POLA

WINDOWS + SCREEN

01-10-13
12:00:00

22.3°
Temperature

Winter

16 k
Luminosity

22.3°
Temp. Set

58 %
Humidity

14 k
Luminos. Set

Mode
Automatic

35 Kh
Wind

Operation
Automatic

Stop
Windows

No
Rain

Closed
Screen

Ok
Alarm

Settings

Installat

Archive

Blocks

A B C D E

XP31 Greenhouse control

XP31 greenhouse control

Main feature

The main feature of the XP31 is the color display screen (3.5") with 320x240 dots resolution with led backlighting. XP31 is made in DIN 96x96 format and the module dimensions are 96x96mm.

The user interface is easy and friendly.
The easy touch screen system gives both the typical "easy to use" approach of a touch screen system and the strength and mechanical protection of a polycarbonate IP54 keyboard.
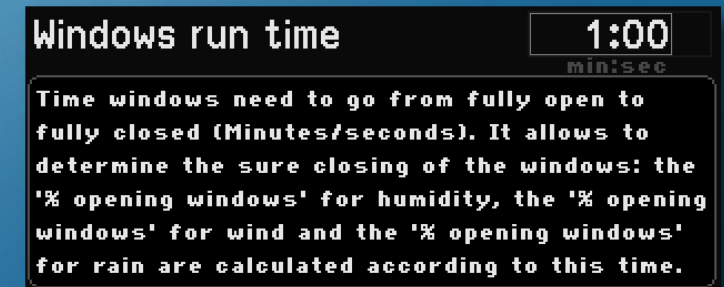
At every screen the function keys display a different graphic making the program very user friendly.

The user can select the display language: all the wordings, acronyms and "help" texts for programming assistance will be displayed in the chosen language.
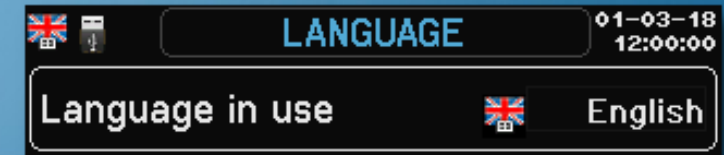
Each programming step has its own help screen so the program has a "built in" instruction manual.

XP31
Greenhouse control

XP31 manages the greenhouse climate by controlling the windows according to the ambient temperature with the option of controlling the shading and insulation based on the external brightness.

The windows are controlled in a floating proportional way according to the ambient temperature and can be conditioned by the ambient humidity, the rain sensor and the wind sensor.

The screen is controlled according to the external brightness and the night time, when the (thermal) screen is fully unrolled and can be conditioned either by the temperature (the sensor is placed at the top between the screen and the ridge in the insulated system case according to the thermal screen function), or placed at crop level in the case of shading systems that perform the cooling function).

You can also program the morning brightness set as different from the set of the day.

The Summer / Winter conditions affect the operation of the screen based on the temperature probe of the screen and the partial closure of the screens.

The light and rain sensors can be connected to multiple XP31, while the temperature, humidity and wind sensors are specific for each **XP31**.

Inputs and outputs

INPUTS

- Window temperature probe
- Screen temperature probe
- Luminosity probe
- Humidity probe
- Wind speed meter
- Rain sensor
- Motor thermal snap signal

OUTPUTS

- Window command
- Screen command
- Alarm command

Other available connections:

→ **USB plug**
XP31 has a USB plug inside.

→ **XNET**
Network connection card (optional) for **XP31** processor (see remote supervision).

One window control

Rain sensor
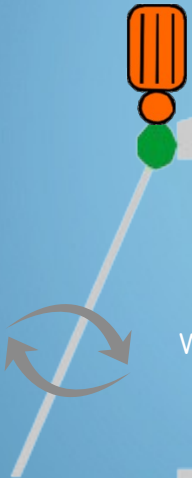
Wind sensor

Window

Window temperature probe

Humidity probe

WINDOWS 01-10-13 12:00:00

22.3° Temperature

58% Humidity

22.3° Temp. Set

Closing for wind

58% Humidity set

35 Kh Wind

Stop Windows

No Rain

Alarm | Settings | Installat | Archive | Blocks

FX01

(window gear motor drive)

For all combinations and relative controls / options, a clear summary table is available on page 16

Two windows control

Rain sensor

Wind sensor

Window
(left)

Windows
temperature probe

WINDOWS

01-10-13
12:00:00

↑ **22.3°**
Temperature

☁ **58%**
Humidity

🌡 **22.3°**
Temp. Set

🔒 **Closing
for wind**

58%
Humidity set

⊙ **35Kh**
Wind

Stop
Windows

No
Rain

🔊 **Ok**
Alarm

⚙ **Settings**

Installat

Archive

🔒 **Blocks**

Humidity
probe

Window
(right)

FX02

(left window gear motor drive)
(right window gear motor drive)

XP31
greenhouse control

Luminosity sensor

Screen
temperature probe

Screen

shade / insulating

SCREEN

01-10-13
12:00:00

16^k
Luminosity

22.3°
Temperature

Winter
Season

14^k
Luminos. Set

Morning
Klux set

22.3°
Temp. Set

Closed
Screen

Ok
Alarm

Settings

Installat

Archive

Blocks

FX01

(window gear motor drive)

For all combinations and relative controls / options, a clear

Two screens control

XP31 greenhouse control

Luminosity sensor

Screen temperature probe

Screen 1
shading / insulating

Screen 2
shade / insulating

SCREEN

01-10-13 12:00:00

☀ 16ᵏ
Luminosity

🌡 22.3°
Temperature

Winter
Season

14ᵏ
Luminos. Set

Morning
Klux set

22.3°
Temp. Set

Closed
Screen

Alarm   Settings   Installat   Archive   Blocks

FX02

(left screen gear motor drive)
(right screen gear motor drive)

For all combinations and relative controls / options, a clear <u>summary table is available on page 16</u>

One window + one screen control

XP31 greenhouse control

Rain sensor

Wind sensor

Window

Screen temperature probe

Luminosity sensor

Window temperature probe

Screen shade / insulating

WINDOWS + SCREEN 01-10-13 12:00:00

22.3° Temperature

Winter

16ᵏ Luminosity

22.3° Temp. Set

58% Humidity

14ᵏ Luminos. Set

Mode Automatic

35ᴷʰ Wind

Operation Automatic

Stop Windows

No Rain

Closed Screen

Ok Alarm | Settings | Installat | Archive | Blocks

Humidity probe

FX02

(window gear motor drive)
(screen gear motor drive)

For all combinations and relative controls / options, a clear <u>summary table is available on page 16</u>

Two windows + one screen control

XP31 greenhouse control

Rain sensor

Wind sensor

Luminosity sensor

Screen
temperature probe

Screen
shade / insulating

Window
(left)

Window
temperature probe

Window
(right)

Humidity
probe

WINDOWS + SCREEN 01-10-13 12:00:00

22.3° Temperature

Winter

16ᵏ Luminosity

22.3° Temp. Set

58% Humidity

14ᵏ Luminos. Set

Mode Automatic

35ᴷʰ Wind

Operation Automatic

Stop Windows

No Rain

Closed Screen

Ok Alarm

Settings

Installat

Archive

Blocks

FX03

(left window gear motor drive)
(right window gear motor drive)
(screen gear motor drive)

For all combinations and relative controls / options, a clear <u>summary table is available on page 16</u>

Two windows + two screens control

XP31 greenhouse control

Rain sensor

Wind sensor

Luminosity sensor

Screen temperature probe

Screen 1
shading / insulating

Screen 2
shade / insulating

Window (left)

Window (right)

Windows temperature probe

Humidity probe

WINDOWS + SCREEN   01-10-13   12:00:00

22.3° Temperature   Winter   16k Luminosity

22.3° Temp. Set   58% Humidity   14k Luminos. Set

Mode Automatic   35Kh Wind   Operation Automatic

Stop Windows   No Rain   Closed Screen

Ok Alarm   Settings   Installat   Archive   Blocks

FX02

FX02

(left window gear motor drive)
(right window gear motor drive)

(screen 1 gear motor drive)
(screen 2 gear motor drive)

XP31 records all the parameters of the environment

XP31 greenhouse control

CLIMATE ARCHIVE
01-10-13 12:00:00

28 — Archive day
10-07-20 — Archive date

	Min	Medium	Max
Windows temperature	19.4°	23.2°	24.6°
Screen temperature	24.1°	26.2°	29.3°
Humidity	57%	78%	86%
Luminosity	0K	13K	18K
Wind intervention		No	
Rain intervention		No	

Exit · Graphics · Day (−) · Day (+)

GRAPH RECORDING
01-03-18 12:00:00

Last 24 hours

Daily

Cycle

Exit · Move · Move · Select

WINDOWS TEMP.
10-07-20 12:00:00

Exit · 27 Cycle Day · View · Day (−) · Day (+)

Multiple levels of registrations:

- Daily data, a recording for each day of the cycle
- Data of every single day with sampling every 15 minutes
- Full cycle data

The daily archive records the following parameters:

- Window temperature
- Screen temperature
- Humidity
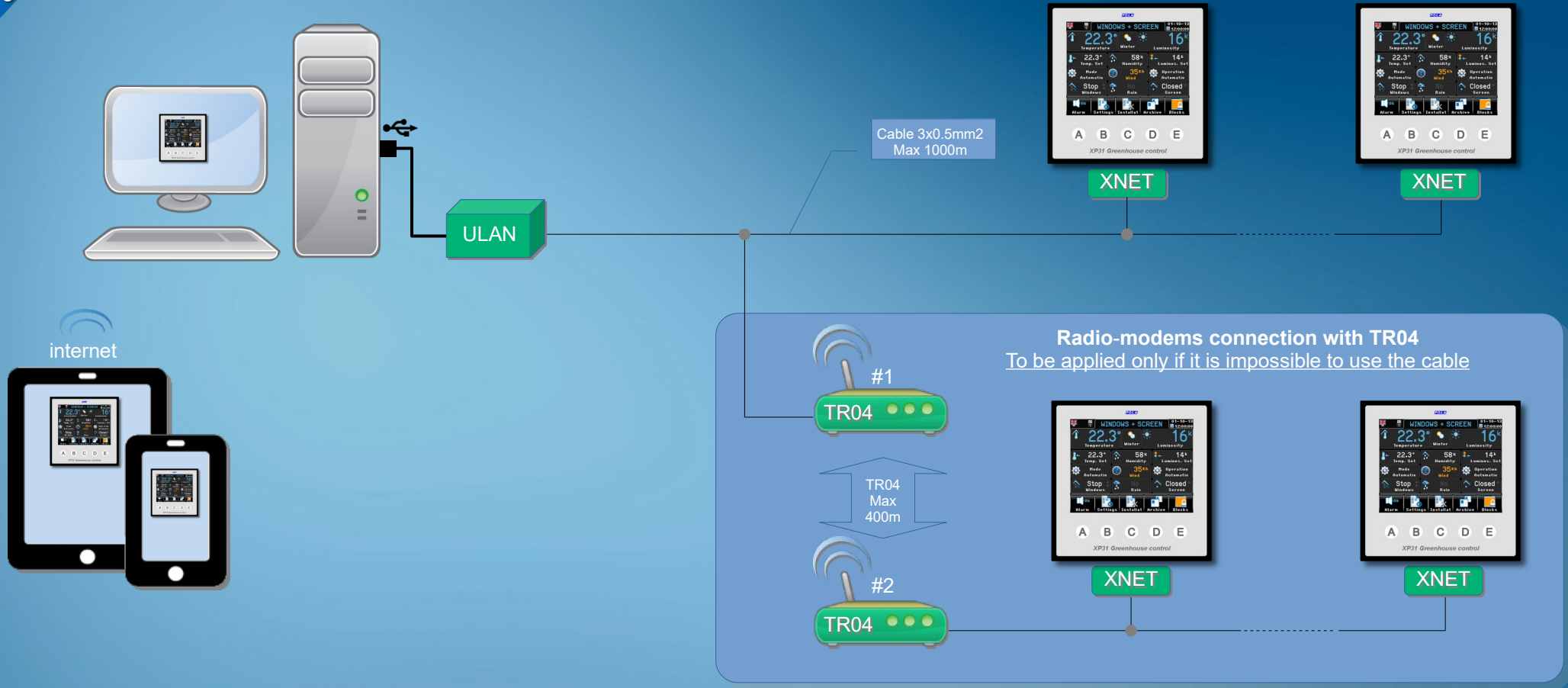- Luminosity
- Wind speed
- Rain intervention
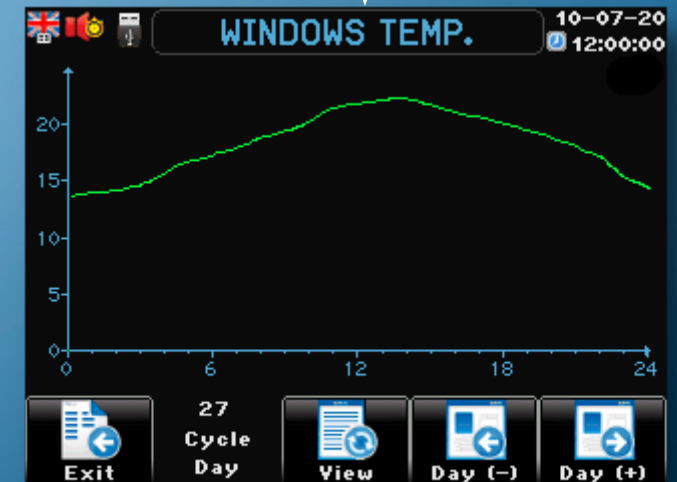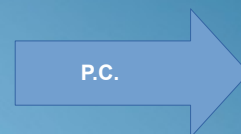
The communication with the outside world is performed by USB key.

➔ **Export archives**
XP31 save in the USB memory a file containing all the day by day recorded data of the cycle.
Connecting the USB key to a PC and by using the XP31 **Dialogue** software you can browse the recorded data in grid or graph formats.

➔ **Importing / saving the setting**
You can save a file with all back-up infos on a USB file.
Saved settings can be uploaded on **XP31** anytime by a user friendly procedure.

Remote supervision

Cable 3x0.5mm2
Max 1000m

XNET

XNET

internet

Radio-modems connection with TR04
To be applied only if it is impossible to use the cable

#1

TR04

TR04
Max
400m

#2

TR04

XNET

XNET

ULAN

Remote supervision of **XP31** processors grants the full management of system by PC.

The XP31 **Net Pro** supervision software enables the full remote control of network connected processors.
ULAN peripheral is connected to PC through a USB connection. XP31 – ULAN connection is done by a simple 3 wires cable.
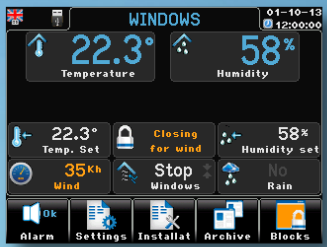In all cases where **ULAN** cannot be cabled to **XP31** we can supply **TR04** radio-modems with a reach of 400 mt.

Components for creating a supervision system:

- ➜ **ULAN**: Network server Pc (with USB connection)
- ➜ **XNET**: Network adapter card (one for each **XP31**)
- ➜ **TR04**: Radio-modem 485 (optional, to be used only when it is not possible to use the cable)
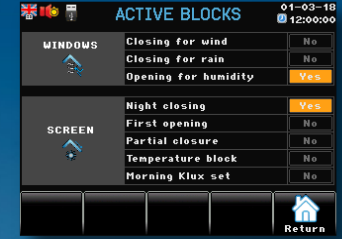
Sample screenshots

view screens

WINDOWS
01-10-13 12:00:00

22.3° Temperature
58% Humidity

22.3° Temp. Set
Closing for wind
58% Humidity set
35 Kh Wind
Stop Windows
No Rain

Ok Alarm | Settings | Installat | Archive | Blocks

Home page view
(only with windows functionality)

SCREEN
01-10-13 12:00:00

16 k Luminosity
22.3° Temperature

Winter Season
14 k Luminos. Set
Morning Klux set
22.3° Temp. Set
Closed Screen

Alarm | Settings | Installat | Archive | Blocks

Home page view
(only with screen functionality)

WINDOWS + SCREEN
01-10-13 12:00:00

22.3° Temperature
Winter
16 k Luminosity

22.3° Temp. Set
58% Humidity
14 k Luminos. Set
Mode Automatic
35 Kh Wind
Operation Automatic
Stop Windows
No Rain
Closed Screen

Alarm | Settings | Installat | Archive | Blocks

Home page view
(windows + screen functionality)

ACTIVE BLOCKS
01-03-18 12:00:00

WINDOWS
Closing for wind — No
Closing for rain — No
Opening for humidity — Yes

SCREEN
Night closing — Yes
First opening — No
Partial closure — No
Temperature block — No
Morning Klux set — No

Return

Viewing
active blocks

setting screens

SETTINGS
01-10-13 12:00:00

Windows
Shading
Alarm
Starting cycle

Exit | Move | Move | Select

Settings
selection

WINDOWS
01-10-13 12:00:00

Operation — AUTOM.
Windows temperature — 25.3°

Exit | Move | Move | Select

Windows parameters
Settings

WINDOWS
01-01-13 17:03:59
SETTING CHANGE PROCEDURE

Windows temperature — 25.3°
Working temperature of windows.

Exit | Decrem | Increm | Enter

Windows temperature
setting

check control screens

CHECK CONTROL
01-10-13 12:00:00

Inputs
Realay outputs

Exit | Info | Move | Move | Select

Check control

INPUTS STATE
01-10-13 12:00:00

Windows temperature probe (SX) — 23.1°
Screen temperature probe (SX) — 25.7°
Luminosity probe (LXS) — 12 K
Humidity probe (RHR) — 78 %
Wind sensor (WX) — 8 K
Rain sensor (RX) — Open

Exit

Inputs state

RELAY OUTPUTS STATE
01-10-13 12:00:00

Windows closing — On
Windows opening — Off
Screen closing — Off
Screen opening — On
Alarm — Off

Exit

Outputs states
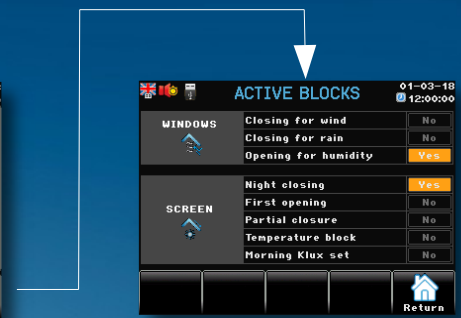
Order composition summary table

Motors to be driven	Order composition								
	XP31*1	FX01*2	FX02*2	FX03*2	LXS*3 + HA20s*4	RHR + HA20s*4	RX*3 + HA20s*4	WX	SX *1
	Control	Drive electrical box 1 motor +1 temp. probe SX	Drive electrical box 2 motors +2 temp. probes SX	Drive electrical box 3 motors +3 temp. probes SX	Luminosity probe + power supply	Humidity probe + power supply	Rain probe + power supply	Wind speed sensor	Temperature probe
Options									
1 Screen	✓	✓			✓				✓
2 Screens	✓		✓		✓				✓
1 Screens + 1 Window	✓		✓		✓	✓	✓	✓	✓
1 Screen + 2 Windows	✓			✓	✓	✓	✓	✓	✓
2 Screens + 2 Windows	✓		✓ (N. 2)		✓	✓	✓	✓	✓
1 Window	✓	✓				✓	✓	✓	✓
2 Windows	✓		✓			✓	✓	✓	✓

*1 XP31 is supplied without SX temperature probes. If you do not order the switchboards FX01-FX02-FX03 (which are equipped with N.1-2-3 SX temperature probes) you must order the additional SX probes that are needed in the system.

*2 Specify the characteristics of the motors in the order (Voltage/Power/Ampere)

*3 The brightness (LXS) and rain (RX) sensors can be connected to multiple XP31s, while the temperature (SX), humidity (RHR) and wind (WX) sensors are specific to each XP31.

*4 If N. 1 HA20s is already present in the system, it is not mandatory to install others (one is enough for all the sensors that require it).

Options available

Model	Description
XP31	Greenhouse control
	-- *Options* --
W02	IP54 box for wall mounting + gasket + transparent cover (CXP)
CXP	Hinged transparent cover for XP + gasket
FX01	Drive electrical box for one three-phase gear-motor (specify motor power), with 1 SX temperature probe included
FX02	Drive electrical box for two three-phase gear-motors (specify motor power), with 2 SX temperature probe included
FX03	Drive electrical box for three three-phase gear-motors (specify motor power), with 3 SX temperature probe included
SX	Temperature probe (see summary table on page 16)
HA20s *	Power supply (it is unique for the connection of the probes: LXS, RHR, RX).
LXS	Luminosity probe 0-100 Klux (require **HA20s***)
RHR	Humidity probe 0...100% (require **HA20s***)
RX	Rain sensor to detect rainfall (rain, snow), a heating element is incorporated (require **HA20s***)
WX	Wind meter rotating sensor
USBP	USB IP65 external plug (to be mounted externally, for access to the USB without the need to access the back of the XP31)
XNET	Network nodal point
ULAN	Network server Pc (with USB connection)
TR04	Radio-modem 485 (IP55 junction box with power supply 230/12v)

If N .1 HA20s is already present in the system, it is not mandatory to install others (one is enough for all the sensors that require it).

Technical specification

XP31

DIN96 module for panel mounting

Protection degree: IP54 **(front panel)**

Case material: ABS

Power supply: 100-240V 50/60Hz

Power consumption: 3W

XP31 + W02

W02

CXP

H

L

P

Dimension: 220x175x130mm (HxLxP)
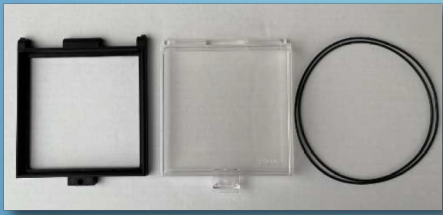
Protection degree: IP54

Case material: PVC

Power supply: 100-240V 50/60Hz

Power consumption: 3W

Supplied with: **CXP** transparent cover that can be opened with a hinge.

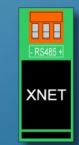# Options

CXP

W02

FX01

FX02

FX03

SX

LXS

RX

RHR

WX

HA20s

ULAN

XNET

USBP

TR04

Performance comparison XP31 vs XPGH

Functionality	XP31	XPGH
Window control	1	2 (ridges + sides)
Shading control	Yes	Yes
Brightness control	Yes	Yes
Shading temperature control	Yes	Yes
Air heating	No	Yes
Basal heating	No	Yes
Air circulators	No	Yes
Cooling	No	Yes
Cover inflation	No	Yes
Dehumidification cycle	No	Yes
Humidity sensor	Yes	Yes
Wind sensor	1	2 (Left-Right)
Rain sensor	Yes	Yes

POLA

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40th

40 YEARS OF INNOVATION