



230V

NV Comfort® touch screen with adaptor



NV Comfort® software card



NV Comfort® basis package

## NV Comfort® Standard / Plus KNX control



Natural  
ventilation



KNX product

### Application

- central control of indoor climate with the potential for individual control in every room
- suitable for both new buildings and for the refurbishment of small and medium-sized buildings
- control of the natural ventilation in up to four/eight rooms/zones
- the Standard version controls the natural ventilation and the heating (radiators)
- the Plus version controls the natural ventilation, the heating (radiators), mechanical fans, lighting and sun screening
- to be combined with WindowMaster MotorControllers and window actuators with MotorLink® technology, which provides millimetre-precise control of window openings at three speeds

### Description

NV Comfort® provides an effective solution for ensuring the optimal indoor climate in each room/zone according to individual pre-defined requirements. The control is ideally suited for both new buildings and the refurbishment of smaller and medium-sized buildings such as offices, hotels, schools, exhibition buildings and sports centres, where there is focus on a comfortable and healthy indoor climate, as well as on low energy consumption and minimal impact on the environment.

With NV Comfort®, the various air, heat and light functions in the building are controlled centrally so that synergy between the functions is achieved and the building's energy consumption is thereby reduced.

### NV Comfort® comes in two versions:

- Standard: Control of windows and heating (radiators)
- Plus: Control of windows and heating (radiators) and mechanical fans, lighting and sun shading

### Window control (Standard and Plus versions)

A healthy and comfortable indoor climate is ensured through the automatic control of the opening of skylights and façade windows. The size of the window openings and the frequency of opening are configured based on the pre-defined values of the operating parameters for temperature, CO<sub>2</sub> level and humidity compared to the measurements of the outdoor temperature, wind speed and rain from the connected weather station. It is also possible to configure predefined airing times.

The system has a built-in safety feature so that the opening of windows is restricted in the event of high wind speeds and the windows are closed in the event of strong wind or rain.

### Heating (Standard and Plus versions)

NV Comfort® controls the radiators via KNX thermal actuators so that the heating is turned on or off based on predefined temperature set-points. This ensures a comfortable and stable room temperature during both heating and ventilation periods. NV Comfort® can also be integrated with the building's heating plant.

### **Mixed mode ventilation (Plus version)**

If the number or size of a building's windows is not sufficient to achieve an optimal indoor climate with natural ventilation, external fans (mechanical ventilation) can be connected and used at peak loads, since NV Comfort® Plus can send a signal (ON/OFF signal and/or 0-10V (0-100%)) to the fans and dampers in a balanced ventilation system.

### **Light (Plus version)**

By connecting PIR detectors, it is possible to turn off the lighting automatically when a room is vacated, thereby reducing the building's energy consumption.

### **Sunlight protection (Plus version)**

The sun screening function allows venetian blinds, awnings etc. to be controlled automatically, both in summer and winter, so that the position of the sun screening can be continually adapted to the prevailing lighting and heating situation in a room. This allows an optimal use and exploitation of the sun screening product as well as optimising the use of solar thermal energy. The actual control is based on measurements of lux and temperature.

## **Operation**

The overall operation of the installation is performed using the touch screen, where there are menus for the daily operation of both the building level and a zone-by-zone level, as well as menus for setting the operating parameters so that windows and any connected heating, mechanical fans, lighting and sun screening are controlled automatically.

The user also has the option of overriding the functions on the touch screen, i.e. open or close the windows, control the heating, sun screening, blinds etc.

Individual keypads can also be fitted in all the connected rooms so that the user has the option of quickly and easily opening or closing the windows and any sun shades in a room. After manual operation, the system will automatically switch back to automatic mode after an individually configured period of time.

It is possible to lock the touch screen with PIN codes at two levels. In a school, for example, this will mean that a screen can be locked so that only a caretaker has access to everything on the screen (general level), the teachers have access to the daily operation (user level), while the students have no access to operate the screen.

## **Function**

NV Comfort® is a pre-programmed KNX product with combined control and colour touch screen with algorithms and functions that ensure uncomplicated design, implementation, installation and operation.

The controls' pre-programmed parameters can thus be regulated on the screen at the general level so that the control is specifically adapted to a given building with the option of also configuring individual values for each of the connected rooms/zones.

Window openings are controlled automatically so that the indoor climate remains optimal. Control is based on the room temperature, CO<sub>2</sub> level and the relative humidity compared to outdoor conditions: temperature, wind speed and rainfall.

The windows can be controlled in two groups per room/zone so that e.g. facades and skylights can be controlled individually.

The communication between NV Comfort® and the installation's sensors and actuators occurs via the KNX bus. Communication between NV Comfort® and the individual window actuators also occurs via MotorLink®, which continuously monitors and controls the window openings with millimetre-precision and also allows the windows to be opened and closed at three different speeds:

- automatically control speed – actuators run slowly and almost soundlessly.
- manual control speed – actuators run faster and more audibly.
- H&S and safety control speed – actuators run fastest. H&S control always has highest priority.

## **Combination options**

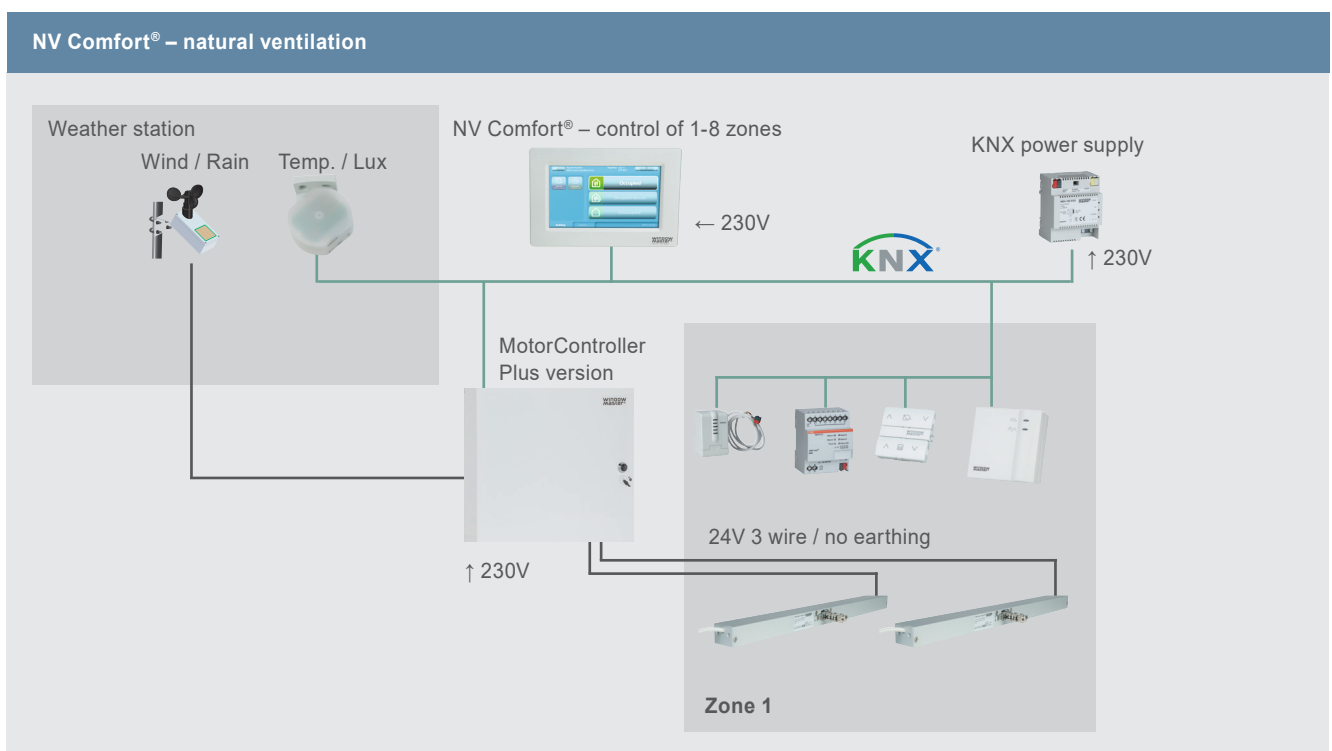
NV Comfort® must be used in conjunction with WindowMaster MotorLink® window actuators and MotorControllers and keypad, sensors and KNX products – refer to the accessory list. For combination with io-homecontrol® products or smoke ventilation, please contact WindowMaster for further information.

## **Installation**

NV Comfort® is a bus-based solution at KNX standard, which must be configured and commissioned with ETS (KNX Engineering Tool software) by an ETS-trained electrician.

The features can be implemented and activated independently from each other and as needed, so the system at any time can be adapted to each project.	Functionality				
	Natural ventilation	Heat-control	Mechanical ventilation (mixed mode)	Light-control	Sun screening
<b>Standard 4 zones:</b> NV Comfort® touch screen with adaptor NV Comfort® soft ware card, 4 rooms/zones, Standard NV Comfort® basis pack (KNX power supply + weather station)	✓	✓	-	-	-
<b>Standard 8 zones:</b> NV Comfort® touch screen with adaptor NV Comfort® soft ware card, 8 rooms/zones, Standard NV Comfort® basis pack (KNX power supply + weather station)	✓	✓	-	-	-
<b>Plus 4 zones:</b> NV Comfort® touch screen with adaptor NV Comfort® soft ware card, 4 rooms/zones, Plus NV Comfort® basis pack (KNX power supply + weather station)	✓	✓	✓	✓	✓
<b>Plus 8 zones:</b> NV Comfort® touch screen with adaptor NV Comfort® soft ware card, 8 rooms/zones, Plus NV Comfort® basis pack (KNX power supply + weather station)	✓	✓	✓	✓	✓

NV Comfort® can be connected to a number of components so that the control can be adapted to the specific project. An example is shown here with one zone and component connections.



## Composition of a NV Comfort® solution

We recommend the following steps in the configuration of a NV Comfort® solution:

### 1. Which features

Besides natural ventilation and heating are other functions to be controlled, e.g. mechanical fans, lighting, and sun screening? If not, select NV Comfort® Standard. If so, select NV Comfort® Plus.

### 2. Number of zones

Determine the number of rooms/zones to be controlled. For 1-4 rooms/zones, select software card for 4 rooms/zones. For more rooms/zones (up to 8) select software card for 8 rooms/zones. When more than 8 rooms/zones, select extra screen/screens and the necessary software cards.

### 3. Basic package

Select NV Comfort® basic package (KNX power supply + weather station).

### 4. Number of windows and actuators

Determine the number of windows to be controlled. Determine the number of actuators.

For new windows, the window manufacturer can deliver the windows with built-in MotorLink® actuators.

### 5. Number of MotorControllers

Decide on the number of MotorControllers. One MotorController can control up to 10 windows in different zones. The distance between the window actuators and the MotorController depends on the cable dimensions, though max. 50m.

### 6. Number of sensors and keypads

Each zone is equipped with a room sensor (combined temperature, CO<sub>2</sub> and humidity sensor) and, if Plus is selected, possibly also a LUX and a PIR sensor.

Each room should also have at least one keypad and preferably one keypad per window or workplace.

### 7. Other components

If heat, mechanical ventilators, light or sun screening is to be controlled, components for these functions must be selected.

## Example of solution

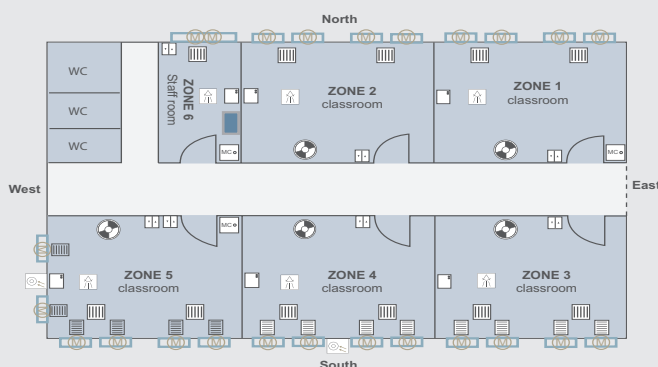
NV Comfort® can be used for many different buildings. The illustration below shows how the NV Comfort® solution can be compiled for two a school.

### School with mixed mode ventilation

The school building consists of five classrooms with mixed mode ventilation and one staff room. Each classroom has four windows, each equipped with one actuator, and the window in the staff room is equipped with two actuators.

The windows in classrooms 3, 4 and 5 also have sun shades. In each room is fitted with one keypad, one room sensor (temp. / CO<sub>2</sub> / humidity) and one PIR detector.

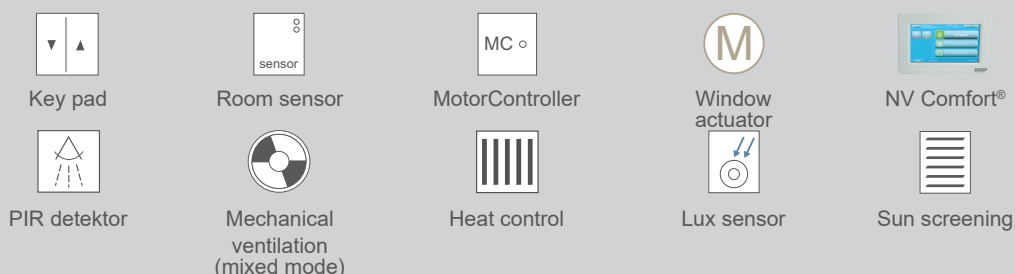
Classrooms 3, 4 and 5 are also fitted with one LUX sensor. The NV Comfort® screen is placed in the staff room.



### The following components have been used:

- 1 x NV Comfort® touch screen with adaptor – NVC KNX A02
- 1 x NV Comfort® software card, 8 rooms/zones, Plus – NVC SC 8P 0
- 1 x NV Comfort® basic package – NVC BP KNX 11
- 22 x actuators, single
- 2 x actuators, double
- 2 x MotorController – WCC 320 S 0810 KNX
- 1 x MotorController – WCC 320 P 1012
- 1 x fieldbus card – WCA 3FK
- 6 x room sensor (temperature / CO<sub>2</sub> / humidity) – WET 112
- 6 x PIR detector, ceiling – WEO 120
- 6 x keypad, operation of a single window group
- 3 x keypad, operation of a double window group
- 2 x lux sensor – WEL 100
- 1 x sun screening actuator, 8 channels – WEA 250 0802
- 1 x thermo actuator for 12 radiators – WEV 112
- 12 x thermo valve actuator – WEV 113
- 12 x valve adaptor – WEV 114
- 1 x output module for the mechanical ventilation – WEA 165

### Symbols:



NV Comfort® touch screen – NVC KNX A02		
Material	Plastic cabinet with brushed anodised aluminium surround + adaptor	
Touch screen	7" LCD Wide VGA	
Size	Touch screen Aluminium surround	185 x 126 x 52mm (W x H x D) 211 x 140 x 5mm (W x H x D)
Installation	<p>NV Comfort® touch screen can be surface mounted or flush to the wall.</p> <p>Surface mounting: frame type NVC A100 (to be ordered separately).</p> <p>Flush mounting: NV Comfort® can be flushed mounted as it is or in an installation housing. Installation housing type NVC A201, NVC A202 or NVC A203 (to be ordered separately).</p>	
Power supply	<p>Touch screen: 24VDC, 0.65A via net adaptor (typical consumption 6W)</p> <p>Net adaptor: 90-265VAC, 50-60Hz, 0.4A, cable length 1.2m, the adaptor is supplied with plugs for Western Europe, United Kingdom and US</p>	
Power supply KNX	Max. 10mA	
Bus connection	KNX bus	
NV Comfort® software card – NVC SC xx x		
Material	SD card	
NV Comfort® basic package NVC BP KNX 11 includes:		
Wind and rain sensor – WLA 340		
Material	Housing/anemometer in plastic, bracket in metal	
Size	80 x 160 x 55mm (W x H x D) without anemometer	
Power supply	24VDC (+20/-10%) (typical consumption 100mA)	
Relay output	1 x potential free switch, 60V/1A	
Wind speed	Pulse output	
Protection type	IP65	
Cable for the wind and rain sensor – WLL 608		
Material	4m UV-resistant cable 4 x 2 x 0.75mm <sup>2</sup>	
Outdoor temperature and lux sensor and GPS – WET 200		
Material	Self extinguishing thermoplastic	
Size	<p>Sensor: 75 x 31 x 65mm (W x H x D)</p> <p>Bracket: 52 x 38 x 57mm (W x H x D)</p>	
Power supply	KNX bus voltage	
Protection type	IP54	
KNX power supply – WEA 102		
Size	4 DIN-rail modules of 18mm	
Power supply	120-230 VAC, 50-60Hz	
Power consumption	Ca. 24 VA (nominal)	
Output voltage	29 VDC, 640mA, up to 64 KNX devices in one bus line	
Output current	640mA, short circuit limited to 1.5A	
Protection type	IP20	
General		
Operation conditions	<p>NV Comfort®, WEA 102: -5°C - +40°C. Max.90% RH, non condensing</p> <p>WLA 340: -20°C - +60°C WET 200: -30°C - +55°C</p>	
Notice	We reserve the right to make technical changes	

# NV Comfort® Standard / Plus

## KNX control

Items	Item no.
NV Comfort® touch screen with adaptor	NVC KNX A02
NV Comfort® software card, 4 rooms/zones, Standard	NVC SC 4S 0
NV Comfort® software card, 8 rooms/zones, Standard	NVC SC 8S 0
NV Comfort® software card, 4 rooms/zones, Plus	NVC SC 4P 0
NV Comfort® software card, 8 rooms/zones, Plus	NVC SC 8P 0
NV Comfort® basic package (KNX power supply + weather station)	NVC BP KNX 11

Accessories	Item no.
NV Comfort® frame in brushed aluminium, surface mounting, 209 x 138 x 52.5mm (W x H x D)	NVC A102
NV Manager™ - log analysis and online operation of one NV Comfort® controller	-
Temperature-, CO <sub>2</sub> level and humidity sensor	WET 112
Lux sensor, outdoor	WEL 100 0101
PIR wall (presence detector)	WEO 102 0101
PIR ceiling (presence detector)	WEO 112 0101
MotorController 10A, 4 motor lines 10A each, max. 10A total, 10 KNX input	WCC 310 S 0410 KNX
MotorController 20A, 8 motor lines 10A each, max. 20A total, 10 KNX input	WCC 320 S 0810 KNX
MotorController 10A, 2 motor lines each 10A, max. 10A total, 2 inputs*	WCC 310 P 0202
MotorController 10A, 6 motor lines each 10A, max. 10A total, 12 inputs*	WCC 310 P 0612
MotorController 10A, 10 motor lines each 10A, max. 10A total, 12 inputs*	WCC 310 P 1012
MotorController 20A, 2 motor lines each 10A, max. 20A total, 2 inputs*	WCC 320 P 0202
MotorController 20A, 6 motor lines each 10A, max. 20A total, 12 inputs*	WCC 320 P 0612
MotorController 20A, 10 motor lines each 10A, max. 20A total, 12 inputs*	WCC 320 P 1012
*To enable KNX communication: Fieldbus card with field bus interface to KNX	WCA 3FK
KNX valve actuator for heat control	WEV 110
6-channel output for operating thermo actuator type WEV 113	WEV 111
12-channel output for operating thermo actuator type WEV 113	WEV 112
Thermo actuator for WEV 111 and WEV 112 (valve adaptor to be ordered separately)	WEV 113
Valve adaptor for WEV 113 for Danfoss RA	WEV 114
Valve adaptor for WEV 113 for e.g. Onda, Schlösser, Oventorp (M30x1.5), Heimeier	WEV 115
Sun screening actuator – shutter module, 2 channels	WEA 250 0202
Sun screening actuator – shutter module, 4 channels	WEA 250 0402
Sun screening actuator – shutter module, 8 channels	WEA 250 0802
Analogue input module, 4-channel	WEA 163
Digital input module, 4-channel	WEA 164
Digital output module, 4-channel, potential free	WEA 165
Analogue output module 0-10V, 4 channel, master	WEA 166
Power supply 24V AC, 0,83A for WEA 166/167	WEP 224 0080

See separate product sheets for further information.

The function of the products is tested together with NV Comfort®. If alternative KNX products are used, others have to ensure that the combination of products functions is as intended and without problems.