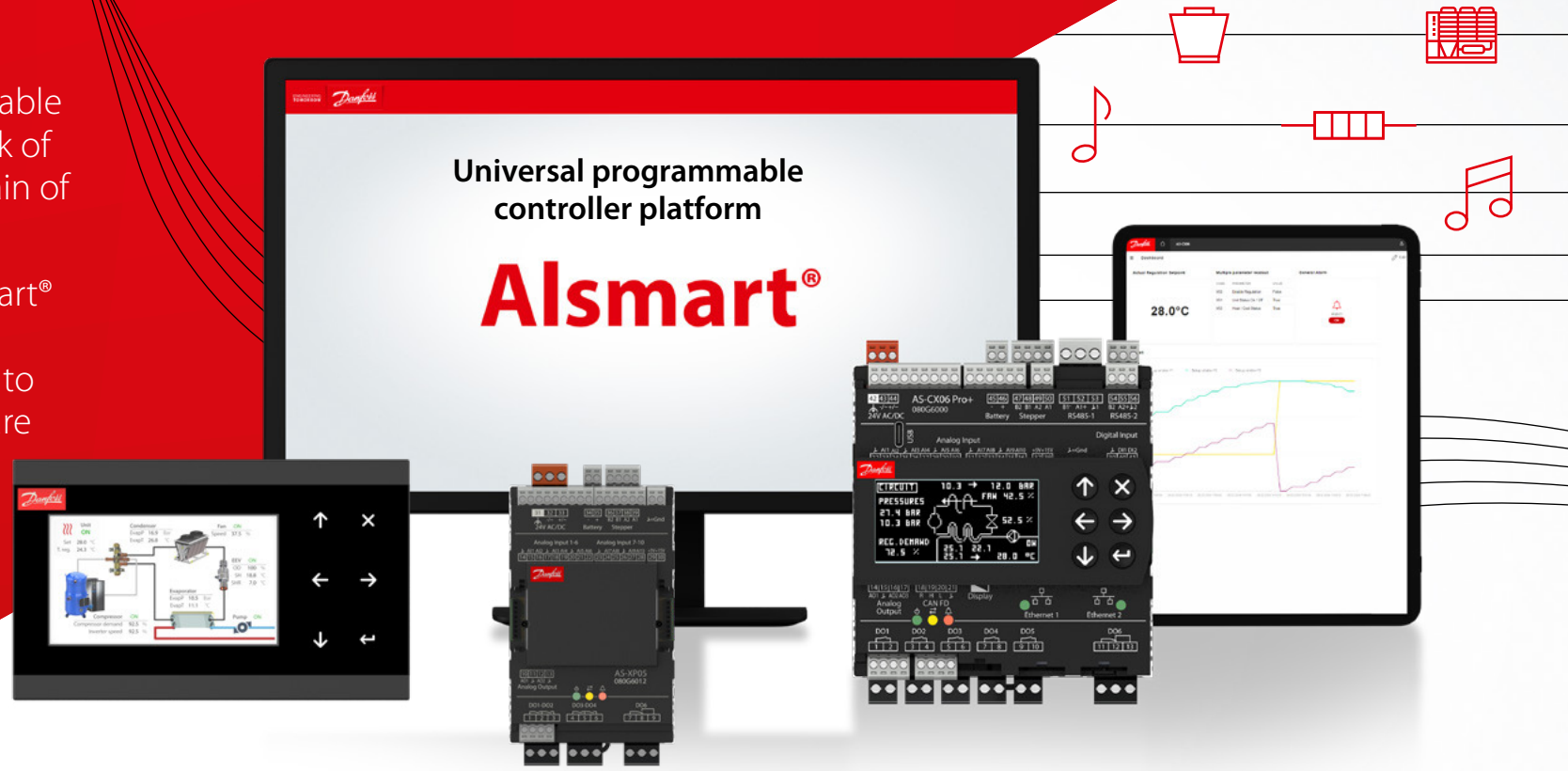
ENGINEERING
TOMORROW

**Alsmart®**

# Master your HVAC **symphony**

Alsmart® is the latest generation of programmable controller platforms for the HVAC market. Think of it as the intelligent, compact and powerful brain of your application.

Packed with state-of-the-art technology, Alsmart® empowers you to take your thermodynamic knowledge to the next level — reducing time to market with module-based design and software functionality simulations.



# Alsmart® universal programmable controller
## — Elevate your HVAC solution with flexibility

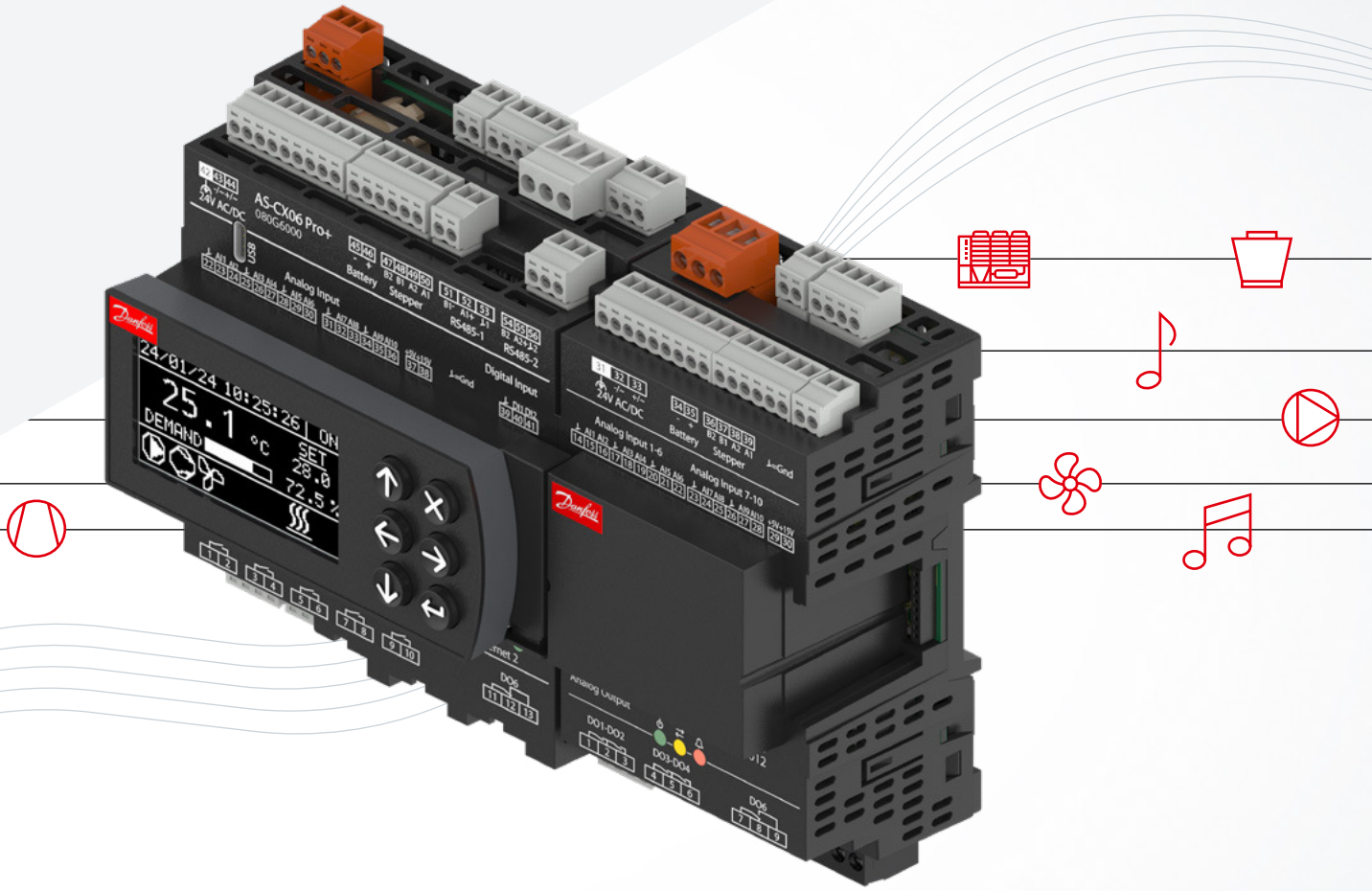
Alsmart® offers a complete and intuitive software platform that helps you take your HVAC application to the next level thanks to the programming tools Alsmart® Design and Alsmart® Service Tool.

**Alsmart® Hardware** contains a comprehensive range of base controllers, I/O expansion modules, a power supply module, user interfaces and accessories to provide you highly customizable and intelligent control solutions for a wide range of demanding HVAC applications such as chillers, rooftop units, heat pumps and DOAS.

**Alsmart® Design** is the programming tool that helps you optimize your HVAC application. It is the core of the toolchain, the programming tool used to program, compile, and debug your application to fully manage the universal controller and expansion modules connected to it.

**Alsmart® Service Tool** is web-server-based and its main purpose is to set up and monitor the application. The dashboard is customizable, allowing you to add new widgets with live diagrams and graphs, as well as monitor specific preferred parameters.

**Alsmart®'s modular design, coupled with its advanced features and robust security, makes it the ideal solution for modern HVAC systems. Discover the power of Alsmart® on the following pages.**



# **The major Alsmart® pillars** to achieve the best performance with your HVAC system

**MQTTS Cloud connectivity***

* In preparation & continuously being updated

**Free programmable controller platform**

Alsmart®

## Flexible I/O

Modular concept (connect up to 20 expansions) –
Auto-recognition function –
Universal I/Os –
Electronic valve driver embedded (Plus versions) –

## Higher execution speed and memory

Enhanced CPU memory –
Scalable RAM and ROM –
Faster compilation time – faster cycle time –

## Wide selection of User interfaces

Remote display –
Snap-on display (with copy function) –
LCD option –
Touch screens –

## Secure and reliable

- Compliant and TÜV certified towards IEC 62443-4-1
- FailSafe feature
- Isolated power supply
- High precisions I/Os
- Natural and low GWP refrigerants ready

## Connectivity solutions for every need

- 2 Ethernet ports
- USB-C
- 2 opto-isolated Modbus RS485
- CANbus FD

## Complete software toolchain

- Alsmart® Design for programming and debugging
- EC 61131-3 IDE (main logic)
- Alsmart® Service Tool for commissioning and monitoring

# **Alsmart®** – Connectivity highlights

## Electronic valve driver

Unipolar/Bipolar

## USB-C

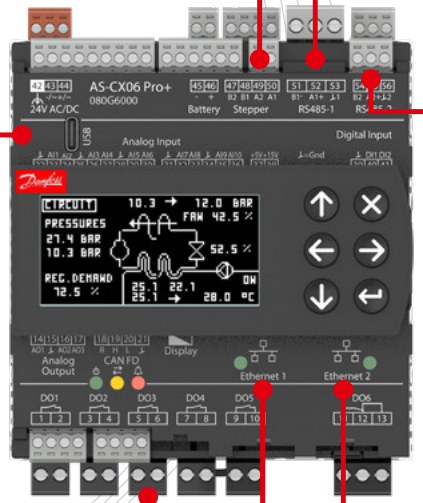
Pen drive
PC connection

## Display port / CAN FD

MMIGRS2

VLT® Drive

AS-UI04 Display




## Opto-isolated Modbus RS485

To BMS

## RS485 fieldbus (BACnet, Modbus)

VZH & VZN inverter scroll compressors

Turbocor®

AB-QM with NovoCon®

3rd. Party device

Field bus

## Ethernet port 2

2nd AS-CX controller

3rd AS-CX controller

## Ethernet port 1

Cloud*

Alsmart Service tool

BMS


* In preparation & continuously being updated

# **Alsmart®**- User Interfaces

### Alsmart® AS-UI Snap-on


**USER-FRIENDLY**
Magnetic mounting: magnetic lock on AS-CX controller, simple and fast

**MONOCHROME**
LCD FSTN display – resolution 128 x 64 dots
Simple design, black and white colors

**SMALL BUT INCISIVE SCREEN**
Total Dimension 105 mm x 44.5 mm x 17 mm
Display Dimension 58.4 mm x 32.2 mm

**CUSTOMIZED SCREENS**
Design your screens from Alsmart Design linked to your application or use the autogenerated screens available to speed up your development

### Alsmart® AS-UI04 Display

**USER-FRIENDLY**
Panel and Wall mounted version with easy connection to Alsmart controller through plug connection (via CAN FD)

**HIGH RESOLUTION**
LCD TFT display – resolution 480 x 272 dots
New set of fonts and symbols to elevate experience

**FULL COLOR, BIG SCREEN**
Total Dimension 166 mm x 101 mm x 27 mm
Display Dimension 97 mm x 56 mm [4”3 inches]

**CUSTOMIZED SCREENS**
Design your screens from Alsmart Design linked to your application or use the auto-generated screens available to speed up your development

# **Software** Toolchain

**Alsmart® Design** is the core of the toolchain, the programming tool used to program, compile, and debug your application to fully manage the universal controller and expansion modules connected to it. It fully complies with the IEC 61131-3 standard and supports five main standard programming languages, with an automated test function embedded, a simulation mode function, options to design and customize your user interface, and many other features that will make the difference in optimizing the performance of your HVAC application.

**Alsmart® Service Tool** is web-server-based and its main target is to set up and monitor the application. The dashboard is customizable by adding new widgets with live diagrams and graphs but also to check preferred specific parameters. It's possible to set different users with different access and visibility to create different levels to monitor and manage all application parameters and set up the communication of the controller. From a service part point of view, it's possible to look, save, and download alarms, logs, and behavior history, in order to have a clear understanding of what is happening live in the system and, as a consequence, in order to easily define the best performance of the system and replicate it quickly once again. It also offers the best support for backing up and restoring controller settings for the ultimate maintenance experience.

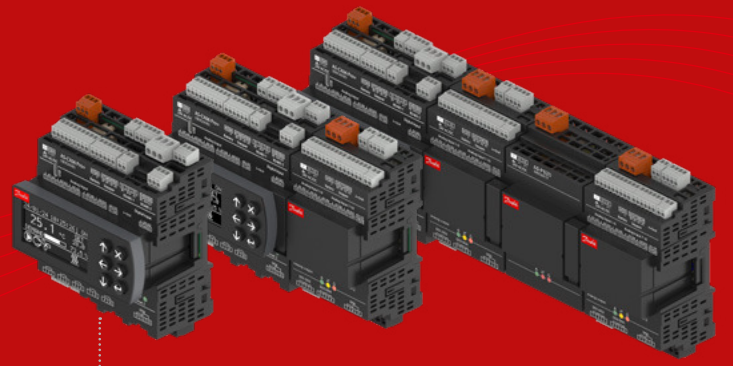
# A world of possibilities

With Alsmart®, you can configure your controller to manage virtually any application. To make things even easier, we are developing a library of pre-programmed blocks and software applications specifically designed for HVAC systems, providing a quick and efficient way to get started.

Our ADC laboratory is contributing greatly to the drafting and testing of the software applications to ensure maximum thermodynamic process optimization during the drafting of the application code.

We've leveraged our vast application know-how, broad portfolio and comprehensive support to create the best HVAC control experience with the highest level of performance and safety for you.

## Alsmart®



### Relevant markets

- Super-market
- Data center
- Commercial buildings
- District heating
- BESS (Battery energy storage systems)

### Relevant applications

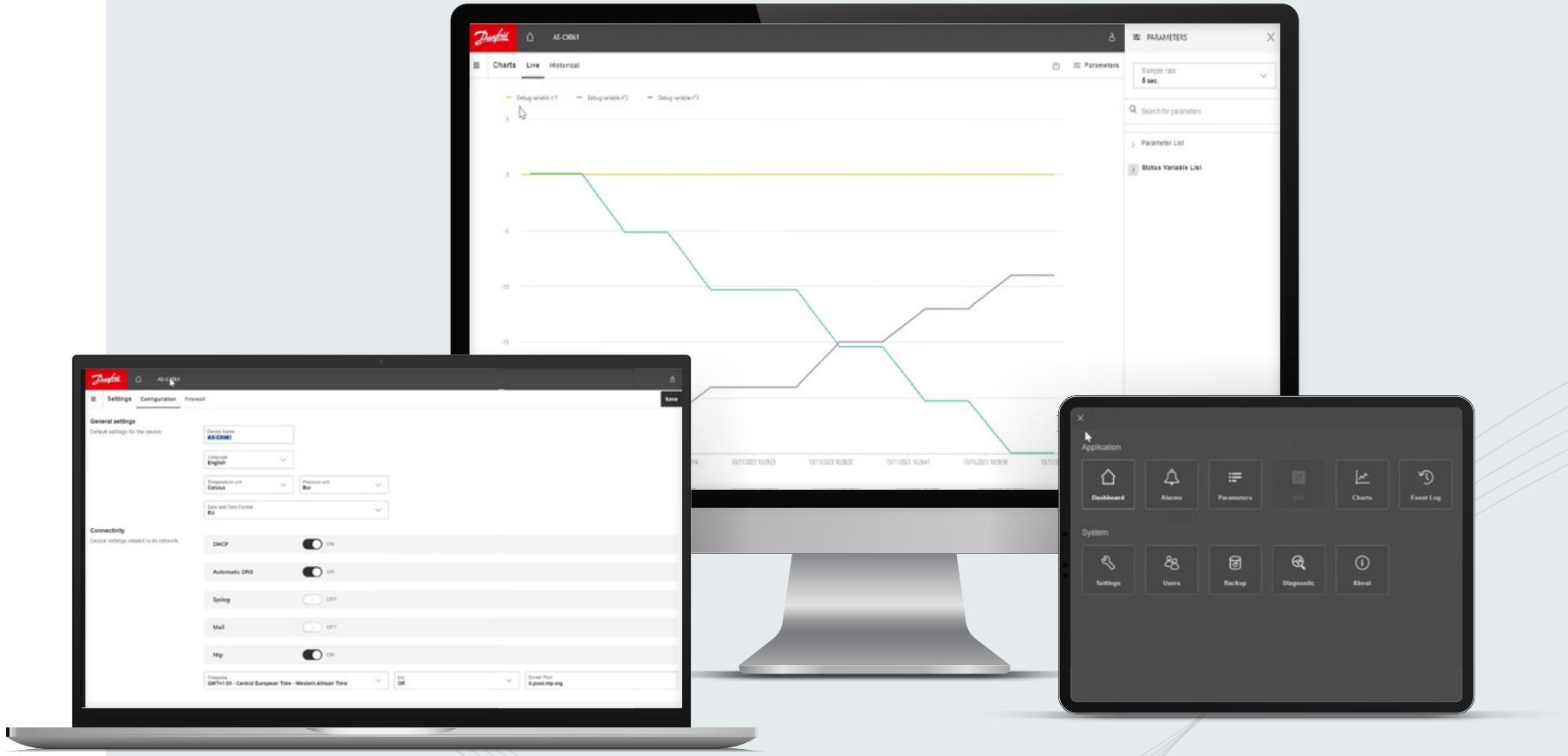
- Chillers
- Heat pumps
- Rooftops
- AHU
- CRAC

# Alsmart® Design – Highlights

- IEC 61131-3 IDE (main logic)
- UI designer for low resolution displays (monochromatic LCD, 7-segment)
- UI designer for high resolution displays (color touchscreen, HTML browser)
- Debugger and simulator
- Parameter database and normalization
- Translation tool
- Automated test system
- Documentation generator (developer's documentation, user manual)

# Alsmart®
# Service Tool
## – Highlights

- Four level of access with different visibility
- Dashboard view customizable with widgets
- Alarm log and history accessible and downloadable
- Event log collect in one view all thesystem notifications and alarms
- Settings and users sections
- Backup to restore and copy parameters and settings



# **Product range overview**
## – Hardware

### Universal Controller AS-CX06

| | | Lite | Mid | Mid SSR * | Mid+ | Mid+ SSR * | Pro | Pro+ |
|---|---|---|---|---|---|---|---|---|
| **Dimension** | | 6 DIN | | | | | | |
| **Digital Output** | **N** | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| | **Type** | 5xSPST 1xSPDT | 5xSPST 1xSPDT | 4xSPST 1xSPDT 1xSSR | 5xSPST 1xSPDT | 4xSPST 1xSPDT 1xSSR | 5xSPST 1xSPDT | 5xSPST 1xSPDT |
| **Digital Input** | **N** | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | **Type** | Voltage free | | | | | | |
| **Analog Output** | **N** | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | **Type** | 0/10V or PWM | | | | | | |
| **Universal Input** | **N** | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | **Type** | NTC, PTC1000, 4-20mA, DI, 0/5V ratio, 0-1V / 0-5V / 0-10V | | | | | | |
| **Electronic valves** | | — | — | — | 1 | 1 | — | 1 |
| **CAN FD** | | YES | YES | YES | YES | YES | YES | YES |
| **Ethernet / Web Server** | | — | — | — | — | — | 2 | 2 |
| **Modbus RS485 (opto-isolated)** | | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| **USB** | | Yes, C type | | | | | | |
| **Power Supply** | | 24 Vac or 20…60 Vdc | | | | | | |

* Available from Q3-2025

### Expansion Modules AS-XP

| | | AS-XP05 | AS-XP05+ | AS-XP10 ** |
|---|---|---|---|---|
| **Dimension** | | 4 DIN | | 6 DIN |
| **Digital Output** | **N** | 5 | 5 | 10 |
| | **Type** | 4x SPST 1xSPDT | 4xSPST 1xSPDT | 8xSPST 2xSPDT |
| **Digital Input** | **N** | — | — | 4 |
| | **Type** | — | — | 24Vac or 230Vac |
| **Analog Output** | **N** | 2 | 2 | 2 |
| | **Type** | 0/10V or PWM | | |
| **Universal Input** | **N** | 10 | 10 | 10 |
| | **Type** | NTC, PTC1000, 4-20mA, DI, 0/5V ratio, 0-1V / 0-5V / 0-10V | | |
| **Electronic valves** | | — | 1 | — |
| **CAN FD** | | — | — | — |
| **Ethernet / Web Server** | | — | — | — |
| **Modbus RS485 (opto-isolated)** | | — | — | — |
| **USB** | | — | — | — |
| **Power Supply** | | From main control, except for electronic valve | | |

### Power Module

| | AS-PS20 |
|---|---|
| **Dimension** | 4 DIN |
| **Digital Output** | — |
| | — |
| **Digital Input** | — |
| | — |
| **Analog Output** | — |
| | — |
| **Universal Input** | — |
| | — |
| **Electronic valves** | — |
| **CAN FD** | — |
| **Ethernet / Web Server** | — |
| **Modbus RS485 (opto-isolated)** | — |
| **USB** | — |
| **Power Supply** | — |

** Available from Q4-2025

# **Product range** **overview**
## – User Interfaces & configurations

### User Interfaces

| | AS-UI Snap-on | AS-UI04*** |
|---|---|---|
| **Type** | Graphic LCD FSTN | Graphic LCD TFT |
| **Colors** | Black/white | 65k colors |
| **Backlight** | Dimmerable via software | Dimmerable via software |
| **Resolution** | 128 x 64 | 480 x 272 |
| **Mounting** | Magnetic lock on AS-CX controller | Panel or wall mounting |
| **Dimension (mm)** | 105 x 44.5 x 17 | 166 x 101 x 27 |
| **Viewing Area (mm)** | 58.4 x 32.2 | 96.7 x 55.54.3'' |
| **Connectivity** | — | CAN FD |
| **Operating T (°C)** | -20 / 60 | -20 / 60 |
| **Degree of Protection** | IP40 | Panel (front): IP65 Wall: IP20 |

*** Available from Q4 2025

### Configuration extensions

| | Lite | Mid, Mid SSR | Mid+, Mid+ SSR | Pro | Pro+ |
|---|---|---|---|---|---|
| **Max. Expansion modules** | 1x AS-XP | 6x AS-XP | 6x AS-XP | 16x AS-XP | 16x AS-XP |
| **Max. Power modules** | — | 1x AS-PS20 | 1x AS-PS20 | 3x AS-PS20 | 3x AS-PS20 |
| **Max. Electronic valves** | — | — | 1 | — | 1 |

### Max. configurations with max. number of XP expansion modules

| | XP05 | XP05+ | XP05 | XP05+ | XP05 | XP05+ | XP05 | XP05+ | XP05 | XP05+ |
|---|---|---|---|---|---|---|---|---|---|---|
| **Max. Digital Outputs** | 11<br>6+5 | | 36<br>6+(6x5) | | 36<br>6+(6x5) | | 86<br>6+(16x5) | | 86<br>6+(16x5) | |
| **Max. Digital Inputs** | 2<br>2+0 | | 2<br>2+(6x0) | | 2<br>2+(6x0) | | 2<br>2+(16x0) | | 2<br>2+(16x0) | |
| **Max. Analog Outputs** | 5<br>3+2 | | 15<br>3+(6x2) | | 15<br>3+(6x2) | | 35<br>3+(16x2) | | 35<br>3+(16x2) | |
| **Max. Universal Inputs** | 20<br>10+10 | | 70<br>10+(6x10) | | 70<br>10+(6x10) | | 170<br>10+(16x10) | | 170<br>10+(16x10) | |
| **Max. Electronic valves** | — | 1 | — | 6 | 1 | 7 | — | 16 | 1 | 17 |

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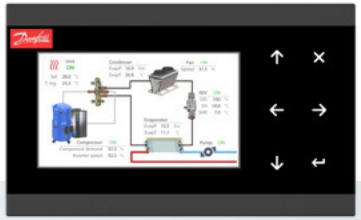
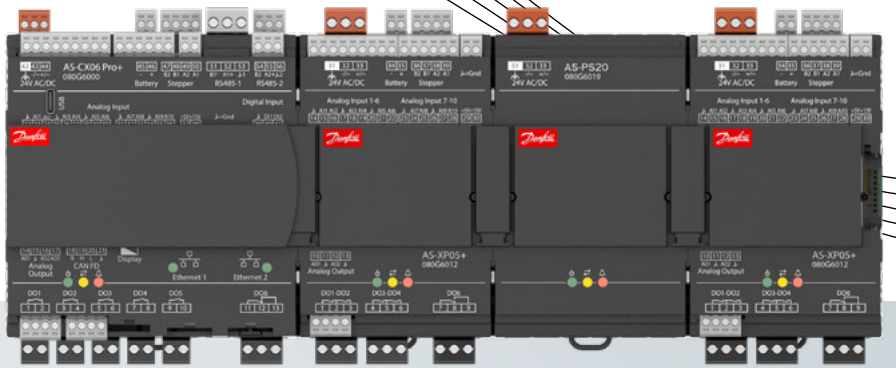
# Ready to **get started?**

To learn more about how Alsmart® can optimize your application, reach out to us.

Contact us here >






## Visit our Alsmart® website

To learn more about Alsmart® and the supporting software toolchain, please visit our dedicated Alsmart® website.

Visit website >

## Alsmart® software suite

To learn more about Alsmart® Design & Alsmart® service tool please visit the Partner portal web page, where you can find documentations, video, guides and further useful tools to quickly get familiar with the Alsmart® tool chain.


Partner portal >

## Alsmart® Training On-demand

For the Alsmart® portfolio Danfoss provide the option for Online Training or Face to Face. We offer standard courses or customize the training according to your needs. These courses are subject to a fee.
Fill out the form and you are on your way to in-depth Alsmart® training.

Training >



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