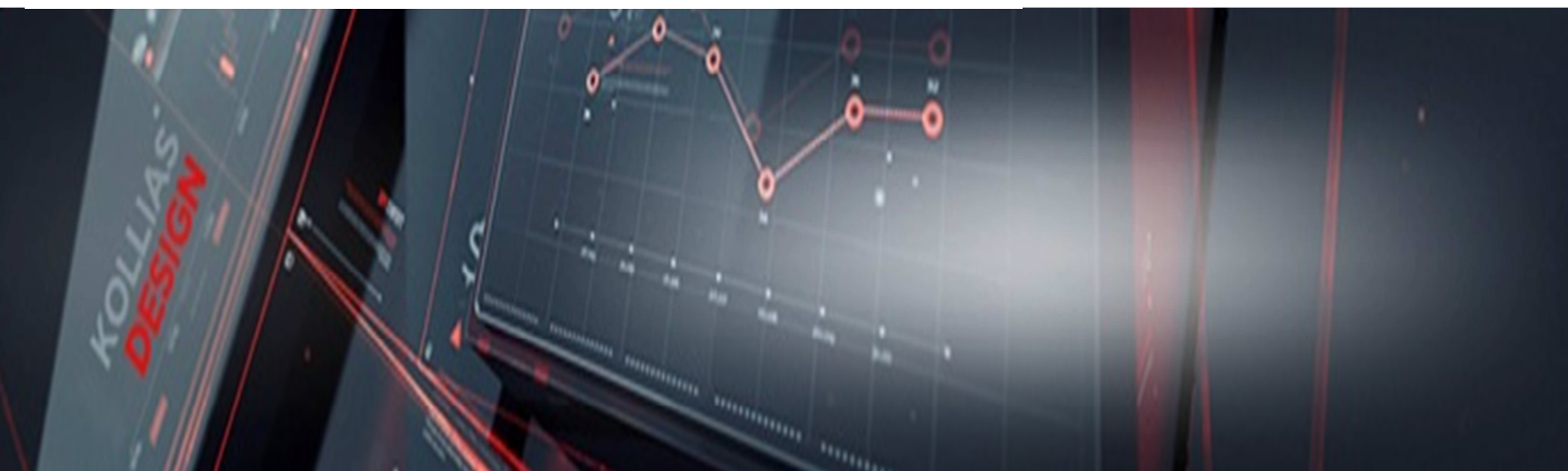


INDUSTRIAL ROLLER SHUTTER (RSM)

www.kolliasdoors.com



TECHNICAL HANDBOOK



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COMPANY'S INFO

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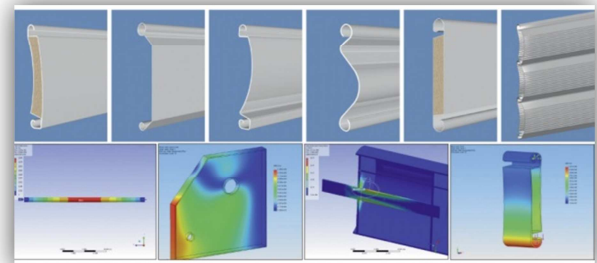
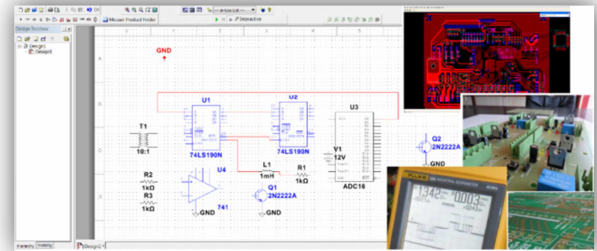


KOLLIAS Ltd. is a modern and integrated industrial unit with a dynamic presence in the industrial sector. Pioneering and leading dynamically in the design, construction and manufacture of industrial roller shutters sectional doors, high speed roller shutters and loading bay equipment at national and international level, undertaking and carrying out difficult construction projects. The philosophy and culmination of our success is the satisfaction of our customers, which is guaranteed by the purchase of quality raw materials from Greece and abroad, with main focus on the production of innovative products of high quality, aesthetics and safety.

The Research & Design department is staffed by experienced engineers with knowledge of CAD / CAM / CAE programs, while the processing department is fully equipped with state-of-the-art CNC processing centers. The design and implementation of electronics and electrical devices is processed by the testing laboratory, which is the main factor for the complete production of mechanical, electrical and electronic equipment by expanding the already large range of our products.

Kollias Ltd. is investing in the logistics infrastructure and throughout the high level network of partners and suppliers, the company meets the most demanding challenges, creating new innovations which are proven from the 20 and more patents it holds in its history as well as by the large number of our customer's trust at national and global level.

Given that the company manufactures 95% of all the electromechanical equipment that accompanies its products, Kollias Ltd. acquires the ability to study and design special requirements products, it is able to realize any kind of constructional requirement and quirk, ensuring absolute adaptation of the product to the environment. In order to achieve all of this, the company has invested in its logistics equipment with the purchase of state-of-the-art programs and equipment. We will briefly mention part of its equipment, which is:



- Construction design and calculation programs such as Solidworks and Cimatron.
- Production management programs ERP (Soft1).
- CNC milling machines with vertical machining centers of four and five axis.
- CNC lathes of four and five axis.
- Conventional lathes and vertical axis milling machines.
- State-of-the-art laser cutting unit with dual autonomy and power supply.
- CNC strands with machining lengths of 8500mm and 4000mm.
- Pulsate welding machines MIG / MAG and welding machines TIG.
- Machines producing single profile and double-skinned profiles with PU insulation.
- CNC composite robotic presses.
- CNC cutter with machining length 4000mm and sheet cutting ability of 6mm.
- Autonomous unit of electrostatic painting and processing of metals to be dyed.
- Contemporary wet dyeing and processing of metals to be dyed



Our mission and vision is to meet our customers' expectations and to consolidate our position in the global marketplace as the first choice in the field of industrial roller shutters and loading bay equipment.

TECHNICAL DESCRIPTION OF INDUSTRIAL ROLLER SHUTTER WITH ANCHOR SYSTEM

Industrial roller shutters are electrically driven devices designed to meet exposures complying with the European Directive 305/2011/EE, which are certified by a notified laboratory under European Standard EN 13241-1. Industrial roller shutters have adjustable operating speed and resistance to large wind pressures.

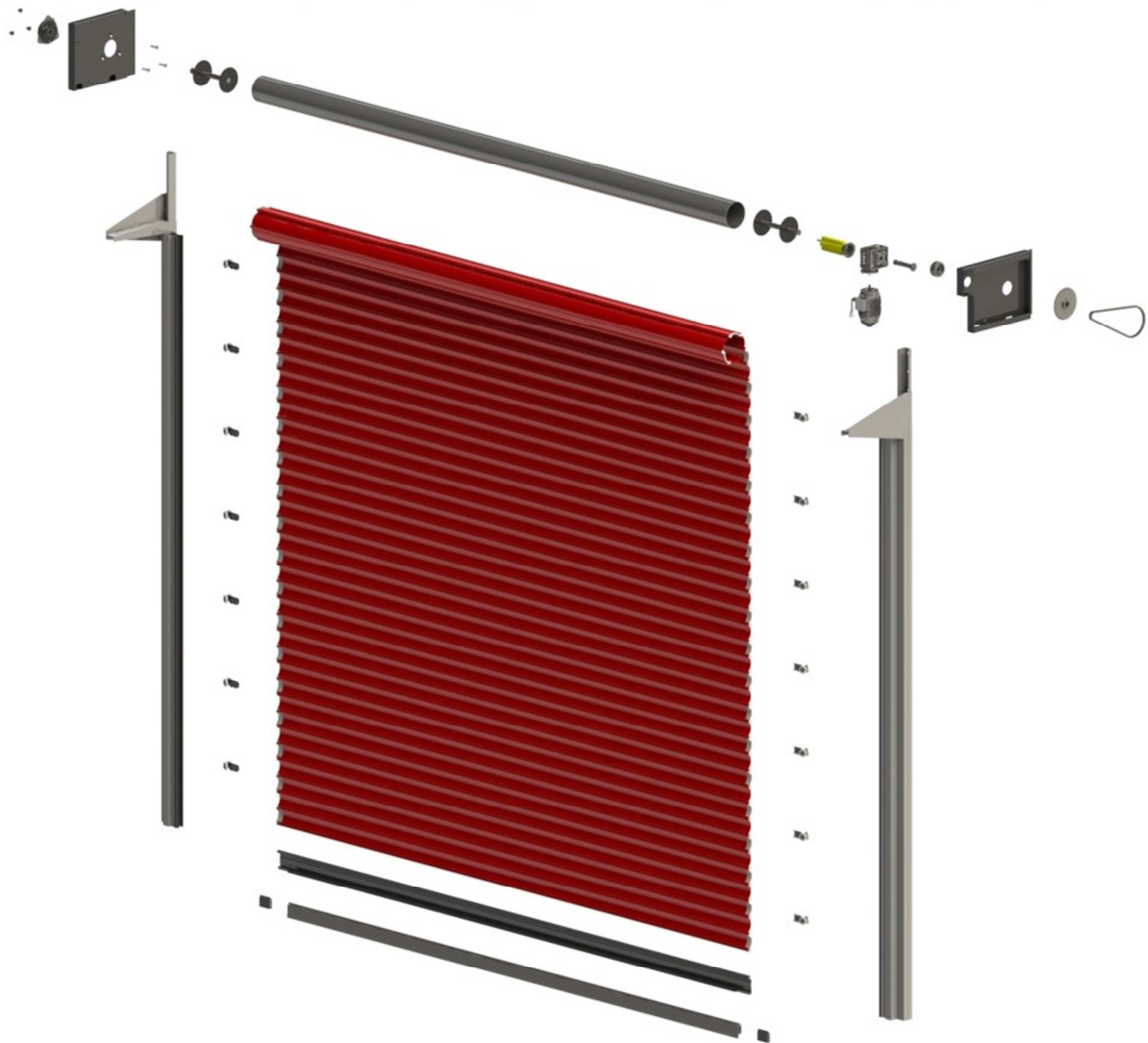


Figure 1

As it is shown in Figure 1, the winding device is mounted on the cantilever shaft which is supported by the vertical guides, in turn of which rest on the building infrastructure. Where feasible, support is carried out directly on the building components, otherwise the formation of a custom metal frame is considered necessary.

The structural elements of the parts of the device's mechanical order, as well as their components, are made of hot-dip galvanized steel sheets which are painted electrostatically with a polyester base color of 120 µm thickness, initially subjected to a chemical pretreatment carried out in several stages prior to dyeing to achieve a high protection of materials and excellent adhesion of the paint to their surface.

The lowest part of the curtain is equipped with a single modular profile, which enhances its robustness and stability. The bottom bar has applied a high quality EPDM reinforced rubber to ensure sealing with the floor.

The rotation of the roller shutter's shaft around of which the curtain is wrapped, is ensured by a three-phase electric motor to which a suitable gear reducer is fitted. The transmission assembly consists of the chain, sprockets and scroll bearings (Figure 2).

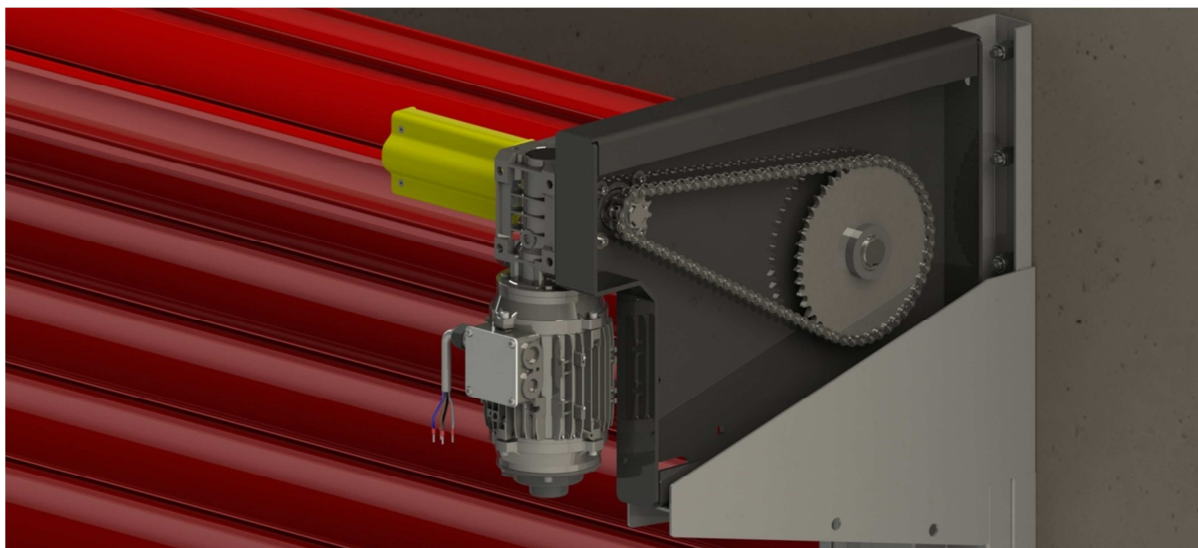


Figure 2

The halt of the screen at the boundary transport positions is ensured by means of terminal switches, while for additional safety provision is made for the installation of mechanical terminals.

To avoid uncontrolled downward movement of the curtain, a centrifugal brake is provided to ensure mechanical locking and immobility (Figure 3). In addition, in order to avoid potential hazards, the device may be equipped (optionally) with photocells and pressure sensors.



Figure 3

In cases of power failure, roller shutters can be operated manually by two options. The basic manual operation equipment includes:

- Crank manual (basic equipment)
- Chain hoist manual (optional equipment, after customer's request)

In order to deal with the stress of the device by strong winds, it is envisaged to place a calculated number of anchors, which are fixed and held firmly to the edges of the profile of the curtain.

The anchor consists of a "bifurcated" plate in which two polyamide wheels are fitted. The smooth rotation of the wheels is achieved by means of closed-type bearing rings (roller bearings), and evolves into a suitably shaped cavity of the vertical guide (Figure 4). In this way it is possible to anchor the curtain on the guides eliminating friction, damages and noise.

The guide has longitudinal aluminum profiles of a suitable cross-section, the fittings of which are fitted with EPDM rubber and PVC profiles respectively, each performing a different task:

- PVC profile has a curved cross-section, so that when it comes into contact with the curtain, smooth and silent sliding is achieved as the coefficient of friction is significantly reduced.
- EPDM tire acts as a barrier for foreign particles that can enter the opening as well as a shock absorber caused by the movement of the curtain, which can cause noise.

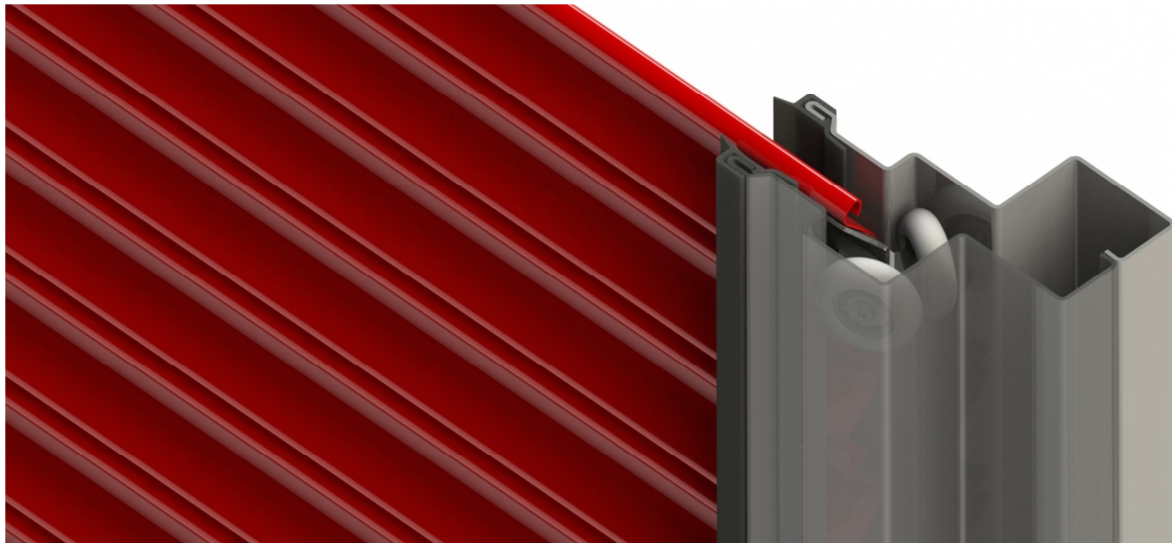


Figure 4

All industrial roller shutters are equipped with an electronic control board, through which the operation of motion is carried out. The ascent and descent of the curtain is achieved either by the prolonged pressing of the control button, located on the control board, or by other means, such as the use of remote control, cameras, motion detection radar, photocells etc.

The electronic control board has an installed emergency button, which allows the interruption of motion in case of an emergency (Emergency stop), while for the same reason it is compatible with all types of commercial motion detectors. In addition, it can be connected to a pair of industrial photocells (optional equipment), which are mounted in the vertical guides, while it also has a built-in remote control system with rolling codes and a stabilized frequency of information transfer, special for industrial conditions.

The electronic control board has a digital communication port, with our construction machines, e.g. recording systems or INTERLOCK control systems, which serve to control the operation of more than one device, communicating with each other, giving priority to each other according to the program. Finally, on the electronic board there are LED indicators, which give information about the various positions and activities of the roller shutter. Furthermore, it should also be noted that there are models for products that carry special digital panels to ensure:

- many programming possibilities
- processing of network voltage measurement
- visual indications existence, concerning the operation of the structure

The device may cooperate with a light repeater (optional equipment), which signals all motions of the curtain, as well as its stay at the upper terminal point for a given period before its descending. Multiple repeaters or even a light signal may be placed on the product if requested.

Finally, the structure can be equipped with a telescopic modular metal frame of wind protection, where combined with the anchor system it offers much more resistance to the roller shutter against wind pressure.

The biggest advantage of the present product is the possibility of replacing or repairing all the mechanical and electrical parts from which it is composed.

It is worth noting that the type and size of the materials used in the present arrangement are suggested by the manufacturer and therefore it is possible to modify some of them according to the needs and the desire of the customer.

SPECIFICATIONS FOR MOTION SYSTEM OF INDUSTRIAL ROLLER SHUTTER

TECHNICAL SPECIFICATIONS OF MOTION SYSTEM FOR RSM 24

Motor's Technical Specifications

Type	MTe	M 71 A2
Rated Power	P	0,37 Kw
Speed	n	2800 rpm
Rated Torque	T _m	1.3Nm
Rated Voltage	V _m	400 V
Current	I _m	1.1A
Frequency	F _r	50 Hz
Power Factor (cosφ)	PF	0.75
Poles	PL	2
Phases	PN	3
Insulation	MP _f	F
Protection	MP _r	IP55

Gearbox's Technical Specifications

Type	RTe	MU 50
Transmission Ratio	i	1/100
Torque	T _{RE}	48 Nm
Gearbox Dynamic Efficiency	RD	0.563
Service Factor	SF	0.96
Min. Operating Temperature	WT _i	- 25 °C
Max. Operating Temperature	WT _a	+ 75 °C

Safety Brake's Technical Specifications

Type	CBTe	L30
Hub Diameter	DH	30 mm
Max. Torque Reaction	T _{CB}	450 Nm
Engagement Speed	n _{CB}	24 rpm
Micro Switch Voltage	V _s	5 V

Technical Specifications of Chaining Elements

Chain Type	CTe	8B
Pitch	p	1/2"
Sprocket Teeth (Driven)	Z _s	45
Sprocket Teeth (Drive)	Z _r	11

Shaft's Technical Specifications

Diameter	D _s	159 mm
Thickness	t _s	3 mm
End-Shaft Diameter (Drive)	D _m	30 mm
End-Shaft Diameter (Driven)	D _{CB}	30 mm

Transmission's Technical Specifications

Gearbox Governor Speed	n _r	28 rpm
Barrel Speed	n _s	7 rpm
Total Maximum Torque	T	192 Nm
Lifting Capacities (Diameter Based)	G	240 Kg
Final Drive	i _o	1/400
Duty Cycle	W	90%

Electronic Board's Technical Specifications

Main Board Type (STD)	ETe	FBM-0
Main Board Type (OPT)	ETe	FBM-1
Micro Switch Voltage	V _{SEQ}	12 V
International Protection Marking	EPr	IP54

TECHNICAL SPECIFICATIONS OF MOTION SYSTEM FOR RSM 45

<u>Motor's Technical Specifications</u>		
Type	MTe	M 71 B2
Rated Power	P	0,55 Kw
Speed	n	2820 rpm
Rated Torque	T _m	2.0Nm
Rated Voltage	V _m	400 V
Current	I _m	1.75A
Frequency	F _r	50 Hz
Power Factor (cosφ)	PF	0.80
Poles	PL	2
Phases	PN	3
Insulation	MP _f	F
Protection	MP _r	IP55
<u>Gearbox's Technical Specifications</u>		
Type	RTe	MU 63
Transmission Ratio	i	1/100
Torque	T _{RE}	110 Nm
Gearbox Dynamic Efficiency	RD	0.586
Service Factor	SF	0.81
Min. Operating Temperature	WT _i	- 25 °C
Max. Operating Temperature	WT _a	+ 75 °C
<u>Safety Brake's Technical Specifications</u>		
Type	CBTe	H40
Hub Diameter	DH	40 mm
Max. Torque Reaction	T _{CB}	750 Nm
Engagement Speed	n _{CB}	24 rpm
Micro Switch Voltage	V _s	5 V

Technical Specifications of Chaining Elements

Chain Type	CTe	10B
Pitch	p	5/8"
Sprocket Teeth (Driven)	Z _s	38
Sprocket Teeth (Drive)	Z _r	9

Shaft's Technical Specifications

Diameter	D _s	159 mm
Thickness	t _s	3 mm
End-Shaft Diameter (Drive)	D _m	40 mm
End-Shaft Diameter (Driven)	D _{CB}	40 mm

Transmission's Technical Specifications

Gearbox Governor Speed	n _r	28 rpm
Barrel Speed	n _s	7 rpm
Total Maximum Torque	T	440 Nm
Lifting Capacities (Diameter Based)	G	550 Kg
Final Drive	i _o	1/400
Duty Cycle	W	90%

Electronic Board's Technical Specifications

Main Board Type (STD)	ETe	FBM-0
Main Board Type (OPT)	ETe	FBM-1
Micro Switch Voltage	V _{SEQ}	12 V
International Protection Marking	EPr	IP54

TECHNICAL SPECIFICATIONS OF MOTION SYSTEM FOR RSM 95

<u>Motor's Technical Specifications</u>		
Type	MTe	M 90L2
Rated Power	P	1,50 Kw
Speed	n	2850 rpm
Rated Torque	T _m	5.1 Nm
Rated Voltage	V _m	400 V
Current	I _m	4.7A
Frequency	F _r	50 Hz
Power Factor (cosφ)	PF	0.66
Poles	PL	2
Phases	PN	3
Insulation	MP _f	F
Protection	MP _r	IP55
<u>Friction-Plate Electromagnetic Coupling System (EM Brake)</u>		
Rated Voltage	V _{BR}	110 V
Rated Power	P _{BR}	150 Watt
Clutch Air Gap	cl	0.5 – 0.7mm
Axial Drive Force	F	4500 N
Instant Max-Torque (Brake)	T _{BR}	30 Nm
<u>Gearbox's Technical Specifications</u>		
Type	RTe	MU 90
Transmission Ratio	i	1/100
Torque	T _{RE}	244 Nm
Gearbox Dynamic Efficiency	RD	0.651
Service Factor	SF	0.87
Min. Operating Temperature	WT _i	- 25 °C
Max. Operating Temperature	WT _a	+ 75 °C

Safety Brake's Technical Specifications

Type	CBTe	H40 - S50
Hub Diameter	DH	40 - 50 mm
Max. Torque Reaction	T _{CB}	750 - 1400 Nm
Engagement Speed	n _{CB}	24 rpm
Micro Switch Voltage	V _s	5 V

Technical Specifications of Chaining Elements

Chain Type	CTe	12B
Pitch	p	3/4"
Sprocket Teeth (Driven)	Z _s	38
Sprocket Teeth (Drive)	Z _r	9

Shaft's Technical Specifications

Diameter –Thickness	Φ ₁	159x3 mm
	Φ ₂	219x3 mm
	Φ ₃	273x4 mm
End-Shaft Diameter (Drive)	D _m	40 - 50 mm
End-Shaft Diameter (Driven)	D _{CB}	40 - 50 mm

Transmission's Technical Specifications

Gearbox Governor Speed	n _r	28 rpm
Barrel Speed	n _s	7 rpm
Total Maximum Torque	T	970 Nm
Lifting Capacities (Diameter Based)	G ₁	1220 Kg
	G ₂	885 Kg
	G ₃	710 Kg
Final Drive	i ₀	1/400
Duty Cycle	W	90%

Electronic Board's Technical Specifications

Main Board Type (STD)	ETe	FBM-2
Micro Switch Voltage	V _{SEQ}	12 V
International Protection Marking	EPr	IP54

TECHNICAL SPECIFICATIONS OF MOTION SYSTEM FOR RSM 150

<u>Motor's Technical Specifications</u>		
Type	MTe	M 90L2
Rated Power	P	1,50 Kw
Speed	n	2850 rpm
Rated Torque	T _m	5.1 Nm
Rated Voltage	V _m	400 V
Current	I _m	4.7A
Frequency	F _r	50 Hz
Power Factor (cosφ)	PF	0.66
Poles	PL	2
Phases	PN	3
Insulation	MP _f	F
Protection	MP _r	IP55
<u>Friction-Plate Electromagnetic Coupling System (EM Brake)</u>		
Rated Voltage	V _{BR}	110 V
Rated Power	P _{BR}	150 Watt
Clutch Air Gap	cl	0.5 – 0.7mm
Axial Drive Force	F	4500 N
Instant Max-Torque (Brake)	T _{BR}	30 Nm
<u>Gearbox's Technical Specifications</u>		
Type	RTe	MU 110
Transmission Ratio	i	1/100
Torque	T _{RE}	353 Nm
Gearbox Dynamic Efficiency	RD	0.690
Service Factor	SF	1.20
Min. Operating Temperature	WT _i	- 25 °C
Max. Operating Temperature	WT _a	+ 75 °C

Safety Brake's Technical Specifications

Type	CBTe	S50– T60
Hub Diameter	DH	50 - 60 mm
Max. Torque Reaction	T _{CB}	> 1400 Nm
Engagement Speed	n _{CB}	24 rpm
Micro Switch Voltage	V _s	5 V

Technical Specifications of Chaining Elements

Chain Type	CTe	20B
Pitch	p	1^{1/4}"
Sprocket Teeth (Driven)	Z _s	45
Sprocket Teeth (Drive)	Z _r	9

Shaft's Technical Specifications

Diameter –Thickness	Φ ₁	219x3 mm
	Φ ₂	273x4 mm
	Φ ₃	324x5 mm
End-Shaft Diameter (Drive)	D _m	50 - 60 mm
End-Shaft Diameter (Driven)	D _{CB}	50 - 60 mm

Transmission's Technical Specifications

Gearbox Governor Speed	n _r	28 rpm
Barrel Speed	n _s	7 rpm
Total Maximum Torque	T	1765 Nm
Lifting Capacities (Diameter Based)	G ₁	1612Kg
	G ₂	1293 Kg
	G ₃	1090 Kg
Final Drive	i _o	1/500
Duty Cycle	W	90%

Electronic Board's Technical Specifications

Main Board Type (STD)	ETe	FBM-2
Micro Switch Voltage	V _{SEQ}	12 V
International Protection Marking	EPr	IP54

TECHNICAL SPECIFICATIONS OF MOTION SYSTEM FOR RSM 200

Motor's Technical Specifications

Type	MTe	M 90L2
Rated Power	P	1,50 Kw
Speed	n	2850 rpm
Rated Torque	T _m	5.1 Nm
Rated Voltage	V _m	400 V
Current	I _m	4.7A
Frequency	F _r	50 Hz
Power Factor (cosφ)	PF	0.66
Poles	PL	2
Phases	PN	3
Insulation	MP _f	F
Protection	MP _r	IP55

Friction-Plate Electromagnetic Coupling System (EM Brake)

Rated Voltage	V _{BR}	110 V
Rated Power	P _{BR}	150 Watt
Clutch Air Gap	cl	0.5 – 0.7mm
Axial Drive Force	F	4500 N
Instant Max-Torque (Brake)	T _{BR}	30 Nm

Gearbox's Technical Specifications

Type	RTe	MU 110
Transmission Ratio	i	1/100
Torque	T _{RE}	353 Nm
Gearbox Dynamic Efficiency	RD	0.690
Service Factor	SF	1.20
Min. Operating Temperature	WT _i	- 25 °C
Max. Operating Temperature	WT _a	+ 75 °C

Safety Brake's Technical Specifications

Type	CBTe	T60
Hub Diameter	DH	60 mm
Max. Torque Reaction	T _{CB}	> 1400 Nm
Engagement Speed	n _{CB}	24 rpm
Micro Switch Voltage	V _s	5 V

Technical Specifications of Chaining Elements

Chain Type	CTe	20B
Pitch	p	1^{1/4}"
Sprocket Teeth (Driven)	Z _s	54
Sprocket Teeth (Drive)	Z _r	9

Shaft's Technical Specifications

Diameter –Thickness	Φ ₁	219x3 mm
	Φ ₂	273x4 mm
	Φ ₃	324x5 mm
End-Shaft Diameter (Drive)	D _m	60 mm
End-Shaft Diameter (Driven)	D _{CB}	60 mm

Transmission's Technical Specifications

Gearbox Governor Speed	n _r	28 rpm
Barrel Speed	n _s	7 rpm
Total Maximum Torque	T	2118 Nm
Lifting Capacities (Diameter Based)	G ₁	1934Kg
	G ₂	1552Kg
	G ₃	1307Kg
Final Drive	i ₀	1/600
Duty Cycle	W	90%

Electronic Board's Technical Specifications

Main Board Type (STD)	ETe	FBM-2
Micro Switch Voltage	V _{SEQ}	12 V
International Protection Marking	EPr	IP54

TECHNICAL SPECIFICATIONS OF MOTION SYSTEM FOR RSM 300

Motor's Technical Specifications

Type	MTe	M 90L2
Rated Power	P	2.80 Kw
Speed	n	2860 rpm
Rated Torque	T _m	9.6Nm
Rated Voltage	V _m	400 V
Current	I _m	8.7A
Frequency	F _r	50 Hz
Power Factor (cosφ)	PF	0.66
Poles	PL	2
Phases	PN	3
Insulation	MP _f	F
Protection	MP _r	IP55

Friction-Plate Electromagnetic Coupling System (EM Brake)

Rated Voltage	V _{BR}	110 V
Rated Power	P _{BR}	150 Watt
Clutch Air Gap	cl	0.5 – 0.7mm
Axial Drive Force	F	4500 N
Instant Max-Torque (Brake)	T _{BR}	30 Nm

Gearbox's Technical Specifications

Type	RTe	MI130
Transmission Ratio	i	1/100
Torque	T _{RE}	552 Nm
Gearbox Dynamic Efficiency	RD	0.54
Service Factor	SF	1.10
Min. Operating Temperature	WT _i	- 25 °C
Max. Operating Temperature	WT _a	+ 75 °C

Safety Brake's Technical Specifications

Type	CBTe	T60
Hub Diameter	DH	60 mm
Max. Torque Reaction	T _{CB}	> 1400 Nm
Engagement Speed	n _{CB}	24 rpm
Micro Switch Voltage	V _s	5 V

Technical Specifications of Chaining Elements

Chain Type	CTe	20B
Pitch	p	1^{1/4}"
Sprocket Teeth (Driven)	Z _s	54
Sprocket Teeth (Drive)	Z _r	9

Shaft's Technical Specifications

Diameter –Thickness	Φ ₁	219x3 mm
	Φ ₂	273x4 mm
	Φ ₃	324x5 mm
End-Shaft Diameter (Drive)	D _m	60 - 70 mm
End-Shaft Diameter (Driven)	D _{CB}	60 mm

Transmission's Technical Specifications

Gearbox Governor Speed	n _r	28 rpm
Barrel Speed	n _s	7 rpm
Total Maximum Torque	T	3312 Nm
Lifting Capacities (Diameter Based)	G ₁	3025Kg
	G ₂	2426Kg
	G ₃	2044Kg
Final Drive	i ₀	1/600
Duty Cycle	W	90%

Electronic Board's Technical Specifications

Main Board Type (STD)	ETe	FBM-2
Micro Switch Voltage	V _{SEQ}	12 V
International Protection Marking	EPr	IP54

INSTALLATION – OPERATION & MAINTANANCE MANUAL OF INDUSTRIAL ROLLER SHUTTER

GENERAL SAFETY RULES



Note: Please keep these instructions for future use.

Carefully read and maintain the manual in a safe place as it provides you with important information about the safe installation and operation of the roller shutters. It also describes the proper care and maintenance of the elements of the product in order to achieve long and safe operation.

ATTENTION

- ▶ It is necessary to secure the space around the place of installation of the roller shutter in order to avoid the passage of persons not related to the work.
- ▶ The roll installation must be carried out by qualified personnel and in accordance with EN 12635.
- ▶ For the proper installation of the product the presence of at least two trained technicians is required on field.
- ▶ For safety and convenience, perform the installation steps in the order specified in these instructions.
- ▶ The roller shutter can only be installed on static infrastructure buildings in order to achieve the required support of the product.
- ▶ The mounting on supporting components must be approved by a manufacturer.
- ▶ The fastening elements must be checked for suitability and selected according to the prevailing structural conditions.
- ▶ Installation must be carried out using secure means (eg scaffolding).

Eliminate the risk of corrosion

To eliminate corrosion risk is required:

- Provide sufficient drainage of water at the site of the roll installation.
- The building should be dry and have adequate ventilation.
- Avoid contact with corrosive and caustic materials.
- Roller shutter's parts must be covered when mortar, cement or gypsum is being applied.

REQUIREMENTS OF INSTALLATION PERSONEL

Requirements of qualified personnel for the correct and safe installation of the product:

- Knowledge of general and special safety regulations and accident prevention.
- Knowledge of applicable electrical regulations.
- Training in the use and maintenance of appropriate safety equipment.
- Sufficient education and training by certified electrician installers.
- Ability to recognize the risks that can be caused by electricity.

Ability to apply the following standards

- EN 12635 ("Industrial doors, commercial and garage doors - Safety devices for electrically operated doors and garage doors - Installation and use").
- EN 12453 ("Industrial doors, commercial and garage doors - Safety devices for electrically operated doors and garage doors - Requirements")
- EN 12445 ("Industrial doors, commercial and garage doors - Safety devices for electrically operated doors and garage doors - Test methods")

REQUIREMENTS OF THE OWNER OF THE INSTALLED PRODUCT

- Briefing on the use of the product.
- Maintaining the manual of the product.
- Knowledge of general safety regulations and accident prevention.

INSTALLATION MANUAL FOR INDUSTRIAL ROLLER SHUTTER

Kollias Ltd. in support of its customers and the optimum utilization of its products, created the following installation guide for industrial roller shutters. In order to highlight the high quality of the product, the way of installation and proper operation is a key element in avoiding damage and malfunctions. The following steps describe in detail the process of the installation of the **Industrial Roller Shutters**.

STEP 1 : Basic checks before the installation of Industrial Roller Shutter

Before starting any installation work, make sure that the right space (WR) and left (WL) of the opening as well as the total height (HT) is sufficient to fit the guides (this is not required when the installation is in "tunnels", meaning between the walls. Also, a check should be made if the floor is tilted to make the necessary corrective movements by cutting a section of the lower part of the guide, which will be placed in the highest altitude position (Figure 1). The purpose of the process of controlling the height difference of the floor is that after lifting and supporting the guides, the roller bearings must be at the same height.

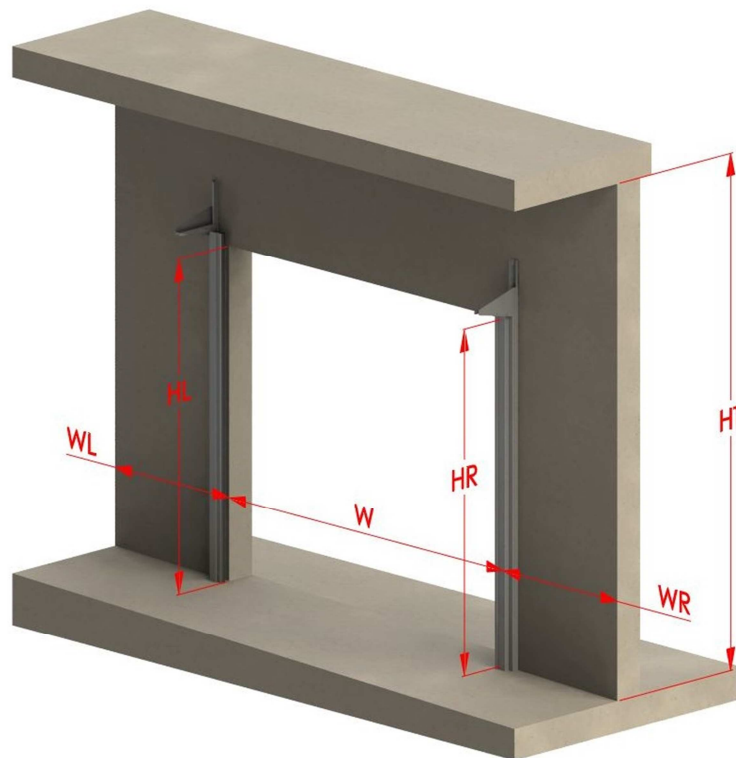


Figure 1



Upon completion of the work lifting and supporting the guides, the bearing bases of the roller shutter must be in the same position of height. Otherwise, there is a risk that the product may malfunction, which may cause premature fatigue in its mechanical components.

STEP 2 : Installation of Industrial Roller Shutter's Guides

Since we have originally set the exact place of mounting of the guides, lift one of the two, seeking to be as vertical as possible. By using control instruments (spirit level or laser) we adjust the position to ensure total verticality in all directions. Special attention is needed, to ensure that the position of the center of the guide is vertical to the building, which will ensure the proper functioning of the roller shutter's curtain.

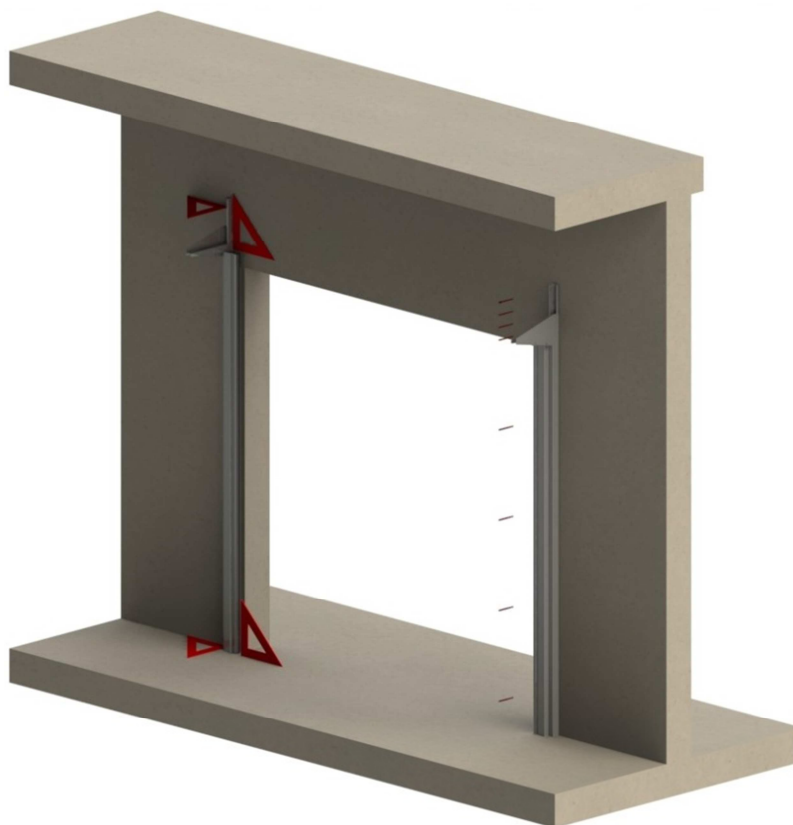


Figure 2

Concluding the guide's suspension process, we continue with its support, wherever it is done with bolts, plugs or welding. Particular emphasis should be placed on positions near the base where at least three support points are required (Figure 2). Work is completed by installing support elements per meter length of the driver.

STEP 3 : Define the distance between vertical guides

We lift the second guide and perform the corresponding actions with the first. In order to safely define the distance between the guides, it is suggested that the measurements be made between the inner surfaces of the shaped beams of the guide (Figure 3), both in their upper and lower position.

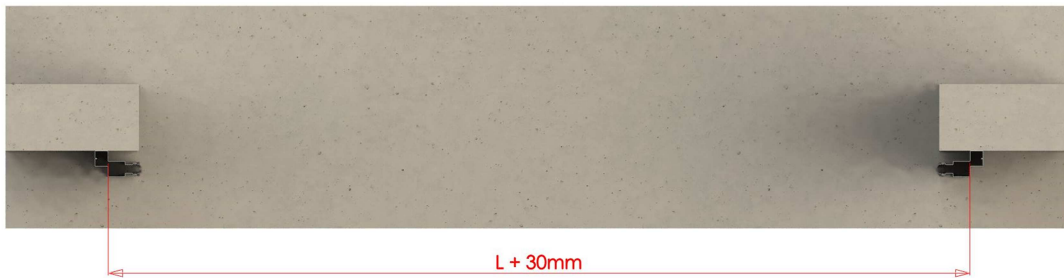


Figure 3

As in the first guide, special attention is required so that the mounting of the roller shutter's base is placed vertically in the building, as shown in (Figure 2).



If screws or plugs are used to support the guides, their application must necessarily be applied to the girder formed thereon and not to the section through which the roller shutter passes. Length (L) as well as height (H) is listed on the roll case, as well as on the motors.

STEP 4 : Rotating the roller shutter's bases

Before fitting the roller shutter onto the mountings, make sure that the motor and safety brake are in the correct position. To achieve this, we lift the roller shutter using either a crane or a forklift at a desired work height. Then adjust the crank to the motor's socket and rotate it, rotate the motor's mounting (Figure 4). Corresponding rotation work is done for the base of the safety brake, which can be accomplished easily by hand.

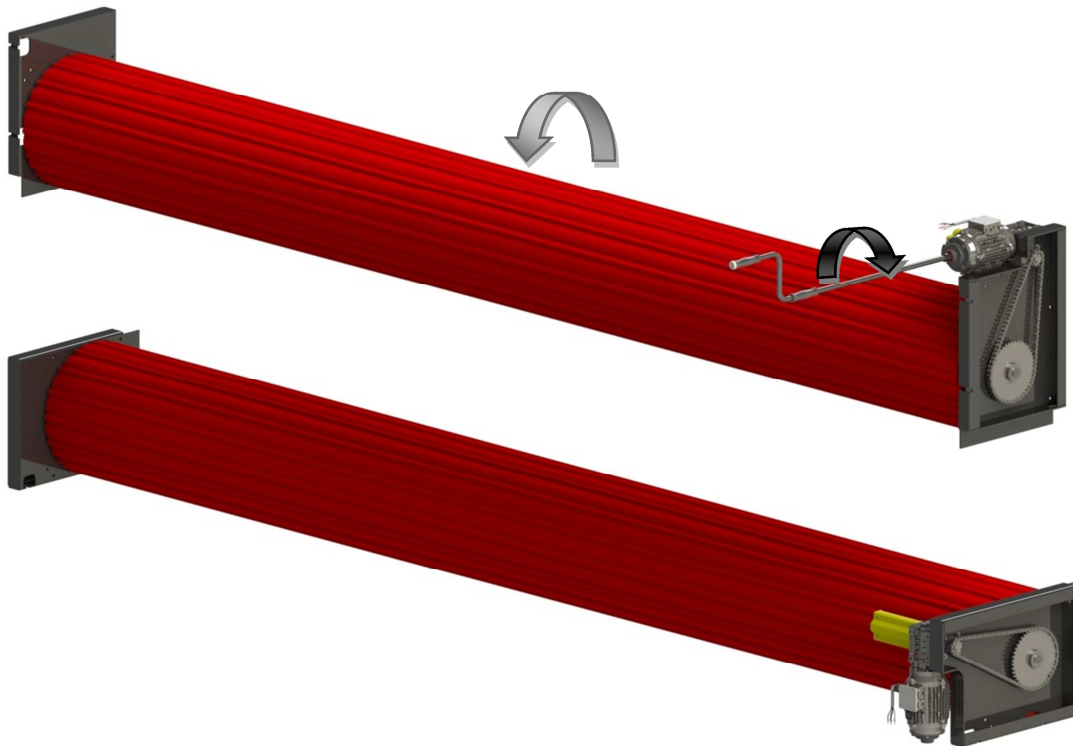


Figure 4

STEP 5 : Positioning the roller shutter on the bearing and checking the gap between the shaft and the base

Raise the roller shutter to a height slightly higher than that of the mountings and carefully move the crane or forklift so that the bases lie above the guides mounting (Figure 5). Place the bases on the mounting and then smoothly move the product, so that they come into contact with the upper part of the guides.

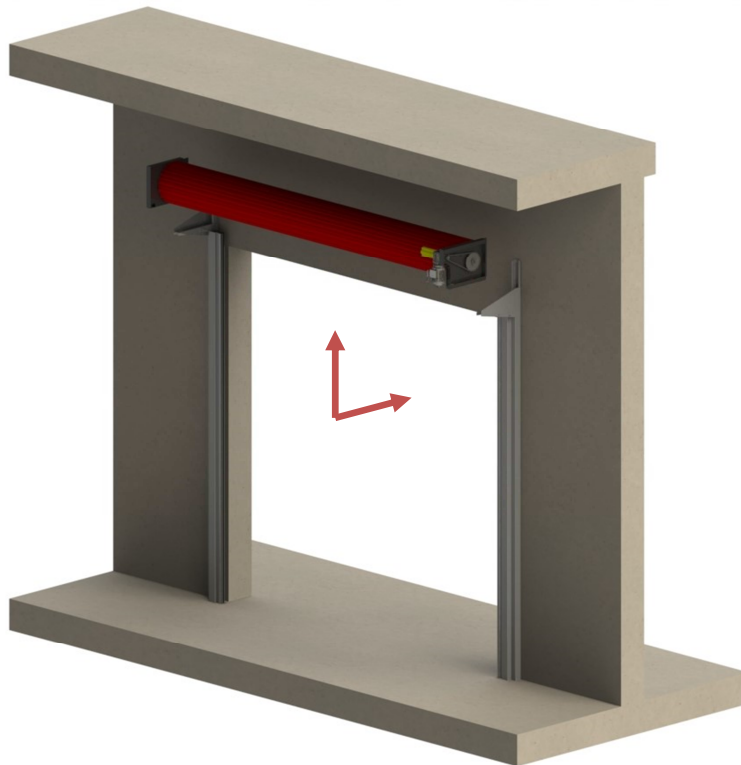


Figure 5

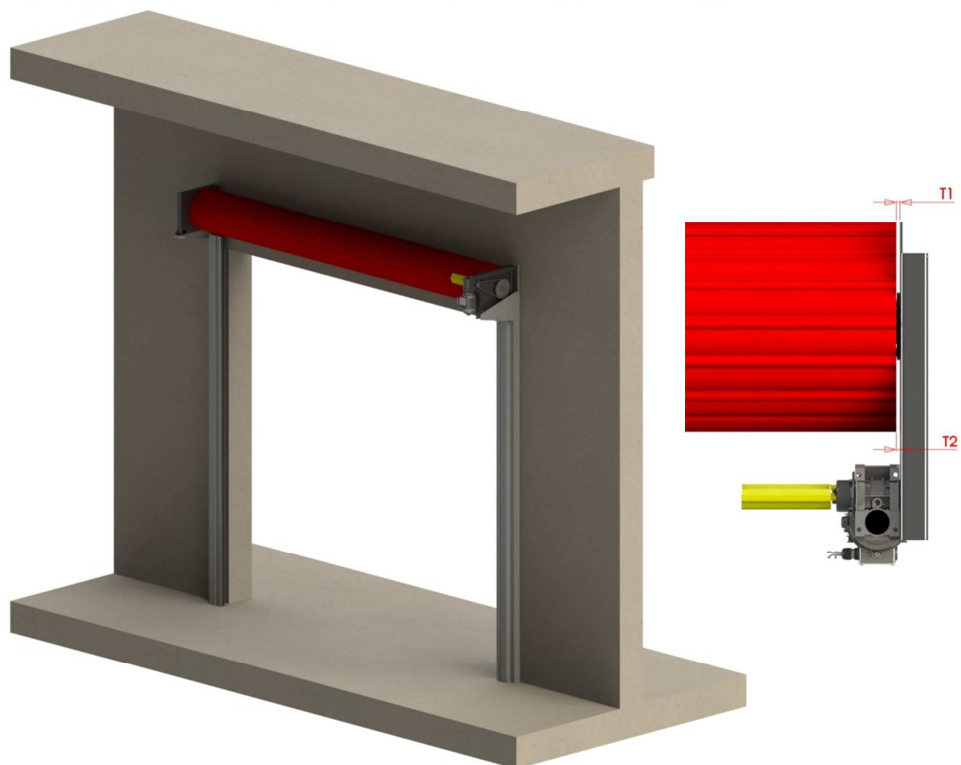


Figure 6

Then place the screws that secure the base to the mounting, and before it is tightened we visually check that the gap between the shaft and the base (motor - safety brake) is uniform ($T1 = T2$) (Figure 6). This gap is designed to be changeable, especially on the side of the motor's base, for reasons of expediency. Particular emphasis must be placed on the correct mounting support so that the gear chain is stretched, thereby ensuring smooth operation on the roller shutter.

STEP 6: Adjust the roller shutter's curtain to the guides

Having fixed the bases on the mountings, we rotate the roller shutter using the crank, so that the bottom bar can be settled on the guide's side. Then we open the screen cover and direct the bottom bar downwards, with simultaneous manual rotation of the roller shutter, within the guides. It is recommended that the device be supplied with electricity, when a portion of which at about 50 cm, is inside the guides (Figure 7).

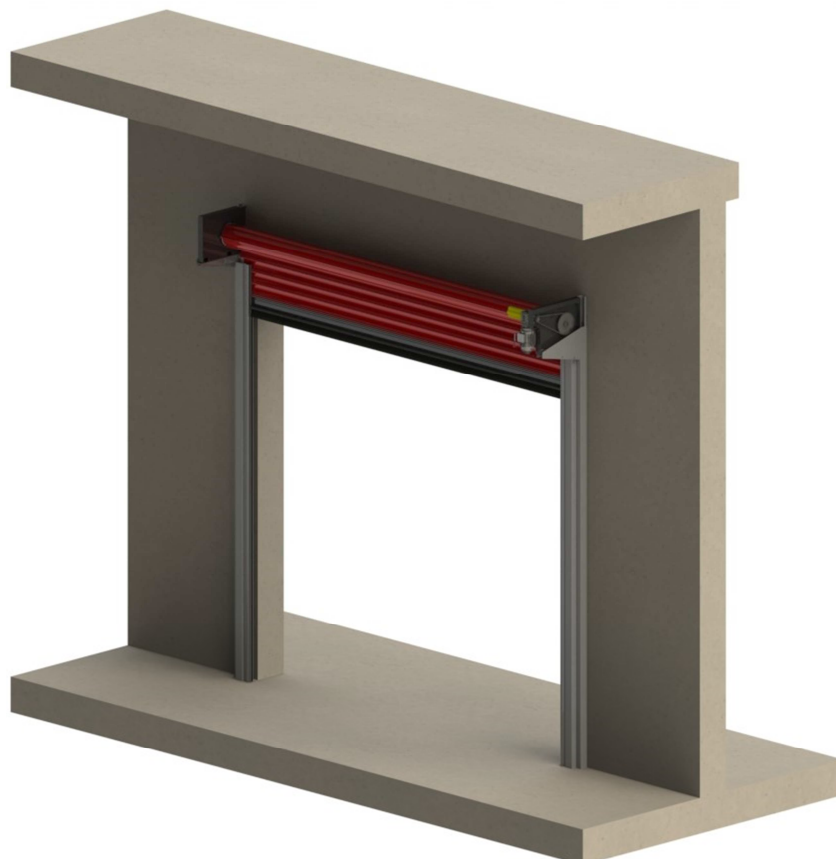


Figure 7

STEP 7 : Connecting the Safety Brake with the Electronic Board

Using a 2x0.5mm cable, we connect the safety brake to the board in the position of the NC D , for boards FBM-0, or Safety Brake on boards like FBM-1 and FBM-2, before removing the existing bridge (throughout 2x0.5mm cable is transferred only command and not electricity). The cable passes over the roller shutter, either in an electrical channel, or on the building chosen positions, selected by the installer of the installation workshop.



In the event that the safety brake switch is opened (opening) (for example, the curtain is suddenly descending), the electronic circuit commands motor's shutdown.

STEP 8 : Adjusting the Terminal Switches of the Industrial Roller Shutter

At first, we connect the electronic board with the manual control knob (Figure 8), watching the BROWN wire being connected to the ASCEND button and the YELLOW cable with the DESCENT button. Then we feed the board with three-phase current and start the process of adjusting the terminals switches.



Figure 8

By pressing the DESCENT button, we see in the terminal control board (Figure 9) that the rotors move to the right. In case, that this does not occur, we invert the two of the three power supply phases, but in no case do we change the motor wiring to the electrical board.

This matter can only be observed in roller shutter assemblies equipped with a FBM-0 electronic board, which does not have a phase sequencer. In contrast to the devices equipped with FBM-1 and FBM-2, the error is detected and indicated by means of a light bulb, whereby reversing of the phases is carried out without requiring testing the roller shutter.

Afterwards, we lower the roller shutter until the bottom bar comes into contact with the floor. In this position, we must adjust that the right rotor, controlling the descent, presses the corresponding contact. To manually move the rotor it is necessary to snap the locking screw, thus allowing it to rotate freely. After completing the previous procedure, tighten the screw again by turning it by hand and not by

using a tool. Then we lift the roller shutter and lower it again, in order to check that the previous terminal setting is accurate. If this is not the case, then we proceed with a correction and repeat the process.

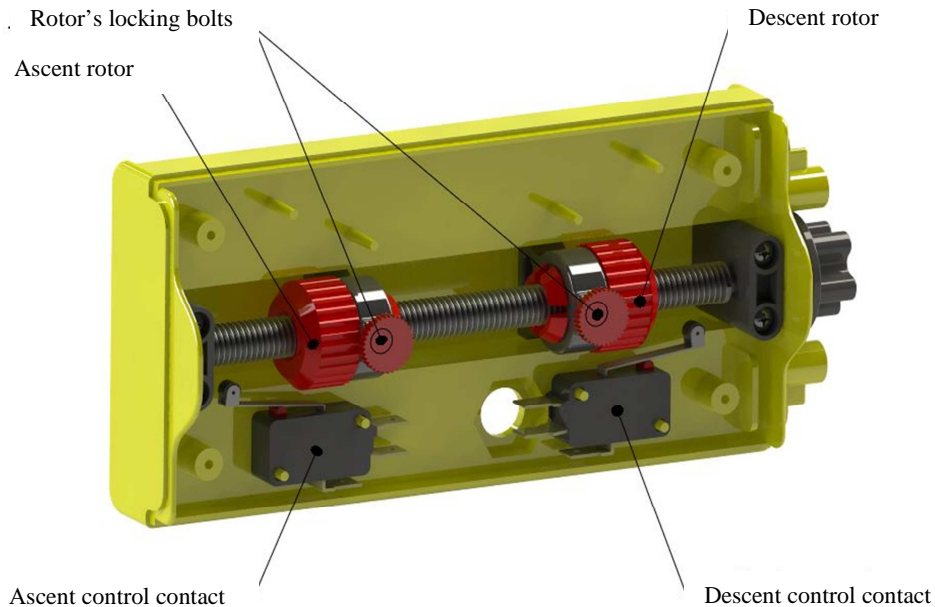


Figure 9

After completing the setting of the lower terminal switch, we begin the procedure for setting the top position of the roller shutter. By pressing the ASCENT button (BROWN wire) we notice that the rotors of the terminal board move to the left. Raise the roller shutter to the position where the bottom bar and the roller shutters slat are located within the guides. In this position we must adjust that the left rotor, controlling the ascent, presses the corresponding contact. Then we lower the roller shutter and raise it to check that the previous terminal setting is accurate. If this is not the case, then we proceed with a correction and repeat the process.

STEP 9: Photocells installation

In the case of devices equipped with photocells, they should be placed at a height of about 50 cm from the floor. Particular care must be taken to ensure that the height of the photocells is exactly the same for both vertical guides.



Note 1 : In RSM24 and RSM45 roller shutter's types, lifting and descending of the roller shutters are achieved by prolonging the pressure of the controller. Upon request, an automatic lifting system, accompanied by a phase success control system (FBM-1, FBM-2), can be customized. To control the roller shutter's position during auto-lift, use the descent button, which is pressed momentarily when the roller shutter reaches the desired position, which acts as a stop.

Note 2 : For the RSM95, RSM150, RSM200 and RSM300, the weight of the construction is greater than RSM24 and RSM45, which means that the lifting capacity of the lifting systems will be multiplied. Also in these embodiments, the guide is provided with an electromagnetic momentary braking system for greater safety.

Note 3 : In the RSM95, RSM150, RSM200 and RSM300 devices the electronic board is equipped with an asymmetry and phase sequencing control. This device protects us from the wrong connection to the grid, preventing the roller shutter from moving in the opposite direction, causing problems in the terminal switches.

Note 4 : To make sure that the wiring has been properly connected to the power grid, the manual operation indication light should turn red (external devices have a green light) and the monitor light inside the panel is green. In the event of a faulty connection, the manual light will not light up, while the supervisor lamp in the panel will turn red. In this case, you will have to reverse the two phases.

Note 5 : In the RSM95, RSM150 RSM200 and RSM300 roller shutter types, the electronic circuit has an auto-lift system, while the descent is achieved by prolonged press of the controller. For this reason special attention is paid to the adjustment of the upper terminal switch, while it is suggested that the adjustment be made at a lower point than the upper limit of the guides, with a gradual displacement of the rotor.

Note 6 : When shipping, the industrial roller shutters assembly, the terminals may be removed so that they are not damaged. The following steps need to be taken, in order to replace them accordingly.

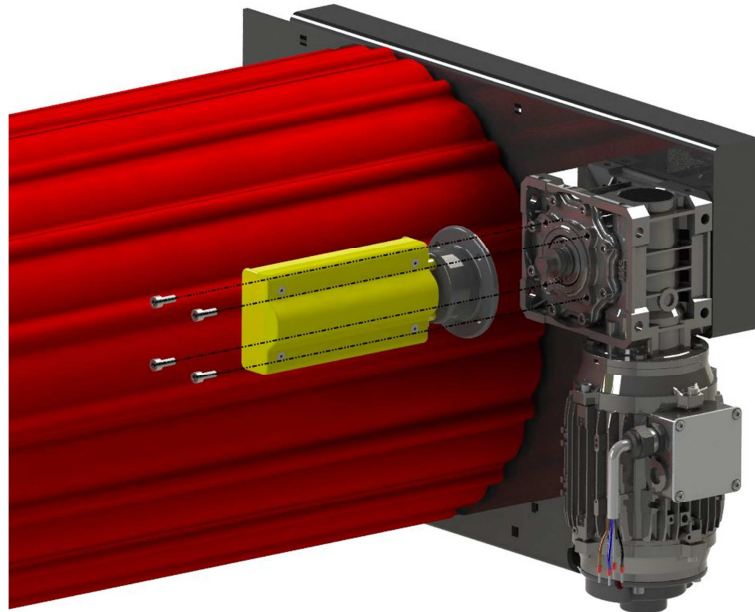


Figure 10

1. Remove the four hexagonal head screws on the gear unit.
2. Install the terminal system into contact and adapt it to the gear unit.
3. Replace the hexagonal screws to hold the board in the gear unit.

Note 7 : In order to properly operate and secure the roller shutter, it is necessary that the floor with which the sealing rubber is in contact is flat and clean.

INSTRUCTIONS OF INDUSTRIAL ROLLER SHUTTER'S PROPER OPERATION

The use of the industrial roller shutter is exclusively to operate as a barrier for the space it is installed. No other use of the product is allowed (e.g. lifting operation). Industrial roller shutters are designed, developed and assembled to withstand all loads that may appear, during its proper operation. Any form of a misuse of the product may contribute with an excess overload that has not been taken into account in their static study, therefore the manufacturer takes no responsibility for the failure of the product or caused accident.

HANDLING ON STATIONARY OPERATION

Operation mode of the industrial roller shutter is fully controlled and automated. The curtain is set for ascent or descent with the operator's interaction on the corresponding button of the basic fixed controller and stops immediately by stopping any activity on it. When the curtain reaches its upper or lower motion, it stops automatically via the terminal switches, even if we continue to operate with the button.

In case of circuit voltage drop, every function of the industrial roll is immediately interrupted. After resetting the voltage to the desired levels, an effect is required on each roller control board as each given command is automatically canceled.

REMOTE CONTROL

As mentioned above, the operation of the roller shutter with instant command by remote control is possible both for upward and downward movement of the curtain.

In the case of automatic ascending and descending of the curtain, the device is necessarily equipped with a photocell placed at a height of 50 - 80 mm from the ground and a pressure switch fitted to the floor sealant, in order to avoid accidents during the unintentional influence on the controller, but also in case of an obstacle within the opening, which the remote user does not is aware of or notice.

In case, where only the automatic ascent of the roller shutter is desired, the device is not required to carry a photocell and a pressure switch, since the descent is affected by the operator at the button of the fixed control operation.

MANUAL OVERRIDE

For manual operation of the industrial roller shutter, the motor is fitted with either a crank manual or chain hoist.

Manual override must be operated only for the most common causes of circuit shutdown, which are mentioned below:

1. Power supply failure.
2. Voltage failure.
3. Failure of electrical safety.
4. Motor's or electrical circuit's malfunction.

During manual operation the terminal switches are set off. Therefore, special attention is needed in both cases, when descending and ascending of the roller shutter. Under no circumstances should they exceed the roller shutter's operating limits, as they will cause damage to the terminal switches.

In order to operate manually the roller shutter, you have to **place and push the crank manual** or by **rotating the chain of chain hoist's system**. This causes an automatic power cut, which is visually indicated by turning off the indicator light. Manually lifting or descending the roller shutter will require a fairly large number of spins due to the gearbox.

To re-activate the electrical circuit of the roller shutter, when using a crank, it must be removed from the socket, checked by the simultaneously lighting of the indication.



If this is not achieved, then the switch located within the crank's holder may have not return to its original position. Reinstall the crank and, with gentle movements, try to unblock the switch.

In case of which the use of a chain hoist is applied, in order for the roller to return to automatic mode, we must rotate the pulley in the opposite direction, from the original direction of rotation. Be careful that the counterclockwise rotation of the chain should be mild (the minimum applied force) to activate the electronic circuit of the roller shutter.

ATTENTION

To avoid any form of injury:

- ▶ Proceed with ascending or descending of the roller shutter, only when the opening is clear and free of any kind of obstacles.
- ▶ Do not operate the roller shutter throughout heavy and strong winds, in order to ensure the proper motion of the curtain.
- ▶ Make sure that the control panel, as well as the remote controller is not being used by children or unauthorized personnel.
- ▶ Make sure that the remote control is not activated unintentionally (e.g. in your pocket).

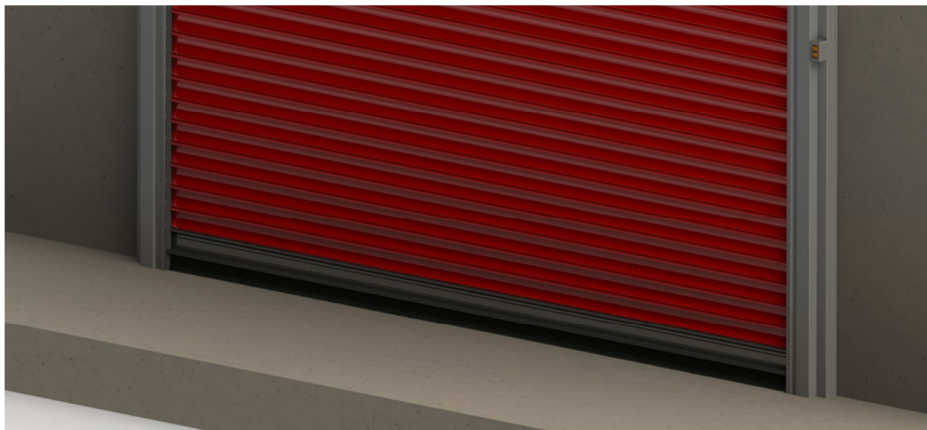
MAINTENANCE INSTRUCTIONS FOR INDUSTRIAL ROLLER SHUTTER

Proper maintenance of the industrial roller shutter is a prerequisite for its smooth and silent operation and longevity. The maintenance of the product includes the following tasks.

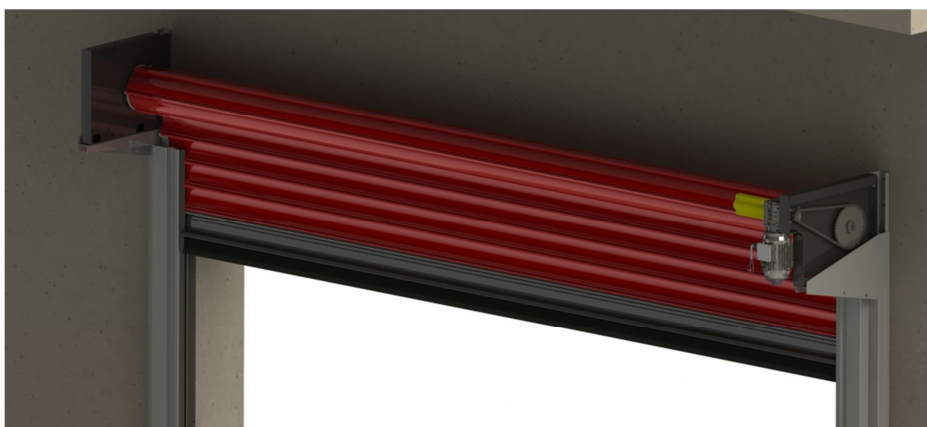
Checking the terminals switches for proper operation

The boundary end positions of the curtain are determined by the terminal board. Inspect visually if the terminal switches are correctly set by following the procedure below:

- The roller shutter is properly adjusted and the curtain is normally down when the sealing rubber is tangled to the floor and the profiles keep the distance between them constant.



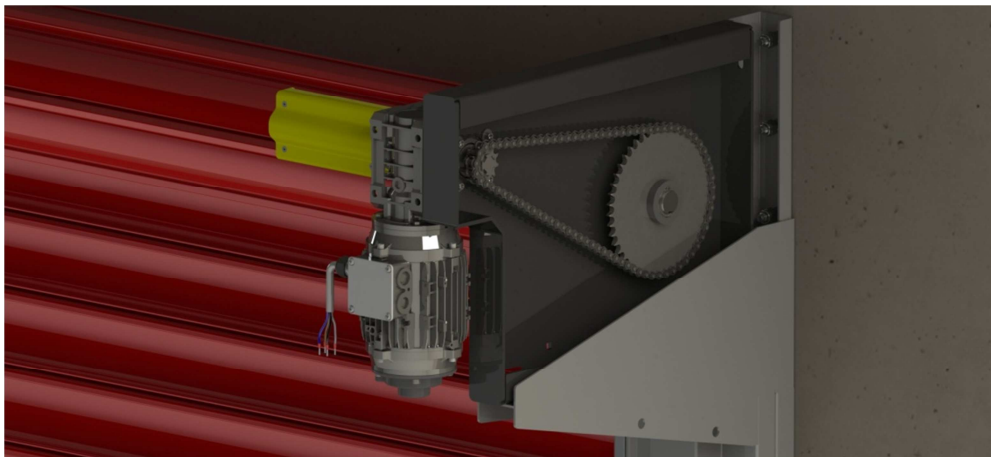
- The roller shutter has been set properly and the curtain is placed in the upper ascending position, when the sealing rubber is in approximate distance of 200mm from the mounting of the roller shutter's base.



In case that none of the above occurs, please contact the manufacturer to send a qualified workshop to make the appropriate arrangements.

Lubrication of the gear chain

Careful and effective lubrication is a prerequisite for achieving a 15,000-hour service life, which is the basis for chain calculation. According to DIN 8195 the type of lubrication is determined by the speed of the chain. Lubrication must be done frequently the greater the chain speed, and as much as the dust and moisture content is the operating environment of the product.



For the industrial roller shutters the speed does not exceed 0.2 m / sec and therefore according to DIN 8195 the lubrication mode selected is manual lubrication. The materials used to lubricate this type of chain are:

- Viscous lubricants (grease type).
- Lubricating oil.

Depending on the ambient temperature according to DIN 8195, lubricating oil with a certain viscosity class is required. For example:

Ambient temperature in °C	Viscosity class for lubricating oil
$-5 < t < +25$	SAE 30
$25 < t < 45$	SAE 40
$45 < t < 65$	SAE 50

As mentioned above, for determining the chain lubrication time, the catalytic factor is the conditions prevailing at the roller shutter installation site as the drive speed is considered to be very low.

Therefore, in a non-constrained environment, such as industrial, craft and commercial areas, chain lubrication can take place every 15,000 openings. In contrast, in places with a high load of dust and moisture, chain lubrication must be carried out every 1500 openings.

Visual inspection of the movement system

The industrial roller shutter's assembly is equipped with an industrial electric motor and a reducer with gearless worm gear. Keep the system clean of dust and dirt. No maintenance of the gear unit is required as it contains long-lasting lubricant, nevertheless check for leaks. In case of leakage, immediately contact an authorized repairer. Also visually inspect the condition of the power cables of the electric motor. If you find any damage, contact an authorized repairer immediately.

Check the sealing and sliding profile of the curtain

The guide carries along the aluminum profile of a suitable cross section, the EPDM rubber and PVC profiles of which are used to seal and smooth the profiles to the guides respectively. Depending on the frequency of use and the operating conditions of the roller shutter (use under severe wind pressure), they may be damaged. In such case it is suggested to replace them in order to ensure maximum sealing and silent movement of the curtain. For better visual control of these elements, it is suggested that the curtain be raised, ensuring better visibility.

Cleaning the roller shutter

Clean the product at regular intervals, especially if it is in a dusty, muddy or other dirt environment.

Always use dry or slightly damp cloth. Do not use chemical cleaners or other corrosive materials. If the curtain contains windows do not use household cleaners, but only damp cloth.



ATTENTION

- Maintenance should be carried out more often if the door is subjected to a high level of use.
- All faulty components must be replaced with genuine accessories.
- Maintenance must be carried out by trained personnel.
- These instructions must be observed when carrying out maintenance work.
- It is important to follow the warnings and safety instructions.
- Door maintenance should be documented.