAN interface. The firmware updates can be read in via an integrated web browser.
Calibration via interface	via LAN interface

Menu Settings and Other Useful Functions and Features

Comprehensive menu settings	Fthe following function groups can be selected: **Networks and interfaces:** IP address management, USB memory/stick, internal and external data export. **Web internet access:** Web browser with input address line and integrated display keyboard, can be deactivated manually and remotely or optionally with external keyboard and mouse **Display settings:** • brightness, languages, screen saver interval • haptic/tactile feedback can be switched on and off • international languages: *elneos six* displays many national languages, so that the entire the entire user guidance system is stored and selectable in multiple languages. **Tones and volume:** • Volume for key tones, information tones, warning tones, voice output **Further settings:** • 3D gestures, Airwheel can be switched on and off. • easy-mode makes it possible to hide many individual menu items. Ideal for basic instruction in HWK's or beginning classes of vocational schools. Easy mode can also be stored in the user profile. **Device information:** • serial number, firmware version, web version, device list with existing devices • stored user manual and teaching videos can be called up directly **Service:** • deposited contact data of erfi Ernst Fischer GmbH + Co. KG • selectable calibration interval 6 / 12 or 24 months • a calibration notice then appears 4 weeks before the due date **User profiles:** The settings made by the respective user are stored here and managed by password. The respective user can use his preferred settings immediately after logging in. **Time and date management:** The unit automatically displays the current date and time when an internet connection is established. The location is determined and set.

* All data apply at +23°C after 30 minutes warm-up time.

Further Mechanical Properties and General Device Data

Central control centre The following device groups can be control centre itself: • DC power supply units, linear • Power DC power supplies (up to 1,500 W) • Power arbitrary generators • digital multimeters • Power meters • Function generator • Fast signal arbitrary generators Notes: • no separate plug-in units necessary • simultaneous integration of all units in one slide-in module • AC sources are usually installed in additional slaves (exception)	**Notes on large control centre elneos® six EL6.1 with 8-inch display:** Extremely compact and easy-to-maintain design with integrated backplane and 4 slots to accommodate the individual unit boards incl. the power amplifiers. This also makes it ideal for use as a stand-alone unit. Up to 4 power supplies or 2 power supplies, 1 power meter with digital multimeter and 1 function generator can be integrated simultaneously. Exception: Very large power modules such as power DC power supplies (3,000 W) and large AC sources are integrated in additional drawers or in TechCubes. **Note on smaller control centre elneos® six compact EL6.1C with 7-inch display:** (for Expand 2 profile) Even in the smaller *elneos six* compact control centre, the digital multimeter digital multimeter, the function generator and the complete control electronics of the power supply units are located in the control centre. Only the power output stages of the DC and AC sources and the power DC power supply units are installed in separate power racks. are installed in separate power drawers and integrated in TechCubes under the table for easy access.
Theft protection	**Internal latching and locking mechanism:** • prevents unintentional removal • All glass slaves have a high level of security against vandalism. • Strong magnets on large additional slaves prevent unintentional access to the unit itself. At the same time, they enable trained personnel to gain quick access. • From the outside, the indestructible glass unit fronts do not offer any points of attack such as screws or operating elements.
Unique maintenance and service-friendliness • The units themselves are removable plug-in cards and are stably contacted in a back-plane by means of a plug-in system. • As a rule, the mechanical central plug-in unit itself always remains in the superstructure, even in the event of repair, and only needs to be removed in a few simple steps to remove the unit plug-in cards. • AC sources and other additional plug-in units have 100% protection against tampe-ring thanks to a new sandwich construction that protects against unauthorised access. *elneos six* – because speed is of the essence when it comes to service!	• The slide-in unit of the control centre consists of a high-quality stainless steel cassette, which allows immediate and convenient access to all units in just a few seconds. • The unit plug-in cards can be exchanged immediately by any user with very little effort and are automati-cally recognised and displayed each time the unit is switched on and off. (Principle of the PC plug-in cards) • As a rule, the replacement plug-in card is sent within one day. (Maintenance contract required) • The replacement unit plug-in cards are independent and calibrated functional units and fully functional immediately after installation. Each card has its own microcontroller and is automatically automatically recognised by the main system. **Advantages over decentralised and modular unit systems in case of repair:** • Only small plug-in boards need to be replaced. (There is no need to ship complete plug-in units in case of repair). • Very short removal and installation times, as only plug-in boards are involved. • No downtimes due to immediate replacement of the plug-in boards when a maintenance when concluding a maintenance contract. • As a rule, the calibrated replacement plug-in board is sent to you on the same day. • Even if a device plug-in card (very compact single board) is to be sent in for repair, this effort is considerably less (low handling costs). • In the event of repair, there are no more gaps in the unit structure, since the front of the plug-in unit always remains in the superstructure. • Even after the removal of a unit plug-in card, all the other units are fully functional (no loss of time). • No time-consuming de-contacting of cable harnesses to other additional plug-in units necessary. • The glass front forms a stable unit with the power cassette, which can be removed in which can be removed in a few simple steps. • The 19-inch additional slaves are also installed in TechCubes and allow easy access under the table thanks to the well-known advantages of 19-inch professional equipment technology. Likewise, some additional slaves have backplane technology and can thus combine the same advantages as the control centre in terms of serviceability. • The AC glass fronts feature a new sandwich construction in which the glass front is secured by strong magnets and a second metal wall behind it protects the slave from unintentional tampering. After removing the additional slave from the cockpit or the TechCube, all components are easily accessible.

Further Mechanical Properties and General Device Data

Environmental conditions	Operating temperature range from 0°C to 40°C Humid heat without condensation from 5% to 80%		
Electrical power	Mains voltage range EU: 230 V (+-10 %) / USA: 110 V Rated frequency range: 50 / 60 Hz Input power starting at 99 W, depending on the built-in DC and AC power amplifiers Output power starting from 30 W, depending on the built-in DC and AC power amplifiers		
Certificates	**Lin. control power supplies & power arbitrary generators, DMM, P-meters & function generators:** USA: UL 962 / Canada: CSA C22 No. 68 EU: according to Low Voltage Directive 2014/35/EU: EN610010-1 EMV: EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11, EN61000-4-39, EN55011 Rad., EN55011 Cond. **Power supply units:** USA: UL 60950-1; EN 60950-1		
Calibration Intelligent calibration through self-calibration and monitoring of calibration intervals.	**Integrated calibration monitoring and self-calibration:** The unit monitors itself to a large extent through regular self-calibration. It has an integrated calibration interval monitor: The calibration interval can be selected on the display (6, 12 or 24 months). 4 weeks before the calibration interval is reached, the user receives a corresponding message. We recommend a calibration every 12 months if the unit is operated 40 h / week in the working range of the above-mentioned environmental conditions. We recommend concluding a maintenance contract that includes calibration. In a maintenance contract, the maintenance and the calibration are carried out and in case of deviation, the correction is carried out immediately and without loss of time. The correction in case of deviation can only be carried out by trained erfi specialists. We would like to point out that external calibration laboratories can only carry out the calibration in the form that only a measurement record can be created. The readjustment in case of a deviation can only be carried out by the manufacturer himself. The conclusion of an erfi maintenance contract is therefore the more economical and faster way in most cases.		
Weight The weight depends on the built-in power output stages of the power supply units. The following are some exemplary combinations as a 19-inch subrack variant alternatively in a standalone housing.	Control centre with equipment Combination example 1: 1 x digital multimeter incl. power meter (1 x EL6.P)	**19-inch plug-in:** 2,4 kg	**Stand-alone:** 4,2 kg
	Control centre with equipment Combination example 2 2 x control power supply units 2 x 0-32 V/0-2 A (2 x EL6 LDC.032.02) 1 x DMM incl. power meter gauge (1 x EL6.P) 1 function generator (1 x EL6.F)	5,2 kg	7,0 kg
	Control centre with equipment Combination example 3: 1 x power supply unit 0-48 V/0-31 A (1 x EL6.GDC.048.031) 1 x DMM incl. power meter gauge (1 x EL6.P) 1 x function generator (1 x EL6.F)	6,7 kg	8,5 kg
Sizes control centres and additional plug-in units	See glass fronts Control centre, additional slavees, connection panels and operating elements		

Subject to technical and formal changes.

* All data apply at +23°C after 30 minutes warm-up time.

DC Precision Control Power Supplies, linear

Specification	Category or characteristics	Technical dats and details
Application		
	Industry and education alike	Research and development, basic education and advanced electrotechnical instruction.
Installation		
	integrated optionally in: *(Depending on the other installed devices and the remaining laboratory sockets of the control centre.)*	• large control centre EL6.1 • small control centre EL6.1C • slave Universal EL6.ZG005.Z • Connection panels *basic* and *acto* • TechCube (under-table mounting)
Technical principle		
Control electronics with real-time measurement through own intelligence.	Control board in the backplane of the control centre or in the additional Universal slave.	Self-sufficient microcontroller unit, completely calibrated and quickly exchangeable, independent of control centre (master).
Control and connection		
	2 laboratory sockets per channel with ring socket illumination and disappearing effect.	galvanically isolated, short-circuit proof, insulated from PE
Max. number of power supply units controllable by one control centre.	up to 32 power supplies can be controlled simultaneously	
Max. number of power supply units installed in one control centre.	max. 4 power supplies	
Output		
Up to 4 outputs in one control centre.	with 4 outputs:	max. 4 x 0-32 V / 2 A max.
	with 3 outputs:	max. 3 x 0-32 V / 3 A max.
	with 2 outputs:	max. 2 x 0-32 V / 5 A max.
	with 1 output:	max. 1 x 0-66 V / 10 A max. or max. 1 x 0-100 V / 6 A
max. output power	per channel, depending on model	from 32 W to 660 W
max. output voltages	per channel, depending on model	0-32 V, 0-66 V, 0-100 V
max. output current	per channel, depending on model	1, 2, 3, 5, 10, 20 A
Output sockets	via two illuminated 4 mm laboratory sockets with disappearing effect	
Adjustment accuracy	16 Bit A/D converter	1 mV, 1 mA
Measurement accuracy	24 Bit A/D converter	0,01 mV; 0,01 mA;
Measured value acquisition (in real time)		
Control deviation 1, with load change 0-100%	Voltage:	300 µV/A,
	Current:	150 µA/V
Control deviation 2, with load change 10%	Voltage and current:	< 0,1 %
Ripple	Voltage:	100 µVeff
	Current:	200 µAeff
Settling time, with load jump from 0-100%	with ohmic load	12 µs
Multi-stage pre-control for minimisation of heat loss	Software-controlled winding changeover	through wear-free thyristors
Temperature coefficient		
Highest thermal stability	Voltage:	0,002%/K
	Current:	0,008%/K
	Permanent temperature monitoring (hardware and software)	High-quality temperature sensor on PCB

DC Precision Control Power Supplies, linear

Specification	Category or characteristics	Technical dats and details
Functions and extensions		
Integrated square wave generator		to 1 kHz with ohmic load, full modulation up to 330 Hz
Constant voltage and constant current source	Automatic change between the operating modes:	CV / CC
Preset function (output OFF/ON)	All outputs can be switched on and off	ring bushing illumination / disappearing effect
Programmable OVL and OCL function	OVL = Over Voltage Limit OCL = Over Current Limit	Limits can be defined on the display and by remote control.
Graphic data logger – 5-channel with zoom function (standard)	100.000 measured values per channel	Simultaneous display of 5 signals or curves, max. 500,000 measured values can be stored; recording speed: 0,01 sec.
Limiter – with trigger and control interface start of measurement by trigger pulse	Freely programmable with limit value monitoring below, within, above with free selection of outputs, trigger inputs via digital inputs.	• 8 digital Inputs • 10 digital outputs (active high/low)
Comfort function for dual power supplies (Option Order no. EL6.C)	Serial / Parallel connection Master / Slave, Tracking / Ratio	• series connection up to 2 x nominal voltage of the source • parallel connection up to 2 x nominal current of the source with display of the total current • colour-accentuated ring socket illumination in violet (serial) or light blue (parallel), depending on function.
Current and voltage measurement at switch-on torque	This can be used to investigate the behaviour of the test specimen in the range of the switch-on torque.	recording of current and voltage
Displays and interfaces		
Screen presentation	Graphical parallel display of the measured values with full screen mode. Graphical display of the measured values is always possible with any other screen display.	• optimal monitoring of the actual values U/I • X-Y zoom function in the graph area • measured values can be saved and loaded
Web server and VNC	1:1 display on PC, tablet, smartphone; With VNC, complete device functionalities remotely controllable.	• no software installation necessary • works with all commercially available browsers • no learning time and immediate continuation of work
Technical interfaces	acc. to technical specification control centre	all functions remotely controllable

Power Arbitrary Generator incl. Control Power Supply Unit, linear (see above)

Specification	Category or characteristics	Technical dats and details
Application		
Simulation of any curve shape by editable and remotely controllable sequencer.	Industry and education alike	Brown-out, power sequencing, PSSR (Power Supply Rejection Ratio), simulation of vehicle electrical systems. Ideal for use in automotive training workshops and in the field of communications engineering with power applications.
Installation (according to DC precision regulation setter)		
Functions		
Sequencer function	Freely editable signal shapes on the display and freely programmable via interface with power of the DC control power supply unit.	Sine, rectangle, triangle
	Duty cycle:	variable
	Number of segments and cascading:	Up to 400 segments (lines) cascadable and therefore reproduction of any signals. Editable on the display, alternatively readable via interface.
	Per segment:	Waveform, period, amplitude and duty cycle as well as superimposed DC parameters with initial and final values (U/I).
	Frequencies:	to 2,5 kHz for sine and triangle; to 1 kHz for rectangle
Further functions, data and interfaces (according to DC precision control power supply unit)		

Subject to technical and formal changes.

* All data apply at +23°C after 30 minutes warm-up time.

DC Power Supplies

Specification	Category or characteristics	Technical dats and details
Application		
High-current applications	Industry and education alike	Research and development, basic education and advanced electrotechnical instruction as well as battery applications of all kinds.
Installation		
	for 800 W and 1,500 W integrated optionally in: *(Depending on the other installed devices and the remaining laboratory sockets of the control centre.)*	• large control centre EL6.1 • slave Universal EL6.ZG008.P1DC80 (80A); EL6.ZG008.P1DC125 (125 A) • Connection panels *basic* and *acto* • TechCube (under-table mounting)
	for 3,000 W integrated optionally in:	• 19-inch / 6 U device cockpit or table-top setups • TechCube (under-table mounting) as separate additional insert
Control and connection		
outputs with 4 pole measurement (sense lines)	galvanically isolated, short-circuit proof, insulated from PE	
Max. number of power supply units controllable by one control centre.	up to 32 power supplies can be controlled simultaneously	
Max. number of power supply units installed in one control centre.	max. 1 power supply	800 W or 1,500 W; 3,000 W power supply units must be integrated in the TechCube or in large 19-inch or 6 U cockpits or table-top setups for space reasons and are wired to corresponding insert plates or connection panels.
Outputs		
max. output power	depending on model	800 W, 1.500 W or 3.000 W
max. output power with 800 W and 1.500 W	depending on model	0-12, 0-15, 0-24, 0-30, 0-36, 0-48, 0-60 V
max. output power with 3.000 W	depending on model	0-150, 0-200, 0-250, 0-300, 0-400 V
max. output power with 800 W	depending on model	0-13, 0-16, 0-22, 0-26, 0-33, 0-53, 0-66 A
max. output power with 1.500 W	depending on model	0-25, 0-31, 0-41, 0-50, 0-62, 0-100, 0-125 A
Output sockets for currents	to 32 A	via any two 4 mm laboratory sockets with disappearing effect
	from 32 A to 80 A	High-current outlet Order no. EL6.ZG007.P1DC80 two 6/4 mm safety laboratory sockets
	to 125 A	High-current outlet Order no. EL6.ZG007.P1DC125 two 6 mm safety laboratory sockets
Output sockets for sense lines (series)	to 32 A	via illuminated laboratory sockets with disappearing effect of the control centre
	from 32 A to 125 A	High-current outlet Order no. EL6.ZG007.P1DC80 or EL6.ZG007.P1DC125 sense connections with two 4 mm safety laboratory sockets
Measured value acquisition		
Residual ripple at 800 W	depending on model, at 20 MHz, 0.1µF & 47µF parallel capacity	approx. 40-200 mVeff
Residual ripple at 1.500 W	depending on model, at 20 MHz, 0.1µF & 47µF parallel capacity	approx. 40-200 mVeff
Residual ripple at 3.000 W	depending on model, at 20 MHz, 0.1µF & 47µF parallel capacity	approx. 500-1200 mVeff
Voltage tolerance at 800 W		ca. +- 2%
Line regulation		ca. +- 1%
Settling time, with load jump from 0-100%		• 100 ms at fill load (800 / 1.500W) • 50 ms at full load (3.000 W)

DC Power Supplies

Specification	Category or characteristics	Technical dats and details
Functions and extensions		
Ramp function editable on the 8-inch display or on the 7-inch display	Convenient input of the ramp parameters on the large 8-inch / 7-inch display. Setpoint, rate of rise, dwell time, current limits/voltage limits	1. voltage ramps with current limitation 2. current ramps with voltage limitation
Constant voltage and constant current source	Can also be used as a constant current source	CV / CC
Preset function (output OFF/ON)	All outputs can be switched on and off	Ring bushing illumination / disappearing effect
Programmable and editable OVL and OCL function	OVL = Over Voltage Limit OCL = Over Current Limit	
Graphic data logger – 5-channel with zoom function (standard)	100.000 measured values per channel	Simultaneous display of 5 signals or curves, max. 500,000 measured values can be stored; recording speed: 0,01 sec.
Limiter – with trigger and control interface start of measurement by trigger pulse	Freely programmable with limit value monitoring below, within, above with free selection of outputs, trigger inputs via digital inputs.	• 8 digital Inputs • 10 digital outputs (active high/low)
Current and voltage measurement at switch-on torque	This can be used to investigate the behaviour of the test specimen in the range of the switch-on torque.	recording of current and voltage
Power and energy measurement	Display of power and energy	in W or Wh
Safety		
Separate safeguarding	Monitoring: load, voltage and temperature	
Cooling	Fan	
Safety standards	Certification:	Certified UL 60950-1; EN 60950-1
		TÜV – type tested safety
Displays and interfaces		
Screen presentation	Graphical parallel display of the measured values with full screen mode. Graphical display of the measured values is always possible with any other screen display.	• optimal monitoring of the actual values U/I • X-Y zoom function in the graph area • measured values can be saved and loaded
Web server and VNC	1:1 display on PC, tablet, smartphone; With VNC, complete device functionalities remotely controllable.	• no software installation necessary • works with all commercially available browsers • no learning time and immediate continuation of work
Technical interfaces	acc. to technical specification control centre	all functions remotely controllable

Subject to technical and formal changes.

* All data apply at +23°C after 30 minutes warm-up time.

Digital Multimeter 5 3/4-digit, 40 A, Dual Measurement U/I

Specification	Category or characteristics	Technical dats and details
Anwendung		
Measurement of electrical quantities	Industry and education alike	Research and development, basic education and advanced electrotechnical instruction. Also ideal for error-free detection of non-sinusoidal signals.
Installation		
	integrated optionally in:	• large control centre EL6.1 • small control centre EL6.1C • Connection panels *basic* and *acto* • slave Universal EL6.ZG005.Z • slave Compact EL6.ZG004.Z
Technical principle		
revolutionary measurement technology with real-time metering through own intelligence	self-sufficient microcontroller unit, completely calibrated and replaceable at any time, Inde-pendent of control centre (master)	• galvanically isolated • short circuit proof
Control and connection		
	4 laboratory sockets with ring socket illumination and disappearing effect	
max. number of digital multimeters controllable by one control centre	up to 32 digital multimeters controllable at the same time	
max. number of digital multimeters installed in a control centre	max. 1 digital multimeter Further digital multimeters are integrated in the additional slave Compact Order no. EL6.ZG004.Z and Universal Order no. EL6.ZG005.Z.	
Functions		
Voltage measurement	DC: 0 to 1000 V	1 µV; ± 0,08 % + 5 dgt.
	AC: 0 to 750 V (Peak 1060 V)	1 µV; ± 0,5 % +10 dgt.
Current measurement	DC: to 32 A continuous current (short to 40 A)	100 nA; ± 0,15 % + 5 dgt.
	AC: to 32 A continuous current (short to 40 A)	400 uA; ± 1,5 % +10 dgt.
Simultaneous measurement of voltage and current	in a circuit and with an earth pull	• saving of a digital multimeter • for AC and DC equally
Resistance measurement	0 to 40 MΩ	1 MΩ; ± 2 % + 5 dgt.
Capacity measurement	0 - 400 nF / 4 / 40 µF 400 µF	1 µF; ± 3,0 % + 10 dgt. 1 µF; ± 8,0 % + 10 dgt.
Frequency measurement	0 to 100 kHz	± 0,1 % +10 dgt
Temperature measurement	- 200 to + 600 °C,	depending on sensor, resolution 0,1 °C
	Accuracy:	class B after EN 60751; Pt 100 sensor or Pt 1000
		sensor can be connected (automatic detection)
Diode test	display of forward voltage	
Continuity test	acoustic support	
Auto range	for all measurands	
True RMS function – measure high-frequency signals reliably and error-free!	High-quality true r.m.s. measurement of non-sinusoidal signals due to very high crest factor.	Crest factor 5; new measuring method with optimised linearity and bandwidth.
Graphic data logger – 5-channel with zoom function (standard)	100.000 measured values per channel	Simultaneous display of 5 signals or curves, max. 500,000 measured values can be stored; recording speed: 0,01 sec.
Limiter – with trigger and control interface start of measurement by trigger pulse	Freely programmable with limit value moni-toring below, within, above with free selection of outputs, trigger inputs via digital inputs.	• 8 digital Inputs • 10 digital outputs (active high/low)

Digital Multimeter 5 3/4-digit, 40 A, Dual Measurement U/I

Specification	Category or characteristics	Technical dats and details
Displays and interfaces		
Data display	5 3/4-digit, display range 400,000 points	
Screen presentation	Graphical parallel display of the measured values with full screen mode. Graphical display of the measured values is always possible with any other screen display.	• optimal monitoring of the actual values U/I • X-Y zoom function in the graph area • measured values can be saved and loaded
Web server and VNC	1:1 display on PC, tablet, smartphone; With VNC, complete device functionalities remotely controllable.	• no software installation necessary • works with all commercially available browsers • no learning time and immediate continuation of work
Technical interfaces	acc. to technical specification control centre	all functions remotely controllable

1-phase Power and Energy Meter up to 24 kW incl. Digital Multimeter (see above)

Specification	Category or characteristics	Technical dats and details
Anwendung		
Measurement of high electrical 1-phase power and energy	Industry and education alike	Precise power measurement, even of non-sinusoidal signals through high crest factor 5 with simultaneous use of all digital multimeter functions.
Installation (corresponding to digital multimeter)		
Performance data		
Active power	24 kW to + 24 kW at 750 V AC - 7,5 kW to + 7,5 kW at 230 V AC, (short 9,2 kW)	Accuracy: ± 0,2 % +10 dgt
Active energy	- 24 kWh to + 24 kWh at 750 V AC - 7,5 kWh to +7,5kWh at 230 V AC, (short 9,2 kWh)	Accuracy: ± 0,2 % +10 dgt
Apparent power	0 to 24 kVA at 750 V AC - 7,5 kVA to + 7,5 kVA at 230 V AC, (short 9,2 kVA)	Accuracy: ± 0,4 % +10 dgt
Apparent energy	0 to 24 kVAh at 750 V AC 0 to 7,5 kVAh at 230 kV AC, (short 9,2 kVAh)*	Accuracy: ± 0,4 % +10 dgt
Reactive power	- 24 kvar to + 24 kvar at 750 V AC - 7,5 kvar to + 7,5 kvar at 230 V AC, (short 9,2 kvar)*	Accuracy: ± 0,2 % +10 dgt
Reactive energy	- 24 kvarh to + 24 kvarh at 750 V AC - 7,5 kvarh to + 7,5 kvarh at 230 V AC, (short 9,2 kvarh)	Accuracy: ± 0,2 % +10 dgt
Auto range	for all measurands	
True RMS function – measure high-frequency signals reliably & error-free!	High-quality true r.m.s. measurement of non-sinusoidal signals due to very high crest factor	Crest factor 5; new measuring method with optimised linearity and bandwidth.
Power factor	cos phi from -1 to +1 and simultaneous angle display	
Frequency display	in Hz	
Crest factor display	for voltage and for current	
Further functions, data and interfaces (according to digital multimeter)		

Subject to technical and formal changes.

* All data apply at +23°C after 30 minutes warm-up time.

Dual Function Generator 40 MHz, 30 Vpp, Free Modulation

Specification	Category or characteristics	Technical dats and details
Application		
Generation of fast small signals in electrical engineering	Industry and education alike	Research and development, basic and advanced electrotechnical education. Broadband use due to high frequency spectrum and high amplitude. Detection of high-frequency signals up to 1.5 GHz.
Installation		
	integrated optionally in: *(Depending on the other installed devices and the remaining laboratory sockets of the control centre.)*	• large control centre EL6.1 • small control centre EL6.1C • Connection panels *basic* and *acto* • slave Universal EL6.ZG005.Z • slave Compact EL6.ZG004.Z
Technical principle		
Two independent programmable function generators in one unit.	Ideal for free modulation of any signals.	More modulation possibilities compared to conventional function generators. Each waveform of the 1st function generator can be modulated with any other waveform of the 2nd function generator in all modulation modes.
Operating principle	direct digital synthesis (DDS)	high frequency stability and low distortion signals
Control and connection		
max. number of dual-function generators controllable by one control centre	up to 32 dual-function generators simultaneously controllable	
max. number of function generators installed in a control centre	max. 1 dual-function generator, further dual-function generators are inserted in the additional slaves Compact Order no. EL6.ZG004.Z and Universal Order no. EL6.ZG005.Z.	
Output		
2 BNC sockets with ring socket illumination and disappearing effect	Output 1:	30 Vss
	Output 2:	5 V TTL compatible
Input		
2 BNC sockets with ring socket illumination and disappearing effect	Input 1: (optional to 1,5 GHz: Order no. EL6.F1G)	Counter input extermal input signals up to 150 MHz; Input sensitivity: 100 mVeff to 5 Veff
	Input 2:	Trigger input for defined signal start active high / low freely selectable
Waveforms and frequencies		
	Sine:	1 µHz to 40 MHz!
	Trapeze:	1 µHz to 5 MHz
	Ramp:	1 µHz to 5 MHz
	Triangle:	1 µHz to 5 MHz
	Sawtooth:	1 µHz to 5 MHz
	Rectangle:	1 µHz to 5 MHz
Functions		
Puls	Single pulse:	Single and multiple pulses to 999 s
	Burst mode can be programmed as required by parameter:	Pulse and pause times: to 999 s Number of repetitions: 1 to ∞
Trigger puls	Extern:	via BNC socket (active high or low / active high and low)
	Intern:	via menu for defined signal start by selecting active high, low or high and low.
Amplitude	Resolution all waveforms: 14 Bit (16.384)	Output: 0-30 Vss, 50 Ω from 0-20 MHz,1,8 mV resolution
		Output: 0-20 Vss, 50 Ω from 0-40 MHz,1,2 mV resolution
Offset		0 bis ± 15.000 V
Duty cycle		0,1 to 99,9 %
Distortion factor	Sine: 0 MHz to 1 MHz	< 0,04 %
	Sine: 1 MHz to 20 MHz	< 0,07 %
	Sine: 20 MHz to 40 MHz	< 0,5 %
Ascent and descent time	Rectangle:	≤ 9ns

Dual Function Generator 40 MHz, 30 Vpp, Free Modulation

Specification	Category or characteristics	Technical dats and details
Modulation		
Freely programmable modulation due to two independent function generators	Generator 1: freely programmable carrier signal (carrier)	All waveforms, frequencies and amplitudes are freely available for freely available for modulation.
	Generator 2: freely programm. useful signal (modulation)	All waveforms, frequencies and amplitudes are freely available for freely available for modulation.
Modulation types (carrier / useful signal)	Amplitude Modulation – AM Frequency Modulation – FM Pulse Width Modulation – PWM Amplitude Shift Keying – ASK, digital modulation Frequency Shift Keying – FSK, digital modulation Sweepmodulation (special form of FM)	
Modulation depth 0-100 % adjustable	at Amplitude Modulation – AM	Amplitude of the modulated signal reduced by a percentage
	at Frequency Modulation – FM	Frequency of the modulated signal reduced by a percentage
	at Pulse Width Modulation – PWM	Duty cycle of the modulated signal reduced by percentage
Displays and interfaces		
Screen presentation	Large graphic display of the respective waveform	
Web server and VNC	1:1 display on PC, tablet, smartphone; With VNC, complete device functionalities remotely controllable.	• no software installation necessary • works with all commercially available browsers • no learning time and immediate continuation of work
Technical interfaces	acc. to technical specification control centre	all functions remotely controllable

Fast Dual Signal Arbitrary Generator incl. Dual Function Generator

Specification	Category or characteristics	Technical dats and details
Application		
Generation of any small signals in electrical engineering	Industry and education alike	Free signal generation and simulation of any signal shapes with free parameterisation.
Installation (corresponding to dual function generator)		
Technical principle (corresponding to dual-function generator)		
Control and connection		
max. number of arbitrary generators by max. one control centre controllable	up to 32 arbitrary generators can be controlled simultaneously	
max. number of arbitrary generators installed in a control centre	max. 1 arbitrary generator generator	
Functions		
Waveforms	arbitrary waveform: 2 free memory locations for arbitrary waveforms	max. total of 8,192 sample points can be stored
Signal shape transmission	via LAN, USB and WLAN interface	By saving a table of an oscilloscope on the PC and transferring it to the instrument by means of the software *highlink Power* or own transfer by means of corresponding SCPI commands.
Frequences	for sinusoidal signals	1 µHz to 40 MHz!
Amplitude	Resolution for all waveforms: 14 Bit (16.384)	Output: 0-30 Vss, 50 Ω from 0-20 MHz,1,8 mV resolution
		Output: 0-20 Vss, 50 Ω from 0-40 MHz,1,2 mV resolution
Offset		0 to ± 15.000 V
Duty cycle		0,1 to 99,9 %
Modulation		
	Free modulation of the arbitrary curves with all curve functions of the function generator.	Functionality corresponds 1:1 to the function generator
The arbitrary functions can be modulated with all other signal forms of the function generator. All types are available for both arbitrary signals.		
Further functions, data and interfaces (according to dual function generator)		

Subject to technical and formal changes.

* All data apply at +23°C after 30 minutes warm-up time.

AC Sources (electromechanically controlled, alt. electronically controlled with frequency adjustment)

Specification	Category or characteristics	Technical dats and details
Application		
	Industry and education alike	Research and development, basic and advanced advanced electrotechnical instruction, frequency converter technology, power electronics, motor control and much more.
Installation of power module		
	19-inch parts racks integrated optionally in:	19-inch unit superstructures and cockpits or in TechCubes (under-table mounting) as separate additional racks.
Device front / Connection Panel (3 selectable device fronts for all 19-inch power modules)		
	1. TSG glas front – device series elneos® six	• 100% scratch-resistant and vandal-proof, various sizes • for 3 / 6 U table tops and equipment cockpits
	2. aluminium front – device series *basic*	• various sizes • for 3 / 6 U table tops and unit cockpits
	3. aluminium – device series acto®	various sizes for Expand 2 aluminium extension profile (horizontal and vertical versions)
Control and connection		
max. number of AC sources controllable by 1one control centre	up to 32 AC sources can be controlled simultaneously	
max. number of AC sources installed in one control centre	max. 1 piece 1-phase AC source of the power sizes up to 780 W	All other power sizes are integrated into the 19-inch subracks.
Versions		
	1- and 3-phase models	not ungrounded, alternatively ungrounded
	Optional rectifier:	1-phase: bridge rectifier RW 48%
		3-phase: three-phase bridge rectifier RW 5%
Control electronics		
	electromechanical control electronics	1- and 3-phase
	alternatively electronic control with various output frequency	1-phase
Output data with electromechanical control electronics (switchable between voltage and current control)		
	1 phase:	120 W to 4,8 kW
	Output voltages / output currents:	0 from 300 V AC / 1 A to 16 A
	3-phase:	900 W to 5,6 kW
	Output voltages / output currents:	0 to 720 V AC / 1 A to 14 A
	Motor:	high-quality and noiseless drive
	Setting accuracy:	< ± 1,5 % v. E. in case of load change or 10% grid fluctuation
	Standard time:	approx. 1 sec. at 10% grid fluctuation
	Setting time:	approx. 5 sec. from 2 to 260 V or 400 V
	Measurement accuracy for voltage and current:	14 Bit resolution
Output data for electronic control (incl. frequency setting)		
	1 phase:	780 VA oder 1.300 VA (see order information p. 100)
	Output voltages / output currents:	0 to 260 V / 3 A or 5 A
	Adjustable frequencies:	50, 60, 400 Hz
	Power factor:	0,95 %
	Accuracy:	< ± 0,7 % v. E. in case of load change from 0 to 100%
	Setting time:	0,1 seconds

AC Sources (electromechanically controlled, alt. electronically controlled with frequency adjustment)

Specification	Category or characteristics	Technical dats and details
Outputs (safety outputs)		
	4 mm laboratory sockets, intelligently backlit function labels with disappearing effect. A very useful safety function for high voltages and currents. Incl. flashing function of the ring socket illumination.	Function labelling for L1, L2, L3, N, PE, plus and minus as well as symbols for earth-free outputs and visualisation of active output sockets incl. flashing functions.
	On/off function, flashing function, different colours per laboratory socket	Highest contacting safety due to variable control of the disappearing effect.
Functions		
Ramp function editable on the display	Convenient input of the ramp parameters on the 8-inch or 7-inch display. Setpoint, rate of rise, dwell time, current limits / voltage limits.	1. voltage ramps (voltage source with current limitation) 2. current ramps (current source) with voltage limitation
Constant voltage and constant current source	The AC sources can be operated voltage- or current-regulated.	
Preset function (output OFF/ON)	All outputs can be switched on and off.	Ring bushing illumination / disappearing effect
Programmable OVL and OCL function	OVL = Over Voltage Limit OCL = Over Current Limit	
Graphic data logger – 5-channel with zoom function (standard)	100.000 measured values per channel	Simultaneous display of 5 signals or curves, max. 500,000 measured values can be stored; recording speed: 0,01 sec.
Limiter – with trigger and control interface start of measurement by trigger pulse	freely programmable with limit value monitoring below, within, above with free selection of outputs, trigger inputs via digital inputs	• 8 digital Inputs • 10 digital outputs (active high/low)
Measuring functions (incl. power meter 1- and 3-phase)		
	Display of all relevant measurement data	All values numerically and graphically in the display
	Voltages AC:	Lx-N [V]
	Current AC:	Ix [A]
	COS Phi from -1 to +1	Simultaneous angle display
	Frequency:	in Hz
	Power:	Active power: P [W]
		Apparent power: S [VA]
		Reactive power: Q [VA]
	Energy:	Active energy: P [Wh]
		Apparent energy: S [VAh]
		Reactive energy: Q [VAh]
Measurement accuracy	14 Bit resolution	high-quality TRMS converters for current and voltage
Displays and interfaces		
Screen presentation	Graphical parallel display of the measured values with full screen mode. Graphical display of the measured values is always possible with any other screen display.	• optimal monitoring of the actual values U/I • X-Y zoom function in the graph area • measured values can be saved and loaded
Web server and VNC	1:1 display on PC, tablet, smartphone; With VNC, complete device functionalities remotely controllable.	• no software installation necessary • works with all commercially available browsers • no learning time and immediate continuation of work
Technical interfaces	acc. to technical specification control centre	all functions remotely controllable

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Note: Page references in bold refer to the respective order pages.

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