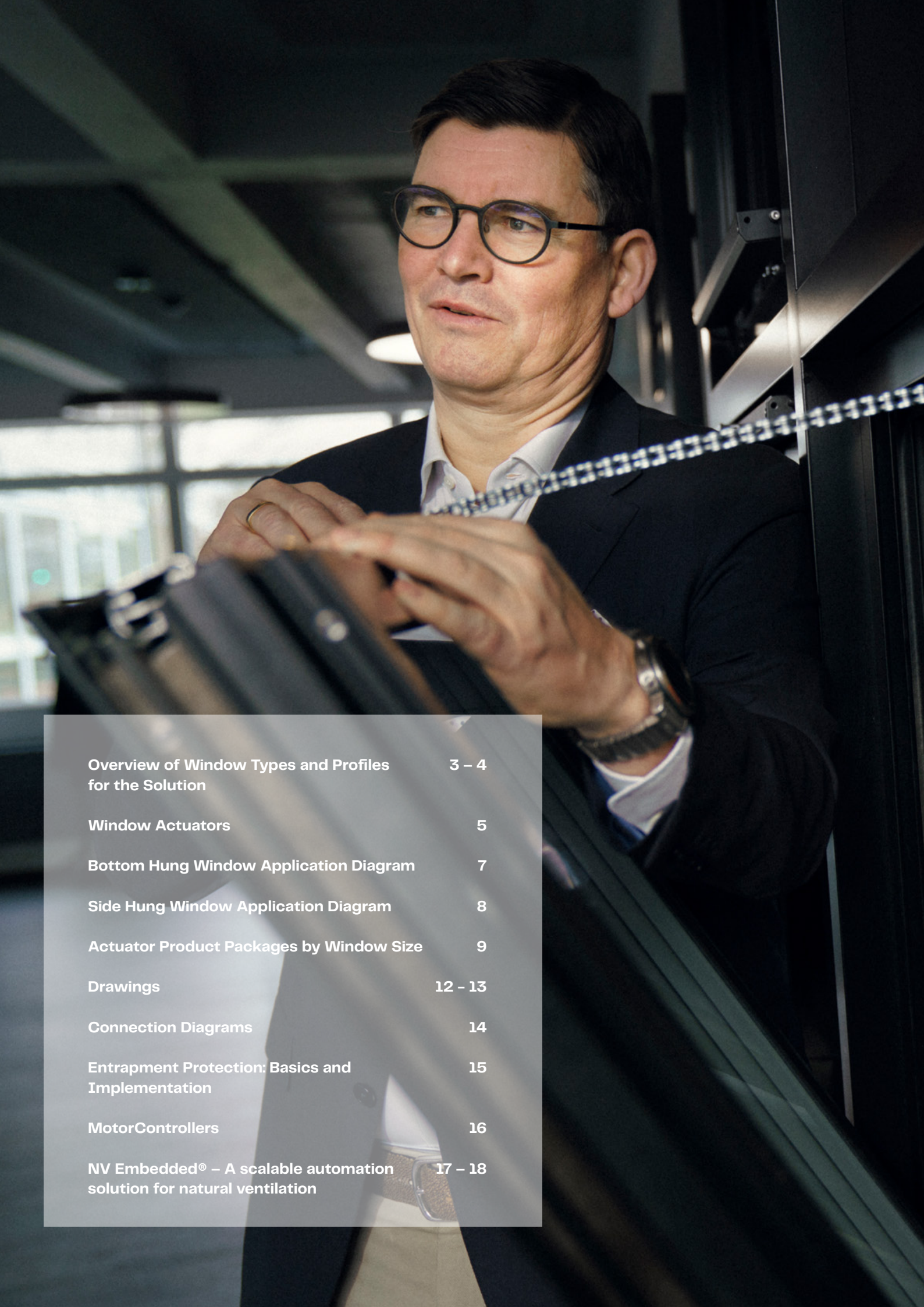


Window Automation WICLINE 75 EVO



Overview of Window Types and Profiles for the Solution 3 – 4

Window Actuators 5

Bottom Hung Window Application Diagram 7

Side Hung Window Application Diagram 8

Actuator Product Packages by Window Size 9

Drawings 12 – 13

Connection Diagrams 14

Entrapment Protection: Basics and Implementation 15

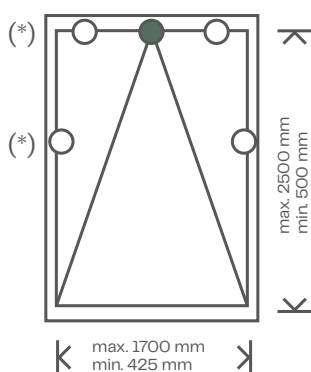
MotorControllers 16

NV Embedded® – A scalable automation solution for natural ventilation 17 – 18

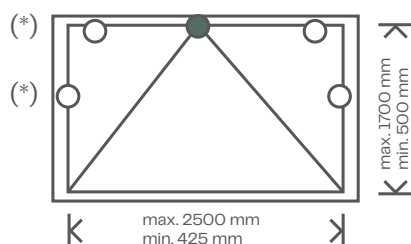
Overview of Window Types and Profiles for the Solution

The solutions listed below are used to automate inward opening, bottom hung and side hung windows from the WICLINE 75 EVO series with the following dimensions:

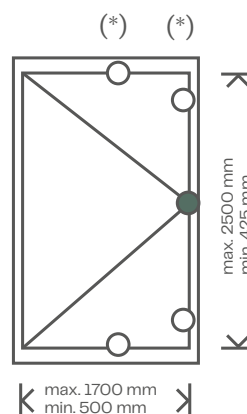
Bottom Hung – Inward Opening



(*) optional



Side Hung – Inward Opening



(*) optional

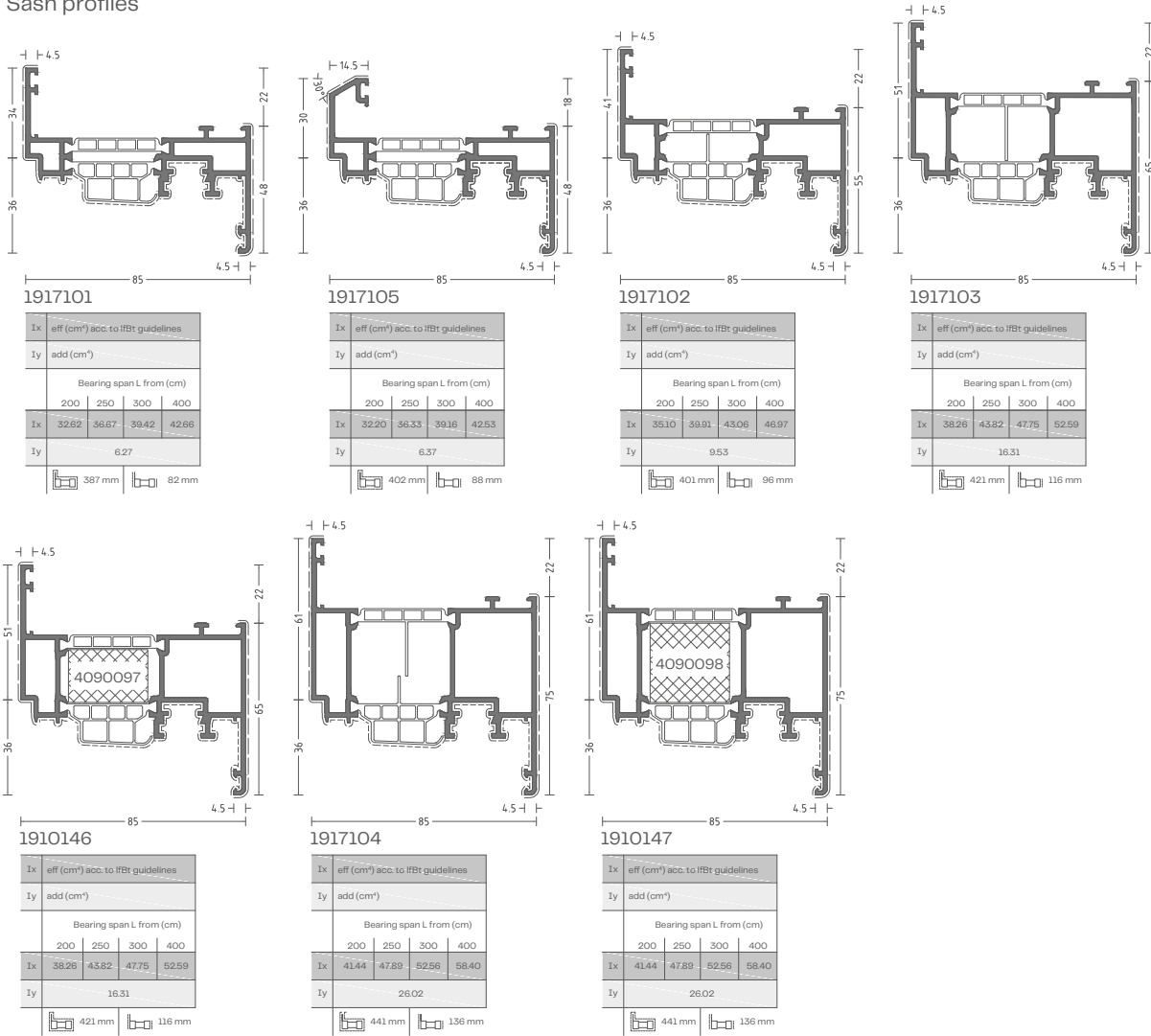
Please note that the maximum realizable sash size depends on which sash profile you choose. We refer here to the current sash sizes in the program list.

The minimum sash sizes and achievable opening widths can be found in the application diagrams in the following sections.

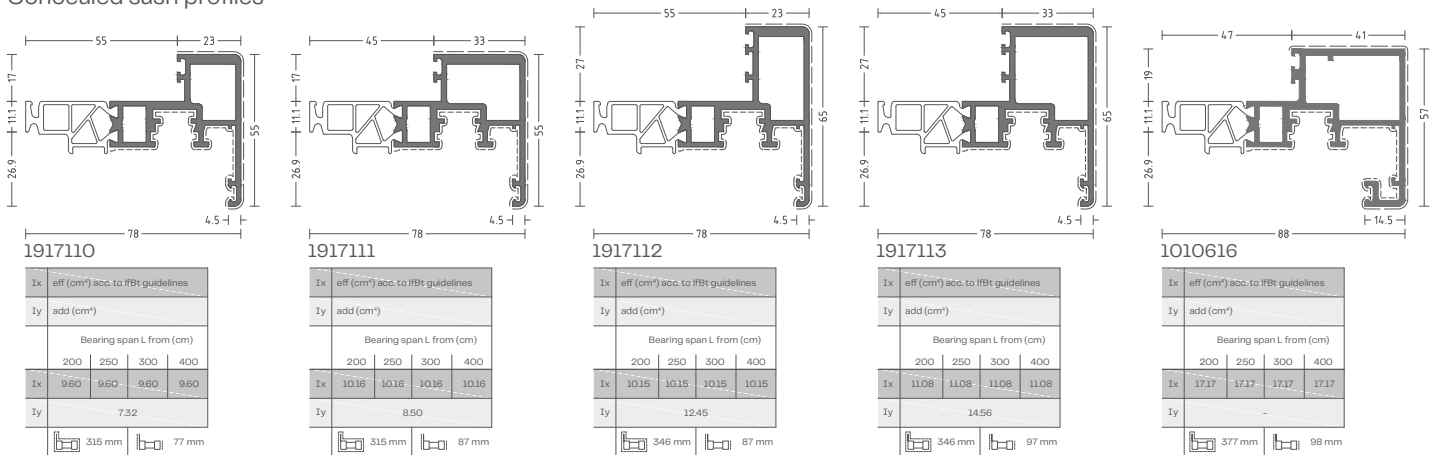
The actuators can be mounted on the following sash profiles:

WICLINE 75 EVO

Sash profiles



Concealed sash profiles

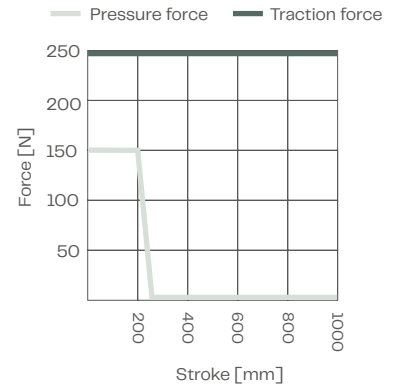


Window Actuators

The window automation solution consists of one or, depending on the window size, several chain actuators – WMX 813 and a locking drive WMB 815. The fittings and cables required to mount and connect the actuator are included. A cable concept completes the system.

The actuator combination required for the respective window design can be determined from the Application Diagrams. The maximum possible stroke lengths of the actuator are also listed. As a rule of thumb, the maximum chain length corresponds to half the sash height.

Chain actuator WMX 813



Technical specifications	
Pressure / Traction force	See diagram
Locking force	2000N
Chain opening	50 – 1000mm in increments of 10mm, maximum opening depends on the window construction
Opening speed	1–17 mm/s (TrueSpeed™)
Sound pressure level	≤25 dBA (operational speed: 1 mm/s), ≤42 dBA (operational speed: 10 mm/s)
Window type	bottom and side hung windows
Nominal voltage	24V DC (max. 10% ripple)
Voltage	20–36V DC
Max. open-circuit voltage	max. 36V DC
Current consumption	max. 1A
Working condition	–5°C – +74°C, max. 90% relative humidity (not condensing)
Switch-on-duration	ED 40% (max. 4 min. per 10 min)
Material	zinc housing protected against corrosion, aluminium
Colour	Black anodized aluminium, black RAL 9005. Other RAL colours available at additional price
Size	22 x 33mm (H x D), length (L) depending on chain stroke – see table.
Weight	400mm stroke: 1.28 kg; 600mm stroke: 1.42 kg; 800mm stroke: 1.63 kg; 1000mm stroke: 1.84 kg;
IP rating	concealed: IP 32
SHE test	Approved according to EN 12101-2 with selected profiles – please contact WindowMaster for further information B300 tested according to EN 12101-2
Life span	Tested with 10,000 opening and closing movements
Delivery includes	WMX 813 Z: Actuator with 35mm connection cable (3-core cables 0.34mm ²) with Molex Micro-Fit connector for WLL cables WMX 813 E: Actuator with 35mm connection cable (3-core cables 0.34mm ²) with Molex Micro-Fit connector for WLL cables and connection for safety device
To be ordered separately	Brackets and standard extension cables (WLL)

Further Technical Details can be found in the [Data Sheet](#).

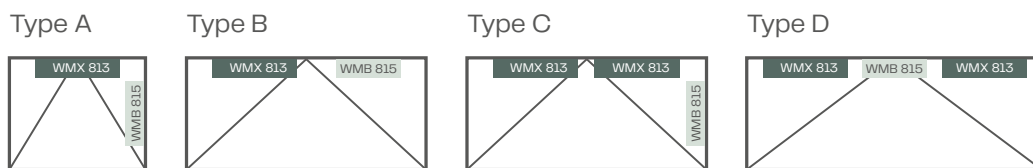
Locking Actuator WMB 815



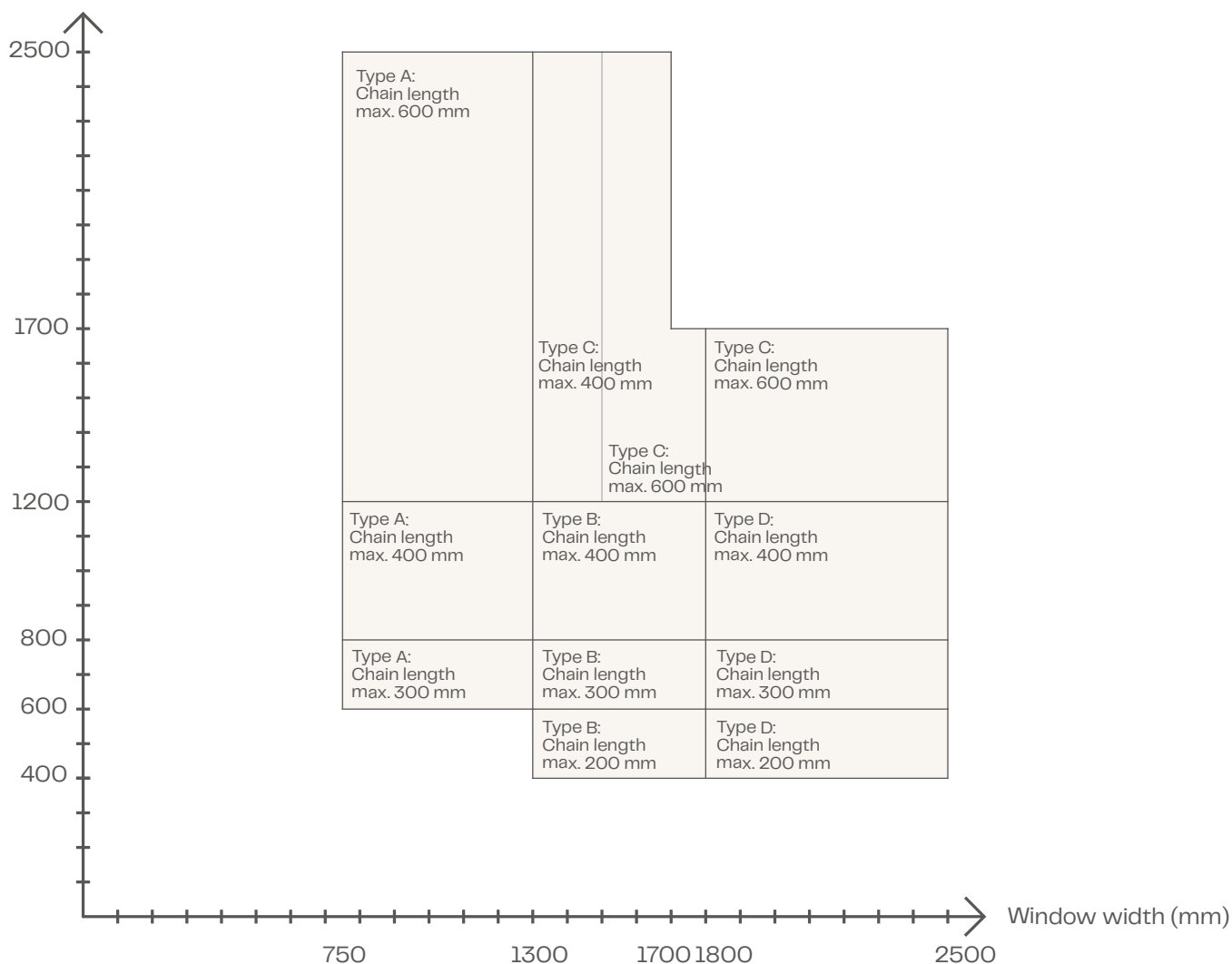
Technical data	
Pressure force / load	300N
Tractive force	300N
Closing force	2000N (break in force)
Speed	1–8mm/s, TrueSpeed™ capable
Window types	bottom and side hung windows
Nominal voltage	24 VDC (max. 10% ripple)
Voltage	19 – 32 VDC
Open circuit voltage	max. 32 VDC
Current consumption	max. 1A
Power consumption	max. 24W
Temperature	-5°C – +74°C, max. 90% relative humidity (not condensing)
Switch on duration	ED 40% (2min. per 5min.)
Material	zinc housing protected against corrosion, aluminium
Colour	black RAL 9005. Other RAL colors available at additional price.
Dimension	22 x 33 x 285 mm (H x D x L)
Weight	0,56 kg
Connection	35 mm black 3-core 0.34mm ² silicone cable with connector
IP rating	concealed: IP 32
SHE test	Approved according to EN 12101-2 with selected profiles – please contact WindowMaster for further information. B300 tested according to EN 12101-2
Lifetime	11,000 open and close movements, full stroke
Delivery includes	locking actuator with 35 mm cable with Molex Micro-Fit connector

Further Technical Details can be found in the [Data Sheet](#).

Application Diagram for Bottom Hung Windows



Window height (mm)

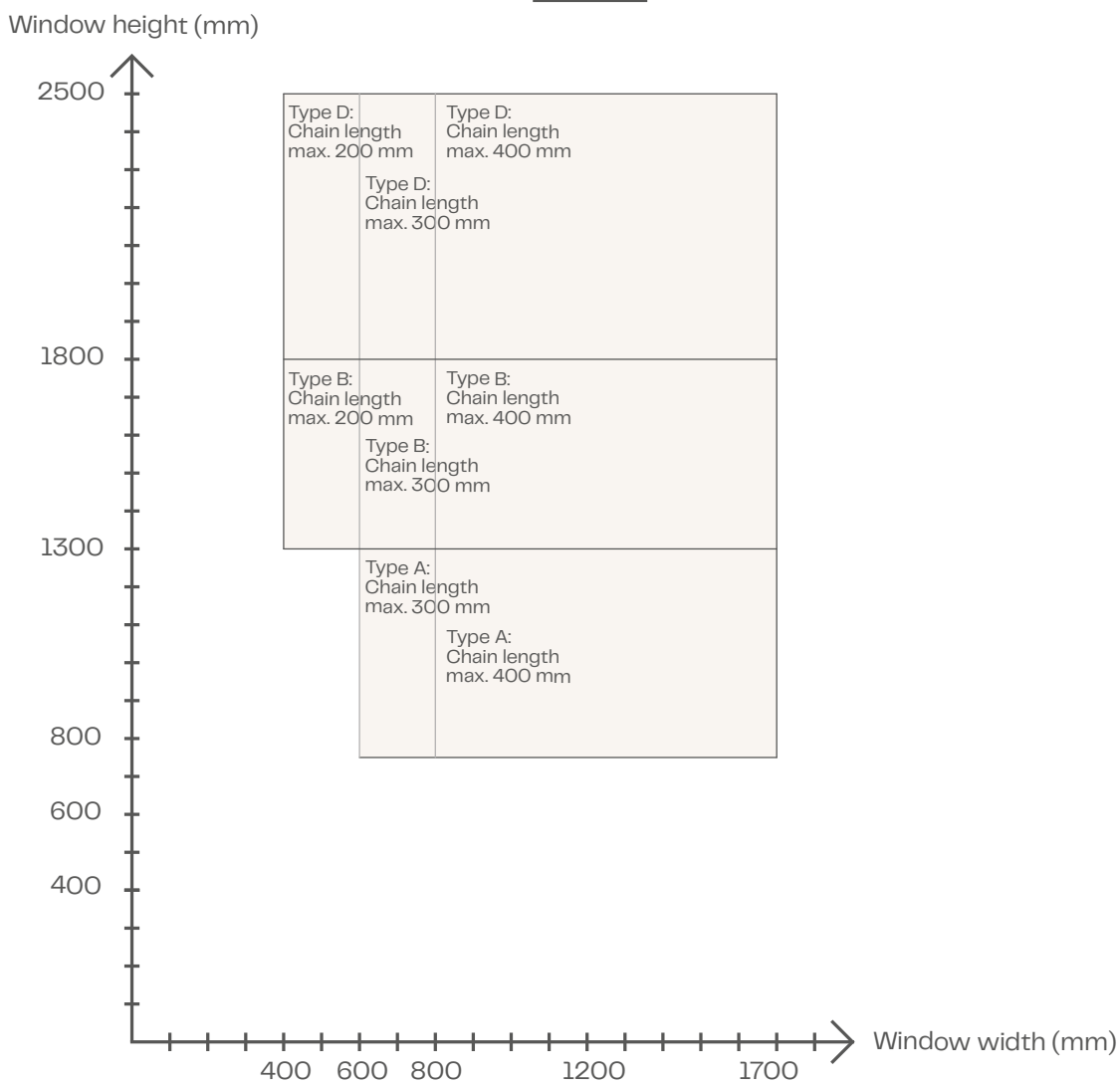
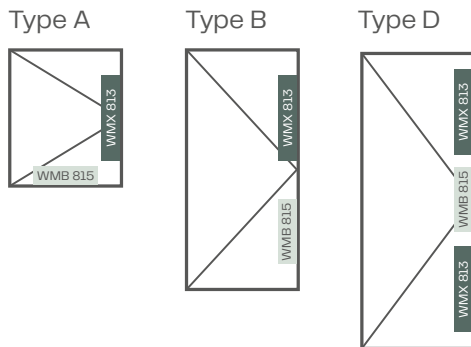


The Application Diagram is designed for a maximum glass thickness of 50kg/m². In individual cases, larger openings may be achieved after a technical consultation with our team.

Please note that the maximum sash size depends on which sash profile you choose. We refer here to the current sash sizes listed in this brochure.

The minimum sash size must be agreed on a case-by-case basis, as this also depends on the WICSTAR bracket used.

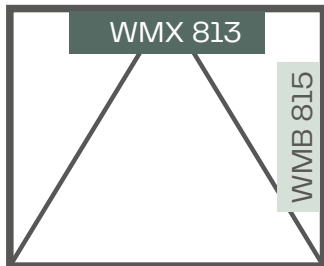
Application Diagram for Side Hung Windows



The minimum sash size must be agreed on a case-by-case basis, as this also depends on the WICSTAR bracket used.

Actuator Product Packages by Window Size

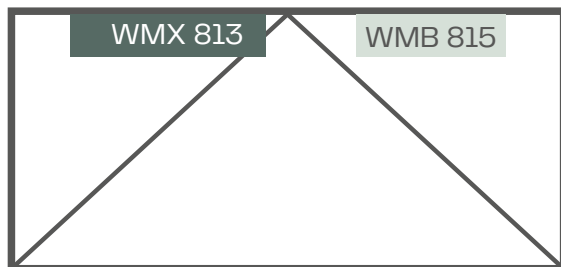
Type A – WICONA-WMZ-xxxA



- 1 x Chain actuator
(depending on the desired entrapment class and stroke width)
- 1 x Bracket set chain actuator
- 1 x Chain guide
- 1 x Locking actuator
- 1 x Bracket set locking actuator
- 1 x Connection cable
- 1 x Entrapment connection cable
- 1 x Tube cable protection

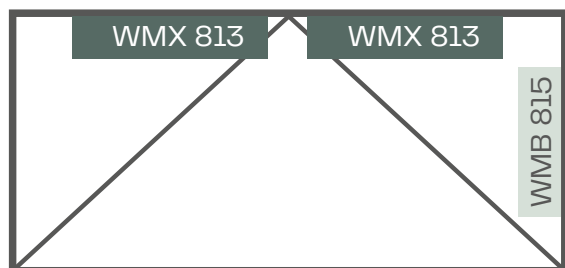
Read more on the different entrapment classes on page 15

Type B – WICONA-WMZ-xxxB



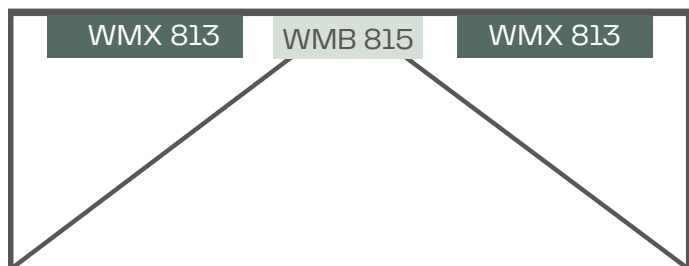
- 1 x Chain actuator
(depending on the desired entrapment class and stroke width)
- 1 x Bracket set chain actuator
- 1 x Chain guide
- 1 x Locking actuator
- 1 x Bracket set locking actuator
- 1 x Connection cable
- 1 x Entrapment connection cable
- 1 x Tube cable protection

Type C – WICONA-WMZ-xxxC



- 2 x Chain actuator
(depending on the desired entrapment class and stroke width)
- 2 x Bracket set chain actuator
- 2 x Chain guide
- 1 x Locking actuator
- 1 x Bracket set locking actuator
- 1 x Connection cable
- 1 x Entrapment connection cable
- 1 x Tube cable protection

Type D – WICONA-WMZ-xxxD



- 2 x Chain actuator
(depending on the desired entrapment class and stroke width)
- 2 x Bracket set chain actuator
- 2 x Chain guide
- 1 x Locking actuator
- 1 x Bracket set locking actuator
- 1 x Connection cable
- 1 x Entrapment connection cable
- 1 x Tube cable protection

Chain Actuator WMX 813 – Article Numbers by Entrapment Class

Actuator Product Packages A und B

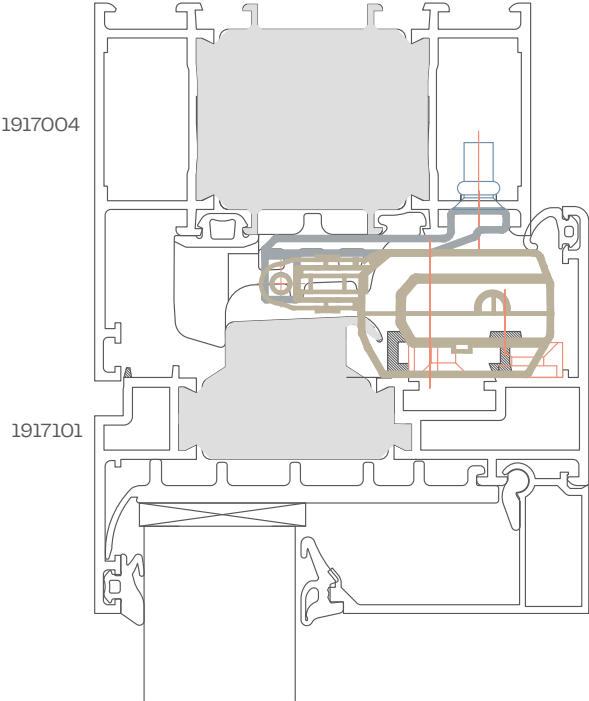
Stroke	Entrapment Class 0-2	Entrapment Class 3	Entrapment Class 4
200	WMX 813-1 B 0200 Z E1	WMX 813-1 B 0200 Z E1 (closing speed < 5mm/s)	WMX 813-1 B 0200 E E1
300	WMX 813-1 B 0300 Z E1	WMX 813-1 B 0300 Z E1 (closing speed < 5mm/s)	WMX 813-1 B 0300 E E1
400	WMX 813-1 B 0400 Z E1	WMX 813-1 B 0400 Z E1 (closing speed < 5mm/s)	WMX 813-1 B 0400 E E1
600	WMX 813-1 B 0600 Z E1	WMX 813-1 B 0600 Z E1 (closing speed < 5mm/s)	WMX 813-1 B 0600 E E1

Actuator Product Packages C und D

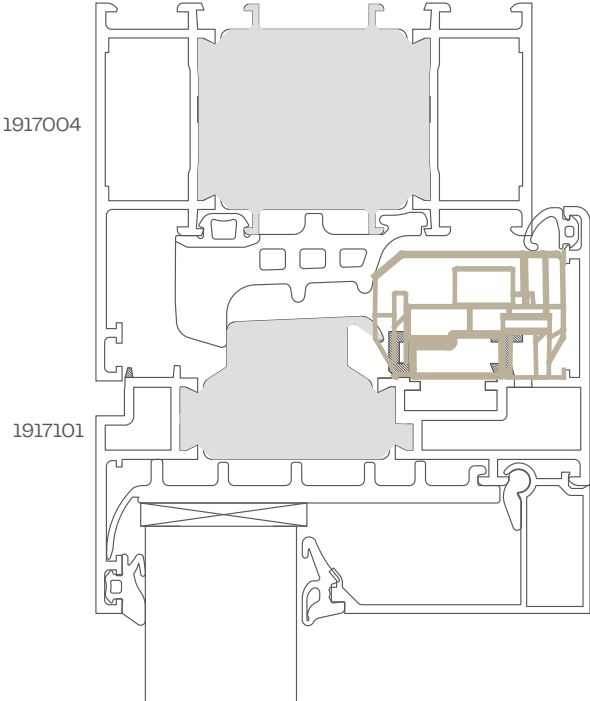
Stroke	Entrapment Class 0-2	Entrapment Class 3	Entrapment Class 4
200	WMX 813-2 B 0200 Z E1	WMX 813-2 B 0200 Z E1 (closing speed < 5mm/s)	WMX 813-2 B 0200 E E1
300	WMX 813-2 B 0300 Z E1	WMX 813-2 B 0300 Z E1 (closing speed < 5mm/s)	WMX 813-2 B 0300 E E1
400	WMX 813-2 B 0400 Z E1	WMX 813-2 B 0400 Z E1 (closing speed < 5mm/s)	WMX 813-2 B 0400 E E1
600	WMX 813-2 B 0600 Z E1	WMX 813-2 B 0600 Z E1 (closing speed < 5mm/s)	WMX 813-2 B 0600 E E1

Drawings

Cross sections

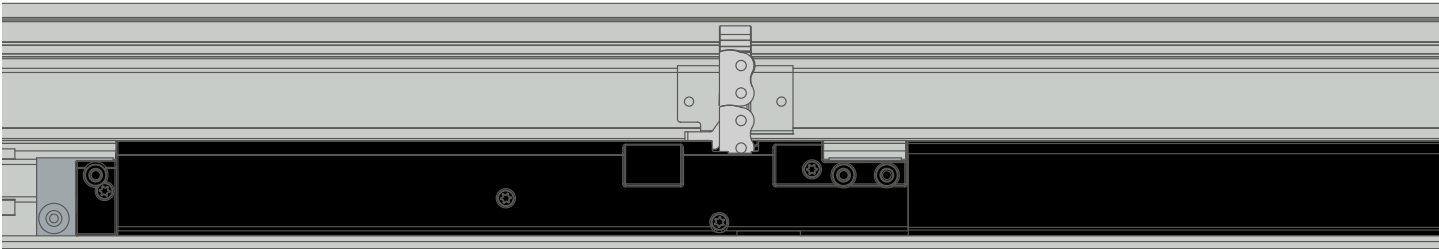


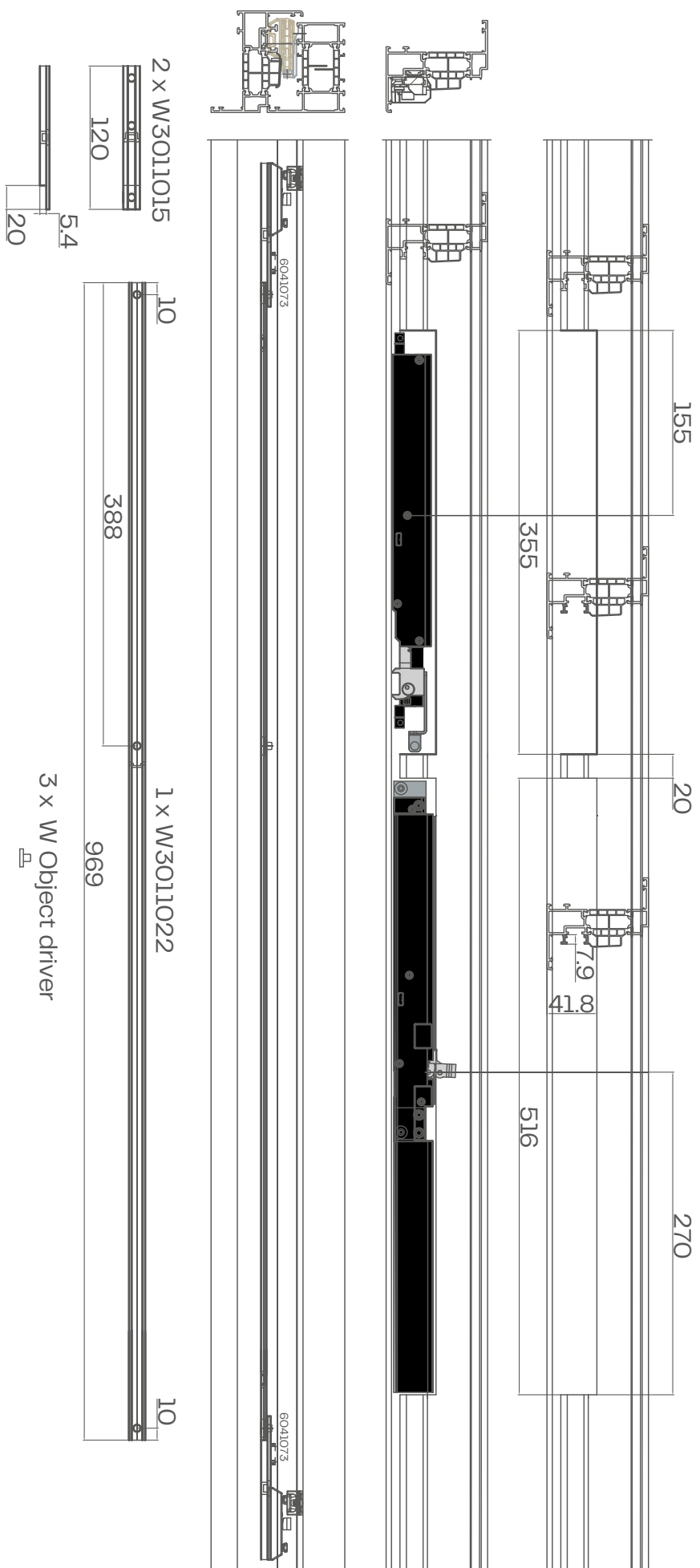
Chain actuator WMX 813



Locking actuator WMB 815

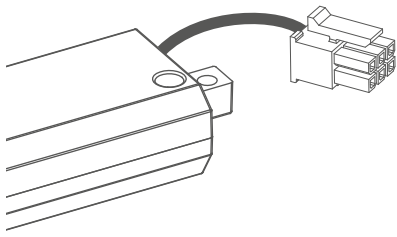
Actuators viewed from the above



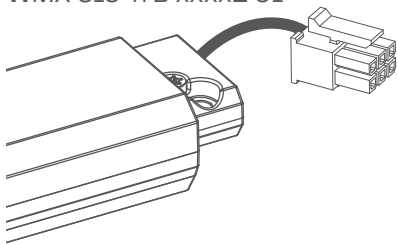


Connection Diagrams

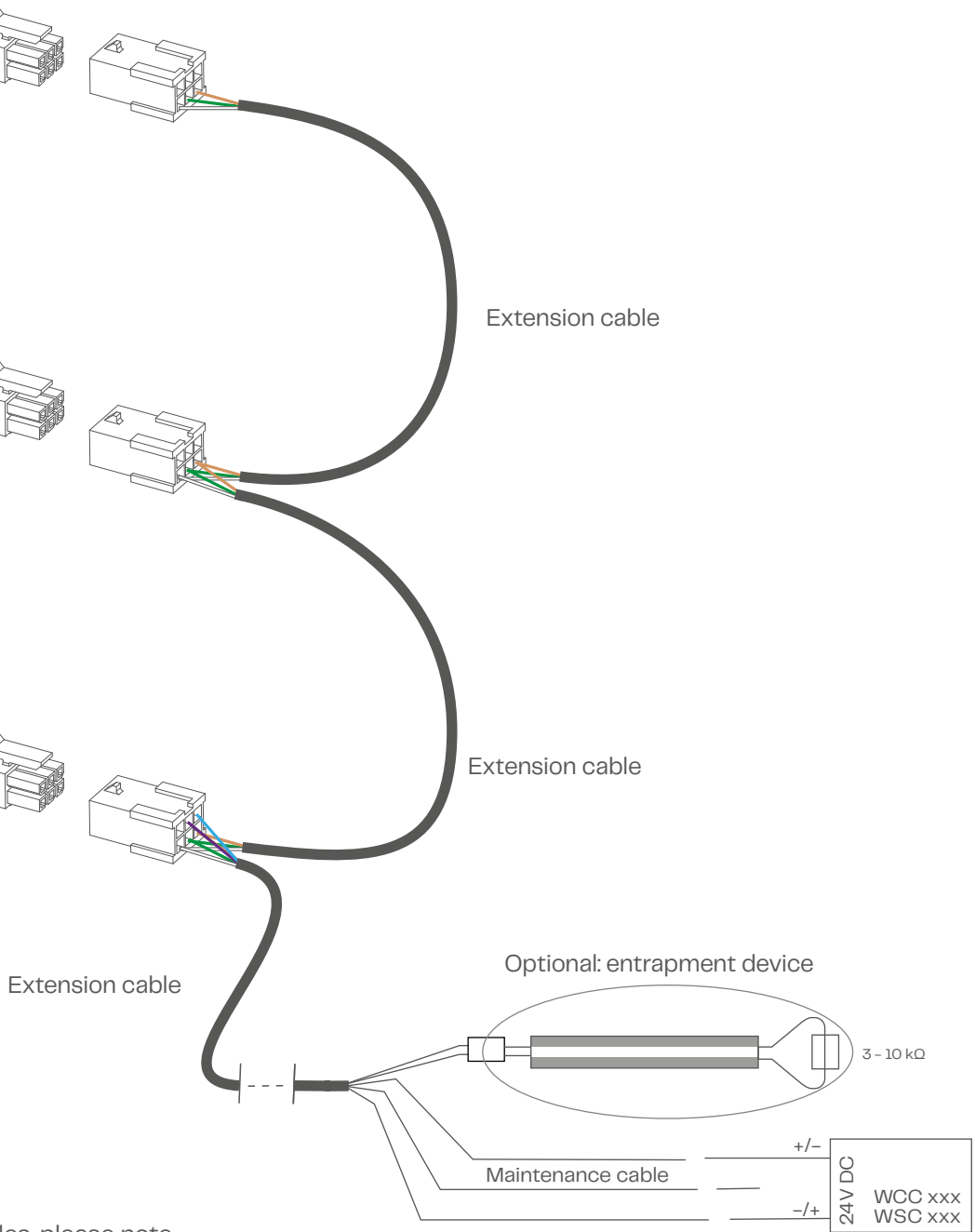
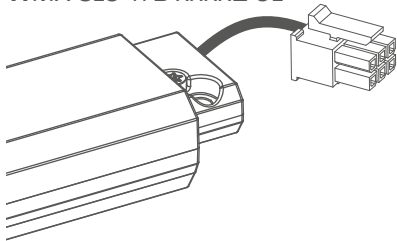
Locking actuator
WMB 815 xxB E1



Chain actuator
WMX 813-n B xxxxE 01



Chain actuator
WMX 813-n B xxxxE 01



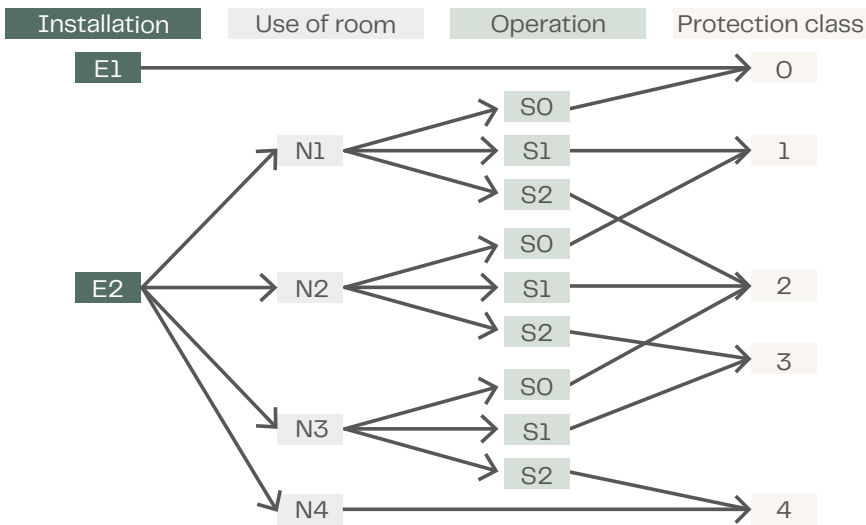
If you need additional cables, please note the following wiring dimensions.

±24V Actuators					
Wiring dimensions		0.75mm ²	1.50 mm ²	2.50 mm ²	4.00 mm ²
Wiring length max.	1 Actuator	42m	84m	140m	224m
	2 Actuators	21m	42m	70m	112m
	3 Actuators	14m	28m	47m	75m
	4 Actuators	11m	21m	35m	56m

Entrapment Protection Basics and Implementation

On electrically actuated windows in close mode, this is a risk of pinching because of the pressure applied for avoiding shearing at the edges. To minimize risk, the building planner can carry out a risk analysis to determine the appropriate Entrapment Protection Class.

The diagram below can help determine the entrapment class through the combination of identified risk parameters: E, N, and S. According to this combination, the entrapment class is assigned to the window.



Source: EuroWindow Guidance Sheet KB.01:2017-07-EN

A detailed explanation of how to determine the Entrapment Protection Class can be found in the following document: EuroWindow Guidance Sheet KB.01: 2017-07 – Power Operated Windows

This leaflet also makes recommendations on the protective measures with which the individual protection classes can be implemented.

The Protection Classes 0-2 can be recommended independent of whether an actuator is implemented or not (e.g. warning notices or warning signals).

To achieve Protection Class 3, we use our chain actuators programmed with a closing speed that is less than 5 mm/s.

To ensure Protection Class 4, the actuators are equipped with entrapment programming allowing direct connection of an entrapment cable. If the safety gasket is triggered, the window will open automatically.

When ordering the chain actuators, the Protection classes should be considered as follows:

Protection class 0-2: WMX 813 – n B xxxx **Z** E1

Protection class 3: WMX 813 – n B xxxx **Z** E1

+






closing speed < 5mm/s

Protection class 4: WMX 813 – n B xxxx **E** E1

The locking actuator has no influence on the Protection class.

MotorControllers

Below is an overview of the controllers that can be used for the window automation solution described in this brochure. Depending on the application, individual controls or group controls can be used. It is also possible to network several controllers to each other. Find data sheets and technical information for these controllers on our homepage windowmaster.com

					
Features	WCC 103	WCC 103BT	WCC 106BT	WCC 310 / 320 Standard	WCC 310 / 320 Plus
Description	MotorController with hard wired connection to actuator/s	MotorController with bluetooth remote control for wireless actuator operation	MotorController with bluetooth remote control for wireless actuator operation	MotorController with hard wired connection to actuator/s	MotorController with e.g. field bus communication
Colour	<input type="checkbox"/> RAL 9016	<input type="checkbox"/> RAL 9016	<input type="checkbox"/> RAL 9016	<input type="checkbox"/> RAL 9010	<input type="checkbox"/> RAL 9010
Output current	3 A	3 A	6 A	10-20 A	10-20 A
Controlling	Comfort ventilation				
Remote control	No	Yes	Yes	No	No
Switch connection	Hard wired	Bluetooth and Hard wired	Bluetooth and Hard wired	Hard wired	Hard wired
Ventilation zones	1	1	2	4 - 8	2-10
MotorLink® functionality	No	No	Yes	Yes	Yes
Size	W: 215 mm H: 206 mm D: 37 mm			W: 355 mm H: 320 mm D: 76 mm	
Voltage	100-240 VAC 0.85 A 50/60 Hz			230 VAC, 50 Hz (85-264 VAC, 47-63 Hz)	
Configuration	DIP switches	DIP switches	DIP switches	-	Touch screen

NV Embedded® – A scalable automation solution for natural ventilation



Natural ventilation



Mobile Management



Accurate surveillance of the indoor climate



Data Logging



Heating / cooling control



Solar screening



Night cooling



Cloud Based

NV Embedded® is a scalable control system for natural and mixed mode ventilation. It is suitable for buildings of nearly any size such as offices, schools, healthcare facilities, hotels, cultural and exhibition centers, sports facilities, and shopping centers.

Incorporating natural cooling and fresh air ventilation all year round contributes to reduced energy demands as well as a healthier indoor environment leading to a more sustainable built environment.

Features and Benefits

- Indoor climate control with the option of individual control in all rooms based on temperature, CO₂, and humidity in the individual rooms; as well as precipitation, outside temperature, and wind speed (optional wind direction).
- Well-suited for new buildings and renovations of small and large buildings.

- Control of natural ventilation in up to ten rooms / zones per MotorController.
- scalable solution with distributed logic – several MotorControllers can be connected to allow for larger systems.
- the combination of MotorControllers and WindowMaster MotorLink® actuators allow precise control of the window opening in three speeds.
- NV Embedded® can be operated as a stand-alone solution or in a BMS system, depending on the configuration.
- Data about the indoor climate is stored in the cloud, offering the possibility of analysis and online support.
- No specific fieldbus technology is required since the system can use BACnet, Modbus or KNX depending on the level of integration.

NV Embedded® is a cloud-based solution that offers individual control and visualization of the indoor climate via app (Android and IOS).



NV Embedded® Associated Products

Related products	Item no.
NV Embedded® Dongle	NVE Dongle
MotorController 10A, 2 motor lines 10A each (in total max. 10A), 2 input	WCC 310 P 0202*
MotorController 10A, 6 motor lines 10A each (in total max. 10A), 12 input	WCC 310 P 0612*
MotorController 10A, 10 motor lines 10A each (in total max. 10A), 12 input	WCC 310 P 1012*
MotorController 20A, 2 motor lines 10A each (in total max. 20A), 2 input	WCC 320 P 0202*
MotorController 20A, 6 motor lines 10A each (in total max. 20A), 12 input	WCC 320 P 0612*
MotorController 20A, 10 motor lines à 10A each (in total max. 20A), 12 input	WCC 320 P 1012*
Room sensor – temperature, CO ₂ and humidity sensor, with WSK-Link™	WWS 100
Ventilation keypad	WSK 100 1161
Ventilation keypad 1 window or 1 window group	WSK 110 OAOB
Ventilation keypad 2 window or 2 window group	WSK 120 OAOB OAOB
Rain and wind sensor with pulse output	WLA 340
Outdoor temperature sensor	WOT 100
Weather station for NV Embedded® (temperature, relative humidity, GPS, wind speed and direction)	WOW 600
24V–230V interface for sunscreen for WxC 310/ 320	WCA 380
Thermo actuator for WEV 111 / WEV 112 (valve adaptor to be ordered seperately) Manufacturer: Theben. Type: Alpha 24V. Home page www.theben.de	WEV 113
Valve adaptor (for WEV 113) for Danfoss RA. Manufacturer: Theben. Type: VA 78. Home page www.theben.de	WEV 114
Valve adaptor (for WEV 113) for e.g. Onda, Schlösser, Oventorp (M30x1,5), Heimeier m.fl. Manufacturer: Theben. Type: VA 80. Home page www.theben.de	WEV 115

*Version 02 or higher

Let's stay in touch

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Friday · 8:15am - 3:30pm

USA · WindowMaster Clearline Inc.

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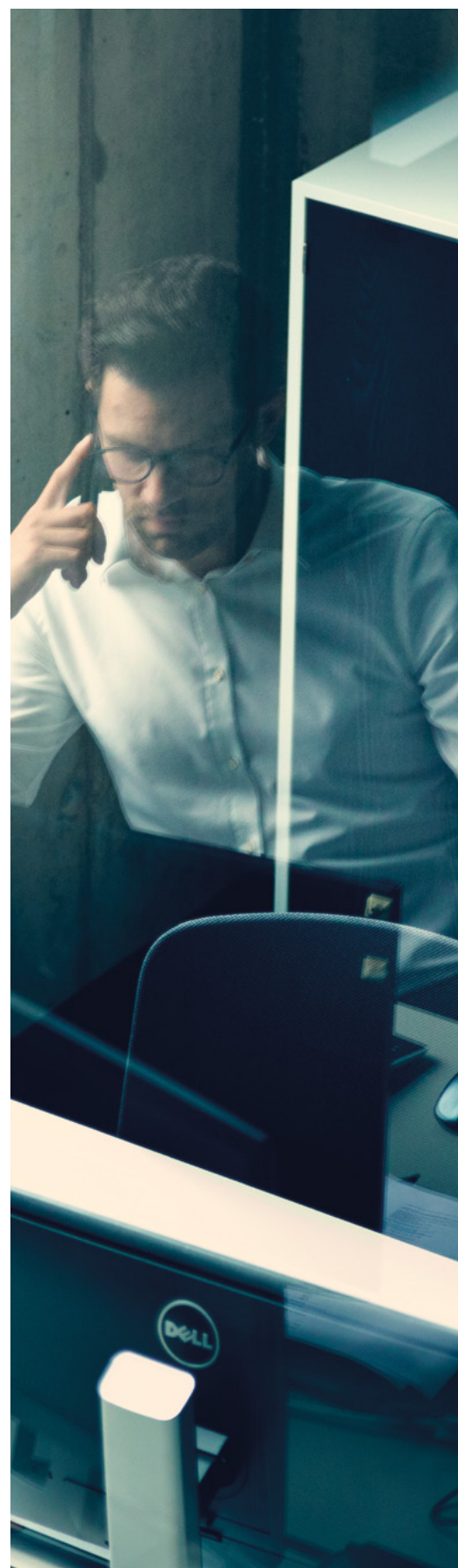
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DK-2950 Vedbæk
Hours of operation Monday - Thursday · 8:00am - 4pm
Friday · 8:00am - 3:30pm



WindowMaster aspires to protect people and the environment by creating a healthy and safe indoor climate, automatically ventilating spaces with fresh air through facade and roof windows in buildings. We offer the construction industry foresighted, flexible and intelligent window actuators and control systems for natural ventilation, mixed mode ventilation, and smoke ventilation – of the highest quality.

WindowMaster employs highly experienced cleantech specialists in Denmark, Norway, Germany, United Kingdom, Ireland, Switzerland, and the United States of America. In addition, we work with a vast network of certified partners. With our extensive expertise built up since 1990, WindowMaster is ready to help the construction industry meet its green obligations and achieve their architectural and technical ambitions.

windowmaster.com