

ROLLING SHUTTERS

Technical Brochure

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INDEX

1. OPEN TYPE ROLLING SHUTTERS	2
ROLLING GRILLES	2
2. CLOSE TYPE ROLLING SHUTTERS	4
GALVANIZED STEEL ROLLING SHUTTERS	4
FLAT BLIND GALVANIZED STEEL PROFILE (TYPE L110)	4
ROLLING SHUTTERS FROM CONVEX PROFILE (TYPE L80)	
CONVEX GALVANIZED STEEL PROFILE (L80,L90)	5
ROLLING SHUTTERS FROM PERFORATED PROFILE (TYPE L110D, L80D,L90D)	6
ROLLING SHUTTERS WITH DOUBLE WALL PROFILE (TYPE L105-2)	7
ALUMINUM ROLLING SHUTTERS (TYPES A100, A65)	8
ALUMINUM ROLLING SHUTTERS (TYPE A100)	8
ALUMINUM ROLLING SHUTTERS (TYPE A65)	9
THE NEW TRANSPARENT SHUTTER (EYEQ)	10
3. ROLLING SHUTTER TECHNICAL DESCRIPTION	10
4. WINDING MECHANISM	11
MECHANISM WITH SPRINGS AND CENTRAL MOTOR	11
MECHANISM WITH LATERAL MOTOR	13
MECHANISM WITH TUBULAR MOTOR	15
5. AUTOMATIONS	15
6. GUIDES	16
SIMPLE GUIDES	16
GUIDES WITH RUBBER	16
SPECIAL REINFORCED GUIDES	16
A65 GUIDES	16
INSTALLATION BEHIND THE OPENING	16
INSTALLATION BETWEEN THE OPENINGS	17
7. HOLLOW SECTIONS AND JOINT FILLING USE	17
8. LATERAL PLATES	17
9. COVER BOXES AND FRONT PANELS	17
10. DOORS AND CONSTANT SHUTTERS	18
11. PACKAGING	18
12. PAINTING	18
13. INSTRUCTIONS FOR SHUTTERS	
IMPORTANT INFORMATION FOR THE ORDER OF THE ROLLING SHUTTER	19
SHUTTER OPERATION	
HAND OPERATED SHUTTERS	20
ROLLING SHUTTERS WITH CENTRAL MOTOR	20
ROLLING SHUTTERS WITH LATERAL MOTOR	21
ROLLING SHUTTER MAINTENANCE	22
14. USEFUL TABLES	23
ROLLER SHUTTER CURTAINS	23
GUIDE TYPE SELECTION FROM ROLLER SHUTTER TYPE AND WIDTH (cm)	24
LATERAL PLATE TYPE SELECTION FROM ROLLER SHUTTER TYPE AND ITS HEIGHT	25
MOTORS AND SHAFT SELECTION	
CENTRAL MOTORS AND SPRING BALANCED SHUTTERS	26
COVER BOXES	27
SHAFT SELECTION TABLE FOR SPRING BALANCED SHUTTERS	28
LATERAL MOTORS FOR NON-BALANCED SHUTTERS	29
WIND SPEED AND WIND PRESSURE CONVERSION TABLE	30
15. GENERAL INDICATIONS FOR THE CHOICE OF VARIOUS ELEMENTS OF THE SHUTTER	31
16. SHUTTER ELEMENTS SELECTION	32

1. OPEN TYPE ROLLING SHUTTERS

This semi-transparent range of shutters combines safety and style, by providing a protective curtain with a pleasing aesthetic appearance, geared to encouraging the almost lost delight of window shopping in city and town areas at night. Their field of application is, mainly, **shops and stores** that want not only to protect but also to show their merchandise.

ROLLING GRILLES

- They are made of **galvanized circular section rod iron (Φ8mm)**, shaped in a hydraulic press and finally, linked with powerful contacts from galvanized iron (thickness 1,5 mm), creating miscellaneous openings (eyes) according to the following categories.

- When visibility for shop window displays out of hours is required but physical protection for window/glass and stock is also needed, this type of roller shutter provides the solution.

- Security grilles provide best value for money deterrents, against vandals or burglary.

- Grilles are also very versatile in choice of construction. The rhomboid iron opening comes in three different versions to cover all needs.

- Security roller grille screens can optionally be configured with part traditional solid steel slats/laths.

- Shutters can be operated manually or electrically according to the weight and frequency of use. The standard actuation method is via an up, down and stop button station but a plethora of alternative access control methods (RF receiver, proximity cards, etc) are available to suit every application.

- The reinforced bottom slat (Blind Flat Profile) provides greater deflection strength and incorporates safety stops plus a 22mm rubber seat.

- All push up doors are fitted with a PVC lifting handle.

- All doors should be serviced regularly. Our service department will contact you after the installation has been completed and advise you on our maintenance schemes.

- Available in the entire RAL color spectrum.

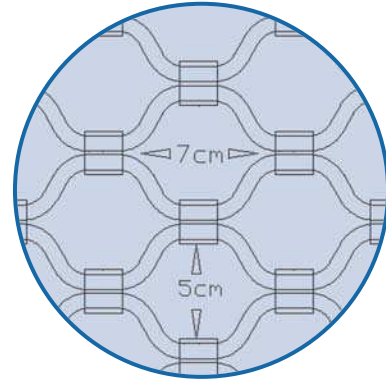


SMALL EYE ROLLING GRILLES

Starting from the denser arrangement with the rhomb measure 7cm x 5cm

The rhomb opening (eye) is 7cm X 5cm, so this type is mainly used to protect shops and trade chambers, which exhibit *small size merchandise* behind the grille.

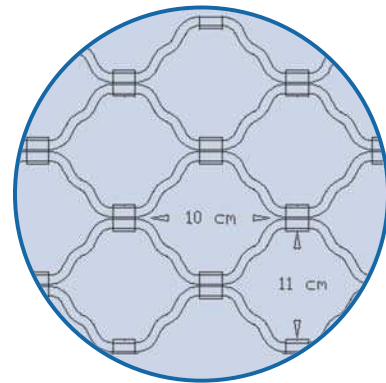
The small eye rolling grille combines safety and visibility.



MEDIUM EYE ROLLING GRILLES

... to a more sparse layout (rhomb measure 10cm x 11cm)

The rhomb opening is 10cm X 11cm, so this type has intermediate dimensions in order to maintain *intermediate transparency and safety* degree.

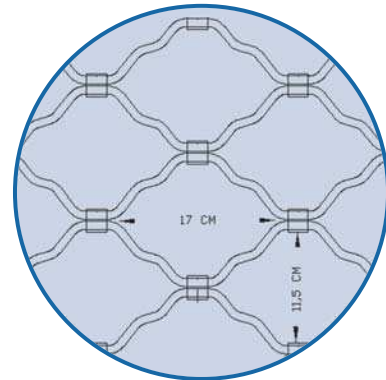


BIG EYE ROLLING GRILLES

... and finally ending up to the thinnest.

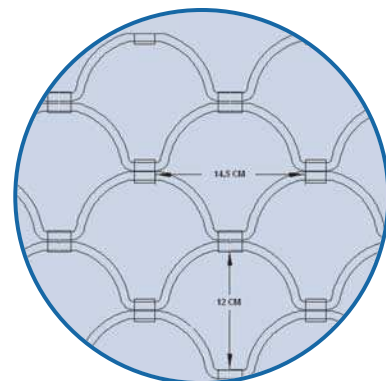
The rhomb opening (eye) is 17cm X 11,5 cm, so this type is mainly used to protect shops and trade chambers, which exhibit *big size merchandise* behind the grille.

The safety degree is smaller than denser types of grille described above, but the transparency is to the maximum.



GOTHIC ROLLING GRILLES

The eye opening is 15cm X 12cm and its rare design variety is suitable to promote the uniqueness of classical stores.



2. CLOSE TYPE ROLLING SHUTTERS

- These roller shutter doors are built to withstand the toughest conditions giving the user the reliability they need whilst retaining ease of operation. The best materials are used and the highest standards of quality are maintained.

- The main characteristic of this type is that it provides **high degree of protection**. There are a lot of variants of curtain (as described below), depending on the demands for security, size and insulation of the space it protects, in perfect harmony with its particular functional and architectural requirements. The close type rolling shutters are classified to steel rolling shutters and aluminum rolling shutters.

GALVANIZED STEEL ROLLING SHUTTERS

- This range of shutters, is made of galvanized steel coil sheets, that are specially shaped so as to form the shutter curtain.

The material thickness varies from 0,6mm to 1,5mm depending on curtain's dimensions, and the covering thickness of galvanization is 275gr/m².

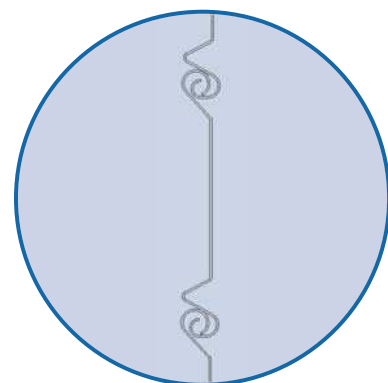
- The sides of the curtain are restrained by, and run, in rolled steel guide channels that can incorporate noise reduction rubber inserts to minimize air penetration. An added dense brush insert reduces significantly operating noise and wear, providing excellent insulation enhancement.

- The profiles are classified to the following categories:

FLAT BLIND GALVANIZED STEEL PROFILE (TYPE L110)

- This particular design of shutter, is constructed in 110mm flat interlocking steel sections made of galvanized steel sheets with nominal thickness ranging from 0.6mm to 1.2mm, and comes complete with end locks to prevent lateral movement.

- Shutters can be operated manually or electrically according to the weight and frequency of use. The standard actuation method is via an up, down and stop button station but a plethora of alternative access control



methods (RF receiver, proximity cards, etc) are available to suit every application.

- A completely perforated curtain band of perforated lath may be incorporated into solid shutters to give partial visibility and/or ventilation.

- All shutters can be equipped with a shutter box to house the coil. The box is made out of 1.25mm thick galvanised steel sheets and can be varnished to match the color of the shutter's curtain.

- The reinforced bottom slat provides greater deflection strength and incorporates 2 safety stops plus a 22mm rubber seat.

Suitable for internal or external applications the combination of blind, perforated and vision slats offers optimum strength with a "transparent" effect. Optional polycarbonate inserts are specifically designed and placed to provide the see-through protection demanded by many local authorities for high streets and modern shopping centres.

- All push up doors are fitted with a PVC lifting handle.

- This profile type is the **most affordable solution** for small medium and big dimensions shutters. The achieved wind-pressure-resistance, with this profile, is more than 30kp/ m².

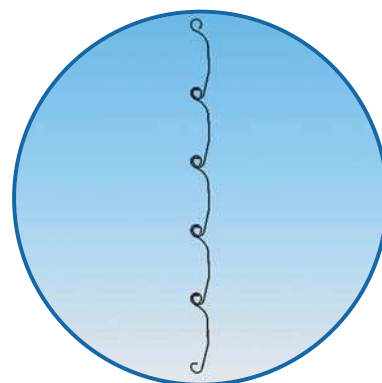
- The usual applications of this profile are garage doors, storehouses, petrol stations, industrial doors and also shops that do not need to show their shop-windows.

ROLLING SHUTTERS FROM CONVEX PROFILE (TYPE L80) CONVEX GALVANIZED STEEL PROFILE (L80, L90)

- This particular design of shutter, is constructed in 80mm or 90mm convex, strengthened cross-section, interlocking steel sections produced from galvanized steel sheets with nominal thickness ranging from 0.6mm to 1.0mm, and comes complete with end locks to prevent lateral movement.

- A galvanized steel bottom rail fitted with an insulating rubber insert is also provided for better fortitude and insulation.

- Shutters can be operated manually or electrically according to the weight and frequency of use. The standard actuation method is via an up,



down and stop button station but a plethora of alternative access control methods (RF receiver, proximity cards, etc) are available to suit every application.

- A completely perforated curtain band of perforated lath may be incorporated into solid shutters to give partial visibility and/or ventilation.

- All shutters can be equipped with a shutter box to house the coil. The box is made out of 1.25mm thick galvanised steel sheets and can be varnished to match the color of the shutter's curtain.

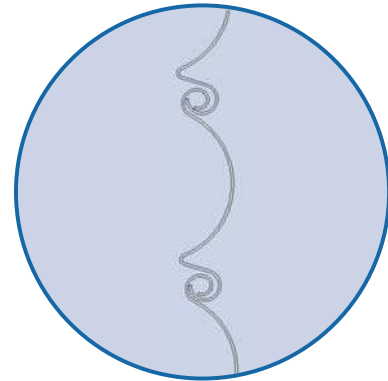
- All push up doors are fitted with a PVC lifting handle

- The functional and operational benefits of tubular motor technology, which is incorporated with this type of shutter, allow installation in cases, where there is a limited headroom space.

- This profile type has **strengthened cross-section** which is the most affordable solution for medium and large dimension shutters. The material thickness is always selected on basis of the manufacturing tenacity requirements and in interrelation with the opening width that be covered. The achieved wind-pressure-resistance, with this profile, is more than 35 kp/m².

- The usual applications of this profile are industrial doors, storehouses, garage doors, petrol stations, and also shops that do not need to show their windows.

- Available in the entire RAL color spectrum.

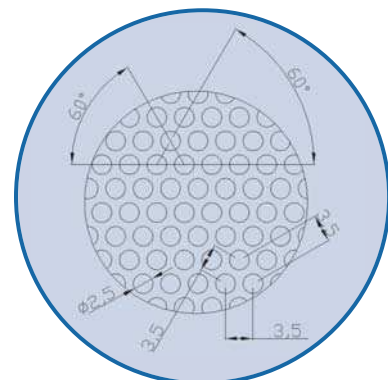


ROLLING SHUTTERS FROM PERFORATED PROFILE (TYPE L110D, L80D, L90D)

- Perforated security shutters provide a transparent effect when background lighting is illuminated. Ideally suited to provide protection for commercial property whilst displaying products to the public.

- This particular design of shutter, available in 110mm flat interlocking steel sections, is made of specially processed galvanized steel coil sheets that offer a **high degree of security with inner integral strength**.

- The lath undergoes a high-density micro-perforation process, of 2.5mm diameter, to allow maximum light transmission without affecting the high-level of security. The shutters are constructed in galvanized steel slats



produced from galvanized steel sheets of 1mm thickness and come complete with end locks to prevent lateral movement.

- The material thickness is always 1mm, so it is not presented any reduction in stability requirements because of the perforation.

- Shutters can be operated manually or electrically according to the weight and frequency of use. The standard actuation method is via an up, down and stop button station but a plethora of alternative access control methods (RF receiver, proximity cards, etc) are available to suit every application.

- The sides of the curtain are restrained by, and run, in rolled steel guide channels that incorporate noise reduction rubber inserts to minimize air penetration. An added dense brush insert reduces significantly operating noise and wear, while providing excellent insulation enhancement.

- The reinforced bottom slat provides greater deflection strength and incorporates safety stops plus a 20mm rubber seat.

- The shutters with this profile type are usually recommended in dark colors because, when they are combined with suitable internal lighting, better merchandise exhibition is achieved.

- These perforated profiles can also combine with the equivalent close type profiles creating alternations, which cover special needs of aeration and exhibition.

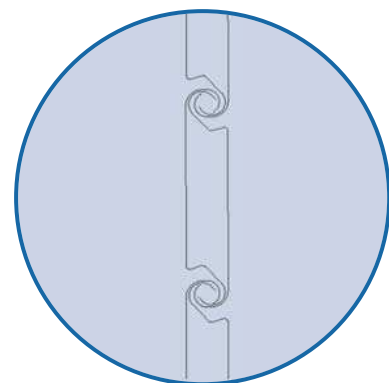
- Available in the entire RAL color spectrum.



ROLLING SHUTTERS WITH DOUBLE WALL PROFILE (TYPE L105-2)

- These roller shutter doors are built to **withstand the toughest conditions** giving the user the reliability they need whilst retaining ease of operation.

- Suitable for industrial use, this type of roller shutter can withstand more than 80kp/m² of wind-load pressure and can reach spans of 18m. The extra strength of steel combined with foam filled insulation (of expanded polystyrene or polyurethane insulation/ acoustic material) provide a strong and efficient solution suited to higher security requirements. Also, the insulation is used for applications where heat loss must be minimised



and dust must be excluded. The flat face profile of the extruded section lends itself to sealing of the curtain against the ingress of water/rain.

- This particular design of shutter, is constructed in 105mm double wall foam filled (optional) interlocking steel sections produced from galvanized steel sheets with nominal thickness ranging from 0.6mm to 1.5mm, giving a total profile thickness of 20mm. It comes complete with end locks to prevent lateral movement.

- The sides of the curtain are restrained by, and run, in rolled steel guide channels that can incorporate noise reduction rubber inserts to minimize air penetration. An added dense brush insert significantly reduces operating noise and wear, providing excellent insulation enhancement.



ALUMINUM ROLLING SHUTTERS (TYPES A100, A65)

- This type is made of **double-walled extruded aluminum profiles** that are articulated in the same way as the galvanized steel ones. The better constructional possibilities of aluminum extrusion allow fine articulations, for smoother and silent operation.



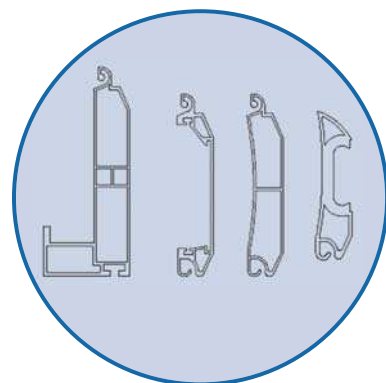
ALUMINUM ROLLING SHUTTERS (TYPE A100)

- Appropriate for industrial use, this type of roller shutter can withstand more than 50kp/m² of wind-load pressure while the combination of low weight and solid construction provides operating comfort and outstanding protection.

- The roller shutter curtain consists of specially articulated interlocking aluminum lathes locked together by plastic end locks. The sides of the curtain are restrained by, and run, in a rolled steel guide channel.

- This particular 100mm double-walled extruded aluminum profile can be filled with polyurethane (without CFC) or expanded polystyrene material in order to meet possible heat insulation requirements.

- Each sidewall is 1.5mm thick while the total profile nominal thickness measures 20mm.



- Suitable for internal or external applications the combination of solid and windowed slats offers optimum strength with a "transparent" effect. Optional polycarbonate inserts may be placed to provide the see-through protection demanded by many local authorities for high streets and modern shopping centers.

- Shutters can be operated manually or electrically according to the weight and frequency of use. The standard actuation method is via an up, down and stop button station but a plethora of alternative access control methods (RF receiver, proximity cards, etc) are available to suit every application.

- This profile type is the best solution for medium and big dimensions shutters that simultaneously have **high stability and insulation** requirements. The shutters with this profile type are mainly suitable for industrial doors.

- Available in the entire RAL color spectrum

ALUMINUM ROLLING SHUTTERS (TYPE A65)

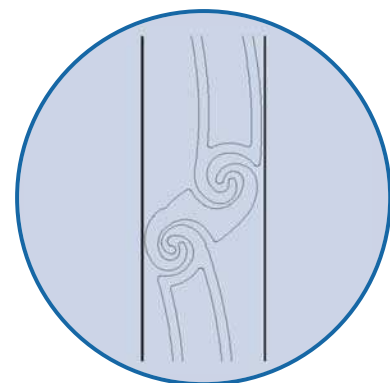
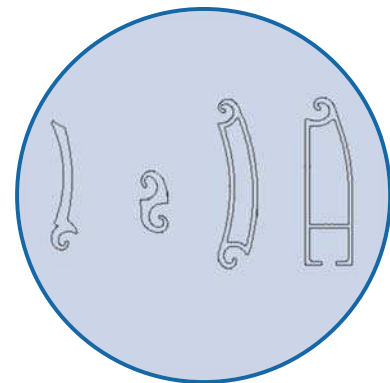
- The functional and operational benefits of tubular motor technology which is incorporated with this type of shutter allows installation in cases where there is a limited headroom space. The combination of low weight and solid construction provides operating comfort and outstanding protection.

- The bottom rail consists of a single length aluminum extrusion with the base of the rail containing a special slot to retain a seamless finned PVC weather seal. The guides are also a proprietary extruded aluminum section with slots at the lips to retain a seamless PVC strip designed to prevent metal to metal contact for smoother and quieter operation.

- Shutters can be operated electrically. The standard actuation method is via an up, down and stop button station but a plethora of alternative access control methods (RF receiver, proximity cards, etc) are available to suit every application.

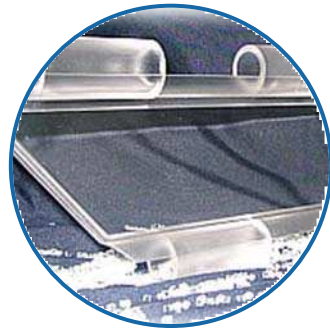
- The rolling shutters of this type are not available as hand operated only.
- This profile type is characterized of **high safety degree**. Its special design in combination with its special guides causes the blockade of the shutter to each effort of violation, as it appears in the next picture.

- Available in the entire RAL color spectrum.



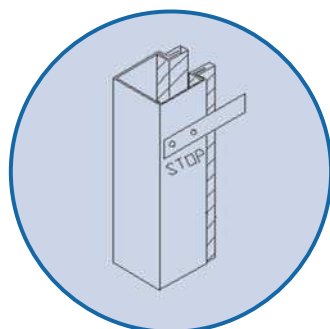
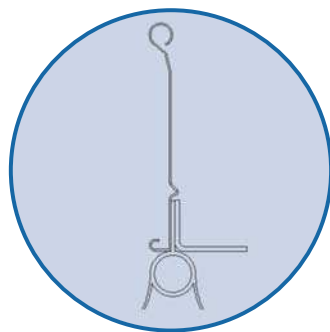
THE NEW TRANSPARENT SHUTTER (TYPE EYEQ)

- This is a very stylish shutter for either garages or shops that combines **security and transparency**.
- It is more resistant than the traditional steel shutter. It absorbs violent shocks and it beats of any attempt of house(shop)-breaking.
- The trapezoidal-shaped links overlap each other. This guarantees a solid structure superior to classic assemblies. Moreover, it is the only defense to be water-, wind-, dust-, heat- and cold-resistant as well as UV stabilized, to protect the products from discoloring. Furthermore, it is very silent and easy to clean.
- There is the possibility to hook one, two or more profiles of transparent shutter to your curtain and double or triple the transparent surface later on.
- Additionally, this "active shield" can be equipped with an electronic generator sending a repellent electric flow along the hinges and a powerful projection of incapacitating gas. This puts a hold to any attempt of housebreaking or ram raid.



3. ROLLING SHUTTER TECHNICAL DESCRIPTION

- The common characteristics in all mentioned types of shutters are explained below:
- The shutter **curtain** is the main body of the shutter. There are a lot of variants of curtain (as described below), covering each security demand of the building it protects, in perfect harmony with functional and architectural requirements.
- The reinforced **bottom slat** provides greater deflection strength and incorporates safety stops plus a 20mm rubber seat of high quality for smooth contact with the ground.
- The edges of the slats are fitted with proprietary **polyamide end-clips** secured to alternate slats to reduce friction and prevent lateral movement of the curtain.



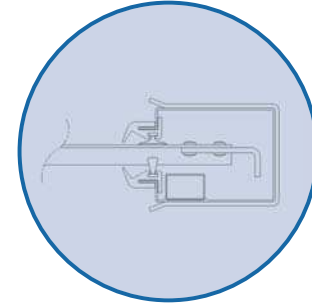
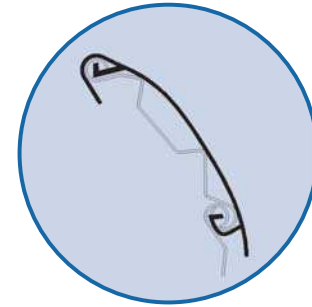
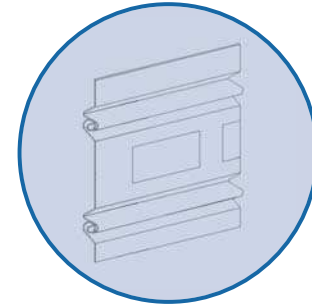
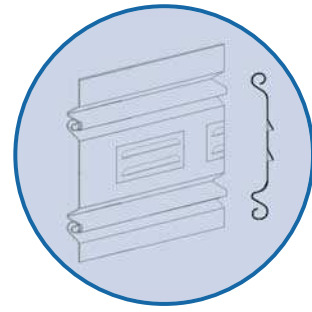
- A suitably placed in the above part of each guide mechanical **"stop"** prevents the exit of the shutter from the guides.

- Laths incorporated with ventilation slots are available, for the **ventilation** of garages. These are usually placed at the lower part of the curtain, right before the bottom slat.

- Optionally, we can insert a pair of mechanical locks or/and polycarbonate inserts with see-through protection demanded by many local authorities for high streets and modern shopping centers. Suitable for L110 and A100 profiles.

- **Hinges**, with noise reduction PVC cover, are used to connect and protect the upper part of the curtain from scratches while winding or unwinding silently.

- A special galvanized steel-mounting angle can be installed at the edges of the shutter curtain to maximize wind-pressure resistance. These anchors are available for L110, L80, L90 and L105-2 profiles.



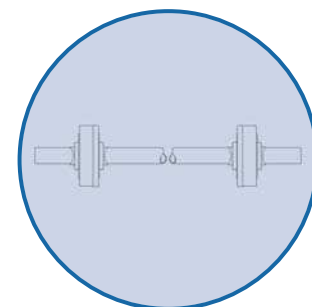
4. WINDING MECHANISM

- According to the size and the type of shutter there are different mechanisms of elevation depending on the weight, width of raised shutter and its frequency of movement.

MECHANISM WITH SPRINGS AND CENTRAL MOTOR

- This mechanism is ideal for **small** and **medium size** shutters with relatively **low frequency** of movement daily. The curtain of the door is manually or electrically raised, assisted by counter balancing spiral springs enclosed in drums that are attached to the shaft. The drums are equipped with noise reduction PVC cover to protect the upper part of the curtain from scratches while winding or unwinding.

Mechanism of that type is constituted by an axis that is steady fixed to the ends. The spiral **springs** have an average life span of 36.000 cycles. The size and diameter of each shaft, varies depending on the weight and the width of the shutter in order to maintain minimum bending deformation of axis.

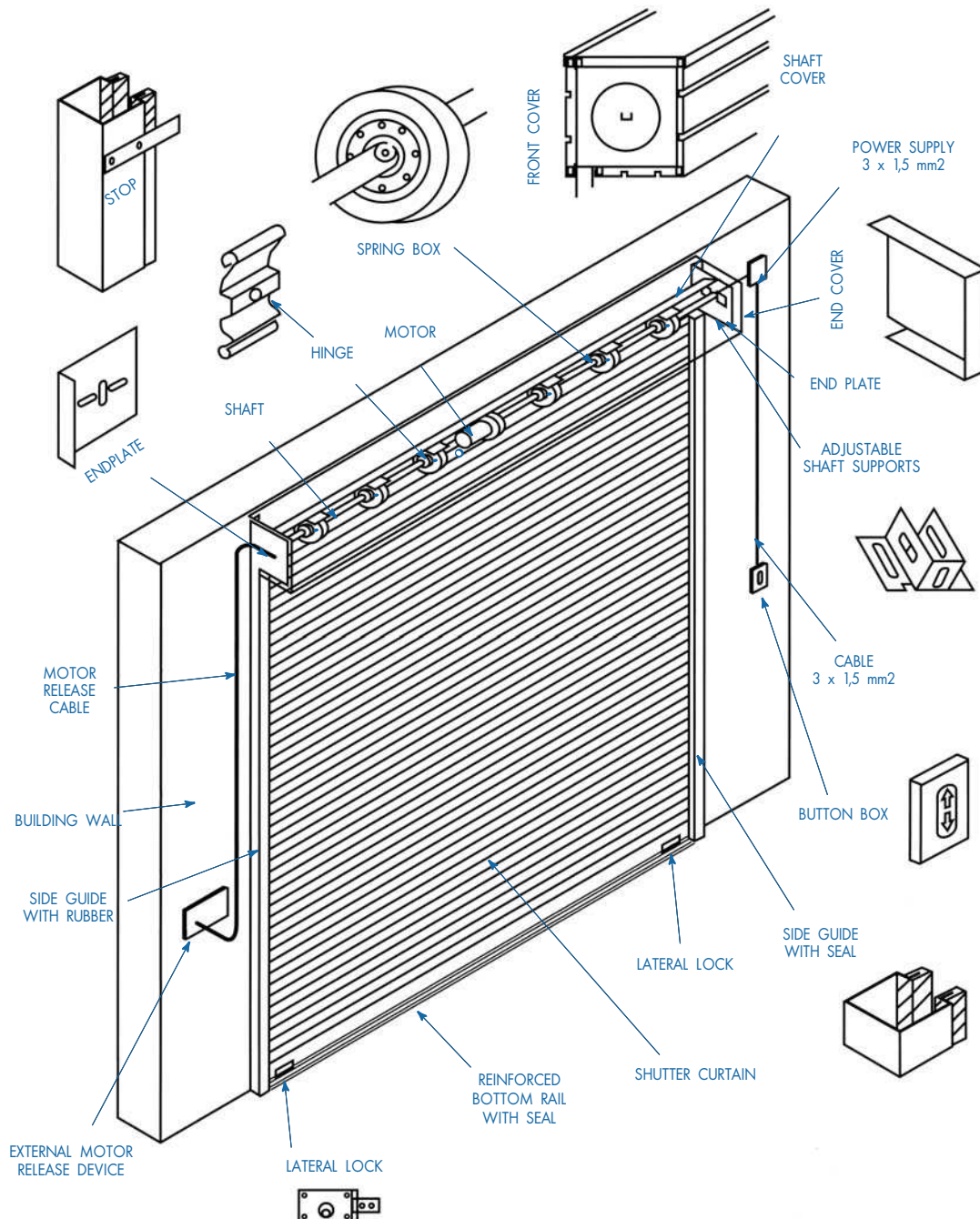
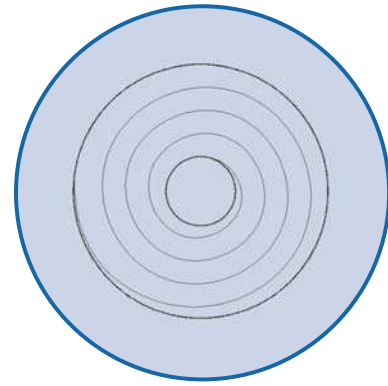


- The resulted spring torque compensates for the weight of the shutter curtain that can be effectively lifted by hand.

- A 60 mm diameter **shaft** requires a 220 mm diameter **drum** while a 76 mm diameter shaft requires a 240 mm diameter drum.

- The operation of shutter can be automated with the aid of a central motor, which is placed in the center of the shaft (even in existing installations).

- The **motor** has an electro-brake that locks the shutter when descends but is also equipped with a manual disengagement system that allows

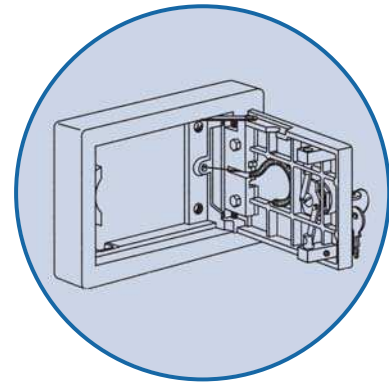


the shutter to function in case of a power failure.

- **Handoperation** can be activated externally or internally.

The choice of motor depends on the weight and the width of the shutter. Central motors are recommended for shutters up to **340 kg** and have restriction of operation up to **20 with 30 times daily**.

Two **limit switches** attend to the automatic halt of shutter in upper and down position.



MECHANISM WITH LATERAL MOTOR

- **When the size of shutter is big or the frequency of movement exceeds 20 to 30 times** large, mechanism with lateral motor is recommended. In this mechanism, there is a big diameter pipe (in order to succeed minimum deformation of bending) supported on one end with a bearing and on the other end connected with the **lateral motor** that carries the weight of shutter without springs.

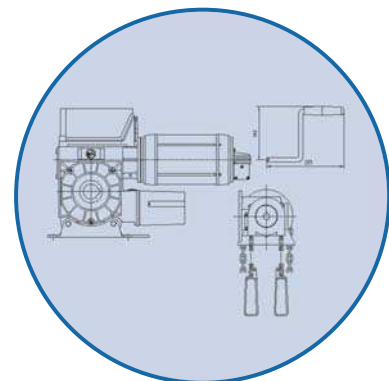
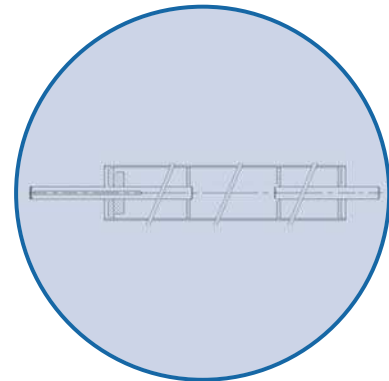
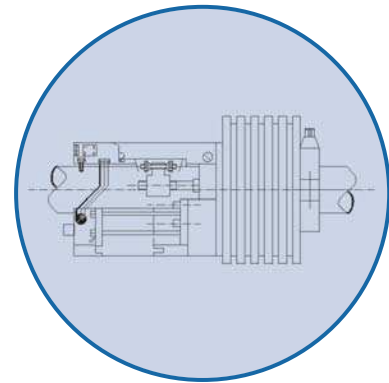
- In this the type of mechanism motor incorporates certain **safety** characteristics that are imposed by the big size of shutters that moves. More specifically, there are double terminal switches for the up and down limit of the shutter to avoid fault operation. In addition, the gears of movement transmission are allocated in such a way to prevent any accident from falling shutter in case of overload or/and teethbreak.

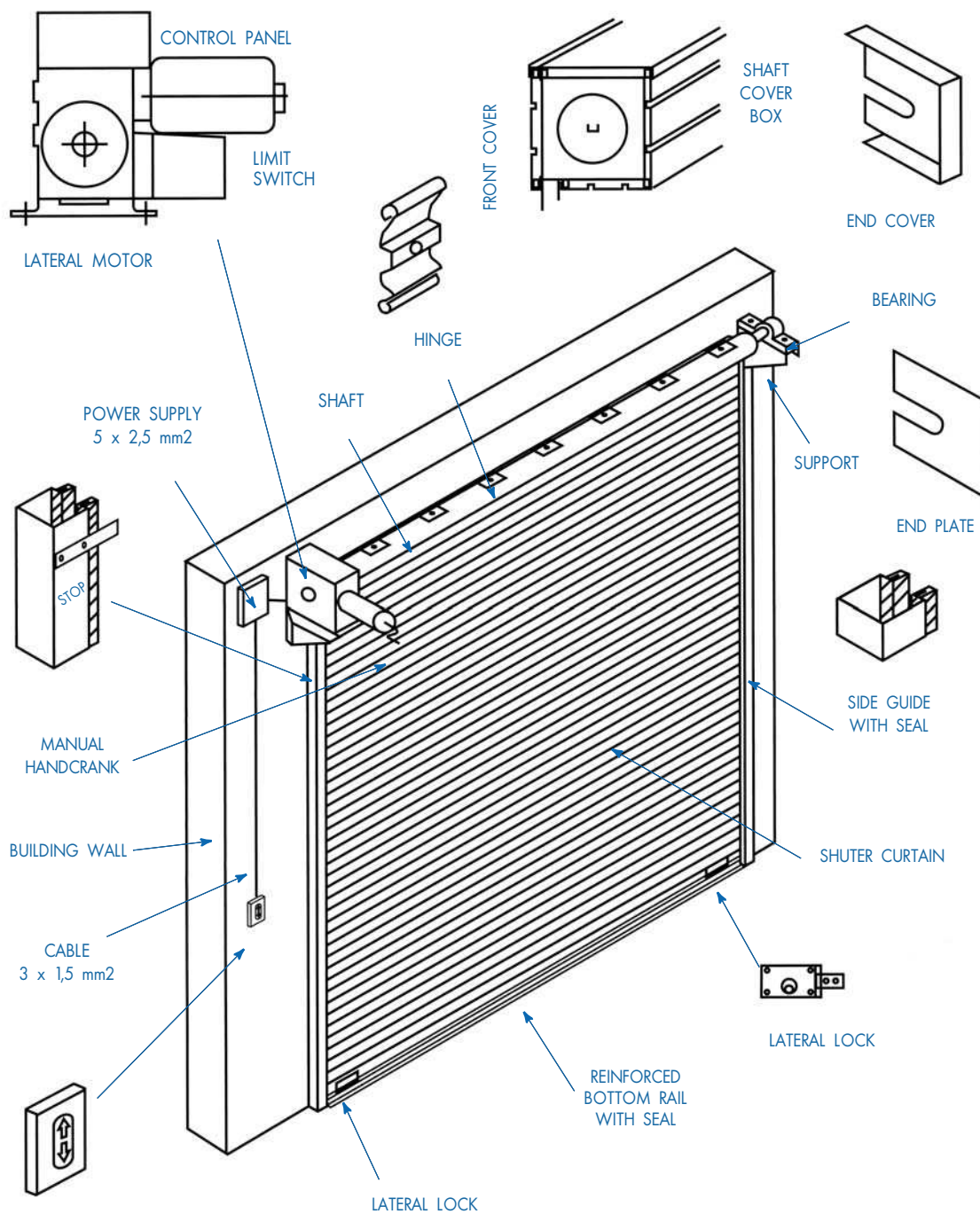
- **The shaft of shutter** has suitable diameter and thickness depending on the width and the weight of curtain. The end shaft axis transports the torque with wedge and welding for more safety.

In regular operation the handling becomes with button while in case of interruption of electricity we use incorporated in the motor **crank** or **chain**.

- **The hand operation** can be activated only from the internal part of building therefore one should take care for the access in the building in case of power failure.

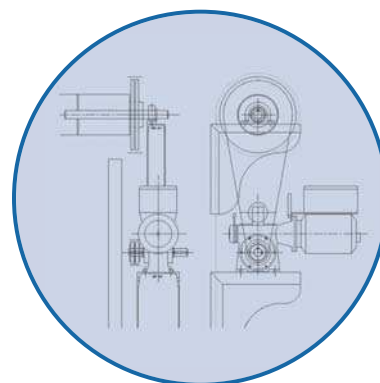
- In order to reach the crank at the motor we need a ladder whereas the chain can be handled from the ground, after its activation.



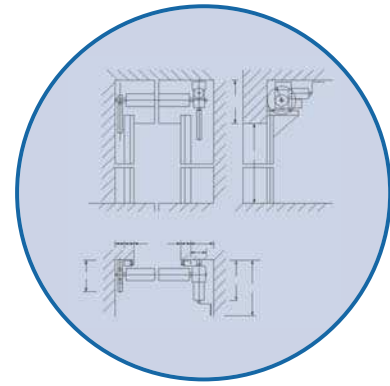


• The transmission of movement in shutters of big size is possible to be done via chain transmission (at a suitable ratio). In this case, the axis should be supported to one or two centrifugal safety bearings that protect the passengers from unverifiable fall of the shutter in case of fracture of the chain.

• In some rare cases where the openings are big, the need of two motors with transmission is possible (one from each side of axis).



- In all cases of lateral motor (with or without chain transition), the existence of space behind the guides should be ensured in order to fit the motor and the bearing. However, if there is not enough space available, we can create some with hollow sections.



MECHANISM WITH TUBULAR MOTOR

- **When the size of the shutter is not very large and the frequency of movement does not exceed 20 with 30 times daily** mechanism with tubular motor is recommended.

- In this mechanism, there is a pipe of 76 mm diameter, upon which the shutter is wrapped directly and consequently less space is required in the lintel for the winding. The suitable shutter types for this arrangement L80, A65 and small eye grilles.

- The axis should be supported in one centrifugal safety bearing, which protects from unexpected fall of the shutter.



- In all the cases with tubular motors, there must be enough space behind the guides in order to place motor and bearing.

- The **hand operation** can be activated only from the internal part of building therefore one should take care for the access in the building in case of power failure.

5. AUTOMATIONS

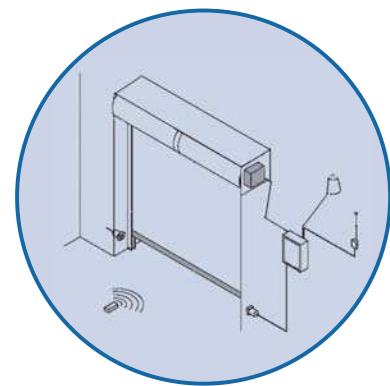
- For easier and safer operation of the shutter it is possible to combine motors with various automations. For instance:

- **Control box** and receiver; with the use of a remote control, the operation of the shutter can be activated from a distance

- **Photocells**; they detect the movement and force the shutter to stop and open, if there is an obstacle between the openings

- **Pressostat**; it also detects obstacles during the closing via an increase of pressure of the bottom rubber

- **Warning light**; it flashes during operation

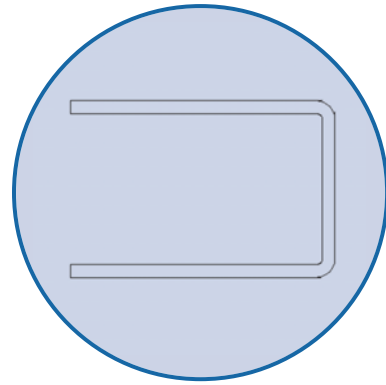


6. GUIDES

- **Different types** of guides are available to cover the needs of different applications and types of rolling shutters.

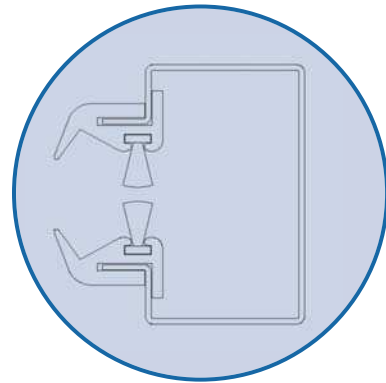
SIMPLE GUIDES

- The **U shape guides** are from galvanized steel with depth of 4 or 6 cm and thickness of 2 or 3 mm.



GUIDES WITH RUBBER

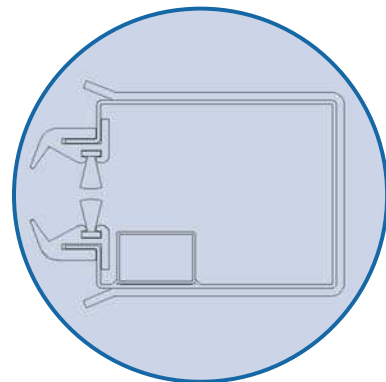
- This type is equipped with **PVC rubber** (available in yellow, black and white color) and optional brush that reduces the friction and the noise.
- The depth of the guides are 7 or 12 cm with thickness of 1.5 mm or 2mm.



SPECIAL REINFORCED GUIDES

- This type has a special shape that works together with the storm anchors of the slats to increase the resistance against wind pressure.

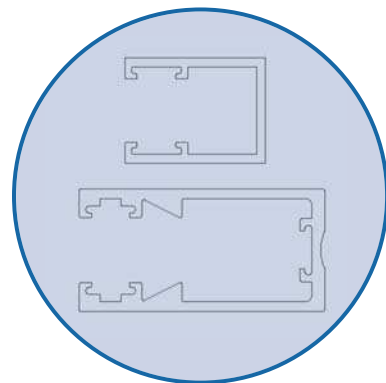
- The depth is 12 cm and the thickness 2 mm. Externally a U shape 3 mm profile reinforces the guide.



A65 GUIDES

- This type is suitable only for the A65 rolling shutter that works together with the special shape of slats increasing the security by jamming the shutter in case someone tries to force open.

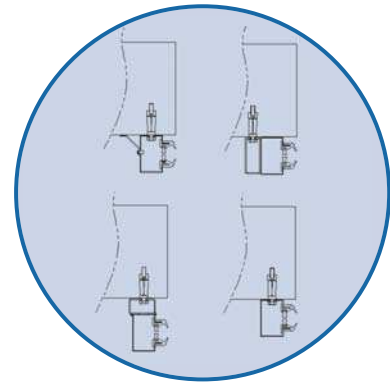
Special rubber is placed on the guide for better insulation and protection against scratches and noise.



INSTALLATION BEHIND THE OPENING

- This is the **suggested** installation type if there is enough space behind the columns of the building.

- We call the winding "normal" when it is internal or "reverse" when it is external.
- Sample installations are indicated in the drawings. With installation behind the opening we are able to correct small measurement errors.

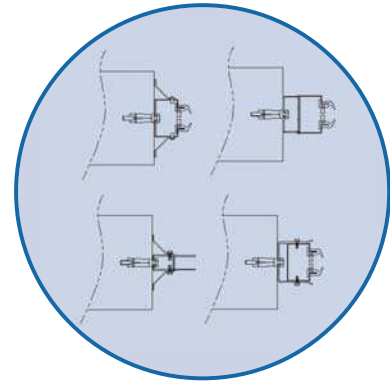


INSTALLATION BETWEEN THE OPENINGS

- This way of installation is **less preferred** because precision in measurement is required. Different ways of installation are indicated in the pictures.

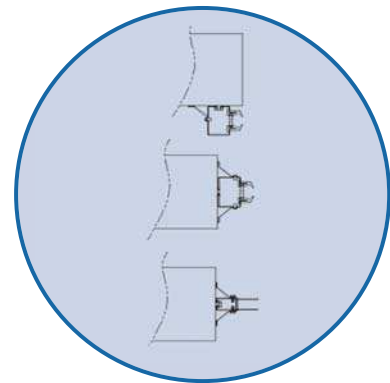
7. HOLLOW SECTIONS AND JOINT FILLING USE

- The **hollow sections** are used in a great variety of dimensions in order to give solutions in cases where:
 - There are difficulties in the support of the structural elements
 - The building wall is not vertical
 - There is a need to divide the opening in smaller openings
 - Not enough space for lateral motor or bearing
- The **joint filling** profiles are useful to cover the gaps between the rolling shutter and the building elements.



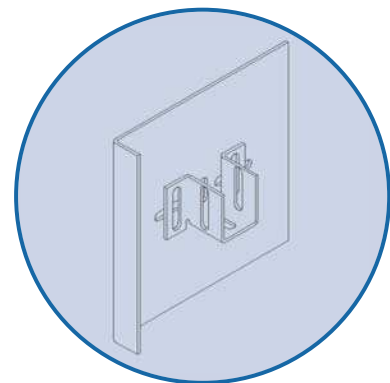
8. LATERAL PLATES

- The **lateral plates** are made of galvanized steel and come in different dimensions from 20X20cm to 50X50cm depending on type and height of the shutter. The material thickness is from 2mm to 3mm.
- The lateral plates for shafts with springs have adjustable supports in two directions for perfect positioning.



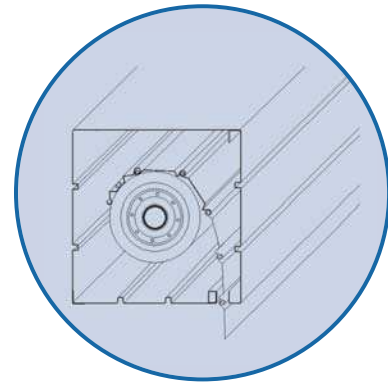
9. COVER BOXES AND FRONT PANELS

Are made from galvanized reinforced steel of 1,25mm thickness. They cover the shutter winding mostly for aesthetic reasons. There are 2 different versions



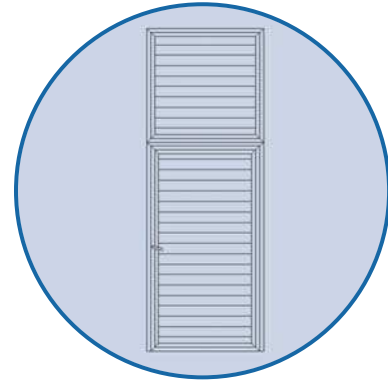
U shape and L shape depending on the height of the lintel.

- The **font panel** is required in cases where there is no lintel or limited space in the lintel.



10. DOORS AND CONSTANT SHUTTERS

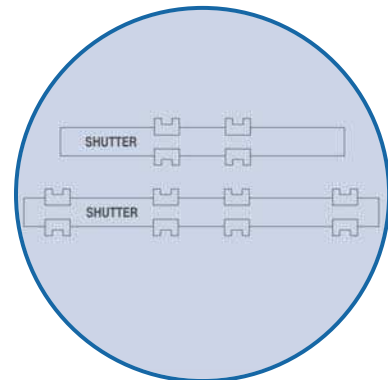
- For every type of rolling shutter **pedestrian doors** and **constant constructions** from the same material as the rolling shutter are available. The opening is decreasing with the door, but we avoid the opening of the whole shutter for the entrance of a passenger. This is very important as we prevent heat loss in air-conditioned areas.



11. PACKAGING

- The rolling shutters curtains and the guides are more sensitive than other parts because they are usually painted. For this reason and they are wrapped with a special paper with **air bubbles**, to protect the product from scratches and punches.

- In special cases there are available **boxes from expanded polystyrene that protect the curtain.**



12. PAINTING

- All the types of rolling shutters are available in a great variety of colors of electrostatic painting.

- The powder coating is baked in oven and the **chemical pretreatment** increases the life and the resistance in corrosion factors.

- Beside the preferred colors of the figure **all RAL colors** are available in special order.

Standard RAL colors (short delivery time):

1013, 5010, 6005, 7035, 7037, 9006, 9007, 9016

Standard RAL colors (normal delivery time):

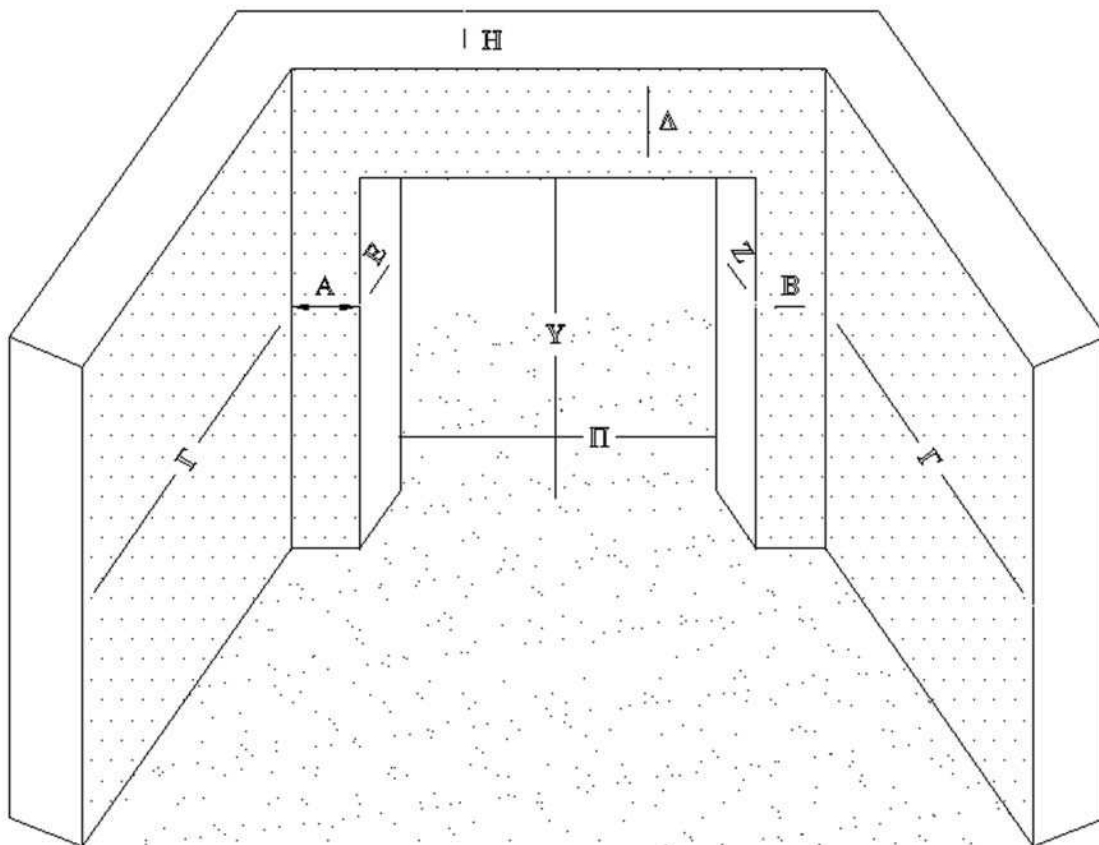
1003, 1007, 1015, 1019, 1021, 2004, 3000, 3002, 3020, 5002, 5003, 5005, 5009, 5012, 5015, 5017, 6002, 6007, 6009, 6011, 6018, 6026, 6029, 7001, 7011, 7015, 7021, 7022, 7024, 7032, 7036, 7038, 7040, 7044, 7047, 8007, 8014, 8028, 9001, 9002, 9005, 9010



13. INSTRUCTIONS FOR SHUTTERS

IMPORTANT INFORMATION FOR THE ORDER OF THE ROLLING SHUTTER

- THE CONSTRUCTIONAL DIMENSIONS (WIDTH BY HEIGHT) IN CM
- THE TYPE OF THE SHUTTER
- THE TYPE OF WINDING (INTERNAL OR EXTERNAL)
- THE COLOR OF SHUTTER (IF NO COLOR IS INDICATED, IT IS SUPPOSED GALVANIZED UNPAINTED)
- THE TYPE AND THE DEPTH OF GUIDES AND RUBBER-BRUSH
- THE EXISTENCE AND THE TYPE OF LOCKS (CENTRAL OR LATERAL)
- THE EXISTENCE OF THE MOTOR AND ITS FREQUENCY OF USE
- THE EXISTENCE, THE QUANTITY AND THE TYPE OF BUTTONS, REMOTE CONTROLS, PHOTOCELLS, PRESSOSTAT ETC
- THE EXISTENCE AND THE DIMENSIONS OF THE FRONT PANEL
- THE EXISTENCE, DIMENSIONS AND THE TYPE OF THE COVER BOX (U OR C TYPE)
- ANY OTHER SPECIAL REQUIREMENT
- DESIRABLE DELIVERY TIME
- WHEN NECESSARY DRAWINGS WITH DIMENSIONS IN THE GROUND PLAN AND SIDES ASPECT OF INSTALLATION AREA THAT SHOWS CLEARLY THE POSITION OF THE GUIDES AND THE WINDING



SHUTTER OPERATION

HAND OPERATED SHUTTERS

The hand operated shutters work together with springs that are in the shaft. In order to operate the shutter we push or pull the handle. In the upper position the shutter stops with a mechanical stop in the leap of the guide.

If the rolling shutter is high, the shutter can be operated from the ground level with a special hook.

It is always important to remember to lock and unlock the rolling shutter before and after any operation.

ROLLING SHUTTERS WITH CENTRAL MOTOR

•With internal simple button

When pushing the button, the shutter is moving to the direction indicated by the arrow. Releasing the button the shutter stops. When the door reaches the upper or the lower point, stops automatically.

•With external key button

There are two arrows pointing up and down.

Rotating the key continually upwards, as indicated by the arrow, the door opens. Turning the key downwards (as indicated by the arrow) the door closes.

Releasing the key from the locker, the shutter stops completely. When the door reaches the upper or the lower point stops automatically.

•With transmitter through control box

Every time that we are giving an order through transmitter the shutter Opens-stops-closes-stops...etc.

•With one button switch

Every time the button is pressed instantly, the shutter opens-stops-closes-stops.... etc

•Hand operation

Hand operation is used in case of power failure. There is a wire ending to a metallic box or a plastic cylinder.

If we are inside the building we unscrew the plastic cylinder until the brake releases. If we are outside we have to open the shutter from the metallic box in order to release the brake.

In both cases after the brake releases we operate the shutter with a normal hand operation.

•Locks

If there are any locks, they must be unlocked every time the shutter is moving.

Photocells and/or pressostat

When the door is equipped with photocell or pressostat the operation during the closing of the door stops when an obstacle appears and the door opens.

ROLLING SHUTTERS WITH LATERAL MOTOR

•With internal switch - 2 button

When pushing the button, the shutter is moving to the direction of the arrow. Releasing the button the shutter stops. When the door reaches the upper or the lower point, stops automatically via limit switches.

•With internal switch - 3 button

When pushing the button, instantly the shutter is moving to the direction of the arrow. Releasing the button the shutter continues until it reaches the limit switches. By pressing the stop the shutter stops.

•With external key button

There are two arrows pointing up and down. Rotating the key continually to the side of up arrow the door opens. Returning the key from the down arrow the door closes.

Releasing the key the door stops completely. When the door reaches the upper or the lower point, stops automatically via limit switches.

•With external key button and stop

There are two arrows pointing up and down. Rotating the key instantly to the side of up arrow the door opens. Returning the key from the down arrow the door closes.

Releasing the key the shutter continues until it reaches the limit switches. By pushing the stop the shutter stops.

•With one button switch (or key switch)

Every time that we are pushing the button instantly the door opens-stops-closes-stops.... etc

•With transmitter through control box

Every time that we are giving an order through the transmitter the door opens-stops-closes-stops...etc.

•Hand operation

In case of power failure there is a hand crank or a hand chain system that has to be activated. In the hand crank system we position the crank behind the motor and we move the shutter rotating it. In the hand chain system there is an endless chain that we operate from the ground level. After the electric power is back we have to deactivate the hand operation back to normal. The basic difference between crank and chain is that only the hand chain solution offers the possibility to work from the ground without the need of a ladder.

•Photocells and/or pressostat

When the door is equipped with photocell or pressostat in case of obstacles during closing, the door stops and opens in order to avoid accidents.

ROLLING SHUTTER MAINTENANCE

- In order to maintain the shutters and to maximize their life there are the following instructions for maintenance.
- The owner of the shutter must check the door for unusual sounds or wear parts every month. In case of any doubt only experienced and authorized technicians are allowed to check and repair the door because there is high risk of hazard.
- Once per year the owner has to call the authorized technicians to check the following:

I. Check and tight

Bolts or welding of the guides
Bolts of the shaft and supports
Bolts of the motor and bearings
Bolts or welding of lateral plates
Bolts of the hinges
Bolts of the cover box

II. Check and replace if required

Worn or crashed slats of the shutter
Worn or crashed guides of the shutter
Worn rubber of the shutter
Worn or crashed springs of the shutter
Worn or crashed chain or sprockets of the shutter
Worn shaft of the shutter

III. Check and replace or readjust the following electric parts

Push buttons, especially the stop button.
Limit switches
Remote control system
Safety systems like photocells, pressostat and torque limiter
Plug connection for all the wires
Condition of the wires for power or automation

ROLLER SHUTTER CURTAINS

	ROLLER SHUTTER TYPE		WEIGHT (Kg/m ²)	MIN. WINDING DIAMETER (mm)	MAX WIDTH*(m)	MAX. HEIGHT (m)
OPEN TYPE	Big Eye	17x12cm	8	Φ159	6,0	7,5
	Big Eye	10x11cm	11	Φ159	6,0	7,0
	Small Eye	7x5cm	16,5	Φ76	6,0	6,5
	Gothic Eye	12x11cm	10	Φ159	6,0	7,0
	EyeQ		9	Φ159	6,0	4,4
	L110D 1.0 mm		10	Φ159	6,0	4,4
	L80D 1.0 mm		12	Φ76	6,0	4,4
	L90 D 1.0 mm		12	Φ130	6,0	4,4
	BLIND TYPE	L110 0.6 mm		8	Φ159	4,5
L110 0.8 mm		10	Φ159	5,0	5,8	
L110 1.0 mm		12,5	Φ159	5,5	7,0	
L110 1.2 mm		15	Φ159	6,0	8,7	
L80 0.6 mm		8,5	Φ76	5,0	4,4	
L80 0.8 mm		11	Φ76	5,5	5,8	
L80 1.0 mm		14	Φ76	6,0	7,0	
L90 0.6 mm		8,5	Φ130	5,0	4,4	
L90 0.8 mm		11	Φ130	5,5	5,8	
L90 1.0 mm		14	Φ130	6,0	7,0	
L90 1.2 mm		17	Φ130	6,5	8,7	
L2in		10	Φ130	6,0	6,0	
L105-2 0.6 mm		16,5	Φ133	7,0		
L105-2 0.8 mm		22	Φ159	8,0	5,8	
L105-2 1.0 mm		27,5	Φ159	9,0	7,0	
L105-2 1.2 mm		34	Φ194	10,0	8,7	
L105-2 1.5 mm		41	Φ220	12,0	10,0	
A100		11,5	Φ159	8,0	8,0	
A65 with security profiles		12,5	Φ76	5,5	6,5	
A65 without security profiles		12,5	Φ76	5,5	6,5	

* THE VALUES OF SHUTTER WIDTH ARE INDICATIVE AS THEY DEPEND ON THE TYPE OF THE GUIDES

GUIDE TYPE SELECTION FROM ROLLER SHUTTER TYPE AND WIDTH (cm)

SHUTTER TYPE									
EYES	Big	up to 350	up to 350	-	-	-	-	-	-
	Medium	350	600	-	-	-	-	-	-
	Small	350	600	-	-	-	-	-	-
	Gothic	350	600	-	-	-	-	-	-
EYEQ		350	450	up to 450	up to 600	up to 700	-	-	-
L110D 1.0mm		350	450	up to 450	up to 600	up to 700	-	-	-
L80D 1.0 mm		400	500	500	650	750	-	-	-
L110 0.6 mm		300	400	400	550	650	-	-	-
L110 0.8 mm		350	450	450	600	700	-	-	-
L110 1.0 mm		400	500	500	650	750	up to 850	-	-
L110 1.2 mm		450	550	550	700	800	950	-	-
L80 / L90 0.6 mm		350	450	450	600	700	-	-	-
L80 / L90 0.8 mm		400	500	500	650	750	850	-	-
L80/L90 1.0mm		450	550	550	700	800	950	-	-
L105-2 0.6 mm / L2in		-	-	600	700	800	-	-	-
L105-2 0.8 mm		-	-	650	800	900	-	-	-
L105-2 1.0mm		-	-	700	900	1000	1400	-	-
L105-2 1.2mm		-	-	750	1000	1200	1600	-	-
L105-2 1.5mm		-	-	800	1200	1400	1800	-	-
A100		-	-	700	900	1000	-	-	-
A65		-	-	-	-	-	-	up to 350	up to 550

LATERAL PLATE TYPE SELECTION FROM ROLLER SHUTTER TYPE AND ITS HEIGHT

	LATERAL PLATE DIMENSIONS (cm)							
	21X25*	33X33	33X33	37X37	40X40	43X43	45X45	50X50
Big Eye		up to 250cm	- 310cm	- 380cm	- 480cm	- 600cm	- 700cm	- 800cm
Medium Eye		- 250cm	- 310cm	- 380cm	- 480cm	- 600cm	- 700cm	- 800cm
Small Eye	- 400cm*	- 250cm	- 310cm	- 380cm	- 480cm	- 600cm	- 700cm	- 800cm
Gothic Eye		- 250cm	- 310cm	- 380cm	- 480cm	- 600cm	- 700cm	- 800cm
L110		- 250cm	- 310cm	- 380cm	- 480cm	- 600cm	- 700cm	- 800cm
L80 / L90	- 400cm*	- 250cm	- 310cm	- 380cm	- 480cm	- 600cm	- 700cm	- 800cm
L105-2					- 270cm		- 320cm	- 400cm
EYEQ		- 190cm	- 240cm	- 285cm	- 380cm	- 430cm	- 490cm	- 600cm
L2in		- 190cm	- 240cm	- 285cm	- 380cm	- 430cm	- 490cm	- 600cm
A100					40X40		45X45	50X50
A65	- 400cm*							

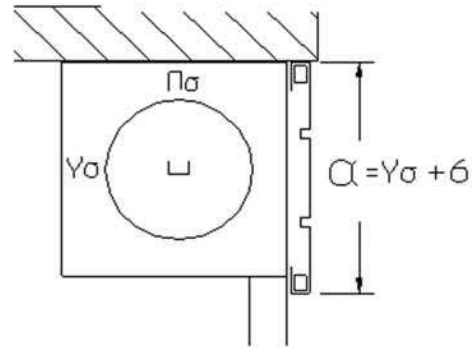
*THE LATERAL PLATES 21X25 ARE SUITABLE ONLY FOR TUBULAR MOTOR OPERATED SHUTTERS

MOTORS AND SHAFT SELECTION

CENTRAL MOTORS AND SPRING BALANCED SHUTTERS

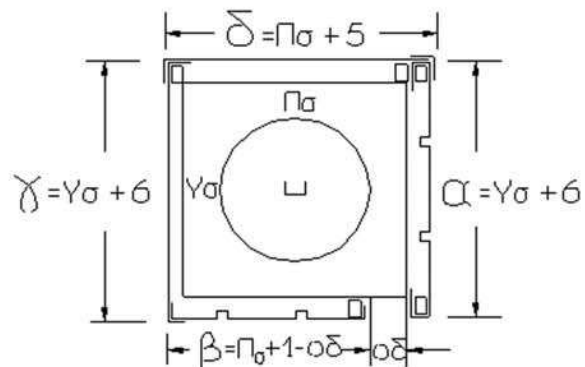
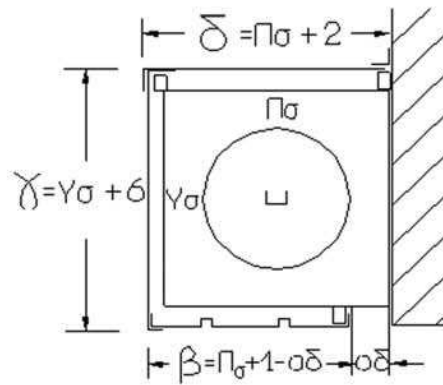
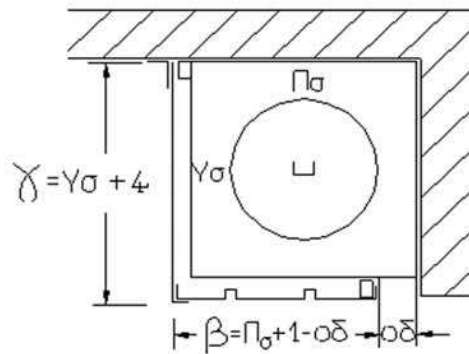
CENTRAL GEARMOTORS WITH BRAKE AND INTERNAL EMERGENCY HAND OPERATION		LIFTING POWER (WITH SPRINGS)	POWER CABLING
MHOUSE 1001	220V Φ 60 (Φ 48)/ Φ 220/ 150 Kg 0,6 KW (12kg/piece)	170 kg	3X1,5mm ²
ROLLPOWER 1001	220V Φ 60 (Φ 48)/ Φ 220/ 150 Kg 0,46 KW (12kg/piece)	170 kg	3X1,5mm ²
S I M U 1001	220V Φ 60 (Φ 48)/ Φ 220/ 150 Kg 0,4 KW (12kg/piece)	140 kg	3X1,5mm ²
MOSER 1001	220V Φ 60 (Φ 48)/ Φ 220/ 150 Kg 0,3 KW (12kg/piece)	170 kg	3X1,5mm ²
ROLLPOWER 1003	220V- Φ 76/ Φ 240/ 200 Kg 0,63 KW (16kg/piece)	210 kg	3X1,5mm ²
MOSER 1003	220V- Φ 76/ Φ 240/ 200 Kg 0,4 KW (16kg/piece)	210 kg	3X1,5mm ²
ROLLPOWER 1005	220V- Φ 76/ Φ 240/ 400 Kg 1,26 KW (20kg/piece)	340 kg	3X1,5mm ²
MOSER 1005	220V- Φ 76/ Φ 240/ 400 Kg 0,8 KW (20kg/piece)	340 kg	3X1,5mm ²

BOXES AND FRONT PANELS



COVER BOXES

- $\pi\sigma$ AND $\gamma\sigma$ ARE WIDTH AND HEIGHT OF THE LATERAL PLATE.
- USUAL HOLLOW SECTIONS FOR SUPPORT ARE 30X20X1.5
- THE VALUE OF $o\delta$ IS:
- $o\delta=3$ CM FOR GUIDES 4 OR 6 CH DEPTH
- $o\delta=7$ CM FOR GUIDES WITH RUBBER
- $\pi\sigma$ AND $\gamma\sigma$ ARE WIDTH AND HEIGHT OF THE LATERAL PLATE.
- USUAL HOLLOW SECTIONS FOR SUPPORT ARE 30X20X1.5
- THE VALUE OF GUIDE IS:
- $o\delta=3$ CM FOR GUIDES 4 OR 6 CH DEPTH
- $o\delta=7$ CM FOR GUIDES WITH RUBBER



SHAFT SELECTION TABLE FOR SPRING BALANCED SHUTTERS

TOTAL SHUTTER WIDTH (cm)	WEIGHT LIMIT (kg)			
	Φ60 X 2.5	Φ60 X 3.6	Φ76 X 3.6	Φ76 X 5.6
0 up to 300	150	200	350	420
301 up to 320	135	190	330	420
321 up to 340	125	180	310	420
341 up to 360	110	170	300	400
361 up to 380	100	160	280	380
381 up to 400	90	150	270	360
401 up to 420	80	140	260	340
421 up to 440	70	130	250	320
441 up to 460	60	125	230	300
461 up to 480	-	120	210	280
481 up to 500	-	115	200	260
501 up to 520	-	110	190	250
521 up to 540	-	100	180	240
541 up to 560	-	90	175	220
561 up to 580	-	80	170	210
581 up to 600	-	75	165	200
601 up to 620	-	70	160	190

NOTES

- Shutters exceeding 140kg should be equipped with the suitable motor
- Intensive use (50 cycles per day or more) roller shutters should be equipped with lateral motors even if central gearmotors emerge from tables
- Upon central gearmotors selection, factors like the lifting power and the suitability of the shaft (see table on right) should never be omitted

LATERAL MOTORS FOR NON-BALANCED SHUTTERS

ROLLER SHUTTER WIDTH(cm)			RECOMMENDED MAXIMUM WEIGHT (in kg) FOR TUBE:							
			Φ 159	Φ 168	Φ 194	Φ 219	Φ 244	Φ 273	Φ 298	Φ 323
1451 up to 1500	-	-	-	-	-	-	-	-	600	
1401 up to 1450	-	-	-	-	-	-	-	-	700	
1351 up to 1400	-	-	-	-	-	-	-	-	900	
1301 up to 1350	-	-	-	-	-	-	-	-	1100	
1251 up to 1300	-	-	-	-	-	400	600	1200		
1201 up to 1250	-	-	-	-	-	500	800	1400		
1151 up to 1200	-	-	-	-	300	600	900	1600		
1101 up to 1150	-	-	-	-	450	750	1100	1800		
1051 up to 1100	-	-	-	300	500	850	1200	2000		
1001 up to 1050	-	-	220	400	650	1000	1500	2200		
951 up to 1000	-	150	300	500	750	1200	1700	2500		
901 up to 950	100	200	400	700	900	1400	2000	2700		
851 up to 900	150	280	500	800	1100	1600	2200	-		
801 up to 850	200	350	600	900	1250	1900	2500	-		
751 up to 800	270	440	700	1100	1400	2100	2700	-		
701 up to 750	320	500	800	1300	1700	2400	-	-		
651 up to 700	430	650	1000	1600	2000	2600	-	-		
601 up to 650	500	800	1200	1800	2200	2800	-	-		
551 up to 600	620	950	1400	2000	2400	-	-	-		
501 up to 550	800	1200	1600	2300	2600	-	-	-		
451 up to 500	1000	1350	1800	2500	-	-	-	-		
401 up to 450	1120	1500	2100	-	-	-	-	-		
351 up to 400	1300	1780	2300	-	-	-	-	-		
301 up to 350	1500	2000	-	-	-	-	-	-		
0 up to 300	1800	2200	-	-	-	-	-	-		
ROLLER SHUTTER WIDTH			LIFTING CAPACITY (in kg)							
LATERAL MOTOR (WITH CONTROL UNIT AND SAFETY BRAKE)	POWER (KW)	VOLTA GE(V)	Φ 159	Φ 168	Φ 194	Φ 219	Φ 244	Φ 273	Φ 298	Φ 323
			Φ 159	Φ 168	Φ 194	Φ 219	Φ 244	Φ 273	Φ 298	Φ 323
23.12 GFA Φ 30 (160 mm–240mm)	0.40	3x380 50 Hz	206	186	173	-	-	-	-	-
KEM 360 SYSTEM (80mm)	0.37	1x220 50 Hz	288	288	288	288	-	-	-	-
40.10 GFA Φ 40 (160 mm –240 mm)	0.75	3x380 50 Hz	358	358	358	358	-	-	-	-
55.10 GFA Φ 40 (200 mm 240 mm)	0.50	3x380 50 Hz	492	492	492	492	492	-	-	-
KEM 670 SYSTEM (80mm)	0.50	3x380 50 Hz	511	485	449	401	363	328	301	-
75.10 GFA Φ 55 (200 mm– 240 mm)	1.10	3x380 50 Hz	671	607	562	502	454	410	377	-
100.10 GFA Φ 55 (200 mm– 240 mm)	1.10	3x380 50 Hz	-	808	748	669	605	546	502	465
140.7 GFA Φ 55 (200 mm– 240 mm)	1.10	3x380 50 Hz	-	1.133	1.048	937	847	765	704	652

WIND SPEED AND WIND PRESSURE CONVERSION TABLE

Wind description	Beaufort scale	Wind speed (knots)	Wind speed (km/h)	Pressure (kp/m ²)
Moderate Breeze	4	11 - 16	20 - 29	2 - 4
Fresh Breeze	5	17 - 21	30 - 39	4 - 7
Strong Breeze	6	22 - 27	40 - 50	7 - 12
Near Gale	7	28 - 33	51 - 61	12 - 19
Gale	8	34 - 40	62 - 74	19 - 27
Severe Gale	9	41 - 47	75 - 87	27 - 38
Storm	10	48 - 55	88 - 102	38 - 50
Violent Storm	11	56 - 63	103 - 117	50 - 68
Hurricane	12	> 64	> 118	> 68

15. GENERAL INDICATIONS FOR THE CHOICE OF VARIOUS ELEMENTS OF THE SHUTTER

- 1) In the electrical operated shutters it is preferable to avoid the use of locks and the danger of electrification of the shutter while it is locked
- 2) In hand operated shutters we recommend the use of locks or padlock for safety reasons
- 3) When we use locks it is preferable the use of lateral than of central locks for more reliable operation
- 4) In areas where the unique entry is the one that is covered by the shutter, we should forecast the installation of external emergency manual operator for central motor (emergency release)
- 5) In areas where the unique entry is the one that is covered by the shutter we should not use lateral or tubular motor
- 6) In case of hand-operated shutters with big height we recommend the use of a hook for the opening and the closing of the shutter
- 7) In case of electric-operated shutters with transmitter, we recommend the use of photocells or safety pressostat
- 8) In case of electric-operated shutters with button, we use button with key switch of one position when using remote control and of two positions without remote control
- 9) When we use pressostat or photocells we should also have the remote control panel.
- 10) In electric-operated shutters with central motor without remote control panel we use button box either simple or industrial with two buttons (we do not use a three-button button box)
- 11) In case of lateral motors where the transmission of movement is done with a chain, we use a bearing in one or both sides of the shaft
- 12) Plastic transparent openings can be used only in profiles L110 and A100 profiles. In their denser version only 5 windowed slats fit on the curtain per m of width
- 13) In case of two neighboring shutters that work with the same remote control, we use two control panels and two-channel remote controls
- 14) Button boxes with 3 buttons we use only in lateral motors
- 15) In cases we have big openings it is more economic to separate shutters in smaller ones with mobile or constant columns with the condition we won't need the wide opening
- 16) When we are going to use a padlock, we should place an iron handle and not a plastic one
- 17) In the electrical operated shutters with remote control we can only use one-button button box or an exterior button box with key of one position
- 18) The shutters with shaft and springs are wrapped in such a way as to have their bottom rail on the exterior whilst the shutters with a lateral motor are wrapped in such a way to have the hinges on the exterior
- 19) We use lateral motors only with shutters that can be wrapped in a $\Phi 76$ shaft, that is A65, L80 and the small eye grill
- 20) In lateral motors, the standardized length of the chain for the hand operation is 5 meters (2,5 meters length from the motor to the ground). Therefore, hand operation is possible in shutters with maximum height up to 4,5 meters, otherwise extra chain should be ordered
- 21) In lateral shutters, where the motor doesn't have incorporated safety mechanism or where the movement is transmitted with a chain, the use of a safety bearing is necessary
- 22) When the shutter wraps up in reverse we always see from outside the reverse side of the shutter (with exception the grilles and the L105-2)

16. SHUTTER ELEMENTS SELECTION

- 1) Measurement of the opening and of the surrounding area (sideroom and lintel)
- 2) Selection of type and color of the shutter either from the prospectus or some samples
- 3) Selection of position, way of winding and number of shutters
- 4) Selection of position and number of hollow sections and guides
- 5) Selection of type and depth of the guides
- 6) Calculation of shutter's weight
- 7) Selection of shaft's dimension
- 8) Check of the minimum winding diameter of the shutter (or go back to step no2)
- 9) Selection of motor's type and position
- 10) Check of alternative entrance in the building in case of power failure
- 11) Selection of: hand operation, button boxes, photocells, pressostat, remote control, locks, window profiles, end slats, brush
- 12) Selection of type, position and size of cover boxes and front panels
- 13) Check if the structural elements of the building are sufficient for supporting the shutter
- 14) Check winding covering and locks covering area of neighboring shutters or go back to step no2
- 15) Check of shutter's covering with other structural elements or go back to step no2
- 16) Check for power supply or go back to step no2
- 17) Check whether there is enough space for lateral motor and bearing or go back to step no2
- 18) Check for special requirements



REPORTS





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