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# SEAT COMFORT SYSTEM.

- ☐ Seat Motion
- ☐ Passenger Interaction
- ☐ Well-Being
- ☐ Light
- ☐ Connectivity

**Your system provider for seat actuation.**

Bühler Motor

Passion in Motion

# SEAT COMFORT SYSTEM.

**Seat Motion**

All kinds of actuators
for simple to complex
motions

**Passenger Interaction**

Passenger Control Units
Tactile Hard Buttons

**Well-being**

Business class and
Premium Economy
Lumbar System

**IMMERSING OURSELVES IN OUR CUSTOMERS' SYSTEMS AND APPLICATIONS IS ONE OF OUR GREATEST STRENGTHS.**

**Light**

Seat Indication Panels
Ambient Lights
Customized Lights

**Connectivity**

IFE
Cabin Server
Maintenance
Personal Electronic Devices

## SYSTEM PROVIDER

# 360° Performance

Are you looking for an innovative seat control and actuation system?
Or do you need state-of-the-art comfort components?

At Bühler Motor Aviation, we combine outstanding system knowledge with aviation expertise at the highest level. This enables us to meet the individual system requirements of our demanding customers optimally and according to the latest standards.

- ☐ System Provider for state-of-the-art Seating solutions
- ☐ One-stop-shop supplier for seat electronics, such as:

  Control of Privacy Divider, Window Shades, In Seat Harness, Interconnecting cables, Control Panels, Seat Motion, Light, Pneumatic Indication of DND, Seat Number, TTL Position Interface to the Aircraft: IFE, Cabin server, Cyber Security, Safety, Entrapment, Light Scenarios

Gorodenkoff/Shutterstock.com

## SYSTEM PROVIDER

# Comfort in every aspect

### Why should you choose Bühler Motor Aviation?

As a system supplier for all electrical equipment in the seat, we will accompany you throughout your journey with comprehensive expert advice – right from the initial idea, and from a single source. Supplying functional prototypes in a timely manner is just as much a matter of course for us as digital MRO and predictive maintenance.

Bühler Motor Aviation covers the entire range of seat actuation requirements at the highest level. Our strong background of expertise in aviation makes it easy for us to understand your needs and translate your requirements into highly professional results. Whether you are looking for Seat Motion, Passenger Interaction, Well-being, Light, or Connectivity. We are your first point of contact and comprehensive partner across all levels.



## Flexible Seat Architecture

- ☐ Modular CAN-based Seat Actuation System scalable from Premium Economy and Cockpit Seats up to Business and First Class Seats
- ☐ Multiple Smart Actuator families available to support a variety of seat kinematics
- ☐ Just one power supply needed for up to 4 PAX
- ☐ Installation effort reduced, through to our simplified harness concept & quick-lock connectors
- ☐ Less calibration effort required during seat installations
- ☐ Easy configuration management

iracom/123RF.com

shapecharge/iStock.com

## Simplified Maintenance and Data Logging

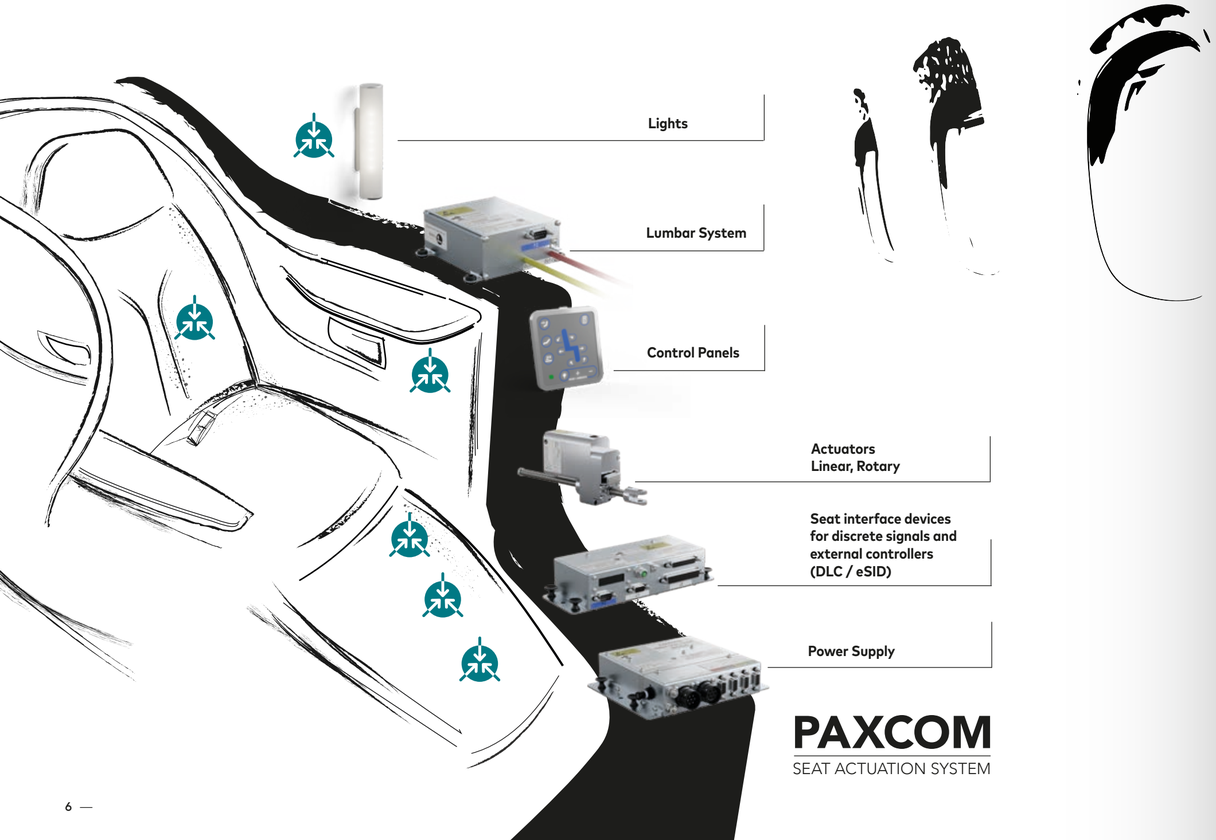
- ☐ On-aircraft software update possible
- ☐ Transparency through ‚Data Analytics'
- ☐ Ability to analyze passenger behavior
- ☐ Evaluate actuator usage with captured data
- ☐ Obtain seat status metrics for predictive maintenance (on request)
- ☐ Lower maintenance effort achieved as a result of the continuous data logging & analysis features in the simplified maintenance concept
- ☐ BITE code display
- ☐ System status views
- ☐ Downloadable log files from system controller
- ☐ Automatic upload of log files for online report generation



## Outstanding Passenger Comfort

- ☐ Smooth, ergonomic seat motion through smart linear & rotary actuators utilizing brushless DC technology
- ☐ Silent seat motion, as a result of specially-designed motor controls and gear material selection
- ☐ A choice of capacitive glass control panels or tactile buttons for a high-end look-and-feel experience
- ☐ 4-way adjustable lumbar support with the quietest and smoothest operation in the industry

Chesky/Shutterstock.com



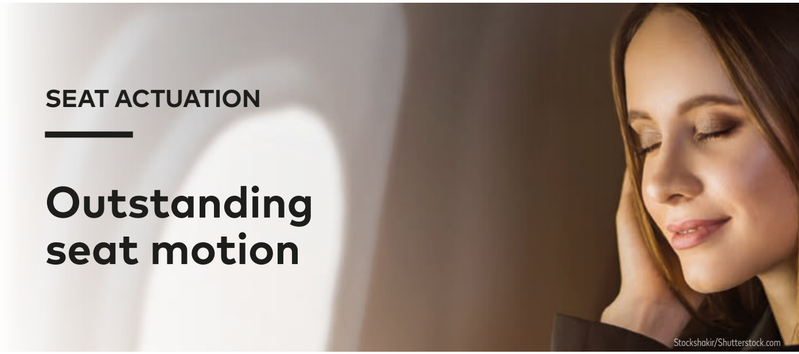

**PAXCOM**
SEAT ACTUATION SYSTEM





## PAXCOM System

- An intelligent system for seat control and actuation to provide customized solutions for your seat kinematics
- Modular CAN-based Seat Actuation System
- Scalable from Premium Economy and Cockpit Seats up to Business and First Class Seats
- Enhanced connectivity for easy integration of discrete and/or smart buyer-furnished equipment (BFE)
- Multiple smart actuator families available to support a variety of seat kinematics
- Innovative maintenance concept with advanced data logging and analysis
- Smooth and ergonomic seat motion, optimized seat kinematics and enhanced reliability for best possible passenger comfort experience
- Connectivity to IFE and cabin systems



SEAT ACTUATION

# Outstanding seat motion

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## COMPLIANCE

**AIRBUS:**

- 2520M1F001200, Electrical Seat Actuation System
- ABD0100, Equipment Design – General Requirements for Suppliers
- ABD0031, Fire Worthiness Requirements - Pressurized Section of Fuselage

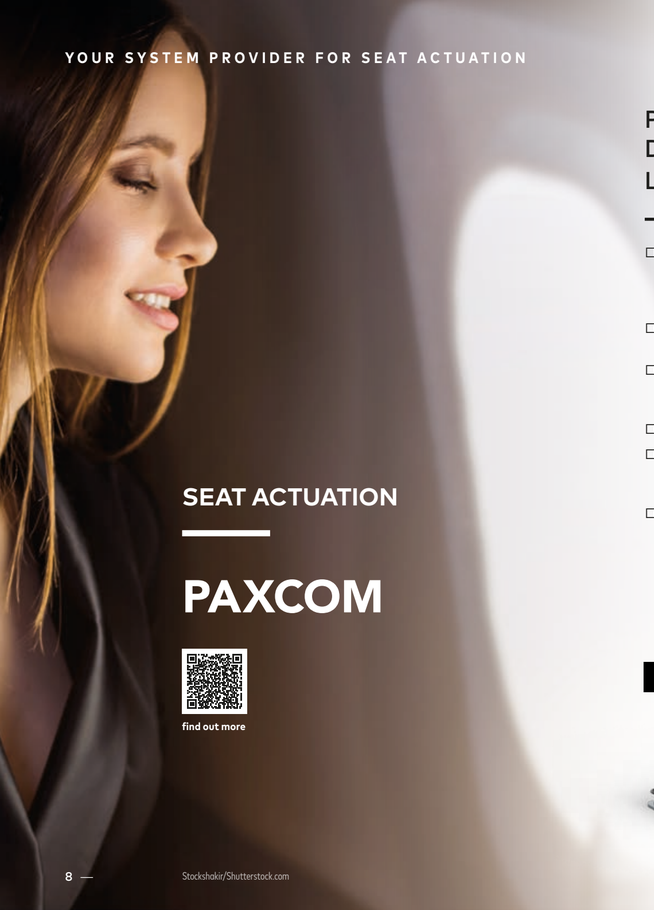
**BOEING:**

- D6-36440, Standard Cabin System Requirements Document
- D6-44588, Electrical Requirements for Utilization Equipment Installed on Commercial Transport Airplanes
- D6-16050-4 Electromagnetic Interference Control Requirements
- D6-16050-5 Electromagnetic Interference Control Requirements for Composite Airplanes

**OTHERS:**

- RTCA DO160G, Environmental Conditions and Test Procedures for Airborne Equipment
- RTCA DO178C, Software Considerations in Airborne Systems and Equipment Certification
- Cyber Security requirements

frank peters/Shutterstock.com



## SEAT ACTUATION

# PAXCOM

find out more

## PAXCOM Discrete Line Controller (DLC)

- Easy integration of discrete and smart buyer-furnished equipment (BFE) including lighting, sensors, switches, and much more
- Integration of up to two 5x5 Matrix control panels
- Customized software packages for automatic updates of all devices in the seat system
- BITE data logging
- Analog and digital inputs for integration of all possible switch and sensor types
- Pulse Width Modulation (PWM) output channels from 5V to 24V

## PAXCOM Extended Seat Interface Device (eSID)

Same basis as the PAXCOM Discrete Line Controller, plus:

- BITE-Code display, based on OLED technology
- Extended connectivity & maintenance functionality
- Continuous data logging of BITE and usage data (large data store, 4GByte)
- Data analytics capabilities
- Single point access for maintenance & software update (USB interface)
- RS485 interface to 3rd party devices
- Ethernet interface
- HW and SW architecture for potential future needs

**DLC**

**eSID**

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## PAXCOM Power Supply

- 115V AC variable frequency power input
- 4 PAX outlets
- Integrated enable/disable function (‚Kill Switch') also for individual outlets
- Quick-lock plugs
- Modular system for connector input box
- Thermal management
- Short circuit protection
- Low weight, high power density
- RS485 interface to 3rd party devices
- Maximum Power Output of 250 Watt

**Power Supply 130 Watt**

**Power Supply 100 Watt**

**ECU**

## PAXCOM ECU

- Combined Power Supply and DLC

**Actuators Linear: Gen I / Gen II**

**Actuators Rotary: Gen I / Gen II – Fast & Strong**

## PAXCOM Actuators

- Smart actuator including integrated motion controller
- Brushless DC drive motor – servo drive behavior
- High-precision positioning
- Smooth, silent movement
- Customized start/stop ramp and obstacle detection
- Enhanced data logging & analysis capabilities
- Modular gear reduction system
- Variable force/torque range
- Variable speed range
- Customized stroke lengths and mounting attachments
- Manual override
- Simple calibration for rotary actuator; plug-and-play for linear and compact actuator
- Easy configuration management
- Compact design, low weight
- Designed to support a variety of seat kinematics

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# CONTROL PANELS

# At your fingertips

Na-taat Panukchoklap/Shutterstock.com

We provide control panels designed to your requirements and to those of your airline customer.

In our glass panels, capacitive touch sensors, combined with a robust glass surface, provide the passenger with a superior tactile and visual experience. Shape, colors, lighting schemes, frames and interface are customized as required. The passenger receives immediate feedback through lighting cues on the panel.

Our mechanical panels with depressable buttons can also be customized to various shapes and sizes. With the right backlighting, this technology provides a visual and tactile feedback to the passenger.

**NUMEROUS DESIGN CUSTOMIZATIONS POSSIBLE**

## FULLY CUSTOMIZABLE

- **Button and frame design**
- **Size, shape, color, surface finish and function**
- **Background lighting and brightness levels**
- **Lighting for buttons, areas or entire screen**
- **Brightness modes e.g. sleep, standby and active**
- **Day and night design options**
- **Button functionality and lighting**
- **Light intensity and timing fully customizable**
- **Aura and pulsating lighting**
- **Predefined button combinations possible for crew and maintenance**
- **Supported interfaces**
- **Discrete lines**
- **CAN, RS-232, RS-485, matrix**

**Capacitive Touch PCU**

**Frameless PCU**

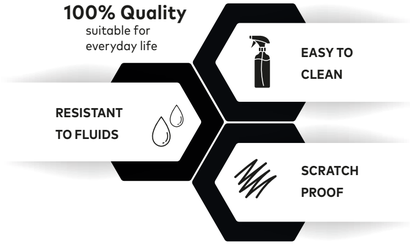
find out more

## Lower TCO

Our **PCUs (Passenger Control Units)** convince with a proven MTBF (Mean Time Between Failure) of more than 2 million flight hours. This translates into less downtime, less maintenance and less repair. Over the long run you do not only benefit from a higher passenger satisfaction, but also from a lower total cost of ownership.

**Hard Button PCU**

**Small shape PCU**



## WELL-BEING // TANGIBLE COMFORT

# We make the sky a home

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**Feature Light**

## Lights

- Customized Solutions, fully qualified
- Different kinds of feature lights, accent lights, spot lights, strip lights

**Indication Panel**

## Indication Panel

- Fully customizable in size, shape, color, surface finish and function
- Multiple functions possible: Seat number light, do not disturb, TToL indication
- Glass panel, easy to clean, scratch resistant



**Lumbar System**

## Business Class Lumbar System

find out more

The 4-way Lumbar System ensures a very high level of passenger comfort

- Low Power Consumption
- Very low noise
- Very low weight
- Massage function available
- A differentiator in the premium economy segment
- Can be installed into nearly every seat structure
- Standard cushion size which is customizable to customer needs
- Tube length adaptable to the seat structure
- Supported interfaces: CAN, RS-485

## Premium Eco Lumbar System

NEW!

- Scalable – up to 4-Pax-Row
- 4-way Lumbar System with two bladders per PAX
- Need for DC power only Max 8 W per group
- Lightweight (500g per PAX), silent and small size
- Only one pump per seat-group, Valve block per seat

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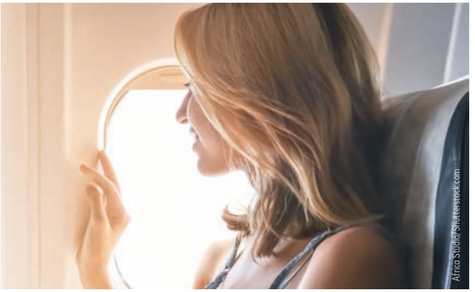

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„I've never known an industry that can get into people's blood
**THE WAY AVIATION DOES."**
**Robert Six**





## Seat Actuation Systems

- ☐ Actuators (linear, rotary)
- ☐ DLC
- ☐ eSID
- ☐ ECU
- ☐ Power Supply

FULLY CUSTOMIZABLE

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## Control Panels

- ☐ Capacitive Touch PCU
  - ☐ Classic PCU
  - ☐ Frameless PCU
  - ☐ Small shape PCU
- ☐ Hard Button PCU

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FULLY CUSTOMIZABLE

## Well-being, Lights

- ☐ Lumbar System
- ☐ Reading Lights
- ☐ Indication Panels

FULLY CUSTOMIZABLE

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**Actuator Rotary Gen I**

**Actuator Rotary Gen II Strong**

NEW!

**Actuator Rotary Gen II Fast**

NEW!

**Actuator Linear Gen I**

**Actuator Linear Gen II**

NEW!

**DLC**

**eSID**

**ECU**

NEW!

**Power Supply 100 Watt**

**Power Supply 130 Watt**

**Main PCU**

**Frameless PCU**

NEW!

**Main + Secondary PCU**

**Main + Secondary PCU**

**Secondary PCU**

**Hard Button PCU**

**Premium Eco Lumbar System**

NEW!

**Lumbar System**

**Indication Panel**

**Feature Light**