![BOPLA logo](A Phoenix Mecano Company)

BOPLA

A Phoenix Mecano Company

THE RED BOOK
COMPACT

interactive

BOPLA
enclosures ■ content matters

interactive

**Take action now.
Here's what to do!**

This brochure is linked with so-called Augmented Reality (AR) contents. By using our BOPLA app, you can experience our products in 3D, and you can make video clips out of single images!

1. Download the BOPLA app from the QR code below, or search for "BOPLA" on Google Play/iTunes.

2. From the app, select "AR-SCAN".

3. Move your smart phone/tablet over an AR object. You can recognise this by the following symbol: AR

Have fun discovering our products and services!

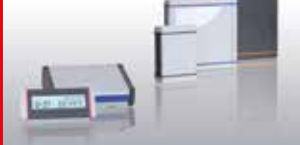for Android   for iOS

From Alubos to accessories.

All enclosures at a glance!

This brochure provides you with a compact overview of our product range.

Here is an overview of the enclosures.

Can't find a suitable enclosure? Then we will create your own individual enclosure.

Looking for a suitable membrane keypad / HMI?

Just let us offer you our all-round service: System integration.

Experience all of BOPLA's services in our interactive overview!

BOPLA
enclosures ■ content matters

A Phoenix Mecano Company

At home
in a wide range
of different sectors.

Measurement and control technology

Whether for devices for data recording
and transfer, for power testing and supply
or for measuring water and air quality – all of them
protect your electronics by using application-specific enclosure solutions.
The individual requirements vary depending on the application. Normally a visually
attractive design and large areas for fitting operating units such as keys or displays
are required.

Machinery and plant engineering

Automatic machine controls, hand-held
devices for operating machines and plant,
devices for data acquisition during
production – these are typical
examples of applications for electronic enclosures. Normally these are exposed to the
rough ambient conditions found in industrial production. This is why they require a
high level of ingress protection (IP) and impact resistance (IK). For this reason they
should be durable and wear-resistant.

Audio, video and lighting technology

In the case of electronics enclosures
for use in event technology, high levels
of functionality, large areas for the fitting of
keys and displays, and an elegant design are all decisive criteria.

Railway technology

The requirements made of electronics enclosures used in rail vehicles are especially high.
They must comply with the strict test specifications of railway standard DIN EN 45545.
Not a problem for BOPLA's UL 94 V-0 polycarbonate enclosures.
They are flame retardant and self-extinguishing. For rail use, the materials of our electronic enclosures correspond to requirement set R 22 according to DIN EN 45545-2,
hazard level HL 3.

Medical technology

Hygiene is of paramount importance
in medical technology. For this reason,
enclosures used in this sector must in general have easy-to-clean surfaces.
This is especially important for diagnostic devices or analysers found in operating theatres. The same applies to peripheral devices for data recording in the laboratory or research. In order to provide protection against bacteria, enclosures can additionally be fitted with antimicrobial membrane keypads and decor foils.

Agricultural technology

Modern agriculture without electronics? Hard to imagine!
Nowadays, feeding systems, agricultural machinery
or also climate control of greenhouses are
controlled automatically. Electronics enclosures used in this sector must be very tough. High levels of ingress protection and good impact protection are required. Enclosures made of UL 94 V-0 polycarbonate and aluminium can score here.

Renewable energies

Whether wind or solar equipment, hydroelectric power
stations or e-mobility – without inverters and electronic controls,
power is not fed into the public grid and to the end users.
These devices, and also the switchgear, are exposed to wind, weather and UV radiation. A high level of IP protection and, for use in offshore plant, excellent resistance against the corrosive force of salt water, are important features which the enclosures must provide.

Automotive engineering / aviation

Automation is constantly increasing in the field of automotive technology. Today, many processes take place automatically – for example, they simplify the work of drivers of construction machines. Vehicle data are recorded in transport technology and local public transport and then transferred to control centres. At the same time, electronic control and alarm devices increase the safety level for everybody involved. The electronics and sensor equipment needed for this calls for protective enclosures which satisfy the wide range of requirements for mobile use.

Safety and building technology

In modern office buildings or apartment buildings,
but also increasingly in private homes, computers are
taking over control of heating and ventilation equipment and also other infrastructure such as lighting, alarm systems or telecommunications. In smart homes they also network and control household devices and consumer electronics.

Process industry
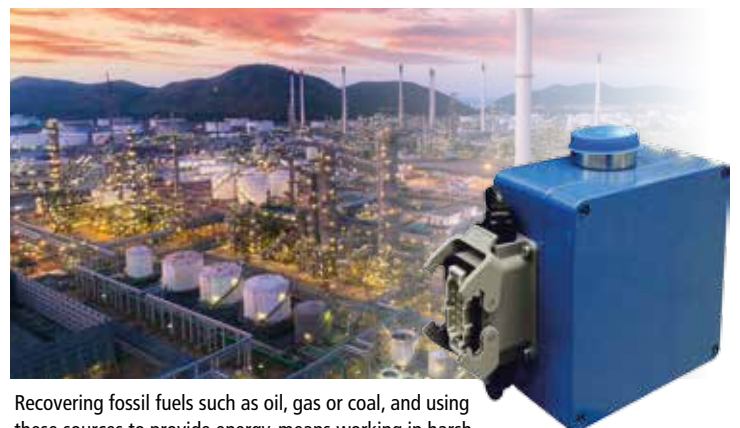
Recovering fossil fuels such as oil, gas or coal, and using
these sources to provide energy, means working in harsh
conditions. Devices used in the chemicals processing industry or on oil drilling rigs and platforms must respond in a very robust way to dust, all kinds of liquids, and mechanical influences. Of course, this also applies to electronics enclosures which are used in these sectors.

5

BoTouch

AR

- BoTouch Plastic (BTK / BTK-IP), optimised for capacitive touch screens (from 4.3" to 10.4")
- BoTouch Aluminium (BTA), optimised for resistive touch screens (from 5.7" to 12.1")
- Project-specific variants on request
- Enclosure front / front membrane: backprinted or printed for specific projects
- Rear hood / enclosure frame fitted with clamps for panel installation
- Project-specific display retaining plate made of aluminium (the following are required for preparation work: sample, CAD data or a datasheet for the touch/display combination.)
- Starter kits consisting of an enclosure incl. a mounted display are available for various versions (BTK: 5", 7"; BTA: 5.7", 7")

Colour:
BTK / BTK-IP: black, similar to RAL 9005; BTA: customer- specific

Protection class:
Up to IP 65 / DIN EN 60529 possible for the installation area

Enclosure material:
Rear hood: galvanised sheet steel
BTK enclosure frame: PC UL 94 V0
BTK-IP enclosure frame: PA 6.6 GF 30 UL 94 V-0
BTA front frame: aluminium (anodised or powder-coated)

Botego

AR

- 4 basic sizes
- For horizontal or vertical use
- 3 standard heights
- Other heights available by using extension sets
- Design with or without air vents
- Locking of the enclosure parts; also screwable (option)
- Design elements and caps in 6 colours
- Angled front (option)
- Front / rear panel, aluminium, plug-in and screwable

- Good stackability
- Flat wall mounting possible

Colour:
Light grey, similar to RAL 7035; special colours on request

Protection class:
Plain: IP 40 / DIN EN 60529;
with air vents: IP 30 / DIN EN 60529

Enclosure material:
ABS

Detailed product information can be found on **www.bopla.de**

Ultramas

AR+

- 5 basic sizes
- Aluminium or plastic front/rear panels
- Horizontal or vertical insertion
- Different heights by use of extension sets
- Version with or without air vents
- 19" internal assemblies on request
- Flat wall mounting possible
- Comprehensive range of accessories

Colour:
Light grey, similar to RAL 7035; screw covers, brackets and feet agate grey, similar to RAL 7038; special colours on request

Protection class:
Plain: IP 4 0/ DIN EN 60529;
with air vents: IP 30 / DIN EN 60529

Enclosure material:
ABS

Aluplan

AR+

- 2 heights
- Individually adjustable length and width
- 16 standard sizes for each height ex warehouse
- Aluminium baseplates and top covers
- Good EMC characteristics
- Wide range of accessories

Colour:
Aluplan 50: black, similar to RAL 9005; Aluplan 100: light grey, similar to RAL 7035; special colours on request
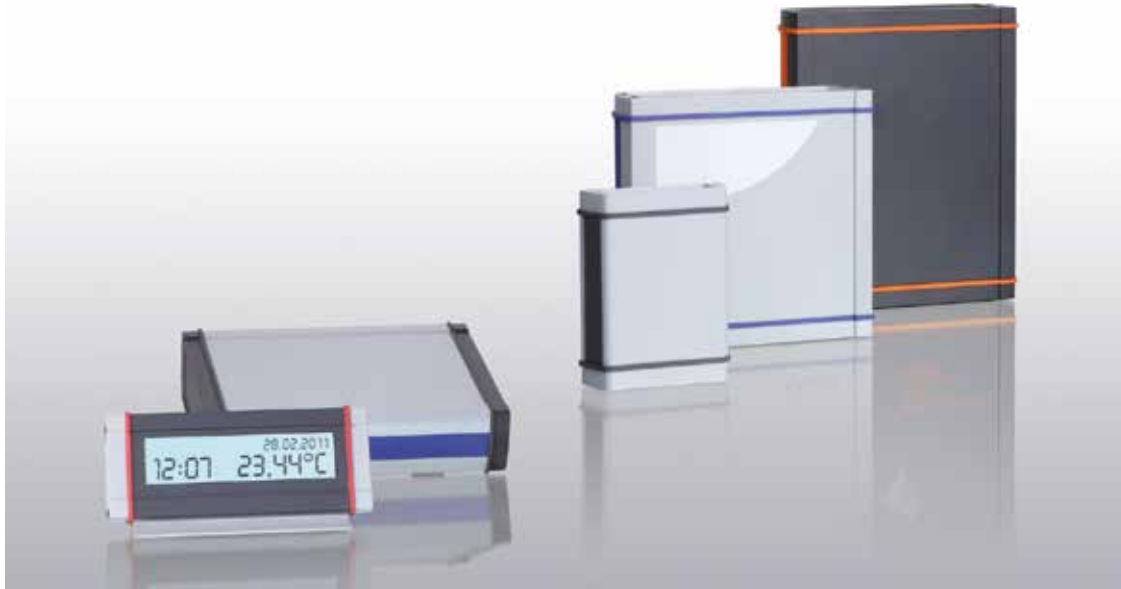
Protection class:
IP 65 / DIN EN 60529

Enclosure material:
Extruded profiles: Al Mg Si 0.5 powder-coated; corners: diecast zinc ZnAl 4 Cu 1, powder- coated; corner caps: PA-GF 15, corner seal TPV / TPE; sponge rubber seal (EPDM) in profile groove

Alustyle

AR+

- 3 profile variants (closed, divided, U-shaped)
- 4 profile cross-sections
- Standard lengths ex warehouse
- Special lengths available at short notice
- Functional diecast zinc end covers
- Ingress protection up to IP 67
- Good EMC shielding
- Powder-coating, depending on type, similar to RAL 7024 or 9006
- Design seals in 5 colours
- Special colours on request
- Wide range of accessories

Colour:
Graphite grey, similar to RAL 7024 or silver, similar to RAL 9006; dark grey seal; special colours on request
Protection class:
ASP: up to IP 66 / IP 68 – 1.2 m (2 hours) / DIN EN 60529 for ASD use; ASPH: IP 65 / DIN EN 60529; ASPU: IP 40 / DIN EN 60529
Enclosure material:
Extruded profiles: Al Mg Si 0.5 powder-coated; diecast lid: zinc alloy Z410, powder-coated; seal: TPE

Alubos

AR+

- 3 profile variants (closed, divided, U-shaped)
- 9 profile cross-sections
- Standard lengths ex warehouse
- Special lengths available at short notice
- Functional diecast aluminium end covers
- Good EMC shielding
- Design seals in 5 colours
- Wide range of accessories

Colour:
Black, similar to RAL 9005; special colours on request
Protection class:
ABP, ABPH: up to IP 65 / DIN EN 60529; ABPU: IP 40 / DIN EN 60529
Enclosure material:
Extruded profiles: Al Mg Si 0.5 powder-coated; diecast lid: GB Al Si 12, powder-coated; seal: TPE

Detailed product information can be found on **www.bopla.de**

BOS-Ecoline

AR

- 3 profile variants (closed, divided, U-shaped)
- 4 profile cross-sections
- 3 standard lengths ex warehouse
- Special lengths available at short notice
- End covers made of ABS, similar to RAL 7037
- End covers also available with moulded-on wall fitting
- Console type on request

Colour:
Profile natural-coloured anodised aluminium; plastic lid dust grey, similar to RAL 7037; special colours on request
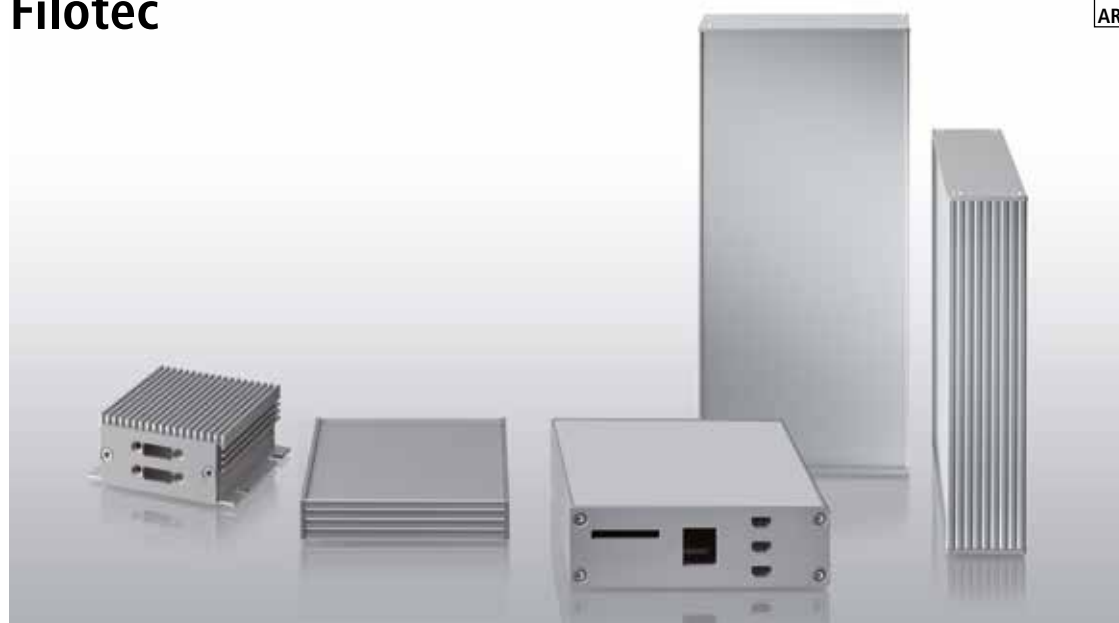
Protection class:
IP 40 / DIN EN 60529; ELP with optional seal, upgradable to IP 54 / DIN EN 60529; ELPH with IP 54/DIN EN 60529 on request

Enclosure material:
Extruded profiles: Al Mg Si 0.5 anodised; plastic lid: ABS

Filotec

AR

- More than 100 standard enclosures, comprised of 6 widths, up to 6 heights, 3 variants and various standard lengths
- Profile variants: Variant with membrane keypad area (1 mm and 1.5 mm), variant with cooling fins, variant with moulded-on wall brackets
- Special lengths available at short notice
- Anodised aluminium end cover

Colour:
Natural-coloured anodised

Protection class:
IP 40 / DIN EN 60529

Enclosure material:
Al Mg Si 0.5 anodised

BoPad

AR+

- 5 basic sizes
- 2 colours
- Flat or inclined variants
- Battery compartment variants up to BOP 900
- Design seal optional
- Impact protection optional
- Optimised for the integration of touch screens or displays (BOP 7.0 / 10.1)
- Direct VESA fitting possible (BOP 7.0 / 10.1)

Colour:
Black, similar to RAL 9005; White, similar to RAL 9016;
Special colours on request

Protection class:
IP 40; with seal: IP 65 / DIN EN 60529

Enclosure material:
Enclosures: ABS
Seal / impact protection: TPE

BOS-Streamline

AR+

- 6 basic sizes
- 2 colours
- Flat or inclined design by turning the enclosure half-shells
- Lid optionally with display screen (DIS) or continuous membrane area (F)
- Versions with or without battery compartment
- Optional impact protection/decor seal in 5 colours

Colour:
Graphite grey, similar to RAL 7024 or light grey, similar to RAL 7035; special colours on request

Protection class:
Up to IP 65 / DIN EN 60529, depending on the model

Enclosure material:
ABS, decor seal made of TPE

Detailed product information can be found on **www.bopla.de**

Bopla-Arteb

AR⁺

- 6 sizes
- End caps in six colours
- Caps made of infrared-permissible material
- Various battery compartments
- Definable access protection
- Versions with display cut-out or continuous membrane keypad area
- Comprehensive range of accessories

Colour:
Agate grey, similar to RAL 7038; special colours on request

Protection class:
IP 40 / DIN EN 60529;
ART 225 to 865: use seal set to upgrade to IP 65 / DIN EN 60529

Enclosure material:
Enclosure and caps made of ABS, seal made of TPE

BOS

AR⁺

- 8 sizes
- Various designs
- Enclosure with display cut-out or continuous membrane keypad area
- Various battery compartments
- With matching desktop and charging station, depending on model

Colour:
Depending on the model: black, similar to RAL 9005, or agate grey, similar to RAL 7038; special colours on request

Protection class:
Depending on the model: IP 40 / IP 65 / DIN EN 60529

Enclosure material:
ABS, seal made of CR

Circum

- 3 basic sizes
- 3 variant versions
- 2 colours
- Consistent design and screwing system concept
- Enclosure screwing system concealed by cover panel
- Cover panels in different colours
- Lids available with moulded-on front panels
  or plug-in front panels
- Up to 3 PCB levels possible

- Wall brackets as an accessory
- Frame for wall fitting of the
  control panel mounting types

Colour:
Graphit grey, similar to RAL 7024 or agate grey, similar to RAL 7038; special colours on request

Protection class:
IP 40 / DIN EN 60529

Enclosure material:
ABS

Elegant

- 7 sizes
- With or without air vents
- Versions with display screen or continuous membrane surface
- Plastic or aluminium front panels (optional)
- Integrated wall hanging system
- Separate wall brackets (optional)
- Depending on the model, screws for lid fixing from above and quick-release
  fasteners are available

Colour:
Lid: light grey, similar to RAL 7035; base, covers and front panels: agate grey, similar to RAL 7038; special colours on request

Protection class:
IP 40 / DIN EN 60529; higher protection on request (EG..., EG...F)

Enclosure material:
PS (polystyrene)

Detailed product information can be found on **www.bopla.de**

Element / Universal

- 12 sizes of the Element; 3 sizes of the Universal
- With air vents and / or recessed membrane keypad area, depending on design
- S version with snap lock
- A version with aluminium front panel in lid
- Depending on the model, lid screwing systems from above and quick-release fasteners are available

Colour:
Lid: light grey, similar to RAL 7035; base graphite grey, similar to RAL 7024; special colours on request

Protection class:
Plain: IP 40 / DIN EN 60529;
with air vents: IP 30 / DIN EN 60529

Enclosure material:
PS (polystyrene)

Alu-Topline

AR⁺

- 4 standard lengths; flexible length design available
- 2 heights
- More dimensions on request
- Horizontally-divided profiles for easy mounting
- Recessed membrane keypad area in the lid
- Mounting grooves inside
- „Invisible" wall fitting as accessory

Colour:
Natural-coloured anodised aluminium profile; plastic lid quartz grey, similar to RAL 7039 or graphite grey, similar to RAL 7024; special colours on request

Protection class:
IP 40 / DIN EN 60529; IP 54 / DIN EN 60529 as an option

Enclosure material:
Extruded profiles: Al Mg Si 0.5 anodised; plastic lid: ABS

Bocard

AR

- 5 sizes
- 2 heights
- UL 94 V0 types on request
- 6 different fronts
- Optional terminal compartment, flexible positioning, separable
- Comprehensive range of accessories allows versatile applications

Colour:
Graphite grey, similar to RAL 7024; light grey, similar to RAL 7035; special colours on request

Protection class:
Depending on the model up to IP 66 / IP 68 – 1.2 m (2 hours)

Enclosure material:
ABS, PC; seal: CR or PU foamed;
UL 94 V0 types on request

RegloCard-Plus
Combifront
Inter Card

VARIANTS
UL 94 V-0
ex-warehouse

AR

- 8 sizes, each in 6 versions
- 3 different fronts
- Metric or PG pre-punchings
- Terminal compartment can be sealed off
- Some enclosures with a UL 94 V-0 design are available ex-warehouse
- UL 94 V-0 material is suitable for external use (f1 listing in accordance with UL 746C) and corresponds to requirement set R 22 according to DIN EN 45545-2, hazard level HL 3
- F-version front element available separately for control panel mounting
- IC 5000 version with optimal insertion grooves for circuit boards

Colour:
Light grey, similar to RAL 7035; special colours on request

Protection class:
Up to IP 65 / DIN EN 60529, depending on the model

Enclosure material:
ABS, PC; seal made of EPDM; UL 94 V0 types on request

Detailed product information can be found on **www.bopla.de**

CombiCard 1000-3000
CombiSet 500

AR+

- 4 widths
- The depth can be varied by combining the components (not with CC 500)
- Various fronts
- Optional rear element with separate terminal compartment (not with CC 500)
- Definable access protection
- Installation of 19" components possible
- Comprehensive range of accessories

Colour:
Base elements light grey, similar to RAL 7035; front lid FD...G crystal-clear, front and rear elements graphite grey, similar to RAL 7024; special colours on request

Protection class:
Up to IP 65 / DIN EN 60529, depending on the version

Enclosure material:
ABS; PC (only crystal-clear lids), seal made of EPDM

CombiCard 5000-7000

AR+

- 3 widths
- The depth can be varied by combining the components
- Easy mounting of the system components
- Hinge and access position freely selectable in the whole system
- Various fronts
- Optional rear element with separate terminal compartment (also on both sides)
- Definable access protection
- Installation of 19" components possible
- Comprehensive range of accessories

Colour:
Lateral trims, front and base elements light grey, similar to RAL 7035; front lid FD...G, crystal-clear, rear elements agate grey, similar to RAL 7038; special colours on request
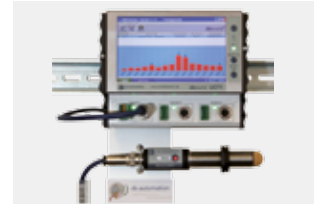
Protection class:
IP 66 / DIN EN 60529; with air vents IP 30 / DIN EN 60529

Enclosure material:
ABS; PC (only FD...G), seal made of CR

Alurail

AR

- 2 basic sizes
- 7 standard lengths
- Special lengths on request
- Variable positioning of the modules
- Can be used as single-PCB enclosure
- Design-matching wall fitting
- Earthing set as accessory

Colour:
Profile, natural-coloured anodised aluminium; profile caps light grey, similar to RAL 7035; special colours on request

Protection class:
Depending on enclosure design, up to IP 40 / DIN EN 60529

Enclosure material:
Extruded profiles: Al Mg Si 0.5, anodised
profile caps: polyamide 6.6 FR

Combirail

AR

- 3 basic sizes
- 3 standard lengths
- Special lengths on request
- Easy snap-on mounting
- 100 °C temperature resistance
- Design-matching wall fitting
- Potential earthing for DIN rail

Colour:
Profile: light grey, similar to RAL 7035;
lateral elements: black, similar to RAL 9005; special colours on request

Enclosure material:
Extruded profiles: polyamide PA-GF HT, UL 94 V0
lateral elements: polyamide PA, UL 94 V

Detailed product information can be found on **www.bopla.de**

CombiNorm-Compact / CombiNorm-Classic

AR⁺

- 8 sizes
- Various lid types
- Matching connection terminals as accessories
- DIN rail holder also for use as wall fitting
- Terminal approvals acc. to UL 1059, CSA 22.2 No. 158 and EN 60998
- Comprehensive range of accessories

Colour:
Light grey, similar to RAL 7035; special colours on request

Protection class:
Up to IP 40 / DIN EN 60529, terminals IP 20 / DIN EN 60529

Enclosure material:
ABS; UL 94 V0 material on request

CombiNorm-Connect

AR⁺

- 7 widths
- Minimal design width with a maximum number of poles
- Optimal proportional relationship between PCB surface area and enclosure size
- Standard scope of delivery includes front panels and transparent hoods
- DIN rail bus connectors with gold-plated contacts
- Spring-cage terminal blocks
- Screw connection terminal blocks, fixed and pluggable into one another

Colour:
Light grey, similar to RAL 7035; special colours on request

Protection class:
IP 20 / DIN EN 60529

Enclosure material:
Polyamide, UL 94 V0

Futura / Ultrapult / Portas / Bopult

AR+

- 15 variants
- Flat or console-shaped designs
- T 900 with collapsible display area
- Recessed, closed console area
- Console area open for separate front panel
- Aluminium or plastic rear panels

Colour:
Depending on the model: light grey, similar to RAL 7035 or black, similar to RAL 9005; Brackets and feet agate grey, similar to RAL 7038

Protection class:
Depending on the model: IP 40 / DIN EN 60529 or IP 54 / DIN EN 60529; higher protection class on request (EG..., EG...F)

Enclosure material:
ABS

Uninorm

AR+

- 36 sizes
- Fixing with screw or spring clamps
- Connecting piece for standard retaining clasps in accordance with DIN 43835 form B
- Comprehensive range of accessories

Colour:
Black, similar to RAL 9005; special colours on request

Protection class:
IP 40 up to IP 65 / DIN EN 60529, depending on the design

Enclosure material:
Modified PPE+PS (SE1 GFN1)

Detailed product information can be found on **www.bopla.de**

Bocube

AR

VARIANTS
UL 94 V-0
ex-warehouse

- Innovative and patented hinged catch technology without screws: open with a screwdriver, close by hand
- 22 sizes, 132 standard combination possibilities
- 2 material variants: ABS or PC UL 94 V-0, flame-resistant and self-extinguishing
- UL 94 V-0 material is suitable for external use (f1 listing in accordance with UL 746C) and corresponds to requirement set R 22 according to DIN EN 45545-2, hazard level HL 3
- Captive lid with membrane keypad area, available in 2 variants: grey or crystal-clear
- Elegant design, hinged quick-release catches available in different colours
- Excellent recyclability because of mono-material plastics without injection-moulded metal parts

Colour:
Graphite grey, similar to RAL 7024; light grey, similar to RAL 7035; special colours on request

Protection class:
IP 66 / IP 68 – 1.2 m (2 hours) / DIN EN 60529

Enclosure material:
ABS or PC UL 94 V0
PU-foamed seal

Euromas II

AR

- 29 sizes
- 2 materials: PC or ABS
- 2 lids: smooth or recessed with membrane keypad area
- Plug-in slots for PCBs
- Separate bosses for clamping rectangular PCBs
- Terminals and mounting on request
- Excellent recyclability because of pure-grade plastics without injection-moulded metal parts

Colour:
Light grey, similar to RAL 7035; special colours on request

Protection class:
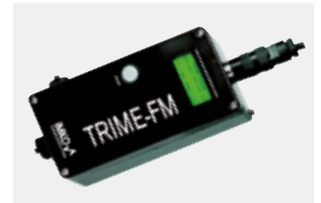IP 65 / DIN EN 60529; higher ingress protection on request

Enclosure material:
ABS, PC (UV stabilised); seal made of CR; UL 94 V0 types on request

Euromas ABS / PC

AR+

VARIANTS
UL 94 V-0
ex-warehouse

- 36 sizes
- 19 different M...V0 versions corresponding to UL 94 V0
- UL 94 V-0 material is suitable for outdoor use (f1 listing in accordance with UL 746C)
  and corresponds to requirement set R 22 according to DIN EN 45545-2, hazard level HL 3
- Terminals and mounting on request
- Fixing screws for DIN rails or mounting panels included in scope of delivery

Colour:
Light grey, similar to RAL 7035; special colours on request

Protection class:
Depending on the model: IP 65 or IP 66 / DIN EN 60529;
IP 67 available on request for some sizes

Enclosure material:
ABS, PC (UV stabilised) and selected sizes in PC UL 94 V0
(additional UL 94 V0 versions on request), seal made of CR

Bocube Alu

AR+

- 8 sizes
- Modern, elegant look in the well-known Bocube design
- All enclosure components made of metal
- Captive lid with smooth surface or membrane keypad area
- Hinge integrated in the enclosure design (manually-operated as an option)
- Hinge integrated in the enclosure design
- No visible enclosure screws
- Prepared for cost-efficient integration of pressure compensation elements
- Mounting space for rectangular front panels and rectangular, scored PCBs
- Terminals and mounting on request

Colour:
Light grey, similar to RAL 7035; Graphite grey, similar to RAL 7024;
special colours on request

Protection class:
IP 66 / IP 68 – 1.2 m (2 hours) / IP 69 DIN EN 60529

Enclosure material:
Enclosure: GD Al Si 12, seal PU foamed; Hinges / covers: Al Mg Si 0.5
powder-coated / natural- coloured anodised

Detailed product information can be found on **www.bopla.de**

Euromas Aluminium / F05

AR⁺

- 43 sizes
- Listing under UL file no. E 196 706
- The materials correspond to requirement set R1 or R7 according to DIN EN 45545-2, hazard level HL 3
- Versions with silicone lid seal with higher temperature resistance (approx. 200 °C)
- Versions with crystal-clear lid on request
- EMC package to increase the electromagnetic screening characteristics on request
- Versions with an aluminium or Vestamid F05 insertion opening

Colour:
Silver grey, similar to RAL 7001; special colours on request
V 215: black, similar to RAL 9005

Protection class:
IP 66 / DIN EN 60529, higher protection class on request
V 215: IP 65 / DIN EN 60529

Enclosure material:
G Al Si 12, PU foamed seal; V215: Vestamid, CR seal

Euromas Polyester

AR⁺

- 27 sizes
- Listing under UL file no. E 196 706
- Lid screws made of V2A
- Optional silicone lid seal with increased temperature resistance (approx. 130° C)
- Terminals and mounting on request

Colour:
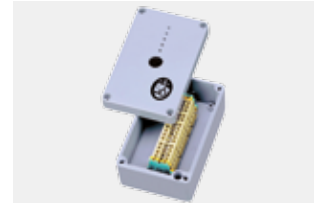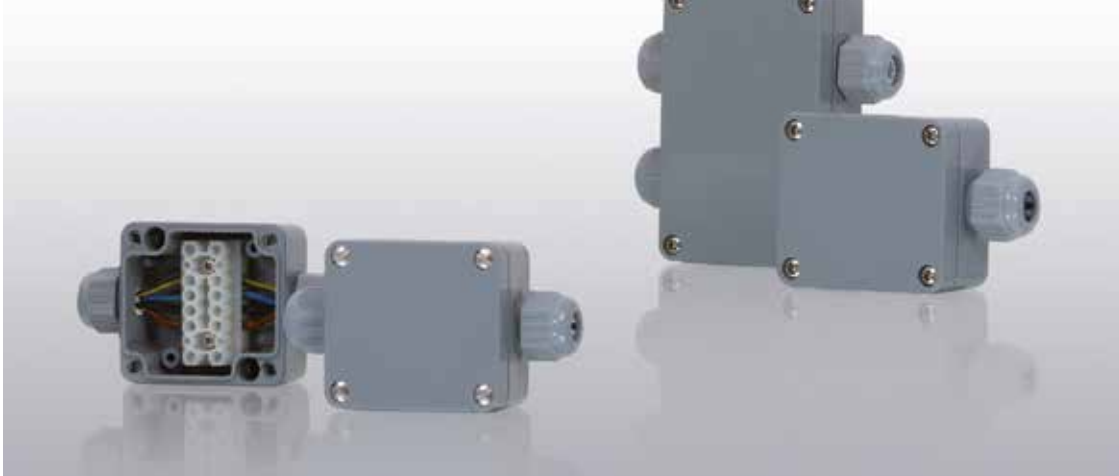Grey, similar to RAL 7000; special colours on request

Protection class:
IP 66 / DIN EN 60529, higher level of protection on request

Enclosure material:
UP-GF 25-30 %, PU foamed seal

Euromas Polymas

AR

- 5 sizes
- Versions with or without screwing systems
- Quick-release fastener versions
- Transparent lids on request
- Terminals and mounting on request

Colour:
Silver grey, similar to RAL 7001; special colours on request

Protection class:
IP 65 / DIN EN 60529; higher ingress protection on request

Enclosure material:
PA 6-GB 30, seal made of CR

Internorm

AR

- 5 sizes
- More sizes on request
- Heights can be adjusted using extension sets
- Collapsible screw cover
- Integrated collapsible tip-up feet
- Front door IP 54 as an accessory
- Wall mounting is possible

Colour:
Light grey, similar to RAL 7035 and silver grey, similar to RAL 7001; special colours on request

Protection class:
IP 40 / DIN EN 60529; IP 54 / DIN EN 60529 as an option

Enclosure material:
PS (polystyrene)

Detailed product information can be found on **www.bopla.de**

Interzoll Case

AR

- Project-specific enclosures using stamping and bending technology
- Variants: Console enclosures, desktop enclosures, DIN rail enclosures, monitor enclosures, cavity wall installation enclosures, 19" enclosures
- Small production runs (50 pieces)
- Interzoll Case 19" acc. to DIN IEC 60297-3-101

Colour:
Project-specific

Protection class:
Depending on enclosure construction up to IP 40 / DIN EN 60529; higher project-specific protection classes on request

Enclosure material:
Aluminium, steel, stainless steel; other materials and surface coatings available at any time on request

Interzoll

AR

- Wide range of standard products
- Standard subracks for Euro and double Euro cards
- Railway-tested versions for use in buses and rail vehicles
- Special subracks can be produced quickly and flexibly
- Part and plug-in front panels
- Frame-type plug-in units
- Comprehensive range of accessories

Colour:
Profiles, natural-coloured anodised aluminium

Protection class:
Up to IP 40 / DIN EN 60529 to the installation area

Enclosure material:
Profile Al Mg: Si 0.5

Interzoll Modul

AR+

- Wide range of standard products
- Standard subracks for Euro and double Euro cards
- EMC protection upgradable at any time
- Railway-tested versions for use in buses and rail vehicles
- Special subracks can be produced quickly and flexibly
- Part and plug-in front panels
- Frame-type plug-in units
- Comprehensive range of accessories

Colour:
Profiles, natural-coloured anodised aluminium

Protection class:
Up to IP 40 / DIN EN 60529 to the installation area

Enclosure material:
Profile Al Mg: Si 0.5

Intertego

AR+
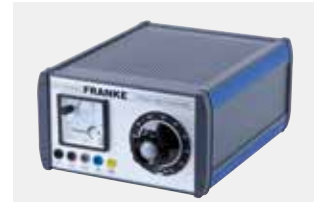
- 3 heights
- Length and width are individually adjustable
- 27 standard dimensions ex warehouse
- Aluminium baseplates and top covers
- Good EMC characteristics as standard
- Higher shielding values possible with accessories
- Installation of 19″ components possible
- For use as 19″ chassis
- Comprehensive range of accessories

Colour:
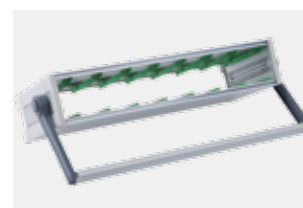Graphite grey, similar to RAL 7024; special colours on request

Protection class:
IP 40 / DIN EN 60529; with ventilation (ADL) IP 20 / DIN EN 60529

Enclosure material:
Profiles: Al Mg Si 0.5; diecast corners: zinc alloy Z410; seal: TPE

Detailed product information can be found on **www.bopla.de**

Interzoll Plus

AR⁺

- 3 widths
- 5 depths
- Interzoll Plus is based on the Interzoll subrack programme – this also applies to the range of Interzoll accessories

Colour:
Light grey, similar to RAL 7035, natural- coloured anodised aluminium, special colours on request
Protection class:
IP 40 / DIN EN 60529; with ventilation (ADG...-L) IP 20 / DIN EN 60529
Enclosure material:
Profiles: Al Mg Si 0.5, anodised; cover plates: steel sheet; plastic covers: ABS-M/MIA / PVC UL 94 V1

Internorm Stil

AR⁺

- 2 heights
- 3 widths
- 5 depths
- With or without integrated ventilation
- Tower enclosure in 2 sizes
- Internorm Stil is based on the Interzoll-Modul subrack programme – this also applies to the range of Interzoll Modul accessories

Colour:
White aluminium, similar to RAL 9006 and anthracite grey, similar to RAL 7016

Protection class:
IP 20 / DIN EN 60529

Enclosure material:
Profiles: Al Mg Si 0.5, anodised; covers: diecast aluminium; front handles / flanges: diecast aluminium; side panels, cover and side plates: passivated aluminium

Cable Glands /
General Accessories

Here is a small selection of all the components which we offer as general accessories.
You can find the complete range of products in our main catalogue THE RED BOOK 4.5 or on our website at www.bopla.de.

BF / MBF / BFK / MBFK:
- Pg / Metric
- IP 68, 5 bar (30 min.) / DIN EN 60529
- Polyamide, light grey,
  similar to RAL 7035
- Integrated strain relief
- Temperature range: -20 °C to +100 °C
- VDE certificate (MBF only): no. 134176
- Integrated anti-kink protection
  (BFK / MBFK)

POZ / MPOZ / POZB / MPOZB:
- Pg / Metric
- IP 65 / DIN EN 60529
- Polyamide, light grey,
  similar to RAL 7035
- Integrated strain relief
- Temperature range: -30 °C to +100 °C
- Integrated anti-kink protection
  (POZB / MPOZB)

MSBF:
- Metric
- IP 68, 5 bar (30 min.) / DIN EN 60529
- Brass, nickel-plated
- Integrated strain relief
- Anti-twist protection
- Temperature range: -20 °C to +100 °C

MSS / MSD / MSKBF:
- Pg
- IP 65 / DIN EN 60529 (MSD / MSK)
- IP 54 / DIN EN 60529 (MSS)
- Brass, nickel-plated
- Integrated strain relief (MSK)
- Temperature ranges:
- 20 °C to +100 °C (MSK),
- 30 °C to +110 °C (MS / MSD)

MZI / PST:
- Pg
- IP 65 / DIN EN 60529
- Polyamide, light grey, similar to RAL 7035
- Integrated strain relief
- Temperature range: -20 °C to +100 °C
- MZI for internal mounting with a flat
  external assembly of 3 mm
- With the PST, pre-configured cables can
  be completely mounted in the enclosure

DZP / TZP / KK / GD:
- Half cable glands
- Pg
- IP 65 / DIN EN 60529
- Polyamide, light grey,
  similar to RAL 7035 (DZP/TZP)
- Hostaform (KK)

M-EX..PA:
- Metric
- IP 66 / DIN EN 60529
- Polyamide, black, similar to RAL 9005
- Integrated strain relief
- Temperature range : -30 °C to +70 °C
- Test standard: EN 60079-0/EN
  60079-7/EN 61241-0/EN 61241-1
- EC test certificates: PTB 99 ATEX 3101 X
  (M12,M16), PTB 99 ATEX 3128 X
  (M 20 and higher)

M-EX..MS/:
- Metric
- IP 68, 5 bar (30 min.) / DIN EN 60529
- Brass, nickel-plated
- Integrated strain relief
- Temperature range : -20 °C to +80 °C (MS)
- Test standard: EN 60079-0/EN
  60079-7/EN 61241-0/EN 61241-1
- EC test certificates: DMT 99 ATEX E016

MEMV:
- Metric
- IP 68, 5 bar (30 min.) / DIN EN 60529
- Brass, nickel-plated
- Integrated strain relief
- Anti-twist protection
- Temperature range: -20 °C to +100 °C
- For leads with shielding

Accessories for cable glands:
- Counter nut, plastic (metric / PG)
- Counter nut, brass (metric / PG)
- Blind plug, plastic (metric / PG)
- Twisting nipple (metric / PG)
- Sealing ring (metric / PG)
- Ex blind plug, brass (metric)
- Multiple sealing rings
- Blanking plugs
- Blind washers

DAE:
Pressure compensation elements in light grey or black.

Protection class:
- IP 66 / DIN EN 60529
- IP 68, 0,2 bar (60 min) / DIN EN 60529
- IP 69 / DIN EN 60529

THIS PRODUCT IS ONLY SUITABLE FOR USE IN INDUSTRIAL APPLICATIONS. It is not designed for the manufacture, processing or packing of foodstuffs, medicines or cosmetic and medical products.

UDS Docking Sation:
- 2 sizes
- 2 colours
- Variable detent for the fitting of mobile devices
- Contacts for connection to mobile devices as accessories
- Desktop or wall use possible

Holding clip:
Every hand-held enclosure can be fitted with a universal holding clip.

Universal clip and tip-up clip:
The universal clip and tip-up clip can be retrofitted to all enclosures. It can be used as a wall hanging unit or belt clip or, if swivelled by 90°, as a tip-up bow.

Screw-on lanyard loop:
By using the universal screw-on lanyard loop, hand-held enclosures can easily be carried round the neck.

Handle:
The swivelling handle allows the flexible width handle to be used both as a carrying handle and a tip-up bow.

DIN rail holders:
Various metal and plastic DIN rail holders available.

Wall fitting:
Because of the various settings (fixed detent position every 10°), the universal wall fitting can be used on a wall or as a foot. The length of the profiles can be adapted to every enclosure.

Universal wall adapter:
Suitable for:
- Wall mounting
- Hollow wall box mounting
- VESA mounting (75 x 75mm)

- Easily removable

Battery compartments:
The different battery compartments allow almost every enclosure type to be used as a hand-held enclosure.

Up to IP 65.

Customer Specific Enclosures

The special advantages of an aluminium profile enclosure:

- Lengths are variable (a "family" of enclosures can easily be created)
- Ideal for use in difficult environments (high chemical and temperature resistance)
- Good opportunities for EMC screening and conductive connections
- Very good heat dissipation
- Low tool costs
- High level of impact resistance
- High-quality design
- Very good stability

The special advantages of a plastic enclosure:

- Individual design
- Low weight
- Low piece costs for large quantities
- In parts which are resistant to aggressive environmental influences (rain, salt water)

The special advantages of a metal enclosure which makes use of stamping and bending technology:

- Low initial costs allow small quantities to be manufactured inexpensively
- Good opportunities for EMC screening and conductive connections
- Ideal for use in difficult environments (high chemical and temperature resistance)
- Low-cost alterations to the enclosure design are possible
- Very good stability

BOPLA
A Phoenix Mecano Company

From the idea to series manufacture.

You are looking for ways to implement one of your own designs? Or do you want to develop your own enclosure in order to integrate specific functions? We will gladly manufacture your special individual enclosure for these purposes. Make use of our many years of experience – we have already created many successful special solutions for arrange of sectors. You will benefit from our high levels of specialist knowledge, excellent product quality, and our experienced employees! We put your wishes into practice – promptly and inexpensively.

1. TECHNICAL ADVICE

Early integration of our experts in processing your ideas is important for ensuring fast success. This is how we create a basis for communication on which all subsequent processes build.

2. DEVELOPMENT CONSTRUCTION

Using the latest 3D CAD systems, our developers create the enclosure with your own design and according to your wishes.
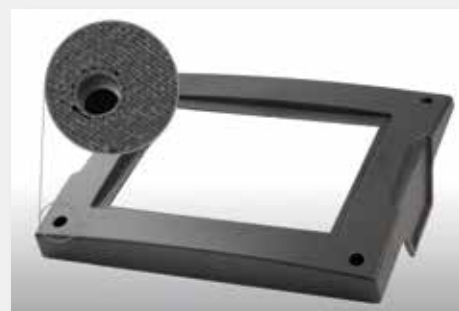
3. PROTOTYPING

Starting with 3D data, prototypes can be manufactured as part of the next stage and make it possible to check and adapt the design results. Mounting and function tests with electronic and other components can be carried out at this stage.

4. PRODUCTION SERIES MANUFACTURE

Secure processes are guaranteed in our in-house production facility. From the selection of raw materials right up to quality control, everything is subject to strict manufacturing guidelines. This is where your enclosure is created.

5. SERVICE

In addition to our comprehensive processing service, we also offer surface improvements, screening measures, wiring or insertions, and customer-specific mounting work. This offer is completed with packaging which matches your product.

Membrane Keypads / HMI

Integration of:

- Resistive touch screens
- Capacitive touch screens
- Displays
- Touch / Display combinations

Membrane keypads / HMI Technologies and design variants:

- Copper technology
- Profiline technology
- Night design
  (electroluminescence or Profiline; back-lit)
- FR4 technology (on the basis of a PCB)

- Doming technology
- Gloss technology
- Antimicrobial decor foil material
- Soft touch
- Support plates
- Short-stroke keys
- Silver technology

Technical features of our membrane keypads:

- Contact elements embedded between high-quality polyester membranes
- Stainless steel snap dome with gold-plated contact side
- Safety chamber for each snap dome, depending on design
- Elegant matt front membrane
- Protected against dirt and splashing water acc. to DIN EN 60529
- Base membrane in copper technology or in conductive silver technology

Membrane keypads for all applications – professional, user-friendly and design oriented.

The applications for our membrane keypads range from medical technology to the automotive industry to the waste disposal and recycling industry. Especially for industrial use, membrane keypads must resist existing environmental demands and be user-friendly. This is where BOPLA know-how comes into its own!

We offer standard and customer-specific keypads. Our standard keypads are designed for use with BOPLA enclosures and can easily be modified so that even short runs can be designed individually and produced at low cost.
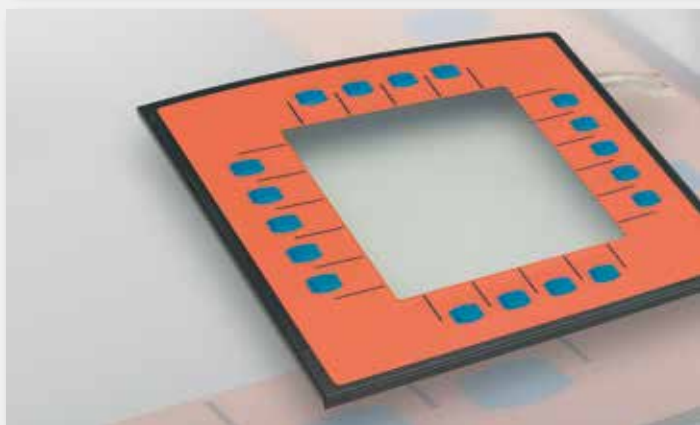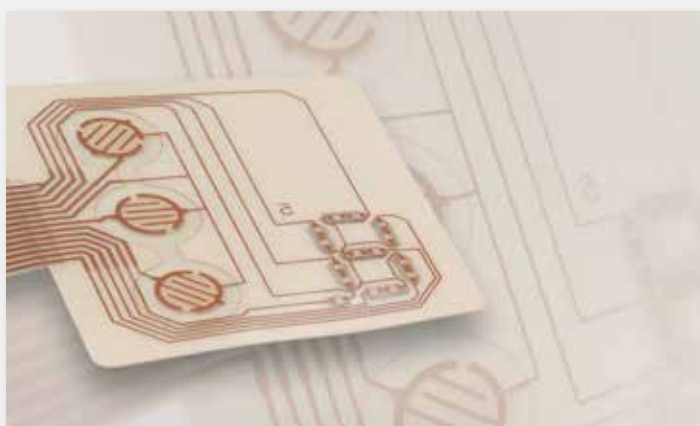
Our speciality: **Copper technology**

BOPLA manufactures high-quality keypads with copper-laminated base membranes, galvanically silver-plated and gold-plated on request. In contrast to the conductive silver technology offered by many manufacturers, copper-laminated material is extremely flexible, so there is almost no possibility of breaks to the membrane cable, and problems such as silver migration cannot occur. Instead of using an adhesive, we can safely and permanently solder LEDs, photo diodes or other components and this process ensures operational reliability.
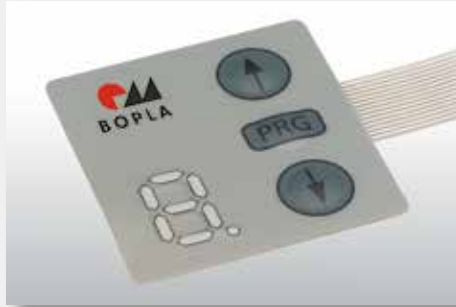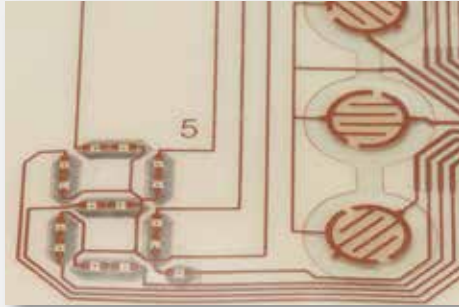
Touch control with: **Touch screens**

Graphic user interfaces are taken for granted today. Integrating touch screens with our enclosures and membrane keypads is part of our day-to-day business.

In future, the need will increasingly be for a combination of both input systems. The touch screen takes over the functions of a computer mouse, and additional inputs continue to be easy via the keypad.

AR + This picture object is linked with AR contents.

BoTouch / front panel

The integration of the touch screen in enclosures or customer-specific supporting plates can be achieved in many ways. For applications in which dirt-collecting edges are not permitted (medical technology or foodstuffs) we also offer solutions with a continuous front membrane – laminated over the entire area or with spacer dots on the back.

New in BOPLA's portfolio: Optical bonding, also for using touch technology behind glass fronts.

Integration of touch screens und displays

The display is fixed by means of a retaining plate which is manufactured for the specific project. BOPLA's trademarked assembly procedure efficiently compensates the measurement and processing tolerances of the various components, and also thermal expansion effects or mechanical loads such as vibrations.

For heavy-duty use: **Capacitive membrane keypads**

Popular HMI in the BOPLA range – capacitive membrane keypads! These are resistant to acid (glass front), dirt and other impurities, and are suitable for high mechanical loads. The surface is easy to clean, ensuring maximum standards of hygiene.
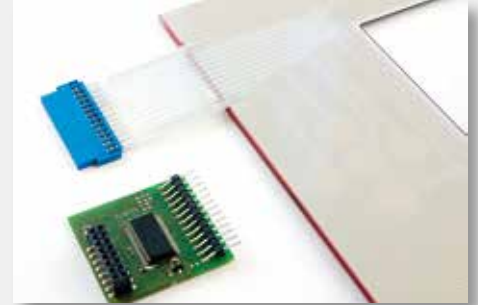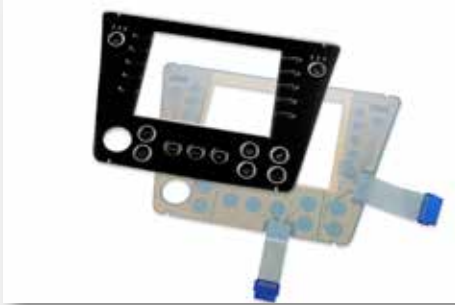
Detailed description of product

There is no mechanical connection to the operator, so the keys are not mechanical. The activating element is separated from the operator by means of a smooth surface, e.g. glass, plastic or another kind of non-conductive surface. This ensures that it is very easy to clean the surface, so the device can be used in places which are at risk of vandalism, and also in hygienically clean environments, e.g. the medical and foodstuff sectors.

In addition, the smooth surface guarantees that it is possible to operate the device without pressure – a light touch is sufficient. Visual and/or acoustic signals can compensate for the lack of tactile feedback. Keypads and switches which operate on the capacitive principle can be set up as individual keys or as arrays, so any shape of key is possible, including individual layout designs.

Beautiful and reliable with:
Gloss technology / Doming technology

When manufacturing our membrane keypads, we use only high-quality materials which ensure a long operating life under all conditions.
Our keypads are tested to guarantee their long-term function.
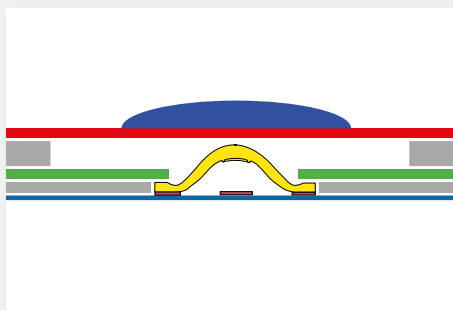
For special occasions – gloss technology

A special type of surface design can be created by using a glossy membrane and a special structure lacquer. The partial glossy sections upgrade the design considerably, giving the keypad a sophisticated and high-quality look and ensuring that it stands out from standard industrial keypads.

Doming technology

Now we can offer coatings using a clear plastic compound, a process known as "doming". This allows us to meet special requirements in respect of a sophisticated design just as much as the specifications for comfortable handling. The plastic compound is "selfrestoring" and this means that the material reacts to mechanical deformations by returning to its original shape within a short period of time.

# Improved haptic and operability: **Profiline**

The so-called "short-stroke" feeling considerably improves the input interface, including for keys with extremely small or extremely large surfaces. This is guaranteed by the highly-tactile, robust key element which is fitted between the snap dome and front membrane. In addition to providing better feedback, the Profiline key areas are also extremely robust.

The integrated acrylic inlay gives protection against dust and moisture and also protects the snap dome against possible deformation. Not even heavy point-specific pressure can damage the key areas.
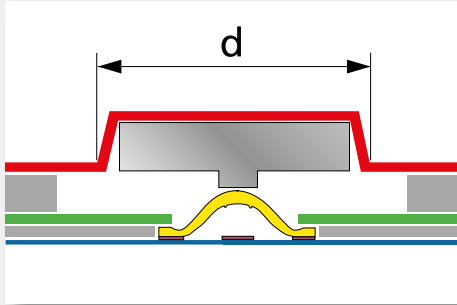
ADVANTAGES:

- Very good tactile feedback
- Tactile feeling to the key element
- Optimal force distribution means less pressure on the snap dome
- Ideal finger guiding
- Large-surface keys and contact elements can be manufactured
- Freedom of design for the key shape
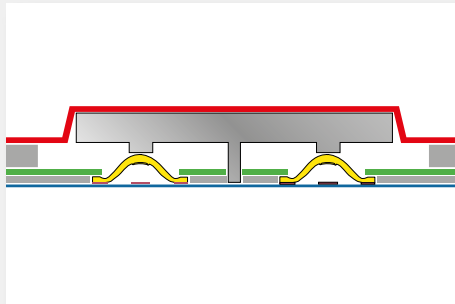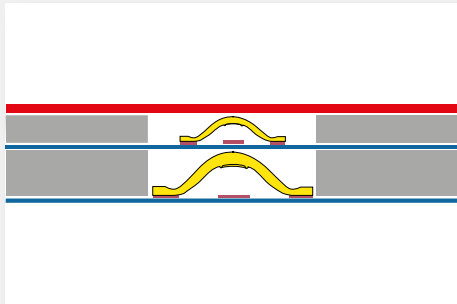
For extra protection: double contact

High safety standards demand a high level of reliability, especially when it comes to operating devices and machines. This can be achieved by the use of keypads with a two-stage key function, which is why we offer the keypad with a double-contact function.
The user can easily distinguish between two switch functions, and TÜV requirements for two separate switch levels are easily met.

Special customer requirements can also be met by means of suitable inlay design. The above illustration shows a construction with a rocker in a +/- key.
Even the requirement for a cursor block was successfully achieved using Profiline inlays.

Lighting up the darkness: **Night design**

By using back-lit Profiline keypads or EL membranes, there are no limits to applications in dark surroundings. Now you only need to decide which technology is the most effective for your application.

Profiline back-lit

The back-lit Profiline keypad is constructed in a similar way to a normal keypad.
The main difference is that it has a special snap dome with a hole in the middle, into which an ultra-flat LED is integrated.
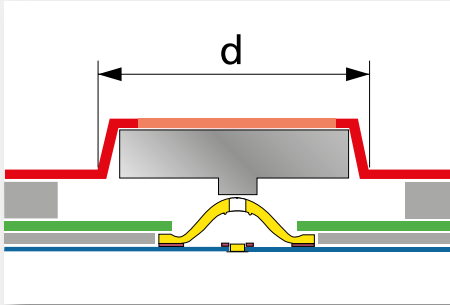
The back-lit Profiline keypad has additional advantages such as its long operating life, low power consumption and haptic. This technology makes it possible to illuminate the keys separately and the light passes through a hole in the special snap dome into the integrated acrylic inlay, where it is scattered accordingly.

The easy-to-feel key element makes it much easier to use.

- The key area is clear lacquered, max. ø 10.0 mm
- Key height: approx. 12 mm, tolerance ± 0.2 mm
- Installation height of the keypad: approx. 2.8 mm, tolerance ± 10%
- Actuation force: approx 5 N

NLF-Backlight

There are many constructional advantages to the use of NLF-Backlight. The technology stands out thanks to the homogeneous light distribution and low power consumption. Using side LEDs means that no expensive and EMC/ESD-problematic converters / inverters are necessary for triggering. The LEDs can be operated with low DC voltage without any additional complex circuitry – even with battery operation.

In contrast to direct selective light sources, with NLF-Backlight the light is introduced from the side by means of an LED. In this way the light is distributed evenly over the entire area. Both single-le keys and large areas can be backlit – including individually, i.e. separately from each other.

The long operating life of the LEDs is an additional advantage. NLF-Backlight is ideal for use in applications with permanent keypad illumination.

The trick with the click: **Short-stroke keys**

Short-stroke keys are electromechanical keys with a 0.3 mm contact travel and which provide a clear, tactile response through the entire key operation process. They are fitted to a PCB and, in connection with a supporting plate and a customer-specific front membrane, they form a membrane keypad.

The use of different key cap lengths allows the mounting of higher components such as LCD displays on the same PCB. Different key cap diameters make it possible to choose the minimum distance – centre point – to centre point-between the individual short-stroke keys. The front panel supports the complete HMI system.

Short-stroke keys:
1.3 N   2.6 N

Height of key caps:
4.7 mm   8.7 mm   18.2 mm

System Integration / Processing Service

Conception and technical advice:

We accompany you from the idea to procurement of all components right up to complete mounting of your individual module.

• Conceptual advice

Processing service:

We offer a wide range of services, from mechanical processing to engraving and printing, and also surface improvement.

• Mechanical processing

• Improvement

System integration:

All the components are brought together at this stage of the process, and your individual device is created!
Comprehensive function and end tests carried out in our in-house laboratory are standard procedure for us.

• Procurement and warehousing of all necessary components

• Insertion (THT / SMT)

• Mounting suitable for ESD

• ESD-supporting manufacture

• Laboratory tests

• Function test

• Labelling and packing

Ready to go – the perfect end product.

For you, system integration means a complete problem-free range of intelligent services tailor-made for your application. For more than 40 years we have been your partner for sophisticated solutions, and we have constantly expanded and perfected our range of services.

You are certain to benefit from our know-how in the enclosure, machining service, membrane keypad / HMI and system integration sectors. We look forward to talking to you!

1. ENCLOSURES

BOPLA's enclosure sector product range is incredibly diverse, and ranges from hand-held, desktop, console and wall-mounted enclosures to 19″ applications. Select the suitable enclosure from our comprehensive product range.

2. MECHANICAL PROCESSING

We excel in all standard processes: milling, drilling, countersinking, thread-cutting, sawing, ultrasonic welding, and many more.

These include engraving and laser engraving, priting and lacquering, and powder and EMC coatings.

3. ELECTRONICS

From the procurement of all the necessary components to the component test - we do it.

4. HMI

We create HMI devices for every application. From simple membrane mounting to the complex integration of touch screens. All in impressive quality and with an appealing design

5. MOUNTING / FUNCTION TEST

The integration of highly-sensitive components / modules and the final check of the device by means of a function and end test is carried out by our qualified and expert personnel.

We can offer more: **Processing and services.**

AR ☐ This picture object is linked with AR contents.
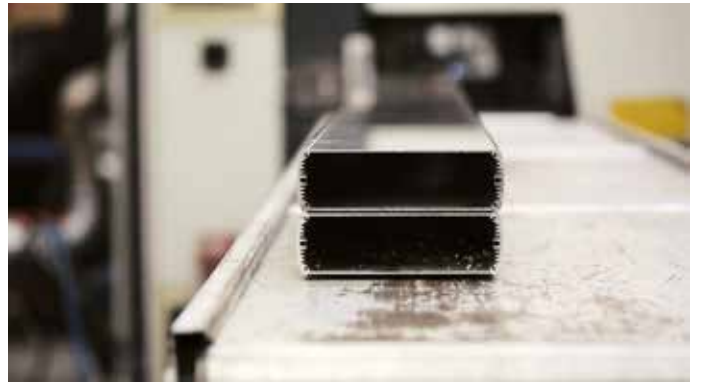Test it!

Prototype construction

Plastic injection moulding

Foaming of seals

Sawing of aluminium profile enclosures

Powder-coating

Measuring processes for quality assurance

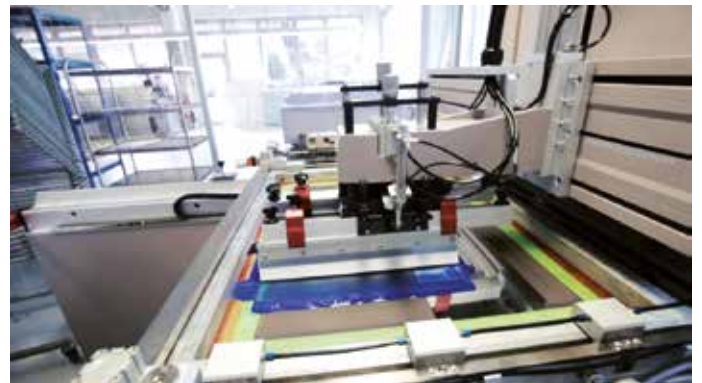Ingress protection test

Machine processing

Laser marking

HMI: Mounting

HMI: Manufacturing the keypad

HMI: Printing of the front membrane

Complete mounting

Final test for quality assurance

Storage and dispatch

Enclosure in use

BOPLA

A Phoenix Mecano Company