The Mec Line mechanical systems for the window remote control are super-tested, reliable, economical, easy and quick to install. The products are constantly improved thanks to the greatest experience in the window manual controls field. The movement transmission from the control operator to the opening mechanism is effected by a steel helical cable which runs inside a steel conduit. The installation must be carried out in order to allow the cable working in pull action during the load operation (ex. in the closing phase for bottom hinged windows and in the opening phase for top hinged windows).

Every system has to be provided with the following items:

- **CONTROL OPERATOR**, flat, mini, simple, concealed and geared operator (see page 56)
- **TRANSMISSION ELEMENTS**: cable, conduit, connectors, saddles, lock springs, end plugs (see page 57)
- **OPENING MECHANISM**, chain openers, forks and locking openers for bottom hinged windows (see page 58-60)

To open no more than one window with one control operator, the previous items are also contained all together in the "BRAVO" or in the "KIT for BOTTOM or TOP HINGED WINDOWS" (see pages 61-63).

In case of installations with more than one locking opener or fork, rotary junction boxes are required. For a right installation the tool for conduit preparation and the conduit bender are very useful (see page 57).

For further information regarding the installation of the Mec Line product, please ask for the installation manual.

**SPECIFICATION PROSPECTS**

The Mec Line mechanical systems for the windows remote control made by Ultraflex Control Systems is composed by the following items:

- Control operators with painted steel handle named: FLAT, CONCEALED, MINI, SIMPLE AND GEARED OPERATOR.
- Transmission line formed by a steel helical cable running inside a steel conduit externally coated in PVC with an internal antifriction polyethylene tube. Other accessories allow a correct installation.
- Chain opening mechanisms both for top and bottom hinged windows with painted or anodized aluminium casing; available stroke 250 and 380 mm.
- Steel forks and swivel 250 mm stroke for sun louvre blades.
- Painted aluminium locking openers for bottom hinged windows, maximum stroke 250 mm.

The instructions for a safe installation are included in the section “SECURITY WARNINGS”
It’s possible to find the most appropriate opening mechanism and handle operator for the required system, referring to the following charts.

### openings mechanism selection

<table>
<thead>
<tr>
<th>WINDOW TYPE</th>
<th>ADVISED MECHANISM</th>
<th>WINDOW TYPE</th>
<th>ADVISED MECHANISM</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Window Type Image 1" /></td>
<td>Chain mechanism, Cat</td>
<td><img src="image2.png" alt="Window Type Image 2" /></td>
<td>Telescopic spindle, Cat</td>
</tr>
<tr>
<td><img src="image3.png" alt="Window Type Image 3" /></td>
<td>Chain mechanism, Cat</td>
<td><img src="image4.png" alt="Window Type Image 4" /></td>
<td>Fork</td>
</tr>
<tr>
<td><img src="image5.png" alt="Window Type Image 5" /></td>
<td>Chain mechanism, Locking opener</td>
<td><img src="image6.png" alt="Window Type Image 6" /></td>
<td>Fork</td>
</tr>
</tbody>
</table>

### Control operator selection

Following charts refer to accurate installation, executed with our tools, with only one 90° bend of the conduit and with no rotary junction box included; the wind load has not been considered. Every additional bend or rotary junction box has to be counted as an additional window. For intermediate window heights refer to the directly lower height; in case of window lower than 750 mm it is necessary to reduce the actuator stroke to 1/3 of the window height. For windows with four-bar hinges the calculation of the necessary force depends on the hinge model. Please contact our Technical Dpt. for any specific application.

**These selection guides have to be considered as a general direction and must be checked by the installer. For any specific application, please contact our technical dept.**

### Charts

- **S = Stroke 250 mm**
- **S = Stroke 380 mm**

#### H WINDOWS

<table>
<thead>
<tr>
<th>WEIGHT OF THE WINDOW (Kg)</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>750 - 1150</td>
<td></td>
</tr>
<tr>
<td><img src="image7.png" alt="Chart Image 1" /></td>
<td></td>
</tr>
<tr>
<td>1150 - 1400</td>
<td></td>
</tr>
<tr>
<td><img src="image8.png" alt="Chart Image 2" /></td>
<td></td>
</tr>
<tr>
<td>1401 - 1600</td>
<td></td>
</tr>
<tr>
<td><img src="image9.png" alt="Chart Image 3" /></td>
<td></td>
</tr>
</tbody>
</table>

No.: No. windows + No. rotary junction boxes + No. bends (over 1)

- Flat operator
- Simple, mini, concealed operator
- Geared operator
**FLAT OPERATOR**

**PART No.**
- White 31560R
- Black 37161J
- Grey 40133A

- It can be used with the 25 cm and 38 cm chain openers and with the locking opener for single bottom hinged windows.
- The inside mechanism and the handle are made in metal and the cover in plastic.
- Maximum cable length: 6 m. The spent travel tube is external.

**CONCEALED OPERATOR**

**PART No.** 30745X

- It can be used with all opening mechanisms.
- It can be concealed into the wall or into the aluminium frame together with the spent travel tube.
- Completely made in metal with painted handle and aluminium anodized cover.

**MINI OPERATOR**

**PART No.**
- White RAL 9010 30748C
- Black RAL 9005 36964S
- Grey RAL 9006 36813E

- It can be used with all opening mechanisms.
- Completely made in metal.

**SIMPLE OPERATOR**

**PART No.**
- White RAL 9010 30750U
- Black RAL 9005 32594G
- Grey RAL 9006 37035E

- Style and efficiency are the main features of this operator.
- It incorporates the antitortion spent travel tube which allows a maximum stroke of 25 cm. Therefore it is not suitable to be used with the 38 cm chain openers.
- Completely made in metal.

**GEARED OPERATOR**

**PART No.**
- White RAL 9010 40517S
- Black RAL 9005 40543T
- Grey RAL 9006 40544V

- Ratio: 5:1
- It can be used with all opening mechanisms.
- Particularly suitable for operating many windows simultaneously and moving heavy windows.
- The inside mechanism and the handle are made in metal. The front cover is made in plastic. The spent travel tube is external.

**GEARED OPERATOR WITH LONG METALLIC COVER**

**PART No.**
- White RAL 9010 40777R
- Black RAL 9005 40778S
- Grey RAL 9006 40779T

- Version of geared operator with inner anti-torque spent travel tube and metal cover.
TRANSMISSION ELEMENTS

In the manual window remote control systems MEC LINE, the transmission elements are the connection between the control operator, a manually moved mechanism through which it is possible to transmit the motion, and the opening mechanism which is directly connected to the window frame and it allows the opening. The transmission elements and accessories required for a correct application are the followings:

**HELICAL CABLE**
PART No. 30764A
It runs inside the conduit and it is the real transmission element. It is supplied in 50 meters reels.

**CONDUIT**
PART No.  
White 40205V  
Black 40206A  
Grey 36383B  
It is supplied in 3 meters steel rods externally coated in white, black or grey PVC. The internal tube is in polyethylene to make the cable sliding easier.

**CONNECTOR**
PART No.  
White 31459U  
Black 36015V  
Grey 40137E  
The junction between two conduit rods.

**LOCK SPRING**
PART No. 30770Y  
It has to be screwed at the end of the helical cable, near the control operator.

**TOOL FOR CONDUIT PREPARATION**
PART No. 40097R  
Necessary to prepare conduit ends.

**END PLUG**
PART No.  
White 40139I  
Black 40174J  
Grey 40191O  
It fixes the spent travel tube to the wall.

**FIXING SADDLE**
PART No.  
White 30767D  
Black 35446R  
Grey 40134B  
It is the element used to fix the conduit to the wall. It has to be placed one every meter and anyway one before and one after every bend.

**ROTARY JUNCTION BOX**
PART No.  
White 30768G  
Black 37040B  
Grey 40135C  
It is used to transfer the movement of the cable from the main line to the auxiliary ones; it is essential for systems with more than one locking opener, forks or chain openers (only if installed on windows placed upon others).

**CONDUIT BENDER**
PART No. 30790G  
Bending radius 100 mm. To form the conduit in such an even radius allowing regular operation of the cable.

**CONDUIT BENDER FOR KIT WITH ROPE**
PART No. 40153E  
Bending radius 50 mm.
MEC LINE

Available with 250 mm or 380 mm stroke.
Suitable for bottom hinged, top hinged and centre hinged windows.
Versatility and simplicity of installation.
Quick connection of the conduit to the chain opener: it's not necessary to work the conduit.
Provided with quick release connector for an easy window cleaning.
Minimum size: the minimum space for the mounting is 16 mm for top hinged windows and 36 mm for bottom hinged windows.
The window opening stroke cannot exceed 1/3 of the window height. The chain stroke can be adjusted acting on the lock spring.
The installation must be carried out in order to allow the cable working in pull action during the load operation (ex. in closing phase for bottom hinged windows and the opening phase for top hinged windows).
In installations with two or more windows placed side by side, rotary junction boxes mechanism are not required.
On windows wider than 1,5 m or anyway with a large area, for better stability to wind, it is suggested to install two or more chain openers.

PART No. Stroke 250 mm Stroke 380 mm
WHITE RAL 9010 37566D 37569I
BLACK ANODIZED 37565C 37568H
SILVER ANODIZED 37564B 37567E

The instructions for a safe installation are included in the section “SECURITY WARNINGS”.
On bottom hinged windows for safety reasons always install side checks.
Suitable for horizontal or vertical sun louvre blades, both for one or more windows.

- Made in stainless steel, it's suitable both for internal and external installations.
- A geared operator should be used for sun-blades and vertical louvres with more than 10 blades or for horizontal louvres with more than 14 blades.
- For installation with more than one window, rotary junction boxes have to be used.