

Roll Down Item No 249

User Manual



Safety Information



WARNING! Read this manual before installing, powering or servicing the product; follow the safety precautions listed below and observe all warnings in this manual and printed on the product. If you have questions about how to operate the product, please contact your Wahlberg Motion Design supplier or Wahlberg Motion Design.

The following symbols identify important safety information on the product and in this manual.



DANGER!
Safety hazard



WARNING!
Moving parts
can crush and
cut



DANGER!
Risk of
electric shock



WARNING!
Risk of fire



WARNING!
Hot surface



WARNING!
See manual



GENERAL PRECAUTIONS

- This product is for professional use and presents risks for severe injury or death.
- Always warm-up electronic equipment to room temperature before applying power.
- Isolate the product from power immediately if defective or showing signs of overload. Do not reapply power until repairs have been completed.
- Do not modify the product in any way not described in this manual.
- Refer any service operation not described in this manual to a qualified technician.
- Install only genuine Wahlberg Motion Design parts.



PROTECTION FROM INJURY

- Fasten the product securely to a fixed surface, rig, or structure as described in this manual.
- Ensure that any supporting hardware can hold at least 10 times the weight of all the devices they support.
- Block access below the work area whenever installing or servicing the product.
- Do not use the product to lift people or animals and do not exceed the load limits.
- Do not use the product over the head of people.
- When the product is installed and may not be used for some time, inspections and maintenance according to this manual shall always be followed.



PROTECTION FROM ELECTRIC SHOCK

- Do not expose the product to rain or moisture.
- Use an AC power source with overload and ground(earth)-fault protection.
- Disconnect from AC power before servicing.



PROTECTION FROM BURNS AND FIRE

- Do not operate the product if the ambient temperature (T_a) exceeds 40°C (104°F).
- The exterior of the product becomes warm during use. Avoid contact by persons and materials. Allow the product to cool for at least 10 minutes before handling.



DISPOSING OF THIS PRODUCT

Wahlberg Motion Design products are supplied in compliance with Directive 2012/19/EU of the European Parliament and of the Council of the European Union on WEEE (Waste Electrical and Electronic Equipment), including amendments where applicable. Help preserve the environment! Ensure that this product is recycled at the end of its life. Your supplier can give details of local arrangements for the disposal.

Index

SAFETY INFORMATION	2
INDEX	3
TECHNICAL SPECIFICATIONS	4
DRAWING	5
INTRODUCTION	6
PACKAGE CONTENT	6
DESCRIPTION.....	6
SAFETY FUNCTIONS	7
AREA OF USE	7
USING FOR THE FIRST TIME	7
TRANSPORT	8
PHYSICAL INSTALLATION	9
FASTENING THE PRODUCT TO A FLAT SURFACE.....	9
MOUNTING THE PRODUCT ON A TRUSS.....	9
MOUNTING THE TUBE.....	10
AC POWER	14
POWER CABLES AND POWER PLUG	14
INSTALLING A POWER INPUT OR OUTPUT CONNECTOR ON A POWER CABLE.....	14
DATA LINK	16
TIPS FOR RELIABLE DATA TRANSMISSION	16
CONNECTING THE DATA LINK.....	16
EMERGENCY STOP SWITCH (OPTIONAL)	17
ENABLE EMERGENCY STOP	18
READY TO USE	18
SETUP	19
MENU SETTING.....	19
MENU STRUCTURE	20
ADJUSTABLE PARAMETERS.....	22
DETAILED EXPLANATION OF PARAMETERS.....	23
DMX ADDRESS SETTING	25
ADJUSTING HARD LIMIT SWITCHES	26
NORMAL OPERATION	28
SYNCHRONIZED MOVEMENTS OF MULTIPLE ROLL DOWNS.....	29
LED FUNCTIONS.....	30
ERROR AND ERROR CODES:	30
SERVICE AND MAINTENANCE	33
PARTS.....	33
ON-SITE SERVICE.....	33
MAINTENANCE PLAN	34
CHECKLIST	34
POWERCON TRUE1	ERROR! BOOKMARK NOT DEFINED.
APPENDIX 1 - DIMENSIONS	35
APPENDIX 2 - POWERCON	37
APPENDIX 3 – BLOCK SCHEMATIC	39
ROLL DOWN - CHEAT SHEET	40

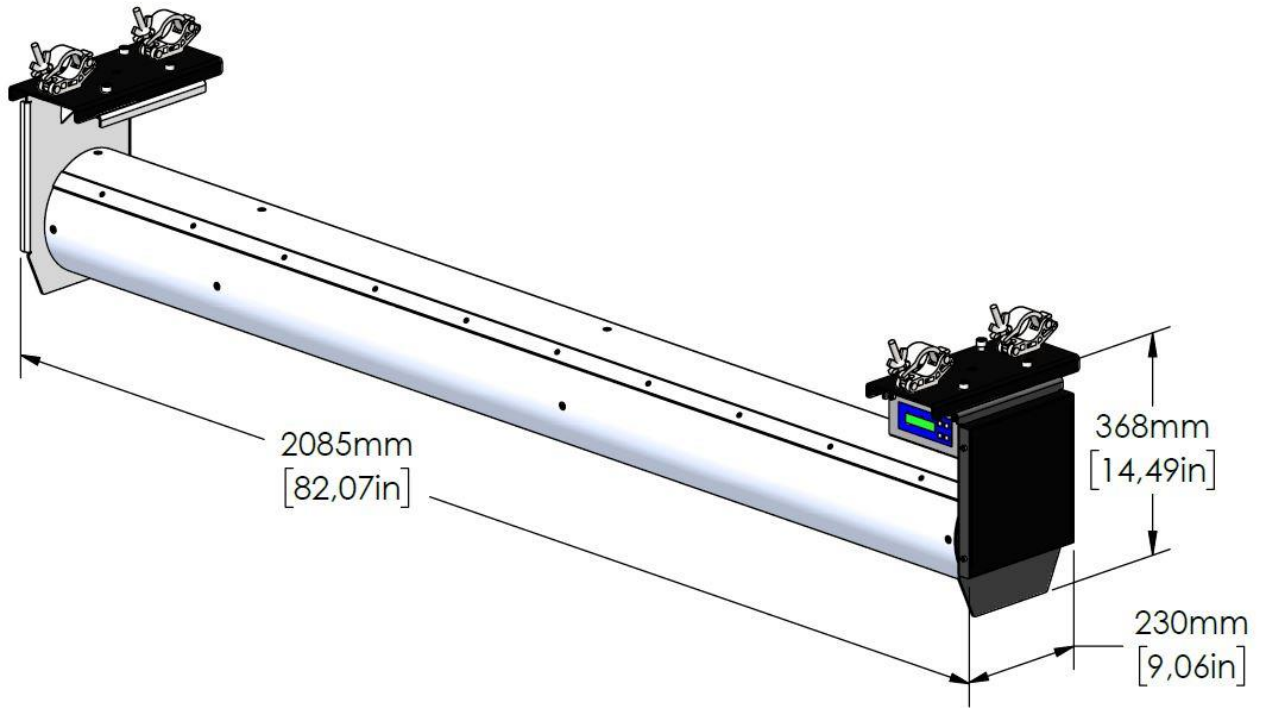
Technical specifications

Model:	Roll Down
Item no.:	249
Dimensions (L×W×H):	
Motor clamp	190 × 320 × 368 mm (7.5 × 12.6 × 14.5 in)
Tube	∅200 × 1500-12000 mm (∅7.9 × 59.1-472.4 in)
Power supply:	208-240V/AC 50-60 Hz
Power consumption:	550 W (2,7-2,3A)
Power inlet:	Neutrik powerCON TRUE1 NAC3PX-TOP (F/M)
DMX control signal:	DMX 512 1990 + DMX512A / 6 channels used
DMX connection:	5 pole XLR (F/M)
Lifting height:	18 m (59.1 ft)
Lifting capacity:	35 kg (77.2 lb)
Lifting speed:	Variable, 5-183cm/s (2-72 in/s)
Minimum load:	None
Noise emission:	~70 dB
Ambient temperature:	5-40°C (32-104°F)
Own weight:	
Motor clamp	40 kg (88.2 lb)
Tube	5,1 kg/m (3.43 lb/ft)
Mounting clamp:	4× Slim eye coupler 42-52 mm (2 in)
Motor:	230V AC, 0.55 kW
Duty cycle:	Maximum 30% when running more than 10min.

Drawing

Roll Down (249)

More detailed drawings and from more angles can be found in Appendix 1 on page 35



Introduction

Thank you for selecting the Roll Down, a DMX controlled Roll Down from Wahlberg Motion Design. Before using the product for the first time, please read this manual carefully. Failure in handling can cause injury of persons and/or damage the product.

Package content

1×	Roll Down
1×	PowerCON NAC3FX-W-TOP female plug for power cable
1×	User manual
1×	Cheat sheet

Description

Roll Down is a Roll Down for stage use, mainly for use in theatres, shows and concerts. It lifts fabrics in and out of the stage sphere at a maximum load of 35 kg up and down. The lifting height is 18 m and the lifting speed is between 5 cm/s and 183 cm/s.

The Roll Down is controlled by the standard DMX signal, so a usual lighting desk can be used to control the movement, programmed as any light.

For a limited number of Roll Downs, a standard lighting desk can be used, but when many Roll Downs are used, more advanced desks should be used to maintain easy control of the units.

The Roll Down uses 6 channels of the DMX-line, and they control the position, speed, limits, and reset functions.

The Roll Down has an advanced internal positioning system with 16 Bit, used for finding the position desired by the operator. With a 16 bit positioning channel (channel 1 MSB and channel 2 LSB) the operator can set the desired position, and the Roll Down will run to this position, at the maximum speed (channel 3).

Channel 4 is used as a safety channel. The motor will not run using DMX if channel 4 is not enabled. With channel 5 and 6 it is possible to set the soft TOP and BOTTOM limits of the movement. Channel 5 is also used for resetting the Roll Down, when powering up if the position was not saved when shut down.

On the Roll Down it is also possible to adjust the hard TOP and BOTTOM limits and, in that way, set the absolute span of motion regardless of any DMX control.

Multiple Roll Downs are easily daisy chained with power in-out and DMX in-out, allowing to create advanced and dynamic movements with several Roll Downs working together in the same installation.

Safety functions

The control system ensures that the motor only is powered when:

- The DMX signal is reliable.
- The mode, position and speed control are set correctly.
- The tube position is within the span of the soft and hard limits.
- No overload.

The Roll Down should only be operated by an experienced DMX-controlled-lighting-desk-operator. The lighting desk must be programmed according to the manual, so the Roll Down will stop when the speed is put to 0 %. It is also possible for the user to stop the Roll Down by disconnecting it from the mains power. After power failure the start position of the Roll Down may need to be adjusted before the Roll Down can function properly again.

Manual operation of the Roll Down is only intended for installation, service, and tests.

Area of use



WARNING! To reduce the risk of electric shock or injury use indoors only.

WARNING! To reduce the risk of electric shock, do not expose to rain.

The Roll Down is intended for indoor use only. It is designed for lifting and lowering material at the weight and speed stated in "Technical specifications" on page 4. Any other use of the product may result in a risk of injury of persons or equipment damage.

Exceeding the load rating may cause failure of the equipment.

Use only the Wahlberg Motion Design approved mounting connectors to secure the load to the tube. Failure to mount the load securely can result in a risk of injury of persons or equipment damage.

Do not modify the product. For any modification contact Wahlberg Motion Design.

It is the customer's sole responsibility to comply with any relevant local laws, regulatory requirements, and restrictions, concerning the use of the product.

Using for the first time



IMPORTANT! The Roll Down must be protected from environmental factors such as physical shocks and vibration during transportation and storage.

WARNING! Read "Safety Information" on page 2 before installing, powering, operating, or servicing the Roll Down. Before applying power to the product.

- Check the Wahlberg Motion Design website at www.wahlberg.dk for the most recent documentation and technical information about the product. Wahlberg Motion Design user manual revisions are identified by the revision number in the bottom of each page.
- Carefully review the "Safety Instructions" on page 2.
- Check that the local AC mains power source is within the power voltage and frequency ranges.
- See "Power cables and power plug" on page 14. Install the provided Neutrik powerCON TRUE1 NAC3FX-W-TOP power connector on a suitable power cable. If using the power from a mains power outlet, install a suitable power plug on the power cable.

Transport



IMPORTANT! The Roll Down must be protected from environmental factors such as physical shocks and vibration during transportation.

Before transport, it is important to roll the fabric of the Roll Down up until the hard TOP limit, and then wrap the remaining fabric around the tube. Fix the fabric with a cable tie or an elastic cord.

Use only the original packaging or flight case for protecting the product during transport. Contact Wahlberg Motion Design for enquiries regarding flight cases or pallet frames.

Physical installation



WARNING! The Roll Down must be either fastened to a flat surface such as a roof or clamped to a truss or similar structure in such a way that the mounting clamp points upwards. Do not apply power to the product if it is not securely fastened.

WARNING! The supporting surface must be hard and flat. Fasten the product securely.

WARNING! Use only the supplied rigging clamps.

Fastening the product to a flat surface

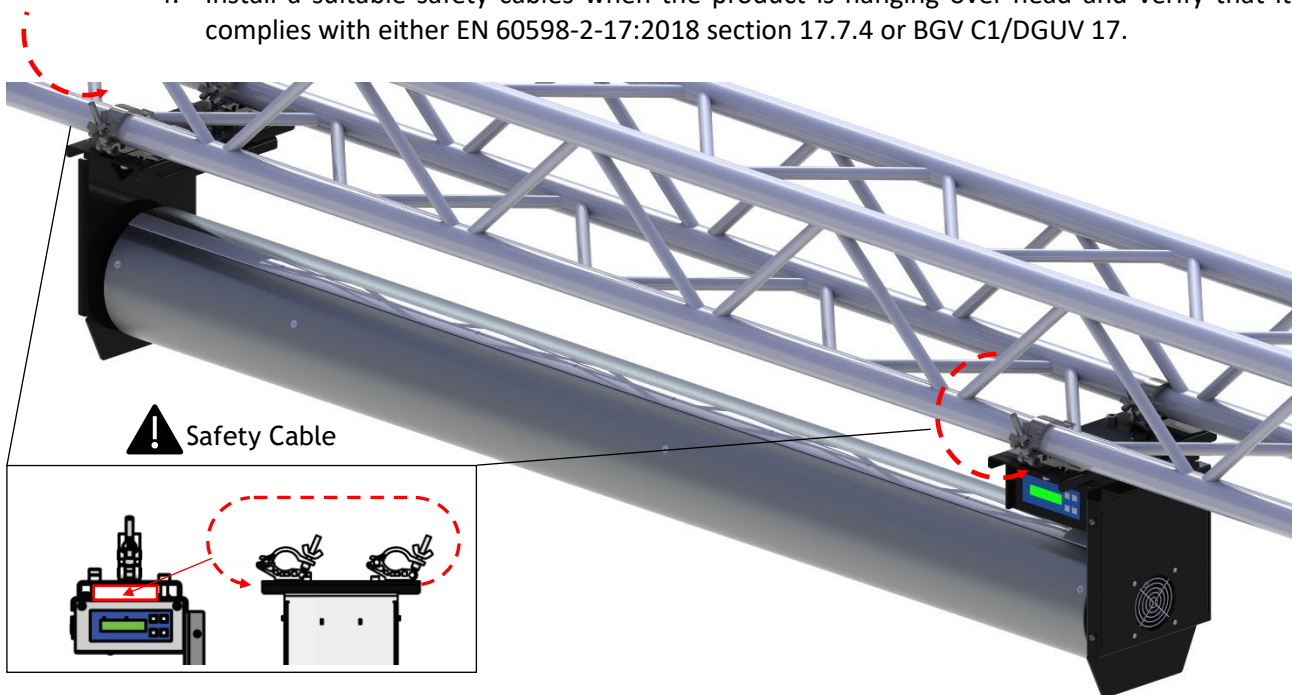
The Roll Down can be fastened to flat surface such as a roof. Check that the surface can support at least 10 times the weight of all products and equipment to be installed on it.

Mounting the product on a truss

The Roll Down can be clamped to a truss or similar rigging structure.

To clamp a product to a truss:

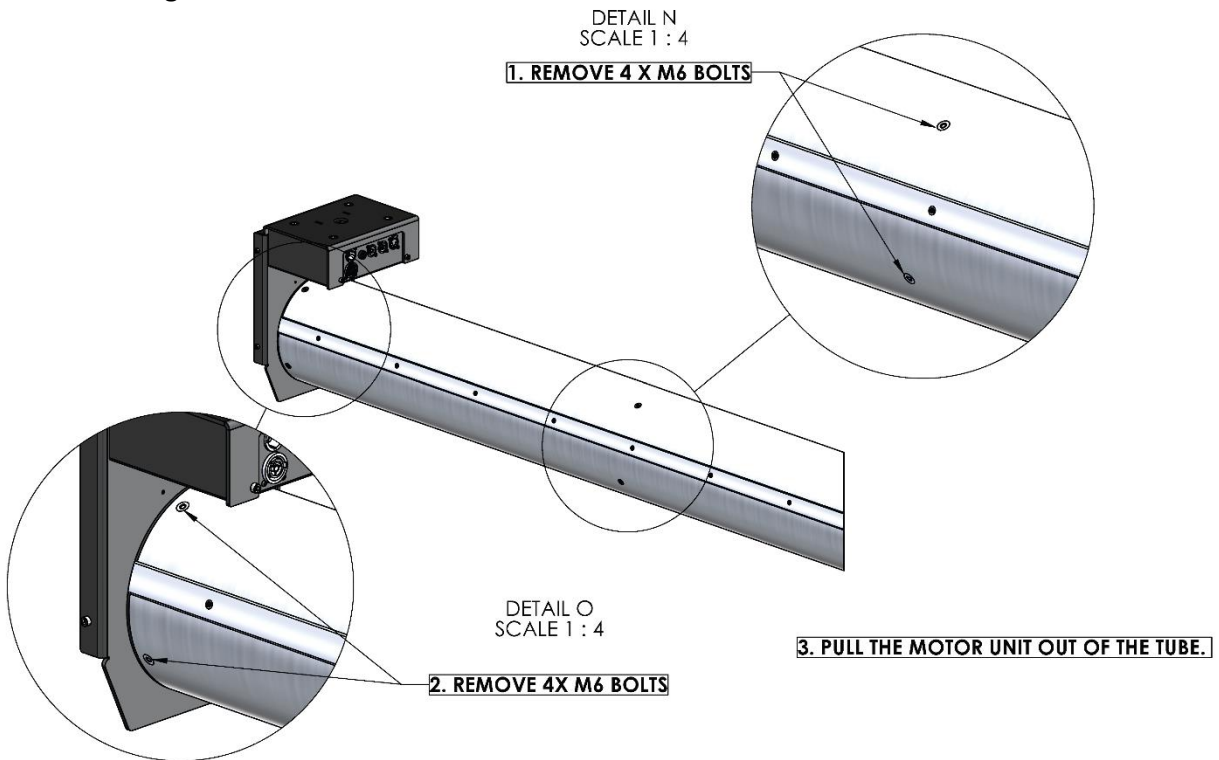
1. Check that the rigging clamps are undamaged and that the rigging structure can support at least 10 times the combined weight of all products and equipment to be installed on it.
2. Block access under the work area. Working from a stable platform, hang the product on the truss with the mounting clamp upwards. Tighten the rigging clamp.
3. Use the supplied 2 slim couplers sitting on the top plate. It is important to use both slim couplers for mounting because the load is not evenly distributed across the product.
4. Install a suitable safety cables when the product is hanging over-head and verify that it complies with either EN 60598-2-17:2018 section 17.7.4 or BGV C1/DGUV 17.



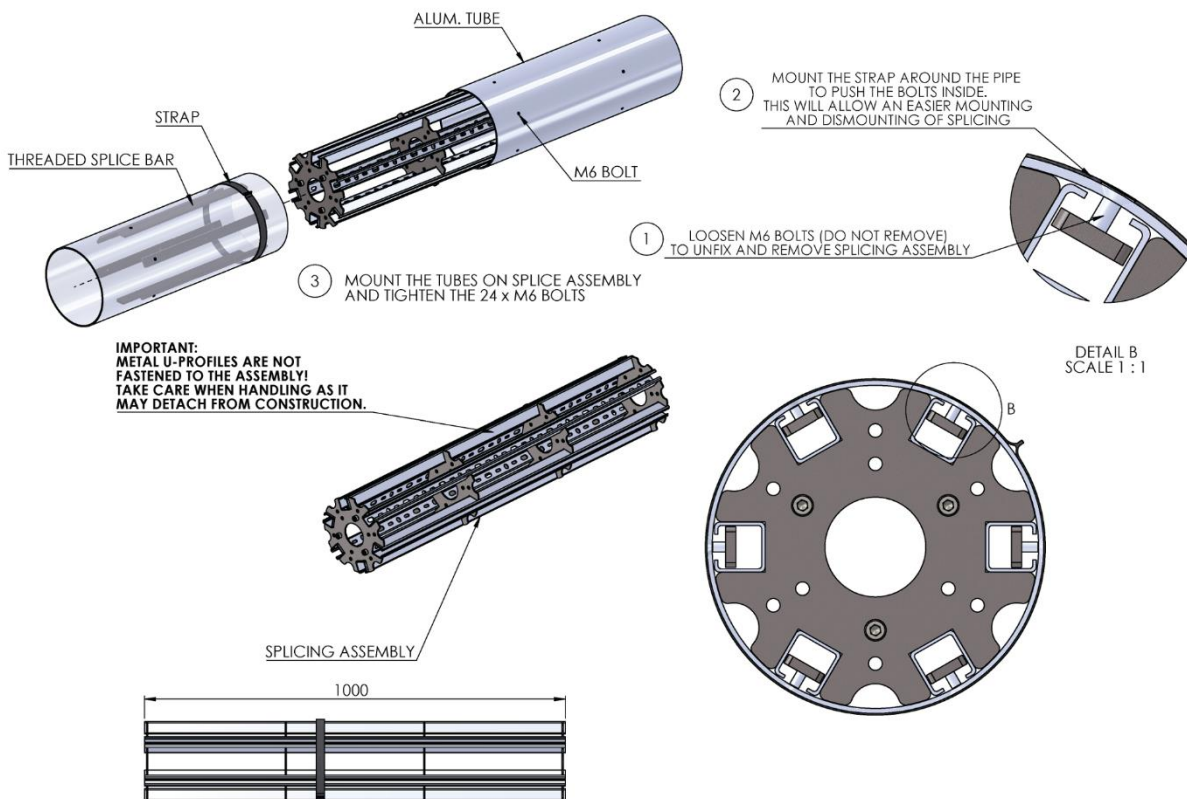
Mounting the tube

The Roll Down comes with either a single tube, or two tubes with a splice that allows a total length of the tube up to 12 meters.

Single tube:



Using a splice:



Mounting the fabric



WARNING! The fabric must be mounted on the tube in a way to ensure that the fabric never can damage the Roll Down.

WARNING! There should be minimum 1½ round left on the tube when the fabric is rolled all the way out if it is mounted with the rail.

WARNING! There should be minimum 2 round left on the tube when the fabric is rolled all the way out if it is mounted with tape.

Mount the fabric in the right position

When mounting the fabric, it is important to move the tube to the desired bottom position before you start.

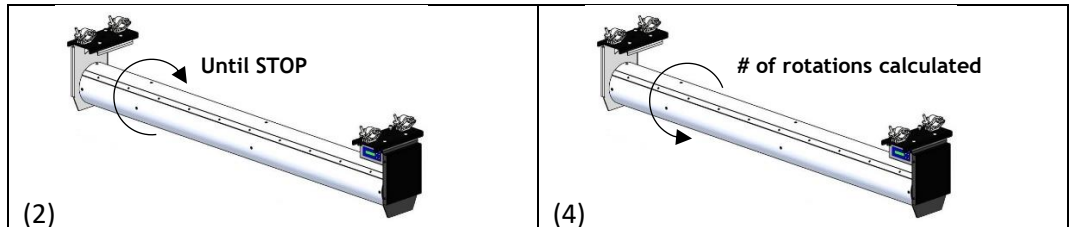
Example: If you are mounting a fabric with a length of 4 meters, follow these steps.

1. Set all channels to 0% and enable the motor by setting channel 4 (50-55%).
2. Move the tube to the **hard TOP** limit with channel 5 (until it stops).
3. Calculate the number of rotations needed for the specific fabric using the formula below.

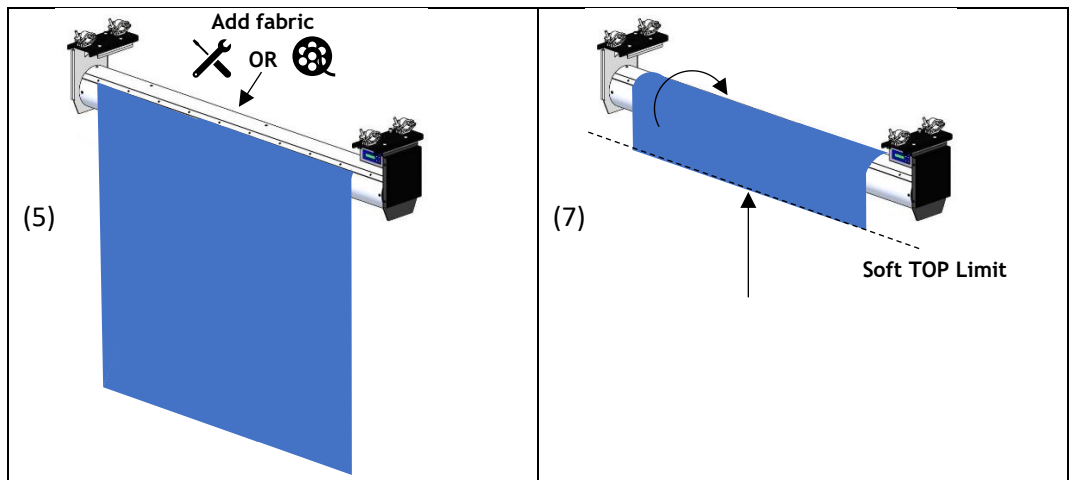
$$\text{Number of rotations}(\text{minimum}) = \frac{\text{Length of fabric}(\text{cm})}{62.8}$$

$$\text{Example: } \frac{400}{62.8} = \text{minimum } 6\frac{1}{2} \text{ rotations}$$

4. Move the tube down with channel 6 while counting the number of rotations calculated above.



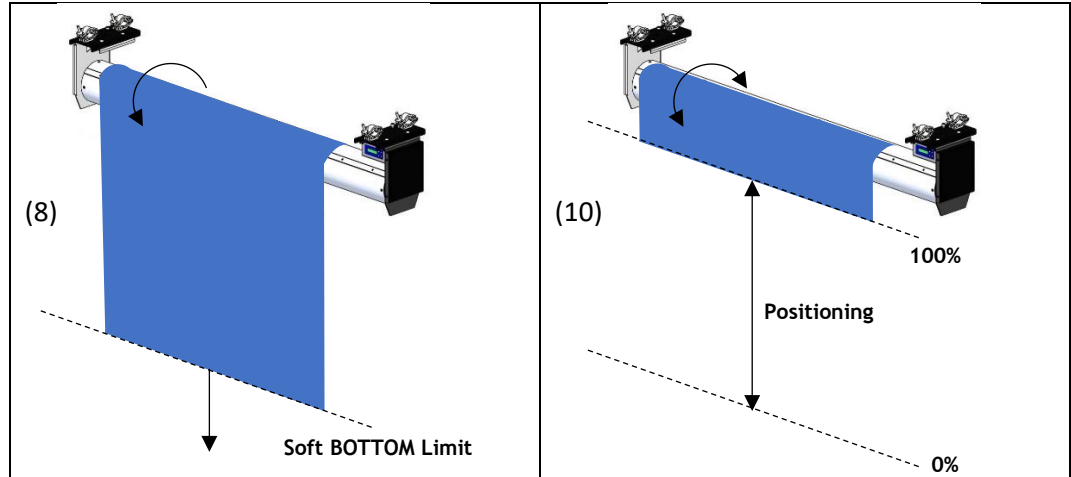
5. Mount the fabric on the tube either with the rail or with tape, see instructions on the next page for details.
6. Now return to the desired **soft TOP** position using channel 5.



- Then set the range/**soft BOTTOM** limit for the desired movement with channel 6.

CAUTION! For this specific situation, the range shall be less than 4 meters to ensure 1½ or 2 rounds of fabric is remaining on the tube.

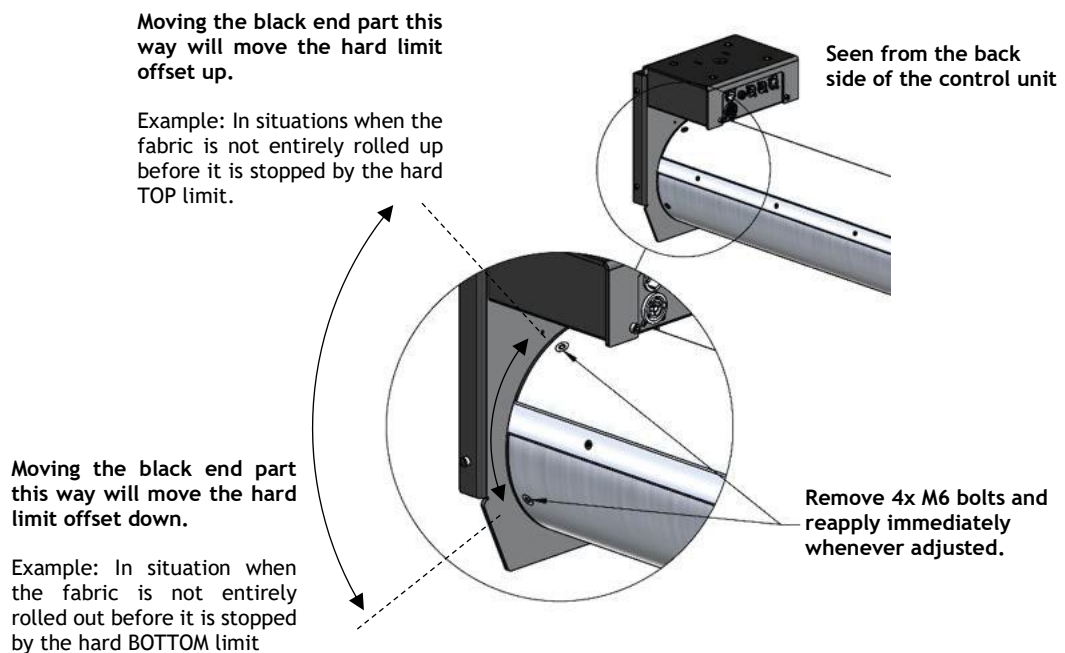
- Now the **100% position** will be with the fabric rolled all the way up and the **0% position** will be with the fabric rolled all the way out.



ATTENTION! Set channel 4 to 0% to power-up again without the needing to readjust the soft TOP limit.

ATTENTION! If you do not move the tube down before mounting the fabric the hard TOP limit will prevent you from rolling the curtain all the way up.

If required, the hard TOP and BOTTOM limit can be offset in steps of quarter turns of the tube, and this simply done by removing the four screws near the control unit and carefully turn the black tube ending as shown below.



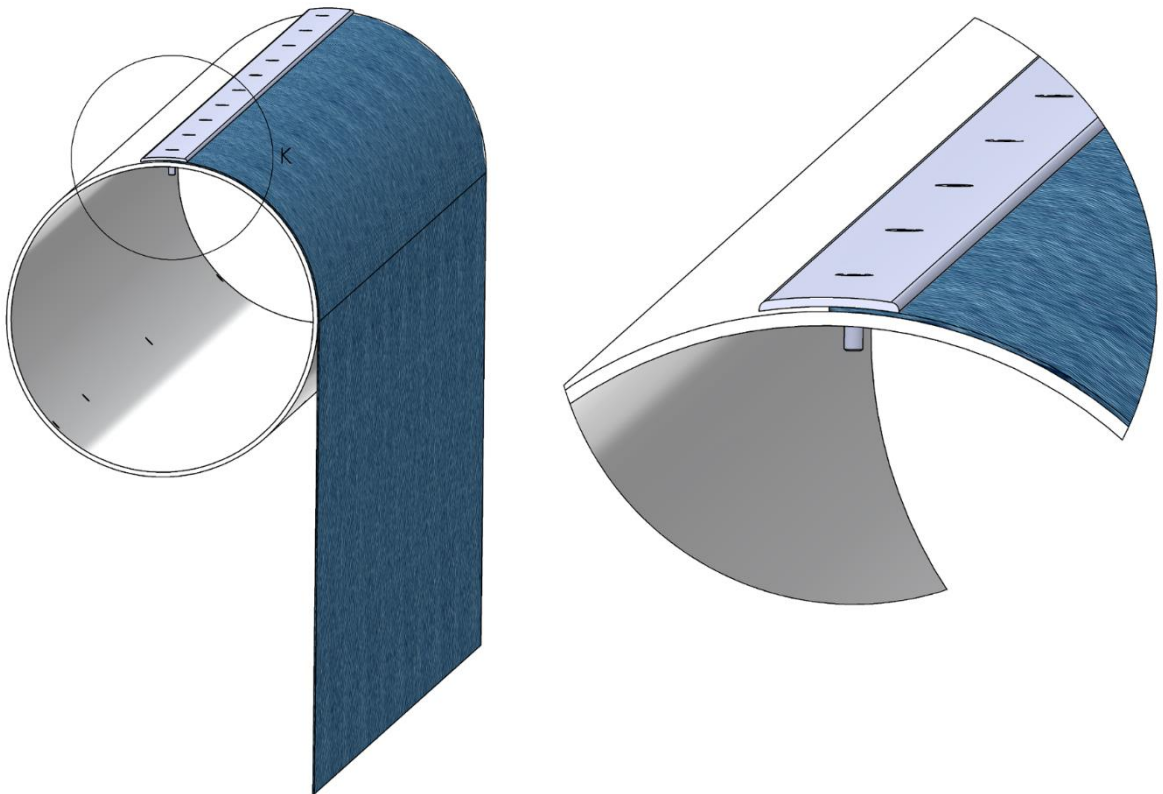
Using the mounting rail

The Roll Down has a rail that can be used for mounting the fabric along the entire length of the tube.

The fabric is mounted by loosening the Hex screws holding the rail in place. When they are all loose, place the fabric under the rail and tighten the screws again to hold it in place.

Make sure the fabric is mounted on the correct side of the rail. If it is mounted on the wrong side, it will fold over itself when moving to the TOP limit.

Refer to Appendix on page 35 for additional illustrations.



Using tape

The fabric can also be taped to the tube, using single- or double-faced tape. This allows the fabric to be mounted at any angle. If tape is used for securing the fabric 2 rounds must remain on the tube when it is fully rolled out.

AC power



WARNING! Read “Safety Information” on page 2 before connecting the product to AC mains power.

WARNING! For protection from electric shock, the product must be grounded (earthed). The power distribution circuit must be equipped with a fuse or circuit breaker and ground-fault (earth-fault) protection.

WARNING! Socket outlets or external power switches used to supply the product with power must be located near the equipment and easily accessible so that the product can easily be disconnected from power.



WARNING! Check that the voltage range specified on the serial number label matches the local AC mains power voltage before applying power to the product. Do not apply AC mains power to the product at any other voltage than that specified.

Power cables and power plug

The Roll Down requires a power input cable with a Neutrik powerCON TRUE1 NAC3FX-W(-TOP) cable connector for AC mains power input. The cable must be rated 20A minimum, have three conductors 1,5mm² (AWG 16) minimum conductor size and an outer cable diameter of 6-16mm (0.24-0.47 inch). Cables must be heat resistant to 90°C (194°F) minimum. In the EU the cables must be <HAR> approved or equivalent and in the USA minimum hard usage type SJT or equivalent.

If you install a power plug on the power cable, install a grounding-type (earthed) plug that is rated 20 A for USA and 16A for Europe. Follow the plug manufacturer’s instructions. Table 1 shows standard wire color-coding schemes and some possible pin identification schemes; if pins are not clearly identified, or if you have any doubts about proper installation, consult a qualified electrician.

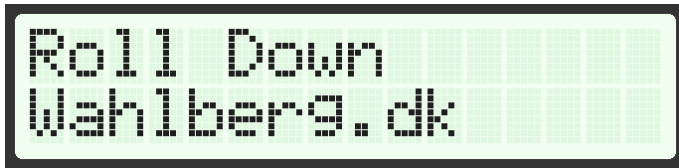
Table 1 - Colour guide

Wire Colour	Conductor	Symbol	Screw (US)
Brown	Live	L	Yellow or brass
Blue	Neutral	N	Silver
Yellow/green	Ground (earth)	 or 	Green

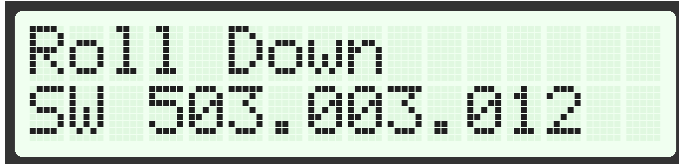
Installing a power input or output connector on a power cable

To install a Neutrik powerCON TRUE1 NAC3FX-W(-TOP)/NAC3MX-W(-TOP) input/output connector on a power cable, follow the original Neutrik instructions in the Appendix on page 37.

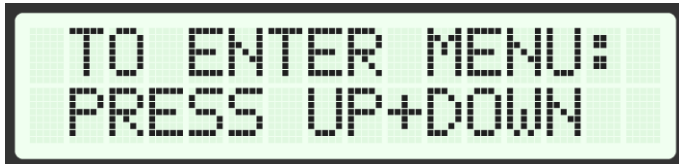
By supplying power to the Roll Down, the display will show a start-up screen sequence showing the model number



Followed by a screen showing the software version, e.g. SW 503.003.012 as shown below



Then a description of how to enter the menu



When it changes to the following, the Roll Down is ready to be operated:



Data link

A DMX 512 data link is required in order to control the Roll Down via DMX. The Roll Down has 5-pin XLR connectors for DMX data input and output. The pin-out on all connectors is pin 1 = shield, pin 2 = (-), and pin 3 = (+).

Pins 4 and 5 in the 5-pin XLR connectors are not used in normal operation and are available for possible additional data signals as required by the DMX512-A standard. However, if desired this additional port may also be used to feedback the actual position of the tube, but in such case, it is not suitable for daisy chaining.

The Roll Down is subject to the common limit of 32 devices per daisy-chained link. Note that if independent control of a Roll Down is required, it must have its own DMX channels assigned. Products that are required to behave identically can share the same DMX channels. To add more products or groups of products when the above limit is reached, add a DMX universe and another daisy-chained link.

Tips for reliable data transmission

Use shielded twisted-pair cable designed for RS-485 devices: standard microphone cable cannot transmit control data reliably over long runs. AWG24 cable is suitable for runs up to 100 meters (328 ft.).

Never split a DMX line without using an opto-isolated RS-485 splitter/amplifier.

Terminate the link by installing a termination plug in the output socket of the last Roll Down. The termination plug, which is a male XLR plug with a 120 Ohm, 0.25W resistor soldered between pins 2 and 3, “soaks up” the control signal so it does not reflect and cause interference. If a splitter is used, terminate each branch of the link.

Connecting the data link

To connect the Roll Down to data:

1. Connect the DMX data output from the DMX controller to the male 5-pin XLR DMX input connector (DMX 512 IN).
2. Connect the DMX output of the products to the DMX input of another product and continue connecting products output to input (DMX 512 OUT).
3. Terminate the last product on the link with a 120 Ohm resistor.

The DMX lamp is the green LED, above the display.

- Glows constantly, when the DMX connection is correct.
- Flashes if the DMX signal is missing or wrongly connected.

Emergency stop switch (Optional)

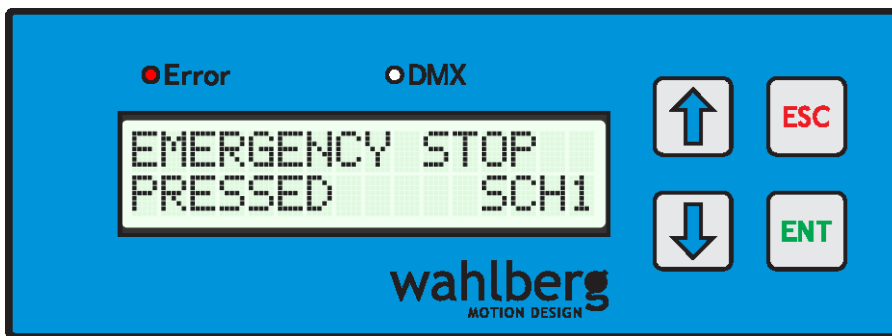
WARNING! By default, the emergency stop is NOT enabled!



The Roll Down can be configured with an emergency stop; by default, the emergency stop is not enabled.

The DMX control from a lighting desk should always have a set up so there is a button that sets the speed of the Roll Down in operation to 0%. Normally lighting desks have a “blackout” button that sets all intensity channels to 0% and this will also cause the Roll Down to stop when assigned correctly.

If the emergency stop switch is activated the red Error LED will be lit and the screen display shows: ‘EMERGENCY STOP PRESSED’ and the current start channel of the unit:



The emergency stop switch is connected to the male 4 pole XLR connector on the winch. Pin 1 and Pin 4 should be powered with 12-15 volt DC to enable operation of the winch.

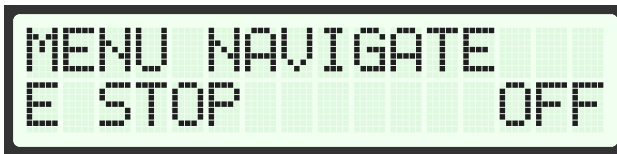
Pin out:	Connection
Pin 1	GND
Pin 2	Not connected
Pin 3	Not connected
Pin 4	12-15 V DV



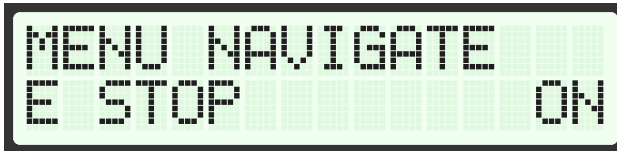
The emergency stop power supply and plug is available for purchase from Wahlberg Motion Design.

Enable Emergency stop

In 'MENU NAVIGATE' change 'E STOP' from OFF



to ON



Refer to section '

Menu setting' on page 19 for guidance on how to navigate the menu.

Ready to use

When the emergency stop has been enabled, and the Roll Down is connected to power, DMX, and an emergency stop switch, it is ready for use, and can be controlled from the lighting desk.

Setup

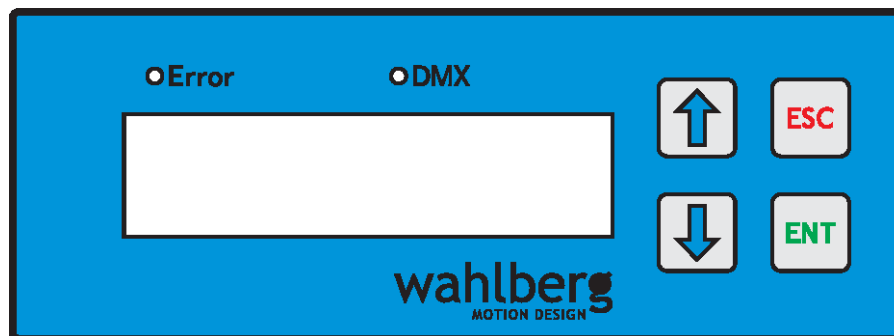


WARNING! Read “Safety Information” on page 2 before installing, powering, operating, or servicing the product.

WARNING! Only experienced DMX users should operate the product. Contact Wahlberg Motion Design for further information and education on DMX protocol.


Menu setting

Use the buttons on the display to enter and change menu settings





Use the arrows  &  to go up or down in the menu

Press  to set values.

Press  to go back one level in the menu

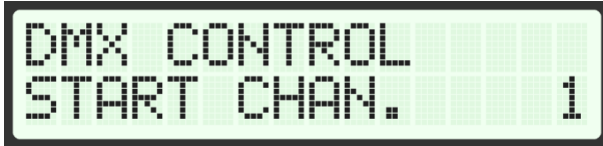
Press and hold both the up and down arrow for 1 second to enter and leave the menu navigation mode, see page 21 or continue using the control mode as explained on the next page.

Menu structure

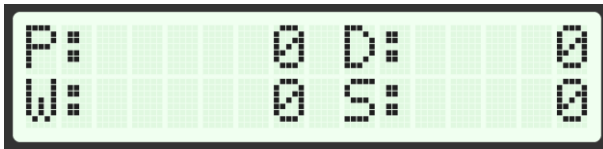
The menu structure is divided into two different areas for safer motor control. Control mode and menu navigation mode. To change between the two push both buttons  &  and hold them for 3 seconds.

Control mode

The display shows:



Shift to next screen by press.



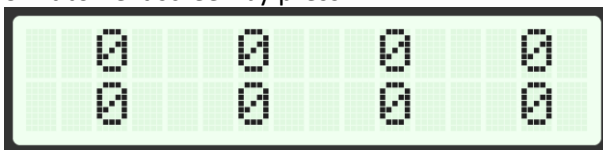
P: Current position (values 0-99.999)
 W: Wanted position (values 0-99.999)
 D: Distance from current to wanted position
 S: Speed (values from 0-maximum motor RPM setting in operation)

The screen shows the tachometer value for the current position, wanted position, distance and speed in motor RPM's.

E.g. the motor is moving with 1750 RPM's of speed from current position with tachometer value 10.000 and the wanted position has the tachometer value of 24.250:

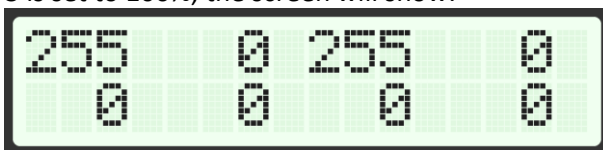


Shift to next screen by press.



DMX channel 1	DMX channel 2	DMX channel 3	DMX channel 4
DMX channel 5	DMX channel 6	DMX channel 7 (not used)	DMX channel 8 (not used)

The screen shows the DMX channel values, if e.g. DMX channel 1 is set to 100% and DMX channel 3 is set to 100%, the screen will show:



To shift back to the previous screen by pressing.

Menu navigation mode



The display shows:



In menu navigate mode, the different parameters can be changed.

In menu navigate mode the motor is stopped, and DMX input has no effect, the motor can be moved by the MANUAL RUN - GOING UP/GOING DOWN menu though.



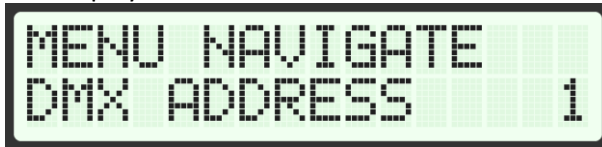
Press the arrows  or  to go up or down in the menu choices.


The bottom line of the display is showing:



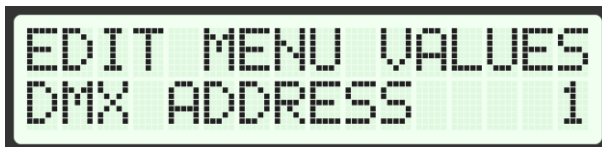
Adjusting menu parameters

The display shows:



Press  to change the *DMX ADDRESS* value.

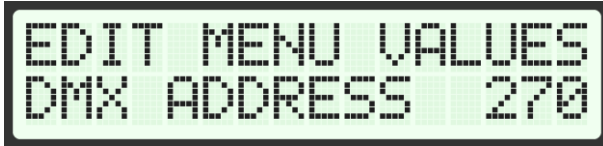
The display shows:



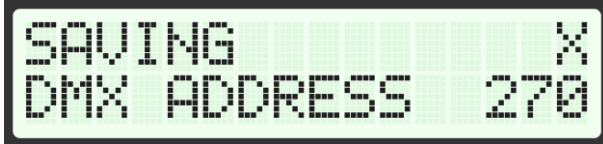
Use the arrows  or  to adjust the *DMX ADDRESS*.

Save changed value

The display shows:



Press **ENT** to change the top line to:

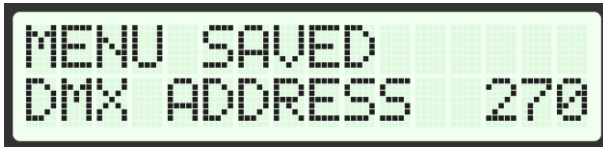


Where X is an increasing number from 1 to 20.



Then press and hold

The top line of the display counts up to 20 then shows *OK*.



The value is now saved in the memory.

Adjustable parameters

Menu	Description	Range	Default
MAN SPEED	Speed for manual driving	200 - 1500	1500
MAN UP/DWN	Run the motor manual from the menu	MOTOR UP / MOTOR DOWN	
DMX ADDRESS	DMX start address	1-506	1
TAC RANGE	Tacho range	1-99,999	10,000
RAMP TIME	Ramping time from 0 to max speed	0.5 - 10.0	1.0
SPEED MAX	Maximum speed	500 - 5,000	3,000
SP MIN UP	Minimum speed UP	50 - 1,000	200
SP MIN DWN	Minimum speed DWN	50 - 1,000	200
E STOP	Enable/disable emergency stop	OFF/ON	OFF
ADV. MENU	Show advanced menu	OFF/ON	OFF
SLACK DELAY	Delay from slack activation to stop	0 - 9999	0
POS OUT	Position feedback	OFF/ON	OFF
UNSAFE MODE	Disable all limit switches	OFF/ON	OFF
NOM. FREQ	Power input frequency	50/60	50
REVERSE DIR	Reverse direction of up and down	OFF/ON	OFF
QUICK SLACK	Stop quickly when slack activates	OFF/ON	OFF
PRECISION	Tolerance for settling	5 - 100	15
SLS DIST	Kilometers moved Since Last Service	Not adjustable	
SLS TIME	Hours moving Since Last Service	Not adjustable	
SLS ON	Hours on Since Last Service	Not adjustable	
SLS RESET	Reset Since Last Service parameters	NO/YES	NO
TOT DIST	Kilometers moved in total	Not adjustable	
TOT TIME	Hours moving in total	Not adjustable	
TOT ON	Hours on in total	Not adjustable	
FACTORY RST	Reset to factory default settings	NO/YES	NO

MAN SPEED and MAN UP/DWN are used for manual control of the motor.

Detailed explanation of parameters

MAN SPEED	Speed for manual driving	Range	200-1,500
MAN SPEED sets the speed for manual driving the motor			
MAN UP/DWN	Manually driving the motor		
MAN UP/DWN is used for manual control of the motor. Pressing the <i>UP</i> button, makes the curtain run up. Pressing the <i>DOWN</i> button, makes the curtain run down, unless a limit switch is activated.			
DMX ADDRESS	DMX start address	Range	1-506
DMX start address defines which DMX address the Roll Down reacts on.			
TAC RANGE	Tacho range	Range	1-99,999
The tacho range is setting the range of the Roll Down from the soft TOP limit to the soft BOTTOM limit. The tacho range can be adjusted, using channel 6 for the soft BOTTOM limit. If the same tac range is required for a range of Roll Downs, use the menu to set the same tac range easily.			
RAMP TIME	Ramping time	Range	0.5 – 10.0
RAMP TIME is the time it takes for the Roll Down to accelerate from a standstill to its maximum speed, and decelerate from maximum speed to a standstill when positioning.			
SPEED MAX	Maximum speed	Range	500-5,000
SPEED MAX sets the maximum speed. If set to 1000, the motor will run at 1000 RPM when DMX speed is set to full. SPEED MAX can be used to lower the maximum speed, if desired.			
SP MIN UP	Minimum speed up	Range	50-1,000
The motor minimum speed, for the up direction. The motor can run at different minimum speeds for each direction; this is to differentiate between different mechanical loads for up and down, see SP MIN DWN. Set this value to a speed where the motor will still run up at full load.			
SP MIN DWN	Minimum speed down	Range	50-1,000
The motor minimum speed, for the down direction. The motor is allowed to run at different minimum speeds for each direction; this is to differentiate between different mechanical loads for up and down, see SP MIN UP. Set this value to a speed where the motor will still run down at full load.			
E STOP	Enable/disable emergency stop	Range	ON / OFF
This enables/disables the emergency stop from the software. However, to get the full functionality of the emergency stop a wire must be plugged in inside the Roll Down. See section on how to change the wire setting for more details.			
ADV. MENU	Show advanced menu	Range	OFF/ON
View the extended menu with advanced options described below. The user should be extra cautious when changing these values since some combinations may lead to dangerous movement and damage to either the unit or equipment attached.			
SLACK DELAY	Delay from slack activation to stop	Range	0 – 9999
This option has no effect on the Roll Down			

POS OUT**Position feedback**

This feature enables you to know exactly where the Roll Down is. The position feedback outputs a DMX signal on pin 1,4,5 of the DMX in/out plugs. All values are zero except for the feedback which is located at the DMX address of the device. Meaning if the Roll Down has starting channel 73 then the 16bit feedback will be at channel 73 and 74. The menu options are

- OFF: No output
- SCALE: 16 bit scaled feedback. The feedback will be 0,0 at the bottom and 255,255 at the top
- DIV 4: 16 bit raw feedback divided by 4. The feedback will be 0,0 at the bottom and TAC RANGE divided by 4 at the top. For a 10 meter span this is roughly 77,104.
- 32BIT: 32 bit raw feedback. This feedback will be 0,0,0,0 at the bottom and TAC RANGE at the top. For a 10 meter span this is roughly 0,1,53,161.

UNSAFE MODE**Disable all limit switches**

CAUTION!: UNSAFE MODE should only be used in emergency situations. It disables both limit switches, and emergency stop.

NOM. FREQ**Power input frequency****50/60**

Frequency of the national grid of installation.

REVERSE DIR**Reverse direction of up and down****OFF/ON**

Reverse motor movement, encoder, and limit switch direction.

QUICK SLACK**Stop quickly when slack activates****OFF/ON**

This option has no effect on the Roll Down

PRECISION**Tolerance for settling****5 – 100**

The tolerance in which the Roll Down will stop. To small a precision will lead to the Roll Down overshooting its wanted position and never stop. This will cause the motor to overheat and eventually get damaged.

SLS DIST**Kilometres moved Since Last Service**

Shows how many kilometres the Roll Down has travelled Since Last Service reset (SLS RESET).

SLS TIME**Hours moving Since Last Service**

Shows how many hours the Roll Down has been moving Since Last Service reset (SLS RESET).

SLS ON**Hours powered on Since Last Service**

Shows how many hours the Roll Down has been powered on Since Last Service reset (SLS RESET).

SLS RESET**Reset Since Last Service parameters****NO/YES**

Set all SLS values to zero. Go through all service steps described in the manual and contact Wahlberg Motion Design for any spare parts.

TOT DIST**Kilometres moved in total**

Shows how many kilometres the Roll Down has travelled since production.

TOT TIME**Hours moving in total**

Shows how many hours the Roll Down has been moving since production.

TOT ON**Hours on in total**

Shows how many hours the Roll Down has been powered on since production.

FACTORY RST**Reset to factory default settings****NO/YES**

Reset all menu values to its default settings.

DMX ADDRESS setting

The DMX address, also known as the start channel, is the first channel used to receive instructions from the controller. For independent control, each product must be assigned to its own control channels. The DMX address is configured in the menu as described in the section above.

DMX channel overview

Channel	Function	Description
1	Position rough (MSB)	These channels control the position of the drum, with the speed on channel 3. The rough position (MSB) and the fine position (LSB) is multiplied into a 16-bit channel for optimal resolution.
2	Position fine (LSB)	However, using only the rough position (MSB) to control the position may be enough for some applications.
3	Speed and brake	This channel controls the speed and defines the max lifting and lowering speed of the drum. This channel may also work as a brake ; since the motor does not run in positioning mode unless the channel is set above 0%.
4	Mode and safety (stop all)	Channel 4 is used as a safety channel with the following functions. Values between 50% and 55% will make the product run. All other values will make the motor stop , reset errors and eventually save the current position before a power down. Make sure to leave this channel at 0% before a regular power down. Doing so will save the current position and the unit is ready to position when powered on. If it is not saved before shutdown the soft top limit must be set again when the unit is powered on.
5	Setting the soft TOP limit	Channel 5 is used to manually move the fabric up and setting the soft TOP . When the value is set $\geq 2\%$ the drum will move up until it reaches the hard TOP limit. 2 – 100% makes the motor run up, at variable speeds (2% = low speed – 100% = full speed). There is a 3 second delay from channel activation to actual movement to reduce accidental limit overwrites. When returning this fader to 0% the drum returns to the current wanted position given by channel 1&2, provided the unit has a valid soft bottom limit too and the speed on channel 3 is not zero.
6	Setting the soft BOTTOM limit	Channel 6 is used to manually move the fabric down and setting the soft BOTTOM . When the value is set $\geq 2\%$ the drum will move down until it reaches the hard BOTTOM limit. 2 – 100% makes the motor run down, at variable speeds (2% = low speed – 100% = full speed). There is a 3 second delay from channel activation to actual movement to reduce accidental limit overwrites. When returning this fader to 0% the drum returns to the current wanted position given by channel 1&2, provided the unit has a valid soft bottom limit too and the speed on channel 3 is not zero. When setting the soft limits the soft top limit must always be set before the soft bottom limit. When both soft limits have been set the internal range is calculated (TAC RANGE) is calculated. The new range is the number of encoder pulses between the soft top limit and soft bottom limit which correlates to 0% position and 100% position on channel 1&2.

Adjusting hard limit switches



WARNING! There must be at least 1½ round left on the tube when the Roll Down is at the hard BOTTOM limit.

Attention! Be careful that the hard TOP limit is not set in a position where the fabric and any counter weight can run into the Roll Down itself, this may damage the Roll Down or fabric.

The hard limit switch determines the maximum and minimum travel distance of the Roll Down. The hard limits are adjusted by rotating the white levers using the screws for hard TOP and BOTTOM limit.

When the hard TOP limit is activated on a unit with start channel 1, the display will show:

```
TOP LIMIT SWITCH
ACTIVATED SCH1
```

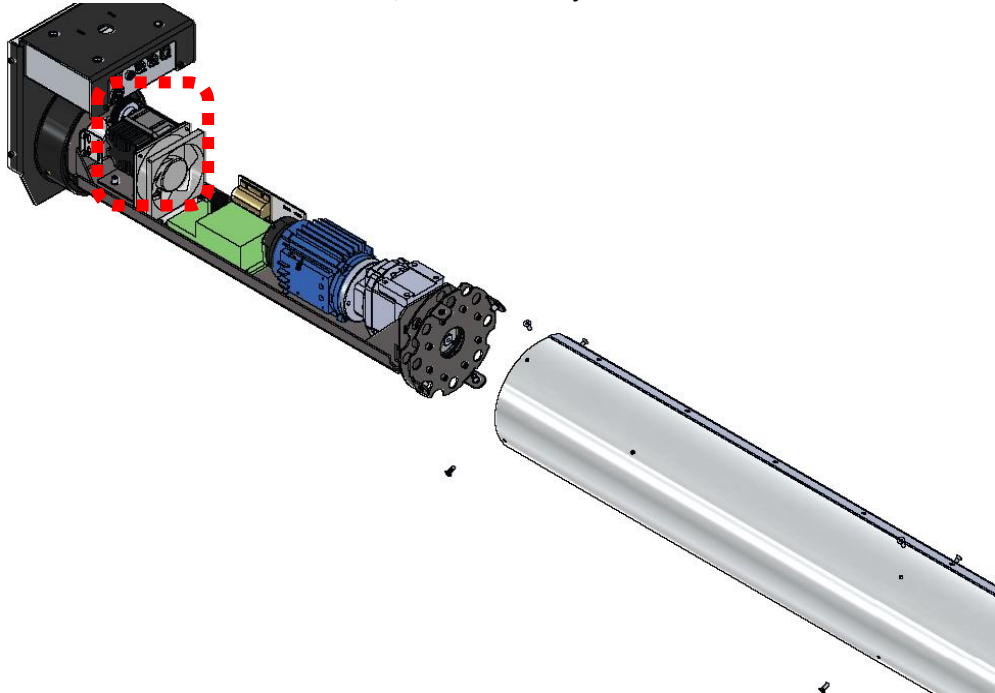
When the hard BOTTOM limit is activated on a unit with start channel 1, the display will show:

```
BOTTOM LIMIT SW.
ACTIVATED SCH1
```

The hard limit switch makes a 'click-sound' when the limit switch is pressed or released.

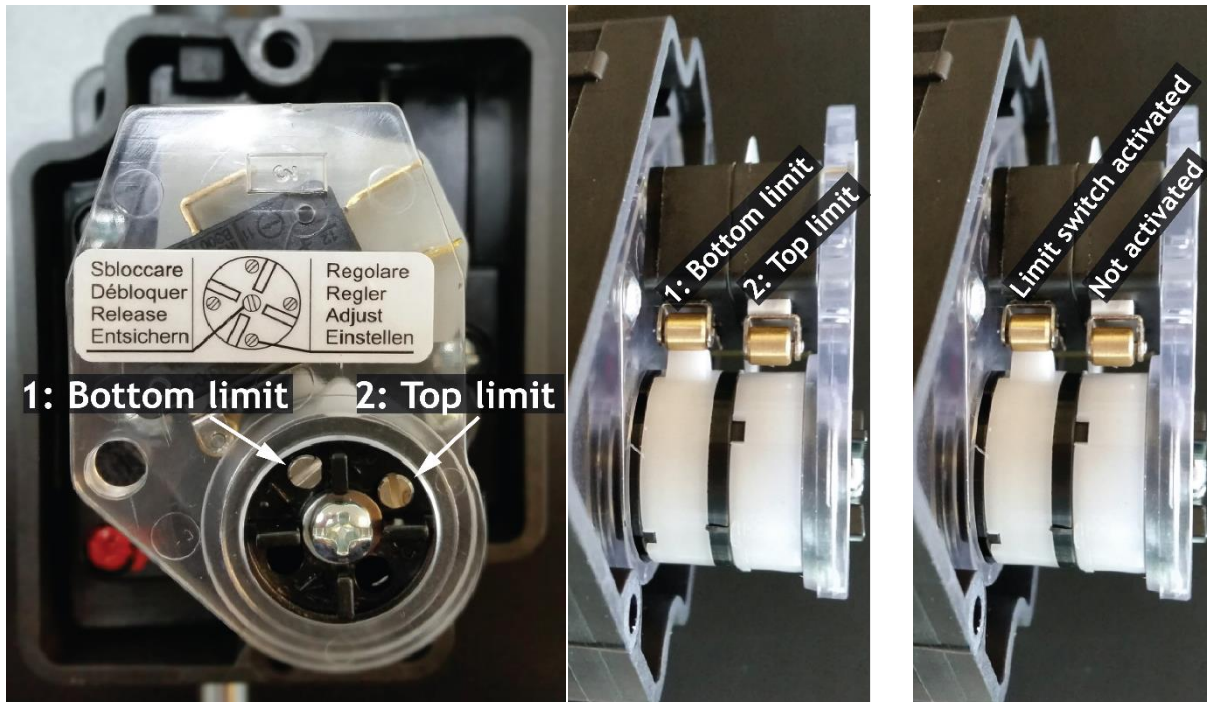
Adjusting procedure

1. Put the Roll Down in manual mode while adjusting the limits.
2. Localise the hard limit switch box, the black box just in front of the fan.



3. Loosen the two screws holding the lid.
4. Loosen the middle screw.
5. Hard BOTTOM limit is adjusted by turning the screw with a 1 next to it.
6. The hard TOP limit is adjusted by turning the screw with a 2 next to it.
7. When adjustments are done tighten the middle screw again.
8. Mount the lid with the two screws again.

The hard limits are factory set to have a travel length of 18 m.



Normal Operation

Temperatures

If the surface temperature of the Roll Down exceeds 70°C (194°F) there is a risk of damaging the Roll Down.

Duty cycle

The Roll Down should not be operated at a duty cycle higher than 30% for longer periods of time. The duty cycle is the fraction of a period where the motor is active. The duty cycle is commonly expressed as a percentage or a ratio. It can be described as the period of time it takes for a system to complete an on-and-off cycle.

Thus, a 10% duty cycle means the system is on 10% of the time and off 90% of the time. The "on time" for a 10% duty cycle is normally connected to a cycle length in minutes. E.g. a max duty cycle of 30% (10 min ON / 23 min OFF), means that the motor may not be active more than 10 minutes every 33 minutes or after 10 minute of ON the motor must be OFF for 23 minutes.

Lifting speeds and weight

The load of the Roll Down impacts the minimum speed it can operate at. At heavy loads the minimum speed up must be increased to a point where the Roll Down can still move.

If a light load is used with high minimum speeds the Roll Down might have problems with finding its position. Lower the minimum speeds if this is a problem.

The minimum speed can be adjusted from the menu.

Synchronized movements of multiple Roll Downs

If several Roll Downs are installed to perform synchronized movements the best result is achieved by using a fading 16 bit position. The Roll Downs have a slight deviation in performance of the motors, so some motors have a slightly higher maximum speed than others.

This difference in speed can be solved by running the Roll Downs with fading positions, like when fading conventional light over time, the position of the Roll Down should be faded from one position to another over a certain amount of time. In that way the Roll Downs will follow the fade-curve, and multiple Roll Downs can follow the same fade curve.

When fading the positions:

1. The speed channel should be set to 100 to gain the highest possible speed.
2. The position channel should be assigned as a 16-bit channel with *MSB* and *LSB*.
3. The speed of the fade needs to be slower than the maximum speed, so the motors have speed enough to follow the fade-curve.

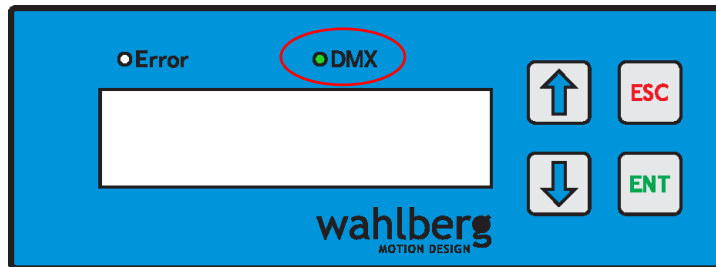
If the fade of the positions is too fast, the Roll Downs will move at the maximum speed, and you will see the difference in the motor speed.

If the fade is too slow the Roll Downs will move – stop – move – stop, when the position changes, thus giving a discontinuous movement.

LED Functions

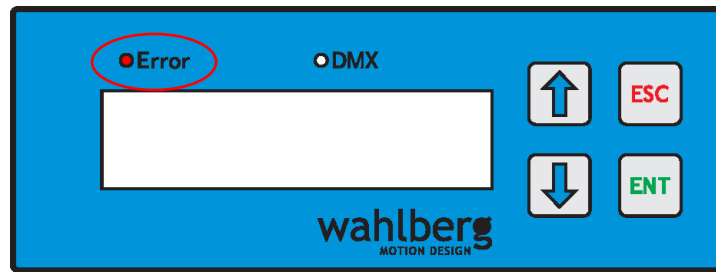
DMX LED

The DMX lamp will be steady green when receiving a DMX signal.
The DMX lamp will flash green if no DMX signal is present.



Error LED

The error LED will light red if there is an error.
Reset error is done by setting DMX channel 4 to 0%.
When the Error LED lights red, there will also be an error description in the display.



Error and error codes

Error	Possible solution
Roll Down will not start, display shows nothing.	Check if the Roll Down is connected to mains power. Check if the fuse in the Roll Down is intact
Roll Down will not start, DMX lamp is blinking.	Check DMX signal
The fabric is not wound up on the tube correctly.	Manually lower the fabric totally off the tube, while inspecting that the fabric comes out of the Roll Down evenly. Afterwards the fabric is rolled back onto the tube. Reset the top position afterwards.
Display says "Not in Pos"	The Roll Down cannot move to its position, this usually occurs when the load is high. To solve this, go into the menu and increase the Minimum speed up.
Display says "NO MOVEMENT DETECTED"	The Roll Down does continuously not measure any movement when trying to move. To solve this, check that the curtain has not caught onto something. If not then go into the menu and increase the Minimum speed up.
Power failure	The Roll Down will stop at power failure. When the power is re-established, the Roll Down must be reset before it is ready to use. It is advisable to set all the DMX channels on 0% before the power is re-established.

When an error occurs, the control system shuts down the connected motor and issues a corresponding error code. This can be queried and used to determine the cause of the error.

Code	Error message	Cause	Solution
1	UNDERVOLTAGE	Shutdown due to undervoltage in the DC link.	The input voltage might be too low.
2	OVERVOLTAGE	Shutdown due to overvoltage in the DC link.	The input voltage might be too high.
4	OVERTEMP. >70C	Shut down due to inverter overheat.	<p>The temperature of the power electronics in the frequency inverter is too high.</p> <p>The cooling is insufficient, for example, ambient temperature too high, insufficient air circulation, dirty air grate or the fan is defective.</p> <p>The drive can only be restarted when it has been allowed to cool down.</p>
5	MOTOR OVERTEMP.	Shut down due to motor overheat	<p>This message is issued when the motor thermostat is triggered or the temperature of the motor PTC is exceeded (if available).</p> <p>The motor is being insufficiently cooled, for example, due to a defective fan.</p> <p>The drive can only be restarted when it has been allowed to cool down.</p>
6	INV OVERCURRENT.	Shut down due to inverter overload.	<p>Inverter output current (active current) too high.</p> <p>Possible cause: → The motor load is too high</p>
7	INV OVERCURRENT.	Shut down due to inverter overcurrent.	<p>The momentary output current is permanently exceeding the rated current by more than 150%.</p> <p>Possible causes: → The motor load is too high</p>
8	INVERTER EEPROM	Malfunction in the inverter memory.	Power cycle the Roll Down. Unplug the power and wait 30 seconds before applying power again.
9, 64	INVERTER SHORT	This is the switch off function due to a short-circuit on the frequency inverter	<p>The inverter was heavily overloaded (also short term).</p> <p>Causes can be for example: a short-circuit / earth fault in the motor or in the supply leads.</p>

10	INV NOT ENABLED	Inverter enable signal missing at the control terminal rail, terminal 3.	<p>The inverter can only be started if an active enabling signal (12-15 V) is applied to the control terminal rail. If this signal fails during drive operations, the motor will shut down and coast to a standstill. The shutdown immediately affects the inverter power section.</p> <p>This signal is provided by an orange wire connected to the number 3 connection on the terminal rail in the Roll Down. If this wire is not connected this error will occur.</p>
11	INV SER TIME OUT	Shutdown when telegrams fail (serial interface).	<p>Power cycle the Roll Down. Unplug the power and wait 30 seconds before applying power again.</p>
255	INV SER TIME OUT	Timer reset of the watchdog.	<p>Power cycle the Roll Down. Unplug the power and wait 30 seconds before applying power again.</p>
12	INVERTER TIMING	Internal timing error	<p>Power cycle the Roll Down. Unplug the power and wait 30 seconds before applying power again.</p>
13	INVERTER SYSTEM	System error	<p>Power cycle the Roll Down. Unplug the power and wait 30 seconds before applying power again.</p>
14	INV START DIRECT	Start attempt with direction error	<p>Power cycle the Roll Down. Unplug the power and wait 30 seconds before applying power again.</p>
15	INV PROGRAM CRC	Program memory CRC error	<p>Power cycle the Roll Down. Unplug the power and wait 30 seconds before applying power again.</p>
16	INV NOT ENABLED	Inverter enabling signal error	<p>The inverter can only be started if an active enabling signal (12-15 V) is applied to the control terminal rail. If this signal fails during drive operations, the motor will shut down and coast to a standstill. The shutdown immediately affects the inverter power section.</p> <p>This signal is provided by an orange wire connected to the number 3 connection on the terminal rail in the Roll Down. If this wire is not connected this error will occur.</p>
17, 250	INV WATCHDOG RST	Reset through Watch Dog	<p>Power cycle the Roll Down. Unplug the power and wait 30 seconds before applying power again.</p>

Service and maintenance



WARNING! Read “Safety Information” on page 2 before servicing the Roll Down.

WARNING! Disconnect the Roll Down from AC mains power and allow cooling down for at least 10 minutes before handling.

WARNING! Refer any service operation not described in this user manual to a qualified service technician.

Attention! Interval of inspections should be determined according to the frequency of use and the working scenario of the Roll Down.

Attention! Signs of malfunction or poor operation should always lead to an inspection of the Roll Down, and the Roll Down should be taken out of operation until the error is eliminated.

Parts

Only parts ordered at or approved by Wahlberg Motion Design should be used in the Roll Down to ensure product function and stability. Contact Wahlberg Motion Design to inquire about spare parts.

On-site service

On-site service and maintenance can be provided by the Wahlberg Motion Design, giving owners access to Wahlberg Motion Design’s expertise and product knowledge in a partnership that will ensure the highest level of performance throughout the product’s lifetime. Please contact Wahlberg Motion Design for details.

Maintenance plan

The results of all the regular inspections are to be documented and kept available at the company. The written result of the last inspection must be kept available at the site of operation, e.g. by an inspection sticker on the Roll Down showing the date of the inspection, the basis of the inspection and the name of the inspector.

Before every use and weekly

Every time when rigging the Roll Down, before running the Roll Down – and at least every week when the Roll Down is in use:

- Check that the Roll Down is safely and correctly installed/mounted.
- Inspect the entire length of the **tube** for bends, damage, wear, and abuse.
- Inspect the **fabric attachment** for damage, wear, or abuse.
- Check that the fabric winds neatly around the tube
- Check that the fabric weighs maximum 35 kg (77 lb).
- Check all safety devices (limit switches, and emergency stop)
- Check that the Roll Down's LEDs are visible from the operating station.
- Make sure that the operator has visual confirmation of all possible movements of the Roll Down at all time.

Monthly

At regular intervals – but at least every month when the Roll Down is in use:

- Check the mounting clamps for damages and proper fastening.
- Change damaged parts according to this manual.

Yearly

The Roll Down has to be inspected by a specialist every 12 months.

Every 48 months

The Roll Down should be inspected by an authorised expert every 48 months.

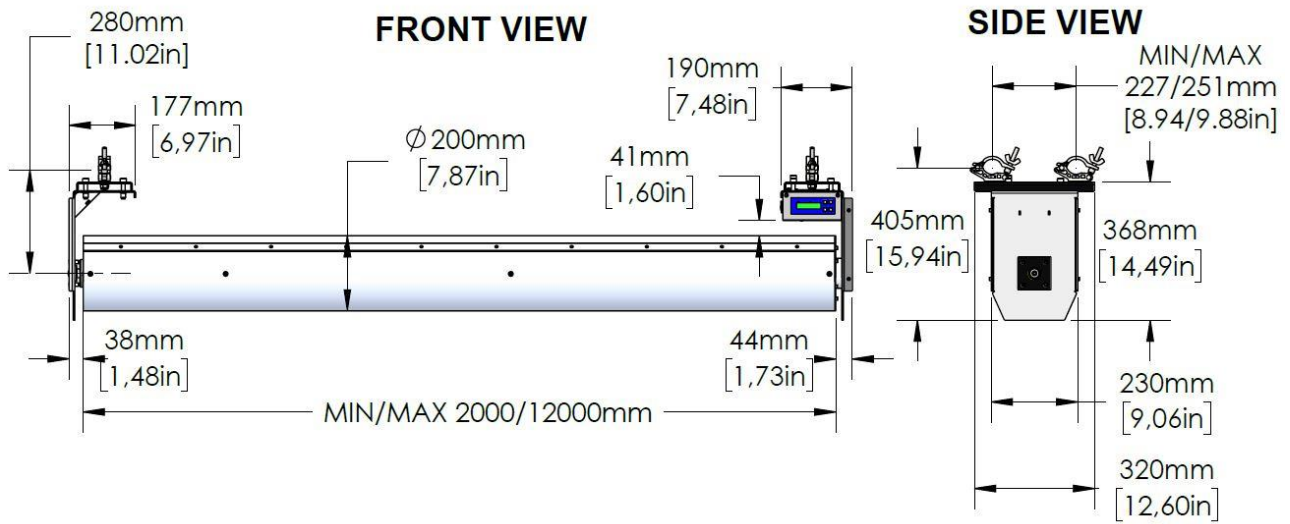
Checklist

Use the checklist accordingly; before each use, each month etc.

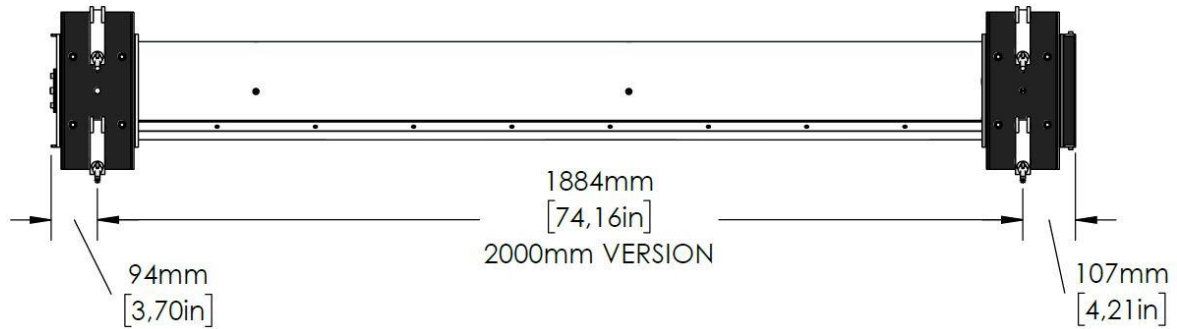
Check	Type	Result
Installed / mounted correct	Inspection	
Load and LEDs visible for the operator	Inspection	
Entire tube length OK	Inspection	
Emergency stop	Functional test	
Fabric is wound neatly around the tube	Inspection	
Fabric attachment	Inspection	
powerCON TRUE1	Inspection	

Appendix 1 - Dimensions

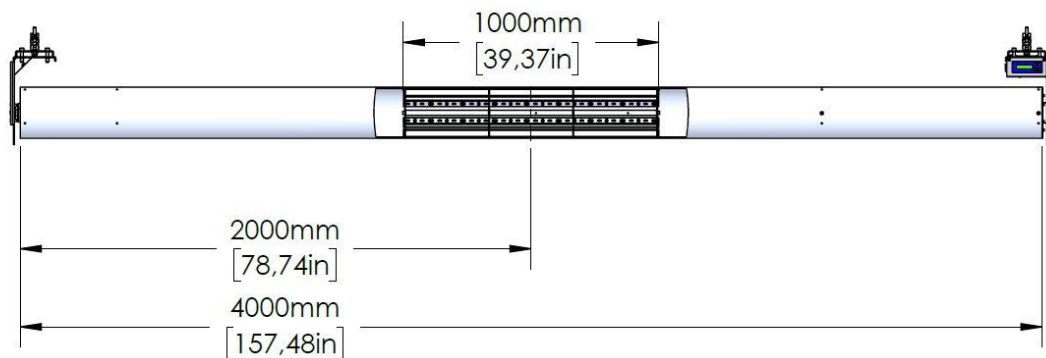
Roll Down (249)



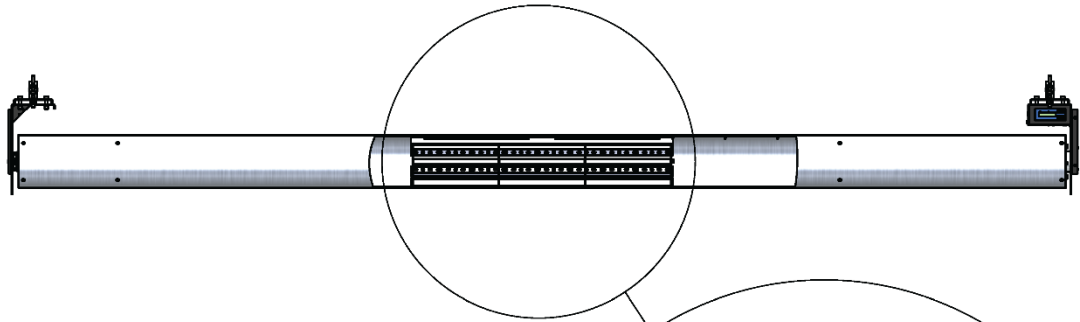
TOP VIEW



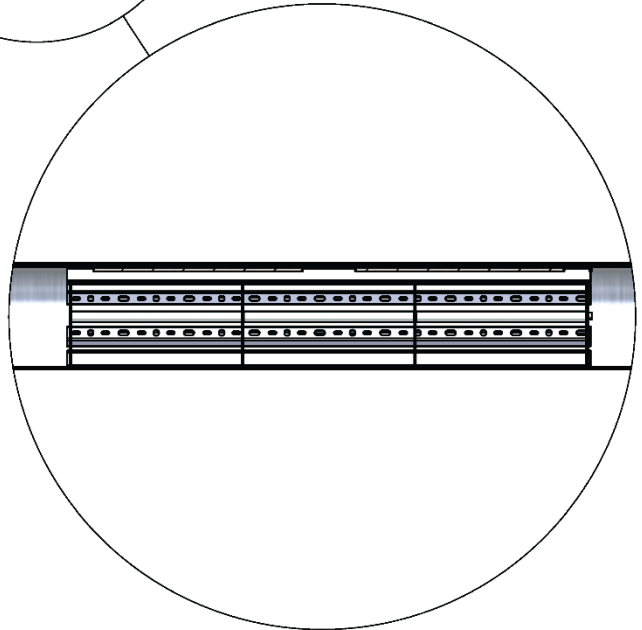
OPTIONAL TUBE SPLICE CONNECTION



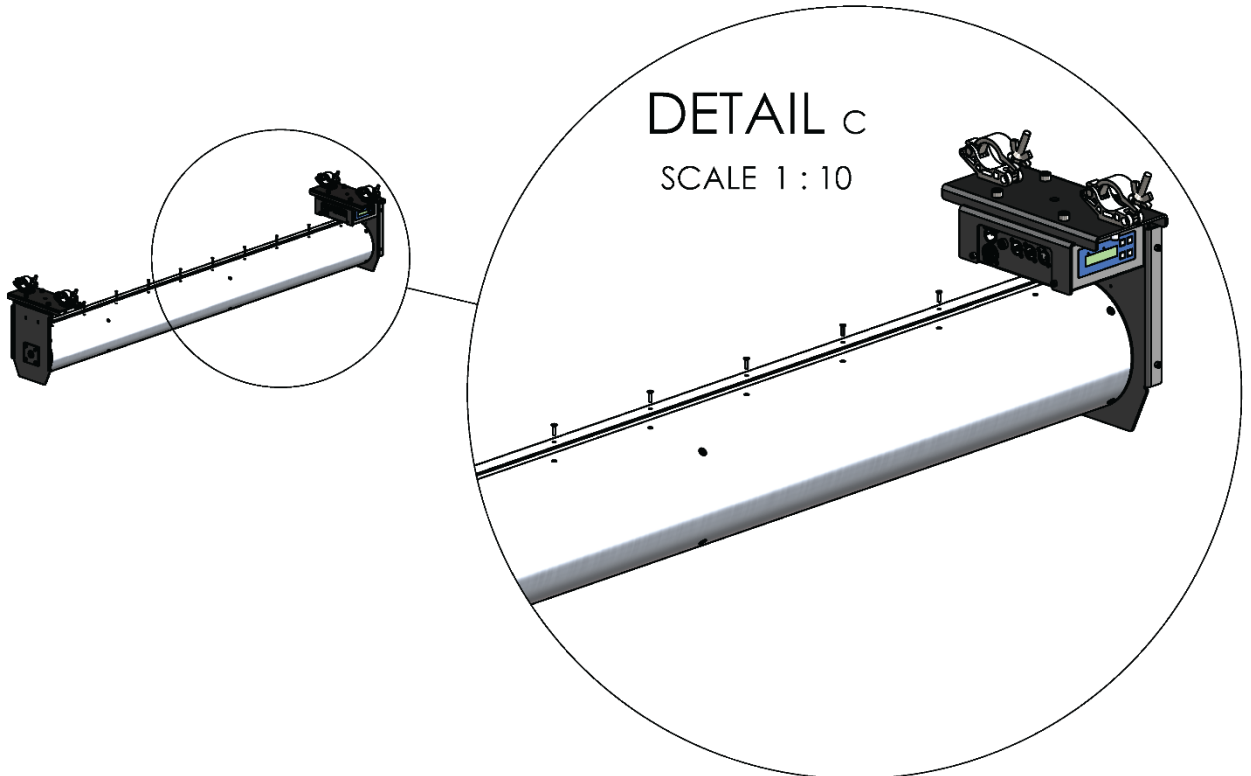
OPTIONAL SPLICE



DETAIL D
SCALE 1 : 13



INSTALLING FABRIC



Appendix 2 - powerCON

A. APPLICATION INSTRUCTION

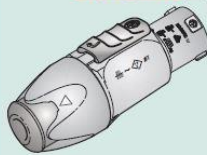
Application:
The powerCON TRUE1 system is certified as a connector with breaking capacity according IEC 60320, VDE 0625. It is intended for use as an appliance coupler and interconnection coupler. It serves to supply power to an appliance and from an appliance to other equipment. To be installed by qualified person only.

CONNECTOR ASSIGNMENT:

APPLIANCE INLET

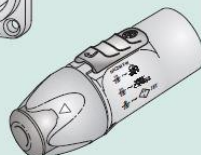
NAC3MPX-TOP
NAC3MPX-WOT-TOP

Power IN



NAC3FX-W-TOP
(Connector)

APPLIANCE OUTLET



NAC3MX-W-TOP
(Plug connector)

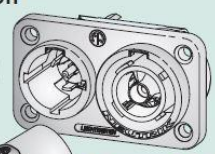
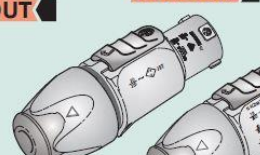
NAC3FX-W-TOP
(Connector)

APPLIANCE INLET / OUTLET

► Combination

NAC3PX-TOP

Power IN



Power OUT

NAC3MX-W-TOP
(Plug connector)

powerCON TRUE1 TOP line is full backward compatible with the preceding powerCON TRUE1 products.

Approval based:	VDE EN 60320-1/EN60320-2-2	<input checked="" type="checkbox"/>	UL UL 498 / CSA C22.2 No. 182.3	<input checked="" type="checkbox"/>
Rating:	250 V ac / 16 A		250 V ac / 20 A	
Cable Type:	H05VV-F3G 1.0 mm ² , Length max. 2 m H05VV-F3G 1.5 - 2.5 mm ² H07RN-F3G 1.5 mm ²		SJTOW, SJOOW 3 x 12 AWG	
Strain Relief:	White chuck		White chuck	
Cable O.D.:	6.0 - 12.0 mm		6.0 - 12.0 mm	

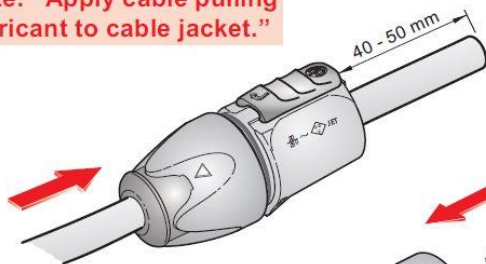
UL50E environmental rating

Enclosure Type 4 when mated with attachment plug NAC3MX-W-TOP or mated with appliance inlet NAC3MPX*-TOP with sealing cover SCNAC-MPX and NAC3PX-TOP with sealing cover SCNAC-PX.

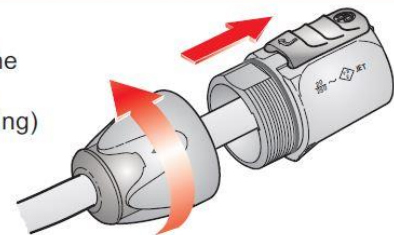
B. ASSEMBLY INSTRUCTION

- A** Insert cable into the bushing and housing.

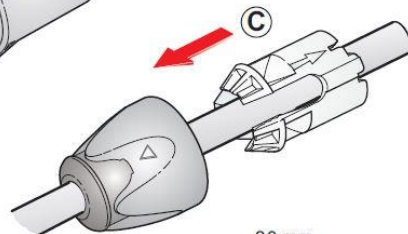
Note: "Apply cable pulling lubricant to cable jacket."



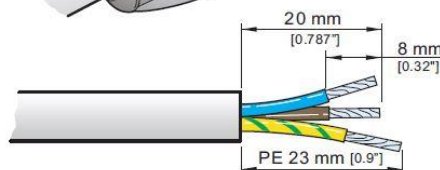
- B** Separate the housing from the bushing (cable remain in bushing)



- C** Place chuck over the cable.

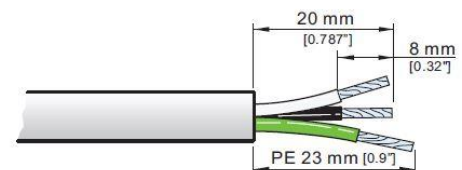


- D** Prepare cable as shown.

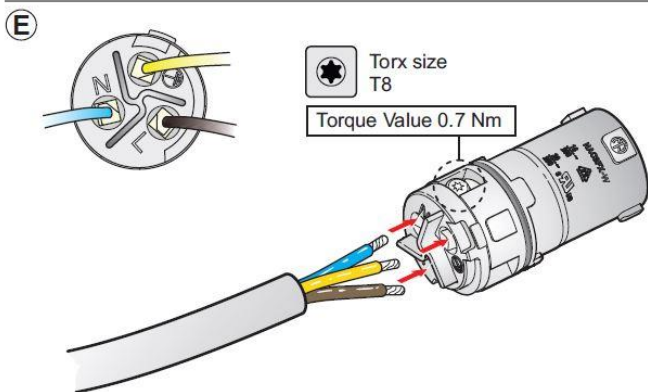


VDE (EN 60320-1/EN60320-2-2)

- i Recommendation:**
Wire Pulling Lubricant - LUB-I/0.95 from 3M™

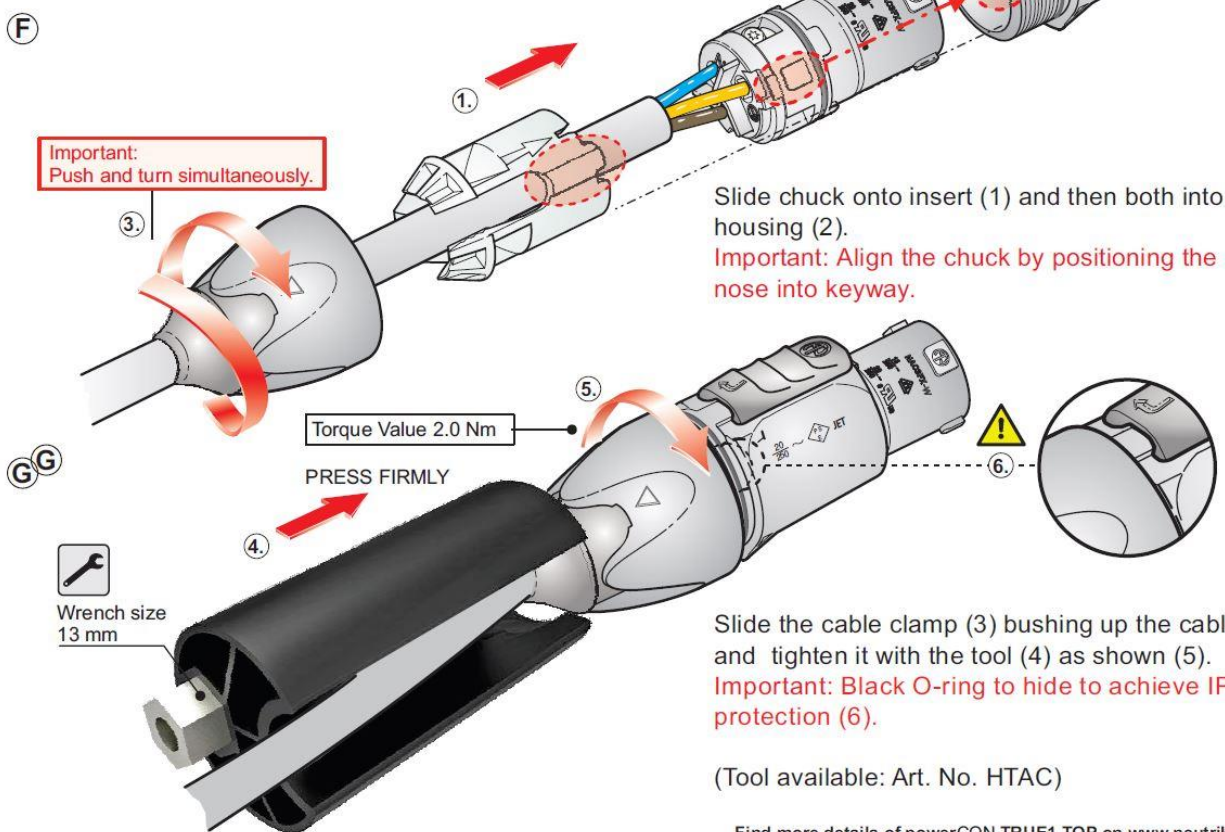


UL (UL 498 / CSA C22.2 No. 182.3)



Slide the cable into the contacts and clamp with the screw with Torx size T8.

Wiring	VDE	UL
L ⇒	brown	black
N ⇒	blue	white
⏚ ⇒	green/yellow	green



Slide chuck onto insert (1) and then both into housing (2).
Important: Align the chuck by positioning the nose into keyway.

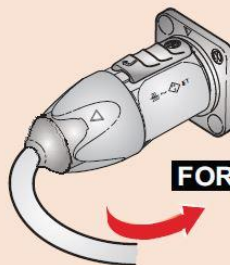
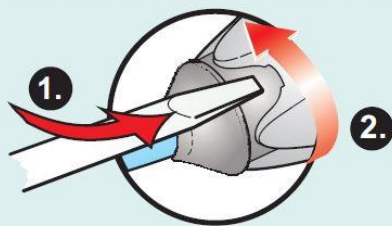
Slide the cable clamp (3) pushing up the cable and tighten it with the tool (4) as shown (5).
Important: Black O-ring to hide to achieve IP protection (6).

(Tool available: Art. No. HTAC)

Find more details of powerCON TRUE1 TOP on www.neutrik.com.

FOR DISASSEMBLY - OPEN TWIST LOCK!

1. Press with screw driver to unlock
2. Turn bushing 360°.
3. Repeat step 1+2 until bushing is unscrewed.



CAUTION

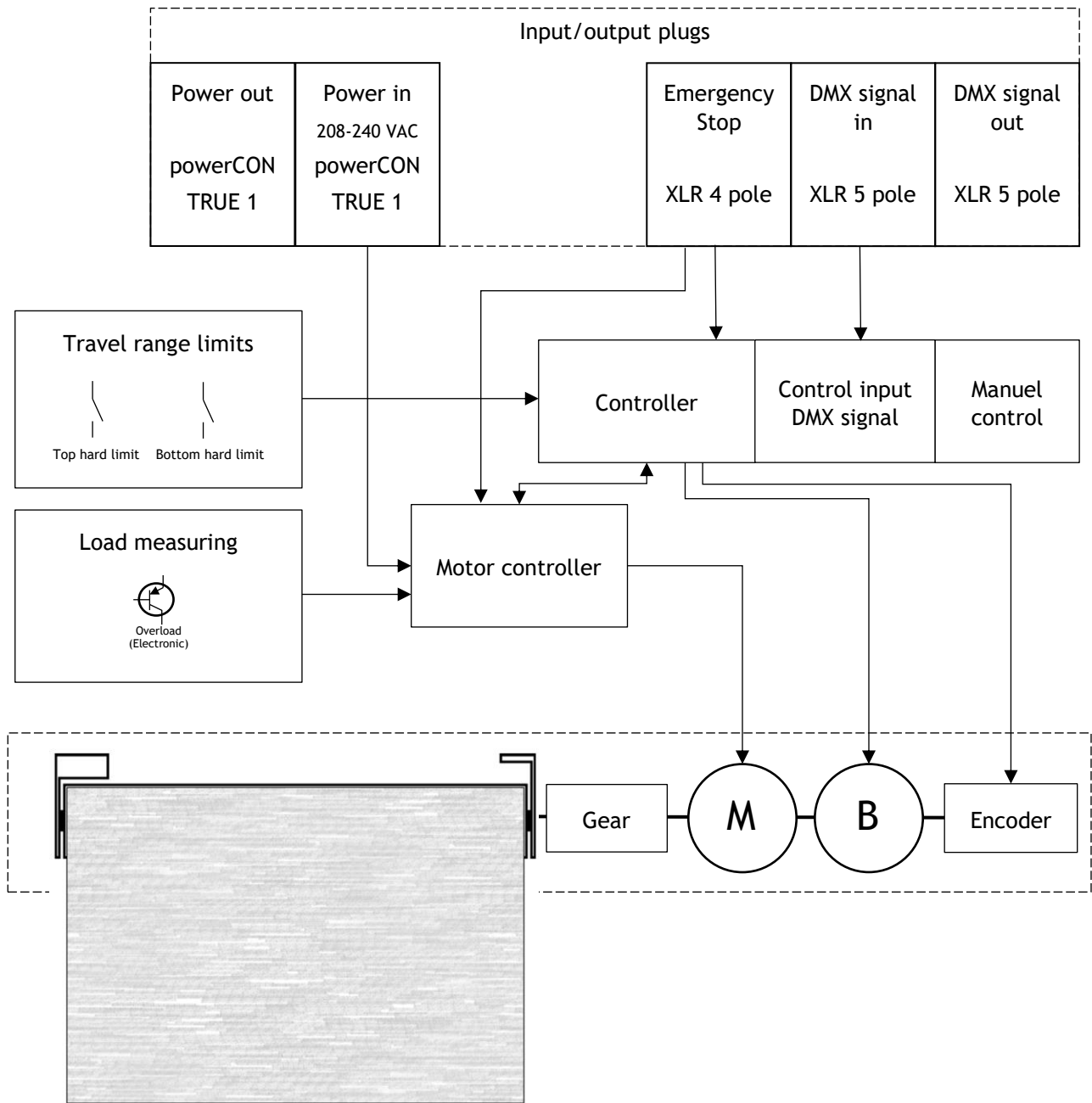
To ensure protection category, do not expose the connection to bending forces (e.g. do not attach loads to the cable, no free-dangling cable windings etc.).



SAFETY WARNING

For safety and certification reasons the connector must be replaced in case of any broken parts or excessive wear and tear.

Appendix 3 – Block Schematic



Block diagram of the control system of the Roll Down.

DMX Ch.	Function	DMX Ch.	Function
1	Position rough (Hi/MSB of a 16-bit DMX Ch.)	4	Motor enabler – Set between 50-55% to run
2	Position fine (Lo/LSB of a 16-bit DMX Ch.)	5	Set soft TOP limit
3	Set the maximum speed	6	Set soft BOTTOM limit

Inspection points!

Before each use

- Inspect the entire length of the **tube** for bends, damage, wear, corrosion, and abuse.
- Inspect the **fabric attachment** for damage, wear, or abuse.
- Check that the fabric weighs maximum 35 kg (77 lb).
- Check all safety devices (limit switches, and emergency stop)
- Make sure that the operator has visual confirmation of all possible movements of the Roll Down at all time.

Warning!
Do not use the Roll Down if any damage or error is found!

JENS JUULS VEJ 1, 8260 VIBY, DENMARK
220.805.006

WWW.WAHLBERG.DK

TELEPHONE +45 86 18 14 20
DATE: 2021-12-07

How to get started

1. Place / Rig the Roll Down in something high with minimum 2-3 meters clearance below.
2. Connect the mains and emergency switch (if enabled). – **The product turns on and the display shows the start-up message.**
3. Set the DMX start address to 1 and apply DMX from a lighting desk, preferably with manual faders.
Make sure that the 6 channels are patched from DMX channel 1 to 6. Pull all channels on to 0%
4. Set DMX channel 4 between 50% and 55% - **The motor is now enabled and the Roll Down can run**
5. Set DMX channel 5 to 30% - **The product starts to move towards its hard TOP limit. To stop the motor, set DMX channel 5 to 0%. Stop when the desired or at the hard TOP limit. The reached position is now the soft TOP limit.**
6. Set DMX channel 6 to 30% - **The motor moves towards its hard BOTTOM limit. To stop the motor, set DMX channel 6 to 0%. Stop when desired or at the hard BOTTOM limit. The reached position is the soft BOTTOM limit, and hence the travel range has now been set from the soft TOP limit to the soft BOTTOM limit.**
7. Set DMX channel 1 to 75% and DMX channel 3 to 25% - **The motor moves with 25% speed to the 75% position.**
8. Set DMX channel 1 to 25% and DMX channel 3 to 50% - **The motor moves with 50% speed to the 25% position.**

<p>LED indicators:</p> <p>DMX LED Glows constant: DMX connection OK. Flash: DMX signal is missing.</p> <p>Error LED Off: OK. On: Error detected, see display.</p>	<p>Emergency stop switch:</p> <p>Pin out Pin 1 = GND Input Pin 2 = NC Pin 3 = NC Pin 4 = 12-15VDC Input</p> <p>The Emergency stop switch is connected to the male 4 pin XLR connector. Pin 1 and 4 should be powered with 12-15VDC to enable the motor.</p>	<p>Tech specs:</p> <p>Lifting speed: Variable 5-183 cm/s (2-72 in/s)</p> <p>Maximum load: 35.0 kg (77 lb)</p>
--	---	---