



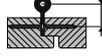
TECHNOLOGY IN MOTION

# MACO RUSTICO

SHUTTER HARDWARE



CATALOGUE

	Installation on timber		Packer thickness
	Part number		Total length of fixing bolts
	Packing unit		Overall component width
	Reveal depth		Overall component length
	Discharge		Shutter distance through striker pin bracket
	Hinge crank		Shutter thickness
	Long sash-hinge total length		Crank opener overall length
	Pin distance (see Section 1.5!)		Length of crank arm
	Minimum pin depth (see Section 1.5!)		Offset
	Pin length		Distance between the shutters
	Shutter pin holder height		Frame clearance
	Shutter pin holder width		Number of slat supports
	Rawlplug total length		Distance
	Shutter pin socket diameter		Hinge size
	Locking hook height		Rebate size
	Distance to wall		Lining thickness
	Screw distance		Insulation thickness
	Screw distance to middle hinge Prima		
	Screw distance to middle hinge Prima		

**BLR** = Hardware range for frame installation

**MMV** = Hardware range for wall/wall cladding

**MV** = Hardware range for wall cladding installation

**PAD** = "Padovana" hardware range

**Pcs.** = Quantity

**var.** = variable



Dear MACO customer,

You are holding our new order catalogue in your hands. Our main aim was to present our product range in a simple and easy-to-understand manner in order to provide you with a practical working document. In addition to this catalogue, our package leaflet and assembly instructions will help you to process and install our products correctly. These are available to download from [www.maco.eu](http://www.maco.eu).

Our products help to ensure that windows, doors and large-scale elements offer optimum function and security. As a premium manufacturer, that carries out its business according to the highest standards, the optimum quality and functionality of our hardware is our top priority. While we guarantee the best possible product characteristics for our hardware components, the responsibility for professional installation and correct fixing lies in your hands.

We want to support you, as a dealer or fabricator, with your responsibility for the safety of your products. Our binding assembly instructions and package leaflets provide information about the general use and processing of our hardware. To ensure the best fabrication and attachment of the hardware components – to suit the relevant installation situation, such as strength and profile design of the timber, arrangement of chambers and reinforcement in PVC profiles, etc., you can have elements tested and evaluated at our certified test centre: an air permeability and driving rain test as well as a pull-out test will help you to meet CE marking requirements. This means that you can rest assured that you are meeting all the standards and directives applicable to you.

You can find information about how to properly store our hardware components in the VHBH guideline of the Quality Assurance Association: Locks and Hardware ([www.fvsb.de](http://www.fvsb.de)) or section Information on storage and transport of hardware components.

***Important for dealers: MACO supplies its products with the corresponding number of package leaflets. As a dealer, you are responsible for enclosing the correct number of package leaflets with the products sold by you. Also, please ensure that you make your customers aware of the relevant binding instructions and legal aspects of the document.***

We also provide you with operation and maintenance instructions for end users for you to pass on to your customers. These can also be downloaded from the MACO website ([www.maco.eu](http://www.maco.eu)).

We offer an option in our extranet ([extranet.maco.eu](http://extranet.maco.eu)) with our online catalogue, which, in addition to highly up-to-date information, also offers the advantage of extensive additional technical information for all components. You can obtain access details from your contact partner in field sales.

All of our printed documentation is continuously revised and expanded. Please make sure that you are working with our most current documentation. All of our documentation is available for download from [www.maco.eu](http://www.maco.eu). We hope that the catalogue will prove to be a valuable tool for your daily work. We wish you every success and hope to see you online soon.

*Please fill in completely*

<b>We confirm receipt and approvingly acknowledge its contents.</b>	
<p>Stamp:</p> <div style="border: 1px solid black; height: 100px; width: 100%;"></div>	<p style="text-align: center;">_____</p> <p style="text-align: center;"><i>Please print your name in capital letters</i></p>
Date: _____	Signature: _____

MACO sales manager: \_\_\_\_\_

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## 1 General and technical information

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## 1 General and technical information

### 1.1 How to use the catalogue

If not otherwise specified, all dimensions are stated in millimetres and packing units in items per box.

Drawings and diagrams are not to scale.

The content of this document is constantly being updated, so regular comparison is necessary.

No liabilities are accepted for possible printing errors, mistakes or changes.

The current version is downloadable from our website ([www.maco.eu](http://www.maco.eu)).

Please send comments or suggestions about our catalogues by email to [feedback@maco.eu](mailto:feedback@maco.eu).

## 1.2 Information on product safety and product liability

### 1.2.1 Shutter hardware for window and casement door shutters

In accordance with the manufacturer's liability for his products defined in the Product Liability Act (PHG in Austria, ProdHaftG in Germany, PrHG in Switzerland, Codice del Consumo in Italy), the following information on shutter hardware for window and casement door shutters must be heeded. Non-compliance shall release MACO from this liability.

### 1.2.2 Product information and proper use

"Shutter hardware" is deemed to be hardware for windows and casement door shutters (hereinafter referred to as "shutters") in building construction.

Shutter hardware are used on vertically installed shutters made of timber, PVC or aluminium and their corresponding material combinations, whereby the professional installation of the shutters can be carried out directly on the frame, directly on the wall or on an assembly frame.

Shutter hardware as a whole can be divided into three main groups and their function considered independently:

- Shutter pins, shutter hinges, shutter pin holders: These are used to close and open the shutter (installed on frame or wall).
- Shutter locks: These are used to hold and secure the shutters in a closed position.
- Shutter catches: These are used to hold and secure the shutters in an open position.

Differing applications do not correspond to their proper use. **Fixing** the sash prevents the shutter from moving in the wind. **Securing** the sash prevents the shutter from moving during a storm. In the case of wind and draught, they must be able to hold the shutters both in the closed and in the open positions. This is achieved by using the appropriate hardware components (locking mechanisms, shutter catches etc.).

### 1.2.3 Misuse of shutters

The following cases, in particular, shall be deemed misuse of the shutter hardware - i.e. utilisation for purposes other than their specified proper use:

- If obstacles are inserted in the opening area, thereby preventing proper use of the product.
- If shutters are pressed against the wall or windows and doors improperly or in an uncontrolled manner (by wind, for example) causing them to become damaged or destroyed.
- If additional loads, (e.g.: dead weight of people and items) act upon shutters, for example: attaching clothes lines, etc.
- If while closing or opening the shutters, someone reaches between the respective motion stop positions (frame and shutter edge) for example (RISK OF INJURY!).
- In the case of absence or in case of a storm, the shutters are to be secured.

### 1.2.4 Principles and limitations of MACO's liability

The relevant entire hardware set may only consist of MACO hardware components. In the case of non factory-approved combinations by and/or inappropriately assembled hardware, and/or the use of non-original and/or non factory-approved accessory components, no liability will be accepted from MACO.

All shutter hardware for windows and casement doors must be inspected and serviced systematically by certified professionals to ensure their functional integrity and safety. This maintenance must be carried out - verifiably and documented - in accordance with our maintenance documentation: otherwise, no liability can be accepted.

Our processing specifications in the product catalogues, installation instructions/information and leaflets are legally binding and must be heeded without restriction; otherwise, no liability can be accepted for the safety and/or durability of the hardware.

Where timber, PVC, light-metal or steel profiles are used, the specifications of the profile manufacturer and/or system owner must be observed.

MACO delivers top quality, reliable components and supplies the assembler with instructions for use. MACO only provides detailed specifications for processing in special cases. In these cases, MACO also provides a guarantee for a functioning solution.

### 1.2.5 Product performance

The fundamental principle for the safety and suitability of use of shutters equipped with MACO shutter components is compliance with all guidelines supplied to the user by MACO. These documents are being updated and the current version is downloadable from our website [www.maco.eu](http://www.maco.eu). Failure to adhere to these guidelines can result in the damage listed under "Misuse of shutters", including the risk of serious injury to persons and considerable damage to property.

If such guidelines are missing for a specific requested application requested, the user shall be obliged to test the suitability of the parts used for this type of application, or arrange to have them tested.

### 1.2.6 Maximum sash weights and sash sizes

The shutter weights and maximum shutter sizes specified in this catalogue and in the assembly instructions must not be exceeded (refer to product information). The maximum permissible sash weight is determined by the component with the smallest load capacity. Application diagrams, installation instructions/information and component assignments must be observed!



### 1.2.7 Hardware combination

The manufacturers guidelines regarding hardware composition (e.g. the use of additional frame hinges, consoles, sash hinges or run-up blocks, as well as the use of optional components) are legally binding and also contained in the product information.

### 1.2.8 Assembly

The assembly of hardware components for shutters may only be carried out by qualified people. Please refer to the product information.

### 1.2.9 Product maintenance

#### 1.2.9.1 General

Inspection and service are fundamental components of maintenance. The verified maintenance is in turn basis for the legal warrant and/or our guarantee.

All inspection intervals and maintenance instructions must be observed! These details must be evident from the operating and maintenance instructions.

Settings and adjustments for the hardware, as well as replacement of components may only be carried out by specialists. Similarly, inserting and/or removing the sashes may only be carried out by specialists. When treating surfaces - e.g.: painting or glazing sashes, all hardware components must be excluded from this treatment and protected to prevent contamination.

#### 1.2.9.2 Maintaining surface finish quality

For maintaining the quality of the RUSTICO PREMIUM-PLUS surface finish permanently please observe the following instructions:

- Avoid surface damage.
- Remove soiling from paintwork.
- The hardware may only be cleaned or polished with mild, pH-neutral cleaning agents in diluted form. Never use chemically aggressive, acetic or abrasive cleaning agents. These can lead to damage of the hardware.
- Please note care instructions in coastal areas.

#### Care in coastal areas

Challenging environmental conditions are present within areas app. 10 km to the sea. During storms sea water is being distributed in the form of spray and may come into contact with shutter hardware. Salt deposits will form after moisture has evaporated. In combination with other deposits and soiling (dust) these salt deposits may cause increased corrosion. The home owner can prolong the hardware service life by good care and maintenance. At least once every year a thorough cleaning and application of oil is required. Even in coastal areas you will enjoy a long service life of your shutter hardware with only a small maintenance effort.

1. Wash away salt deposits and soiling with fresh water. Never

use aggressive cleaning agents!

2. Let the hardware dry.
3. After drying apply a coating of anti-corrosion spray (e.g. BRUNOX Turbo item no. 362831). Avoid spraying other areas or components (e.g. facade, untreated timber). Anti-corrosion spray may also assist during the cleaning process.

#### 1.2.9.3 Information and instruction duties

The following is available to comply with information and instruction obligation duties and perform maintenance work in accordance with the product liability legislation:

- for dealers: catalogues, operation and maintenance instructions, installation instructions/information and leaflets for components
- for processors: catalogues, tool drawings, operation and maintenance instructions, installation instructions/information and leaflets for components
- for owners and end users: operating and maintenance instructions.

To ensure the functional integrity of shutter hardware for windows and casement doors:

- Designers must request all relevant product information from the manufacturer and observe the details provided.
- Specialised dealers are obliged to comply with all relevant product information and, in particular, request installation instructions/information, as well as operating and maintenance instructions from the manufacturer and hand these documents over to the processors or end user.
- Processors are obliged to comply with all relevant product information and, in particular, request operating and maintenance instructions from the manufacturer and forward these documents to the owner and end user.

All above mentioned reference material is available for download from the MACO website ([www.maco.eu](http://www.maco.eu)).

The shutter manufacturer is required to comply with their duty to provide information to the user of the shutters which they manufacture (according to EN 13659). This should also be indicated in an appropriate form on the operating instructions and maintenance instructions for the shutter hardware, as well as on the information on intended use of the shutters.

In particular, it is important to inform about any damage which may result from faulty maintenance or misuse. Damage to the shutter hardware and the shutters could lead to breaking off of shutter parts or even the whole shutter. This creates the risk of serious personal injury and significant damage to property.

#### 1.2.10 Disclaimer

The manufacturer's liability can also be excluded, among other things:

- If the fault is attributed to a regulation or an official ruling, to which product compliance was stipulated.
- Characteristics of the product, which have given rise to the



claim (against the manufacturer), could not be identified as a fault according to the conditions of science and technology at the time.

- The claim (against the manufacturer) only involves a basic material or a part product that was manufactured, and the fault is due to the construction of the product that was incorporated into the basic material or the part product, or as a result of instructions issued by the manufacturer of this product.

#### **1.2.11 Product information**

##### **Maximum sash weights and sash sizes**

The shutter weights and maximum shutter sizes specified in this catalogue and in the assembly instructions must not be exceeded (refer to product information).





## 1.3 Wind resistance

### 1.3.1 General information

When constructing, installing and operating window shutters, note that these are subjected to very strong loads during storms. Storm damage to shutters can have serious consequences - if part of a shutter or an entire casement breaks free (drops) this can cause damage to property and danger to life and limb.

MACO supplies high-quality shutter fittings and also supports manufacturers, fitters and end users by offering its expertise on the following topics:

- Identifying risks
- Meeting specifications from laws and standards
- Minimising storm damage
- Covering residual risks through insurance

#### Causes of increased risk are

- Position exposed to wind (location, height above ground, exposed position, periphery of the building, etc.)
- High hazard potential (shopping street, etc.)
- Large and/or heavy shutters, air tight version, unfavourable arrangement
- Anchorage on the pivot point - restricted wind resistance (inner opener, snap holder)
- Shutters prone to vibration
- Folding shutters with internal pivot point (danger of falling when not in secured status)
- Inadequate user instruction, lack of care and absence
- Insufficient maintenance

#### Specifications from laws and standards (EU)

The national version of the relevant standard applies for each country:

- The specifications of EN 13659:2015 apply for the wind resistance of the closed shutter.
- The fixing and securing of the open shutter must be designed for wind actions determined according to EN 1991-1-4.

In June 2014, the Bundesverband Rollladen + Sonnenschutz e.V. (Federal Association for Manufacturers of Roller shutters and Sun protection) published guidelines for Germany (TR 106) and a summary (TR 106a), which go through the content of the standards and also cover the shutters. These guidelines are available for use free of charge to anyone. They were created for Germany and also offer suggestions for other countries. MACO recommends the use of these guidelines as an aid when applying the standards: <https://rs-kompetenzzentrum.de/normen-richtlinien/technische-richtlinien/>.

MACO provides special notes for the products with anchorage on the pivot point (inner opener and snap holder).

### Minimising the risk for storm damage

The cause of damage is often an increased load in conjunction with errors in assembly, operation and maintenance. MACO recommends the following measures:

- Use self-engaging shutter catches which can automatically fix a non-latching shutter.
- Attach safety catches, so that the shutter cannot be unhinged by the storm.
- Provide an additional lock (e.g. lock or shutter catch) for storms and for when inhabitants are away.

### Insurance

Check the scope of validity, amount of damages, excess, etc. (storm damage, building liability, and so on).

### Terms

- Fixing:  
Fixing the sash prevents the shutter from moving in the wind.
- Securing:  
Securing the sash prevents the shutter from moving during a storm.
- Safety-catch:  
The safety-catch prevents the lifting and unhinging of a shutter during a storm. This problem can also occur with low sash weights, with extreme wind gusts and in cases where the sash is beaten uncontrollably against the window and façade.

### 1.3.2 Closed shutters

The specifications of EN 13659:2015 apply for the wind resistance of the closed shutter.

	Wind resistance classes according to EN 13659:2015						
	0	1	2	3	4	5	6
Nominal wind pressure $p_N$ (N/m <sup>2</sup> )	<50	50	70	100	170	270	400
Safety pressure $p_S = 1.5 p_N$ (N/m <sup>2</sup> )	<75	75	100	150	250	400	600

### Planning:

#### Which wind resistance class does the shutter need?

It is the responsibility of the planner of a building to select the required wind resistance class. In many cases, the shutter supplier "automatically" takes on the role of the planner and must determine the requirements at the place of use.

The TR 106 guideline contains instructions and recommendations for selecting the required wind resistance class for a specified place of use in Germany.

In Germany, a large amount of shutters are fitted in wind zones 1 and 2 (see wind zone map). Wind resistance class 3 is normally sufficient here for installation heights up to 10 m.

**Declaration of performance:**

**Which wind resistance class does the shutter provide?**

Standard EN 13659:2015 requires shutter manufacturers to declare the wind resistance of their products (class 0 - 6). This only takes closed shutters into consideration. The wind resistance is checked by the manufacturer in accordance with EN 1932 and declared on the CE marking and the declaration of performance.

In the case of turning shutters, the wind resistance class mainly depends on the lock. With a **multi-point locking rod** the highest class can usually be achieved (class 6), but it depends on the screw fixing and profile system.

In the case of shutters **without multi-point locking rod**, i.e. with inner opener or with centre lock, lower classes are achieved.

**Information for shutters with inner opener**

The tables 1 and 2 show standard values for the wind resistance classes, which can be achieved for shutters with inner openers. The size of the shutter plays a decisive role here. For locations that are exposed to the wind and/or large casements, MACO recommends that an additional safety device is attached to increase wind resistance.

A 2F shutter lock can be fitted as an additional safety device. This must be locked when there is a risk of a storm or when the inhabitants are away.

When the user is away or there are wind speeds greater than the specified value, the shutters must be closed and/or also secured to prevent damage.

**Wind resistance classes with inner opener**

Table 1 - with inner opener hinge

		Class 5				Class 4				Class 3				
Shutter height (mm)	3 hinges	2.100												
		2.000												
		1.900												
		1.800												
		1.700												
	2 hinges	1.600												
		1.500												
		1.400												
		1.300												
		1.200												
		1.100												
		1.000												
		900												
		800												
		300	400	500	600	Shutter width (mm)								

**Wind resistance classes with inner opener**

Table 2 - with rotary arm and bearing block

		Class 5				Class 4				Class 3				
Shutter height (mm)	3 hinges	2.100												
		2.000												
		1.900												
		1.800												
		1.700												
	2 hinges	1.600												
		1.500												
		1.400												
		1.300												
		1.200												
		1.100												
		1.000												
		900												
		800												
		300	400	500	600	Shutter width (mm)								

**Explanation for the tables 1 and 2**

- Standard values for classification according to EN 13659:2015
- Testing in accordance with DIN EN 1932:2013
- Only for shutters in closed position

**1.3.3 Open shutters**

The design loads for open shutters are derived from EN 1991-1-4 (wind actions) and explained in the TR 106 guideline. This guideline is available free-of-charge for anyone at: <https://rs-kompetenzzentrum.de/normen-richtlinien/technische-richtlinien/>.

QUOTE: A pressure/suction of 400 N/m<sup>2</sup> should normally be sufficient for dimensioning non-air tight window shutters.

**Open shutters with anchorage on the pivot point**

The inner opener and the snap holder are restraining systems with anchorage on the pivot point. They do not provide any storm resistance. Therefore, MACO recommends extremely careful planning, advice, installation, use and maintenance when using these products. The instruction manual is extremely important. In practice, high level of satisfaction is achieved with due care.

**In exposed locations, MACO advises against the use of inner openers and snap holders, or using them with an additional safety device.**

**Behaviour in the event of wind with anchorage on the pivot point**

If the shutter remains open, then normally no damage will be incurred. Depending on the installation site, the stronger the wind the more likely it is that hardware components will break. In the case of an inner opener, the drive bolts can be twisted off, for





example. In the case of a snap holder, the pressure pins can be torn off, for example. The wind will then cause the shutter to hit the window and curtain wall in an uncontrolled manner, thereby causing further damage.

This situation must be taken into account when planning, to be co-ordinated with the client and documented in the handbook.

Folding shutters with inner pivot point must never be secured with a snap holder for this reason.

In extreme cases, the shutter can be unhinged by the force of the wind. This risk must be averted by installing a safety catch (1 per casement).

#### 1.3.4 Instruction manual

According to EN 13659:2015 (Section 6), the shutter manufacturer is obligated to provide an instruction manual:

- for installation
- for operation (must be provided to the end user)
- for maintenance (fitter and end user)

The Pflichten katalog\_2015\_(CE) (Catalogue\_of\_specifications\_2015\_(CE)) from the Bundesverbands Rollläden + Sonnenschutz e.V. (Federal Association for Manufacturers of Roller shutters and Sun protection) also provides support at [www.itrs-ev.com](http://www.itrs-ev.com).

Information relating to dangerous situations (e.g. storms) must be clear and detailed. If necessary, the operating instructions must also contain information about the wind velocity at which

the shutter is to be closed (or secured using another method) in order to prevent the risk of it breaking off.

#### Information from MACO

MACO provides instructions for installing, operating and maintaining hardware. These instructions can be used by the shutter manufacturer as a building block for creating its manual. The latest version of these instructions is available to download at [www.maco.eu](http://www.maco.eu).

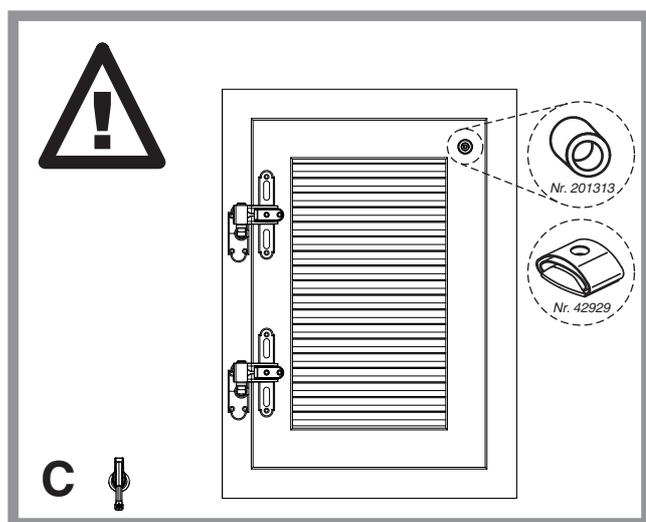
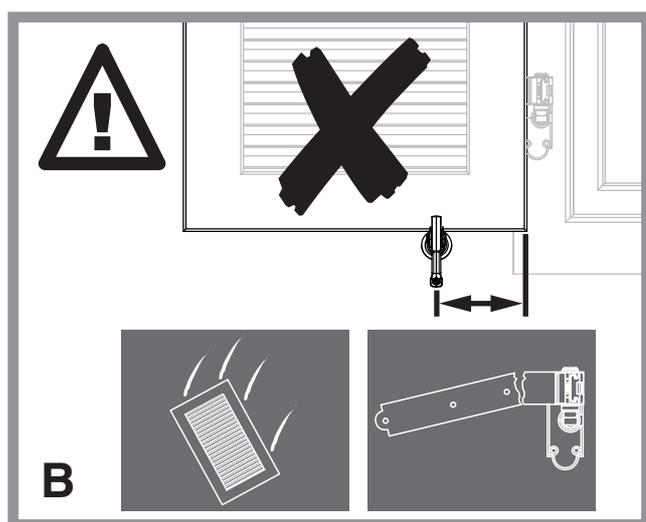
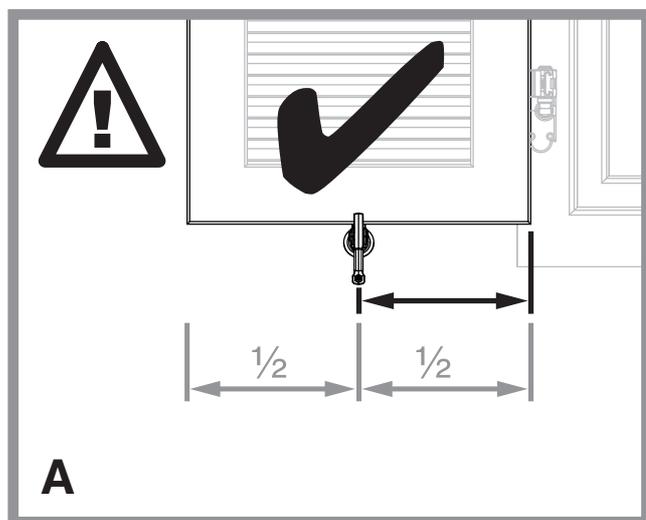
#### Maximum wind velocity with anchorage on the pivot point

In the case of sun protection products with limited storm resistance, EN 13659:2015 requires a maximum wind velocity to be defined in the operating instructions. When the user is away or there are wind speeds greater than the specified value, the shutters must be closed and/or secured to prevent damage.

Calculation of the permissible wind pressure and thus the permissible wind velocity can be performed according to EN 1991-1-4. However, the time, effort and uncertainty (dynamic behaviour) are so great that MACO recommends the use of experience values. The standard value of 60 km/h for peak wind values has proven successful for the permissible sash sizes and max. sash weight. Above this value, a storm warning is usually issued.

- max. shutter width 600mm
- max. width for folding shutters 2 x 600mm
- max. height 2,100mm
- max. sash weight 20kg (applies for folding shutters for the total weight of both casements)

## 1.4 Shutter catches and buffer stops



**CAUTION:** Failure to observe the following points can cause damage due to misuse of shutters described in Section 1.2 "Information on product safety and product liability", including the risk of severe injury to persons and damage to property!

- **Shutter holders minimum 1/2 shutter width**

Shutter holders must be installed at half the shutter width (see Figs. A + B). All shutter holders and locks must be installed so that they are held securely in the open and close position! Failure to do so can cause the hinges to break and shutter to drop, with risk of damage to property or personal injury.

- **Buffer stops**

A buffer stop must be used to prevent the top part of the shutter springing back when it snaps into place (see Fig. C). When the buffer stop is used, make sure that the facade has sufficient compression strength (e.g. when thermal insulation is used).

- **Distance 210mm for light shutters**

For shutters with an overall weight to a maximum of 20kg (maximum 30kg for MMV hardware range), the distance between the shutter holder and the edge of the shutter at the hinge side must be at least 210mm. This also permits the use of the deluxe shutter holder for windows for these shutters - independent of the width of the shutter.

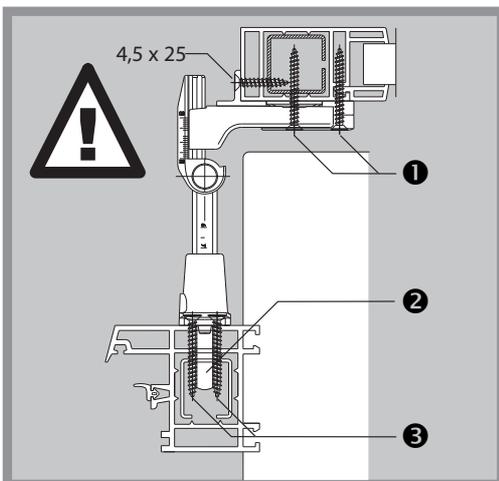
## 1.5 Screw fixing and pin depth

**A fastening agent must be placed in each screw hole of the hardware components to ensure sufficient anchorage in the foundation.**

The application diagrams are based on endurance tests (EN 14648). The MACO screws used in these endurance tests have the following values:

- In Spruce timber with 22mm insertion, without pre-drilling: 1,600N
- In Alu with 1.5mm wall thickness and drilling 2.5mm: 1,200N

### Window and shutter made of PVC



1 - at least 1 screw in the reinforcement

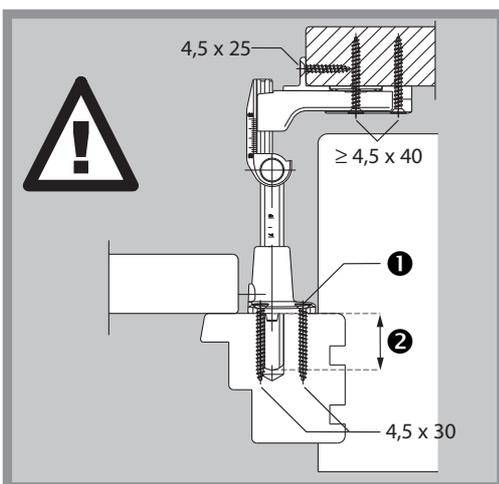
2 - Adjusting pin must reach at least 8mm into the reinforcement and be routed in the Ø 12mm pin hole

3 - Fasten the screws through at least 2 walls and through the reinforcement

If the pre-drilled hole of the straight pin causes problems, cranked pins can be used (e.g. upright reinforcement).

The force between the shutter and hinge is transferred via the hinge body, not via the decorative bracket. The hinge body and mounting bracket must be fastened through the reinforcement.

### Window and shutter made of timber

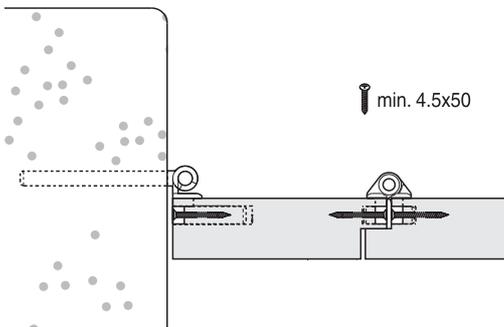


1 - In combination with snap holder  $\geq 4.5 \times 40$ mm

2 - Pin insert depth in Ø 12mm pin holes:

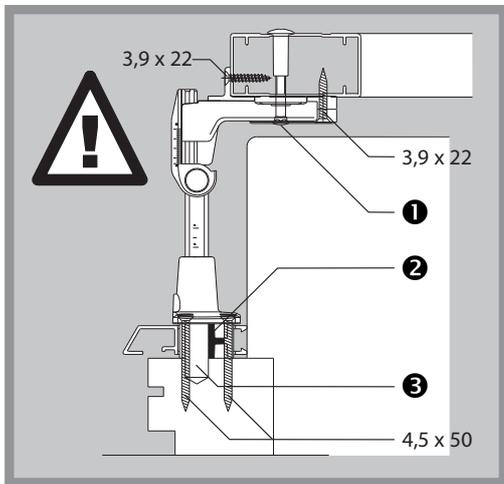
- at least 15mm for pins L59-L135
- at least 20mm for snap holder L90-L140 and for pins L150
- at least 25mm for pins or snap holders up to L165

Concealed hinges on timber



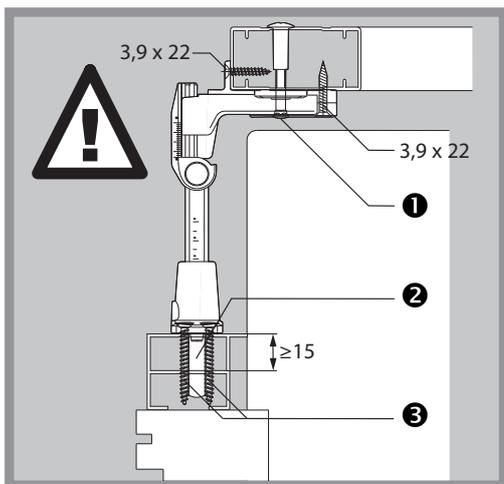
*i*

Window made of timber-aluminium and shutter made of aluminium



- 1 - Fixing screw with threaded sleeve
- 2 - Underlay for aluminium profiles
- 3 - Pin depth in timber frame at least 15mm in pin hole Ø 12mm

Frame and shutter made of aluminium



- 1 - Fixing screw with threaded sleeve
- 2 - Adjusting pin must reach at least 8mm into the second wall and be routed in the Ø 12mm pin hole
- 3 - Fasten the screws through at least 2 walls



## 1.6 Application diagrams

### 1.6.1 Instructions for determining permissible shutter sizes

To read the permissible shutter sizes in the application diagrams, the weight per square meter ( $\text{kg/m}^2$ ) of the shutter must be known.

For the application diagrams shown, the weight per square meter ( $\text{kg/m}^2$ ) is always specified.

#### Determining the weight per square meter ( $\text{kg/m}^2$ )

The easiest method is to "Weigh - measure - divide". Proceed as follows: Use commercially available bathroom scales to determine the overall weight of the shutter, then calculate the shutter surface by multiplying the values for the length and width (specified in meters). Finally divide the weight (kg) by the surface area ( $\text{m}^2$ ).

#### Example calculation

- Shutter height 2.10m, shutter width 0.75m
- Shutter surface =  $2.10\text{m} \times 0.75\text{m} = 1.575\text{m}^2$
- Shutter weight acc. to scales 18kg
- Weight per square meter =  $18\text{kg} : 1.575\text{m}^2 = 11.4\text{kg/m}^2$

#### Select the matching diagram

- For MMV hardware range: Diagram "max.  $12\text{kg/m}^2$ "
- For BLR hardware range: Diagram "max.  $14\text{kg/m}^2$ "

For solid timber shutters, the weight per square meter can be calculated as follows: Multiply the weight of a cubic meter of the timber used by the shutter thickness (specified in meters).

#### Benchmarks for timber weights

- Spruce  $400\text{-}500\text{kg/m}^3$
- Oak  $670\text{-}850\text{kg/m}^3$

#### Example calculation

- Cubic meter weight 430kg, shutter thickness 0.044m
- Weight per square meter =  $430\text{kg} \times 0.044\text{m} = 18.92\text{kg/m}^2$

When using PVC or aluminium profiles contact the profile manufacturer to determine the weight per square metre.

**In installations where hardware components from different hardware ranges are used, the corresponding diagrams for the BLR/MV hardware range must be taken into account when determining the permissible shutter sizes!**

#### Using calculation diagrams

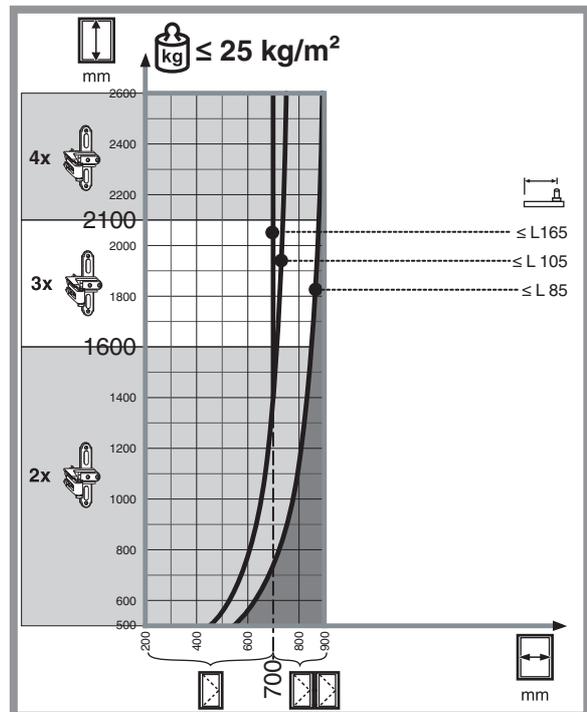
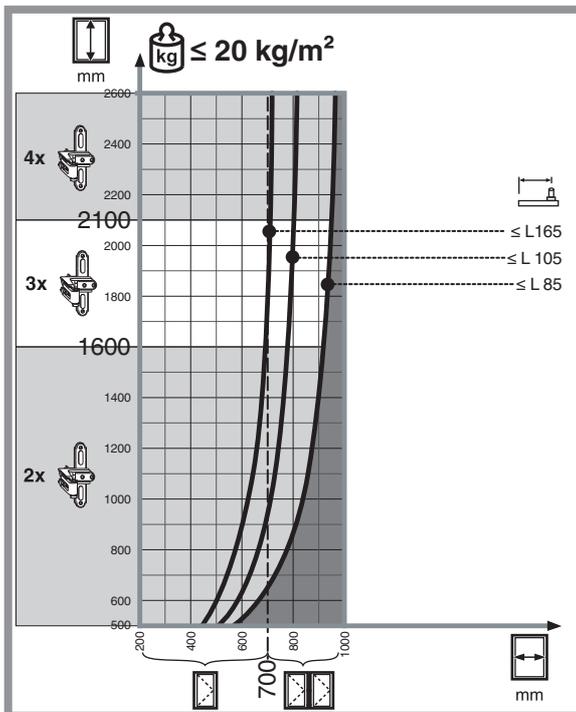
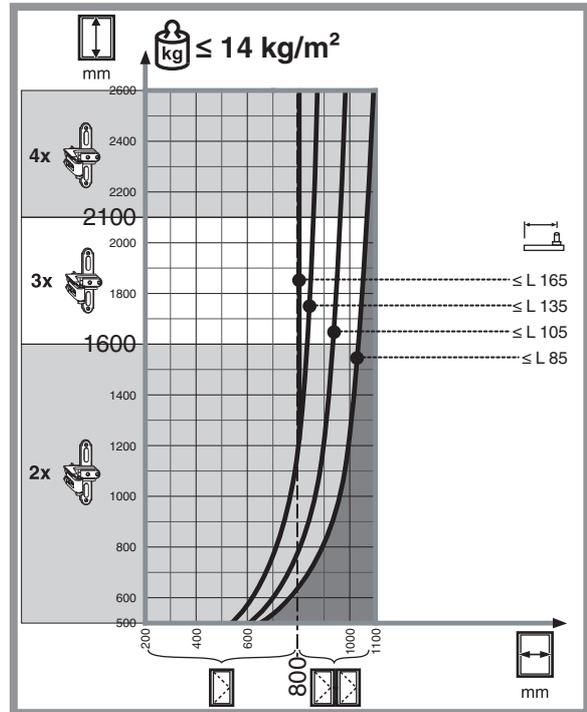
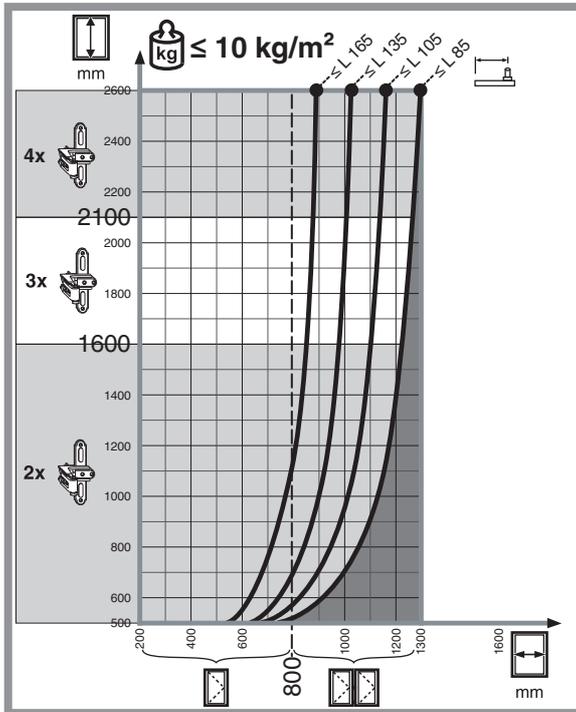
Mark the intersection of the width and height in the diagram for the shutter to be installed.

Use the examples below to determine which important information can be read from the diagrams to ensure correct hardware selection and shutter installation:



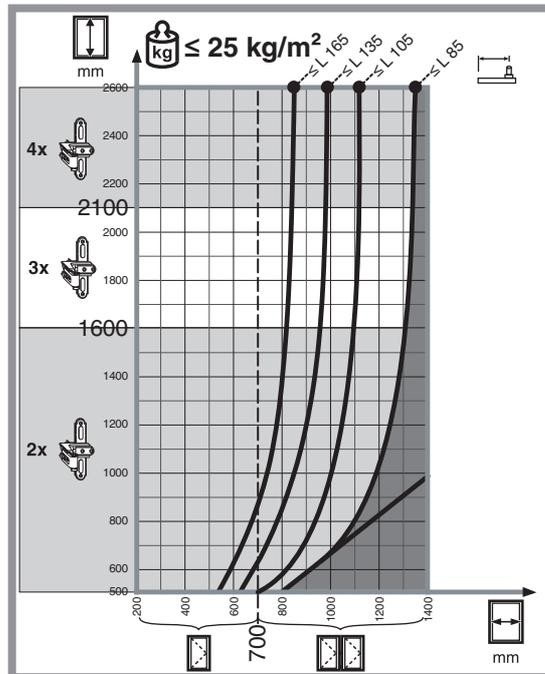
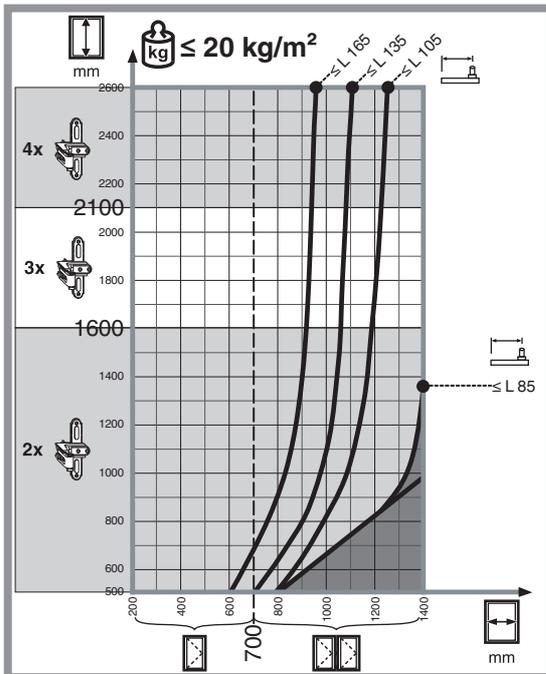
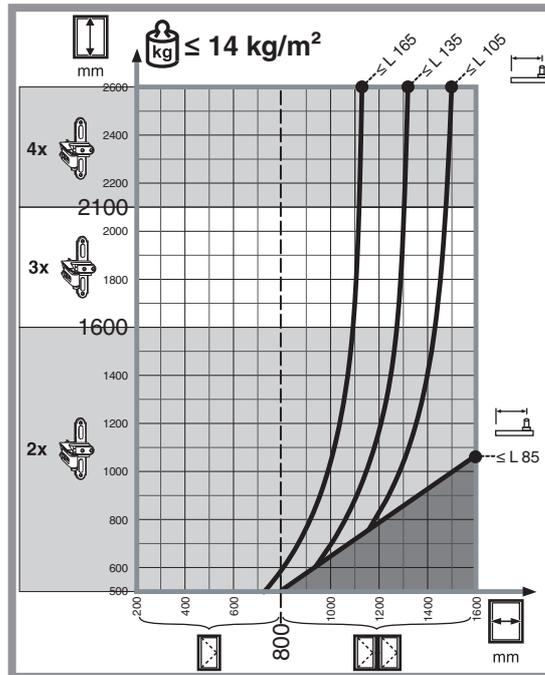
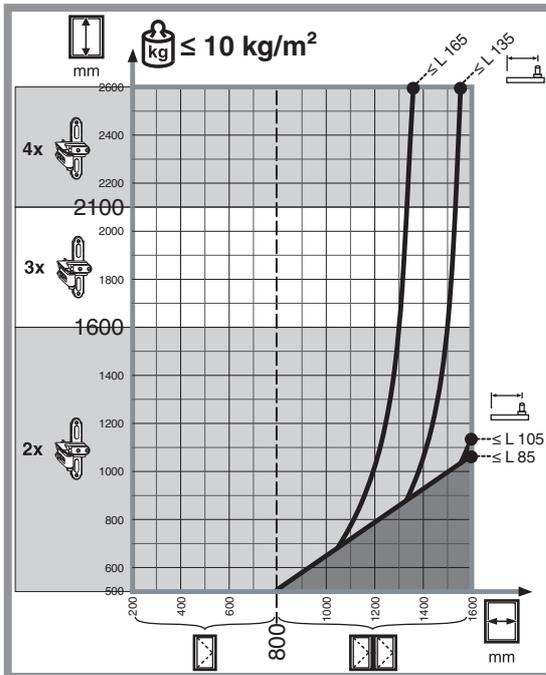
1.6.2 BLR application diagrams, 25mm wide shutter pin holder

The following diagrams apply to MV hardware and to BLR hardware with 25mm wide shutter pin holder.



1.6.3 BLR application diagrams, 35mm wide shutter pin holder

The following diagrams apply to BLR hardware with 35mm wide shutter pin holder and with BLR surface mounted frame hinges.



### 1.6.4 Instructions for masonry installation

The MMV hardware range offers a stable steel hinge and the advantages of adjustability!

The lateral adjustment is used to correct deviations that can arise in the following situations:

- Inaccuracies during installation
- Sash deformation ("hanging")
- Deformation of fasteners and/or hardware components

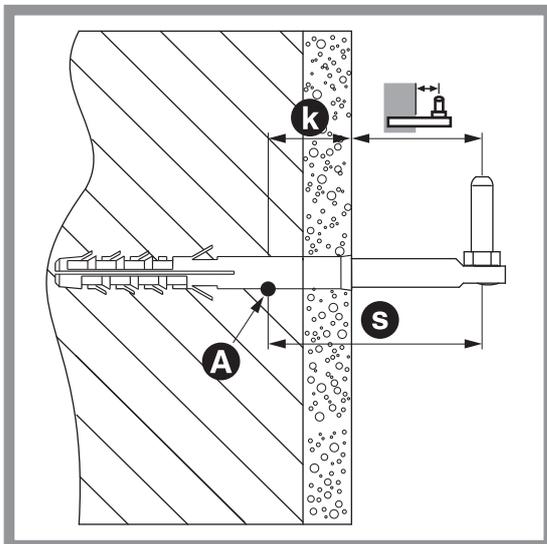
Observe the following points for all following diagrams:

- Use folding shutters for wider shutters and use folding shutter couplings to fasten them to the inside shutter or shutter

holders to fasten them the doors.

- Observe assembly instructions for masonry fixing (item no. 49490)! Particularly observe correct positioning of shutter catches and buffer stops.
- The load-carrying capacity of the shutter pin in the masonry must be checked by the user. If necessary, a different suitable fastening method (e.g. chemical dowel pin etc.) must be used.
- The support span **s** depends on how the shutter pin is fastened and on the properties of the masonry (plaster, insulation) — see figure below "Pin support span":

#### Pin support span



- S** Support span This length is decisive for the shutter pin strength — refer to diagrams for MMV hardware range.
- A** Support point Pin support point in the masonry
- k** Distance This is the distance from the wall surface to point A. This distance depends on how the shutter pin is fastened and on the properties of the masonry (plaster, insulation).



#### Additional

- The load capacity of the anchoring of the shutter pin in the masonry must be assured by the user.
- The 90° shutter pin drilling is no longer valid in terms of current technology. Due to the low edge distance, it is not possible to achieve sufficient safety in many cases.

#### Recommendations from MACO

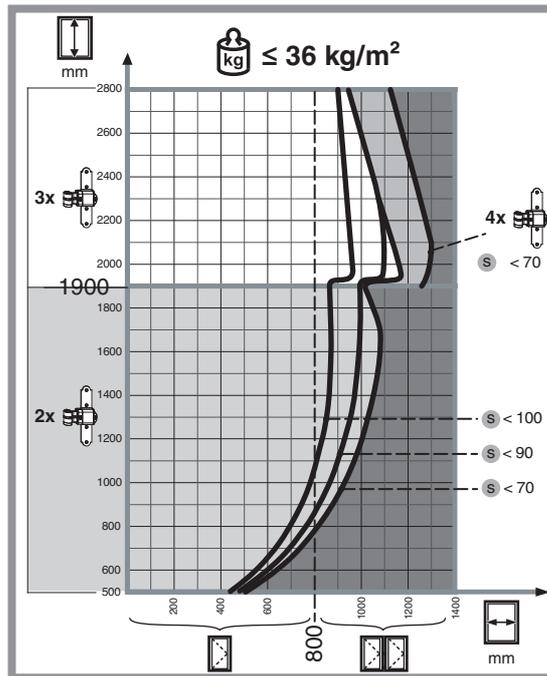
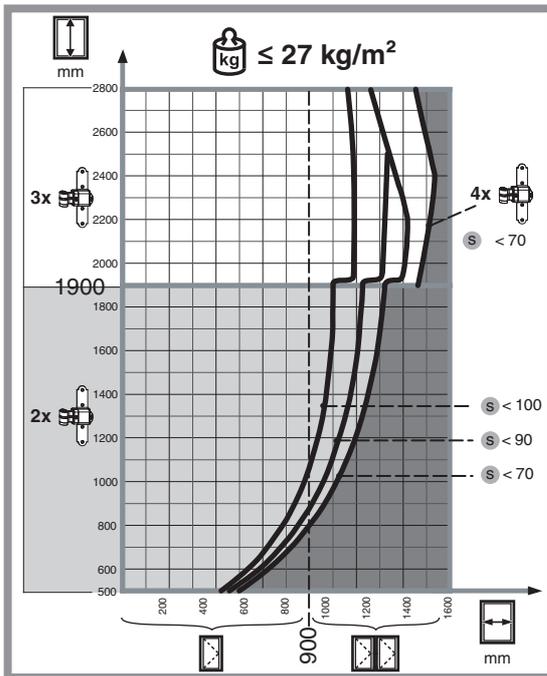
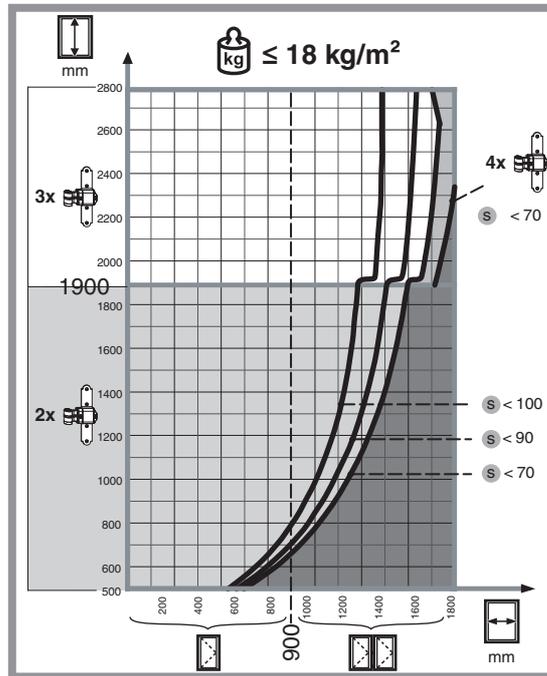
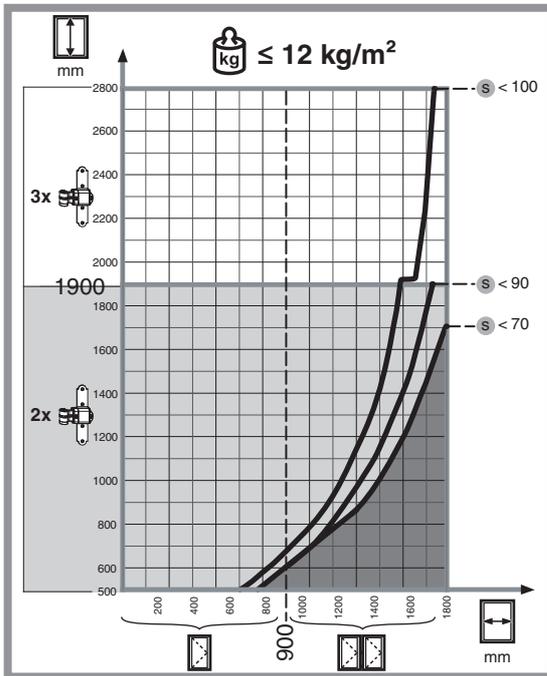
- Careful selection of a suitable fixing to match the masonry
- If in doubt, check the use of chemical dowels

- Slanted shutter pin drilling instead of straight drilling
- Sufficient depth of anchorage (shutter pin length)
- Use of three shutter pins + three hinges for each sash
- Selection and installation of the fixing by qualified personnel
- Define and arrange for regular inspection

#### Restriction

- When using long hinges, the total weight must not exceed 60kg.

1.6.5 MMV application diagrams



*i*

### 1.6.6 Instructions for Ø16 masonry pins

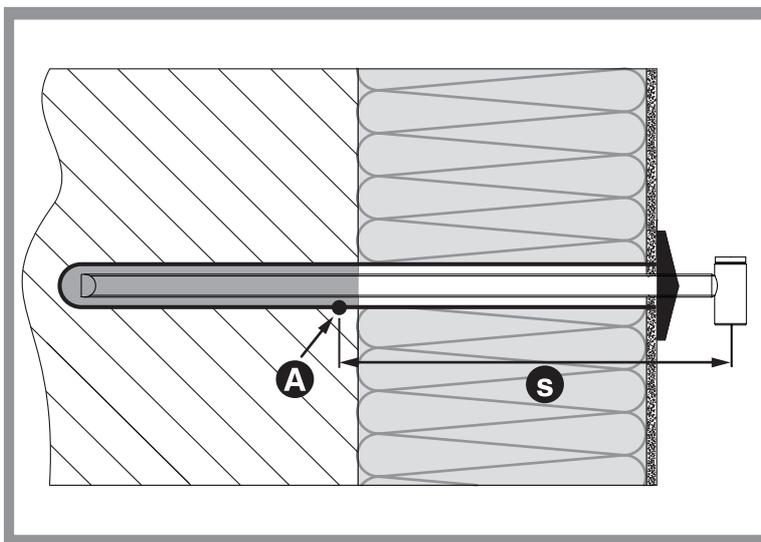
The installation instructions for Ø16 masonry pins (item no. 756580) and the package insert (item no. 750487) must be observed! In particular, make sure that the drilled hole is resistant to heavy rain and that the shutter catch and buffer stop are positioned correctly (refer to section 1.4 *Shutter catches and buffer stops*).

To fasten correctly, we recommend the use of a chemical rawlplug (e.g. from HILTI or WÜRTH).

The load-carrying capacity of the shutter pin in the masonry must be checked by the user. If necessary, a different suitable fastening method (e.g. chemical dowel pin etc.) must be used.

When using certain types of chemical rawlplugs it may be necessary to chamfer the end of the shutter pin to prevent subsequent rotation of the shutter pin after installation.

#### Pin support span

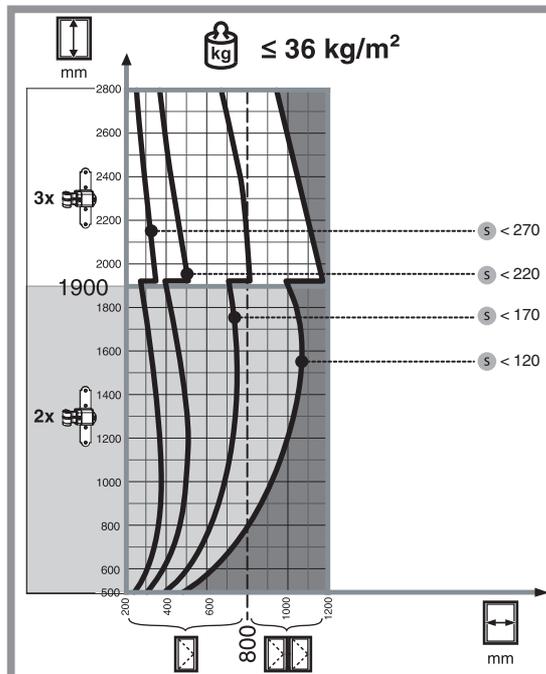
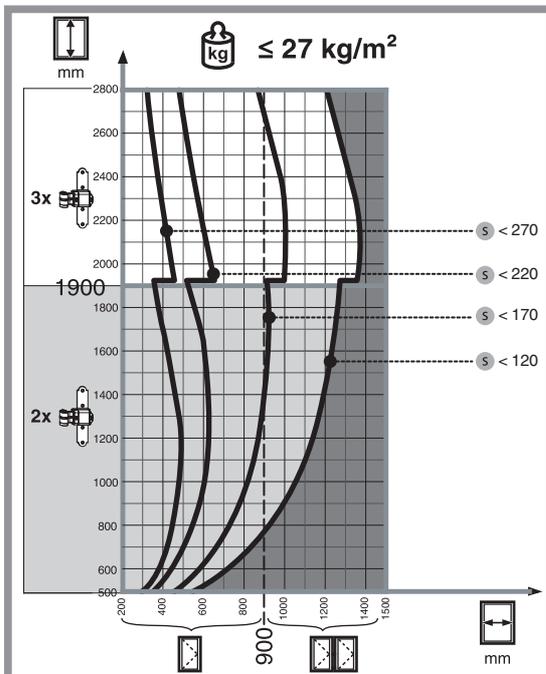
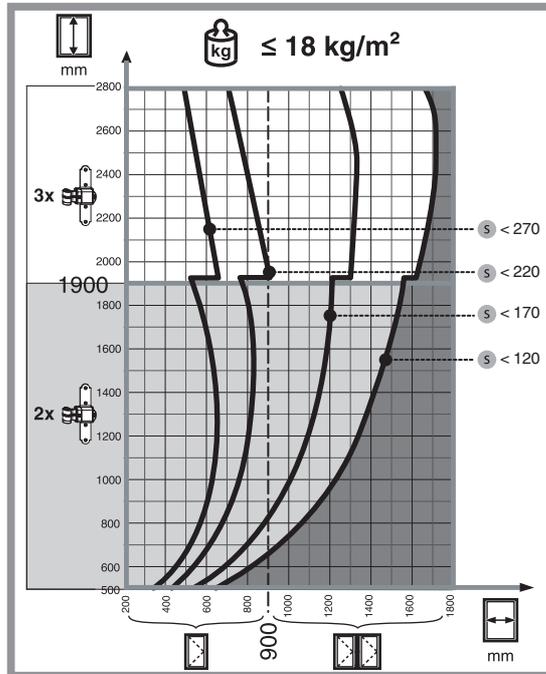
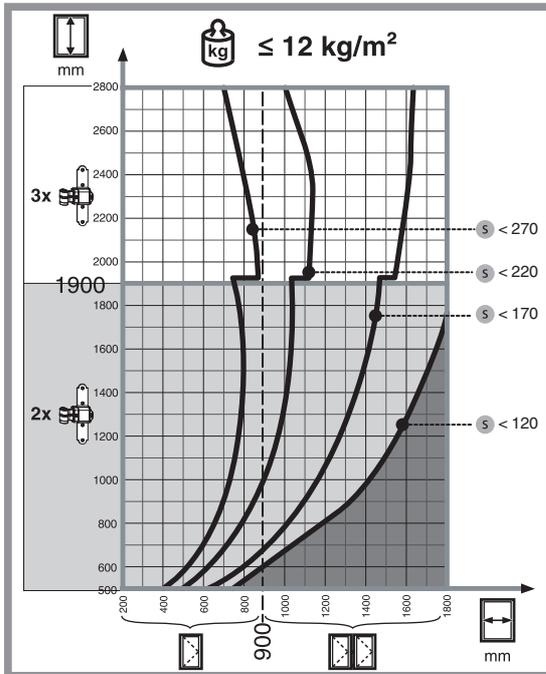


**S** Support span This length is decisive for the shutter pin strength — refer to diagrams on the following page!

**A** Support point Pin support point in the masonry

1.6.7 MMV application diagrams, Ø16 thread

The following diagrams apply to MMV hinges and MMV shutter pins, Ø16 thread.





**1.6.8 PAD table**

The following table applies to PAD hinges and shutter pins. Maximum sash weight 21kg/m<sup>2</sup>.

Number of shutter hinges	Shutter height	Shutter width
2	≤ 1600mm	max. 900mm
2	≤ 1900mm	max. 800mm
3	≤ 2200mm	max. 900mm
3	≤ 2400mm	max. 800mm



## 1.7 Surface finish RUSTICO PREMIUM-PLUS

### 1.7.1 Surface finish with 10-year guarantee

From 2013, the RUSTICO hardware comes with a new anti-corrosion coating technology. MACO guarantees to the fabricator a 10-year resistance to corrosion. This guarantee applies to all locations, including coastal regions. For more information about the guarantee, please contact your MACO specialist or check the guarantee certificate. The certification by ift Rosenheim and the guarantee certificate can be found on our website ([www.maco.eu](http://www.maco.eu)).

### 1.7.2 Sustainability

- Long service life
- No solvents
- Closed production circuits
- Chrome -VI free

### 1.7.3 Quality

- The exceptionally high resistance to corrosion is continually tested by in-house salt-spray testing in compliance with ISO 9227. All parts are flawless after 1,500 hours. Furthermore, we continually monitor raw material quality and layer thickness.
- Test certificate issued by the accredited testing institute ift-

Rosenheim (Germany) regarding salt spray testing according to ISO 9227. All parts turned out flawless even after 1,500 hours and have therefore clearly surpassed class 5 (highest level) according to EN1670 (this standard requires only 480 hours exposure).

- UV-resistance and colour stability of all powder-coated surfaces.
- The textured surface is robust and dirt-repellent and possesses high scratch resistance.
- PVC parts made of UV-resistant and colour-stable materials.
- Natural weathering test.

### 1.7.4 Available colours

MACO-RUSTICO hardware components for shutters are available in three standard colours:

- Black S: fine structure RAL 9005
- Grey S: fine structure RAL 7004
- White S: fine structure RAL 9016

### 1.7.5 Care

To preserve the quality of the hardware for long time, please observe the information provided in the operation and maintenance instructions for window shutters.





## 1.8 Certificates and guarantees

MACO ensures high quality, not only with ongoing continuous internal testing, but also through external auditing by renowned, independent institutes. Copies of all our current independent test certificates, covering our quality, safety and environmental management systems, as well as our product

guarantees are available to download from our website [www.maco.eu](http://www.maco.eu). In addition our safety descriptions relating to dangerous substances (REACH Declaration) are available, covering all MACO products.

## 1.9 General terms and conditions

Our current general terms and conditions are available for download from our website ([www.maco.eu](http://www.maco.eu)).



## 2 Frame installation

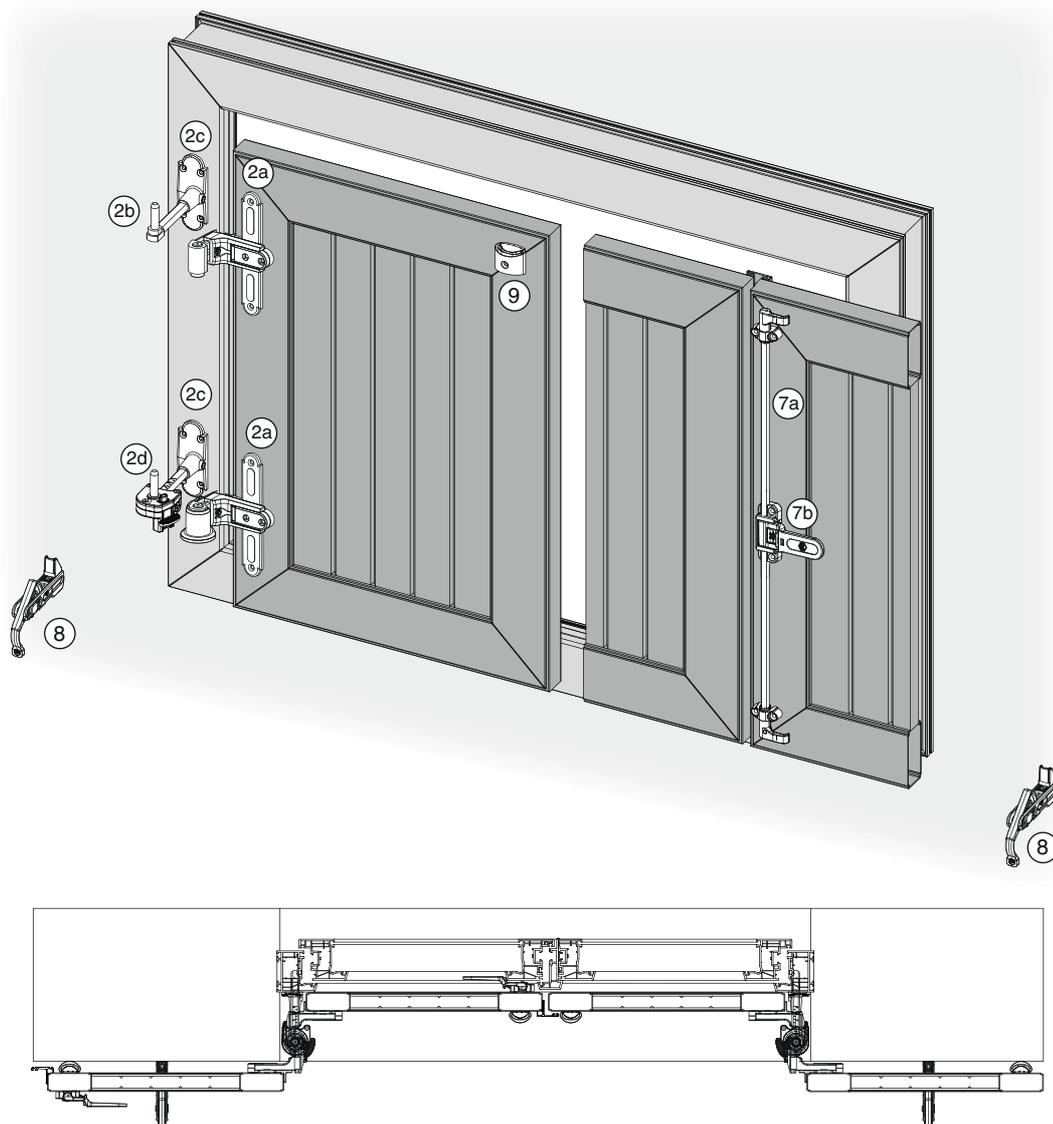
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## 2 Frame installation

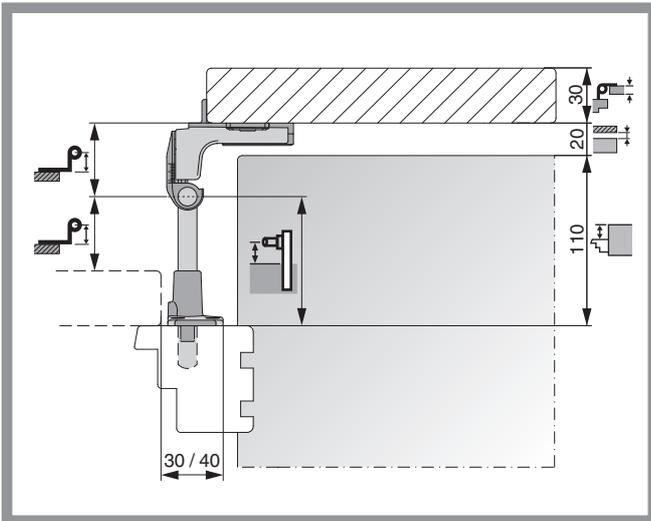
### 2.1 Information for hardware selection

#### 2.1.1 2-sashed



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2c	2.4 BLR shutter pin holders	→54
2d	2.5 BLR snap holders	→55
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7b	7.7 Centre locks	→129
8	8 Shutter catches	→132
9	9.2 Buffer stops	→146

2.1.1.1 Flush mounted without spacing



Calculation shutter pin distance

$$\begin{array}{r}
 \begin{array}{l} \text{Shutter thickness} \\ \text{Distance between shutter and frame} \end{array} \\
 \begin{array}{l} 110\text{mm} \\ + 20\text{mm} \\ + 30\text{mm} \end{array} \\
 \hline
 = 160\text{mm} : 2 = 80\text{mm}
 \end{array}$$

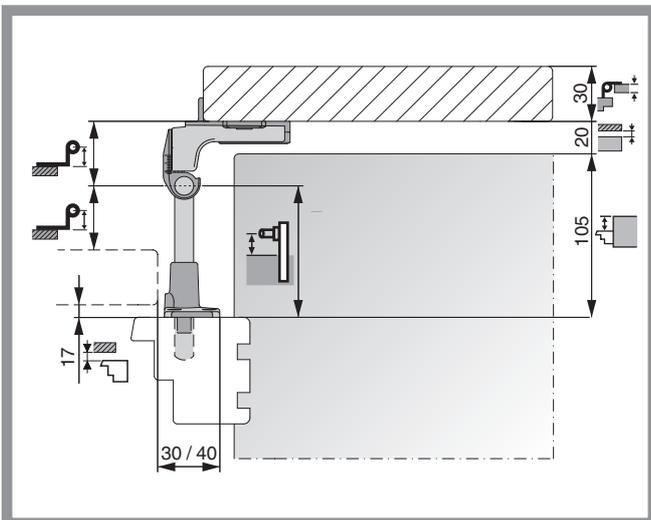
→ L 105 (60-90mm)

Calculation hinge crank

$$\begin{array}{r}
 \begin{array}{l} \text{Shutter thickness} \\ \text{Distance between shutter and frame} \end{array} \\
 \begin{array}{l} 110\text{mm} \\ + 20\text{mm} \\ - 30\text{mm} \end{array} \\
 \hline
 = 100\text{mm} : 2 = 50\text{mm}
 \end{array}$$

→ Gr. 2 (45-70mm)

2.1.1.2 Flush mounted with spacing



Calculation shutter pin distance

$$\begin{array}{r}
 \begin{array}{l} \text{Shutter thickness} \\ \text{Distance between shutter and frame} \\ \text{Shutter thickness} \\ \text{Distance between shutter and frame} \end{array} \\
 \begin{array}{l} 105\text{mm} \\ + 20\text{mm} \\ + 47\text{mm} \\ \text{(shutter thickness 30mm + distance 17mm)} \end{array} \\
 \hline
 = 172\text{mm} : 2 = 86\text{mm}
 \end{array}$$

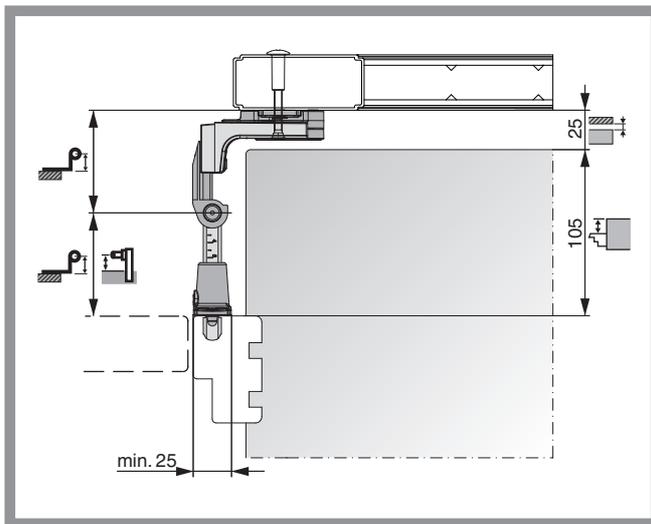
→ L 105 (60-90mm)

Calculation hinge crank

$$\begin{array}{r}
 \begin{array}{l} \text{Shutter thickness} \\ \text{Distance between shutter and frame} \\ \text{Distance between shutter and frame} \\ \text{Distance between shutter and frame} \end{array} \\
 \begin{array}{l} 105\text{mm} \\ + 20\text{mm} \\ - 30\text{mm} \\ - 17\text{mm} \end{array} \\
 \hline
 = 78\text{mm} : 2 = 39\text{mm}
 \end{array}$$

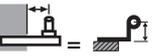
→ Gr. 1 (32-50mm)

2.1.1.3 Flush



Calculation shutter pin distance = hinge crank

	25mm
	+ 105mm
<hr/>	
=	130mm : 2 = 65mm
<hr/>	

 = 

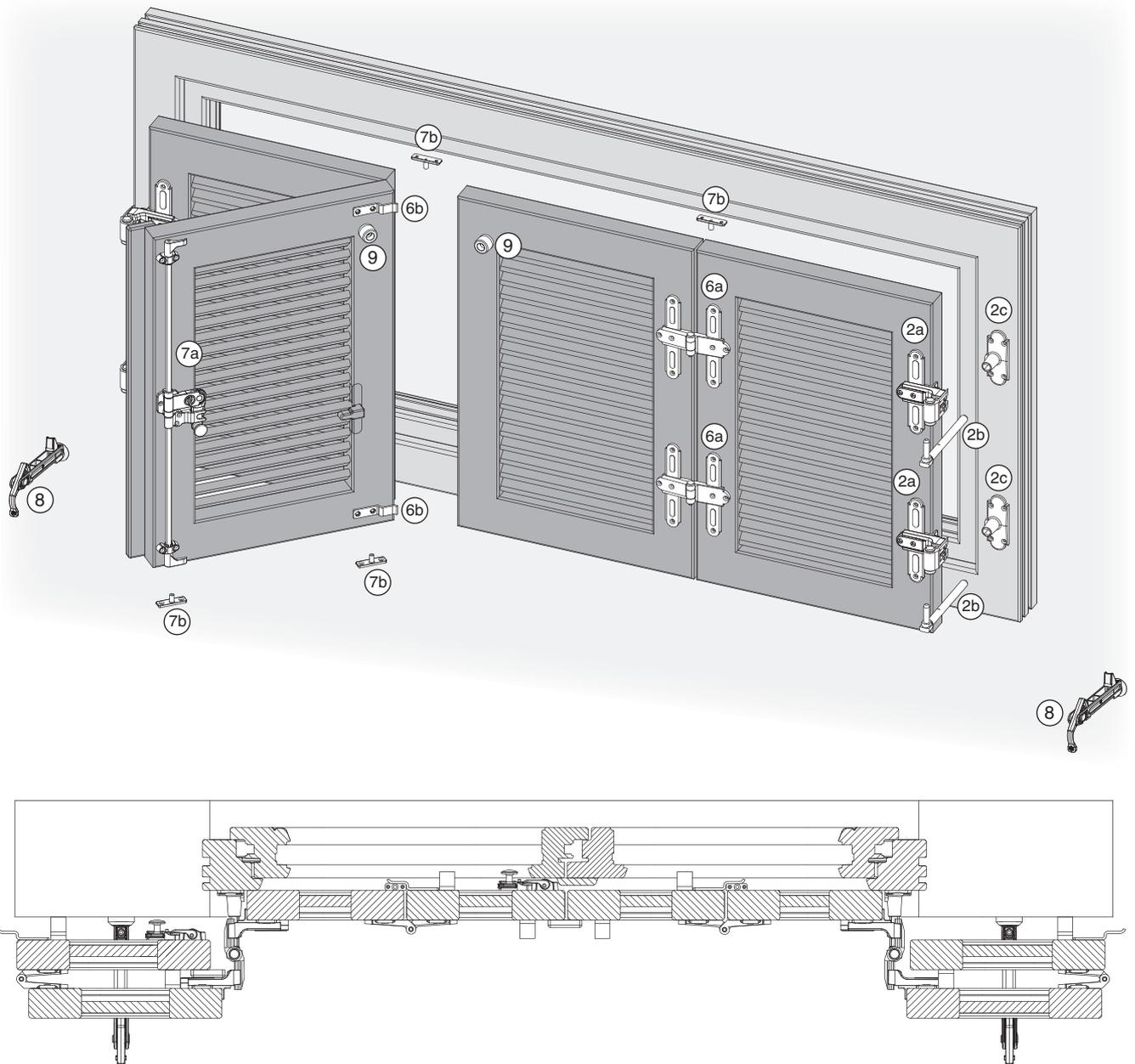
MACO  
RUSTICO



## Frame installation Information for hardware selection

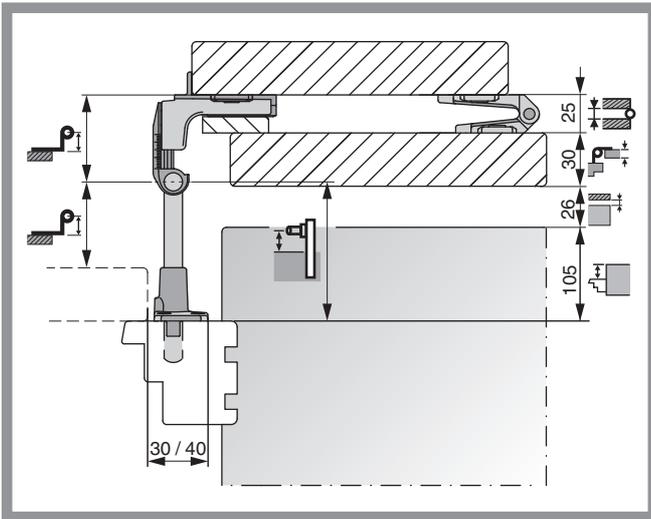


2.1.2 4-sashed with external pivot point



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2a	2.2.2.2 BLR cross hinges with variable crank	→47
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6a	6.1.1 BLR centre cross hinges	→102
6b	6.6 Multi-sash locking hooks	→108
7a	7.1.3.2 2F shutter locks with spring-loaded locking hooks	→115
7b	7.3 Striker pin brackets for frame installation	→118
8	8 Shutter catches	→132
9	9.2 Buffer stops	→146

2.1.2.1 Flush mounted without spacing



Calculation shutter pin distance

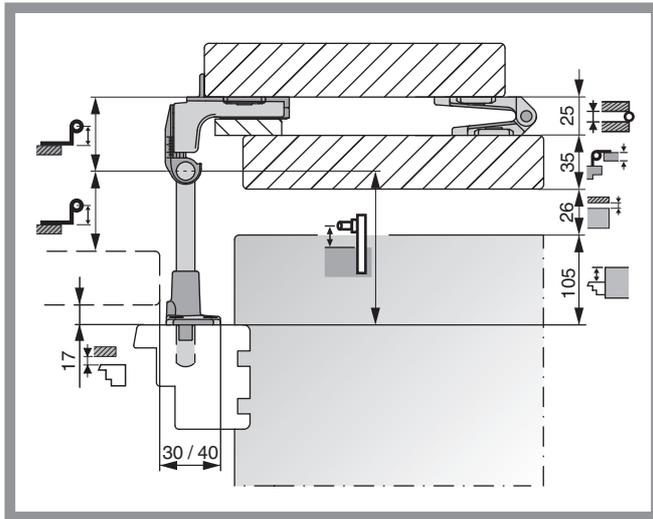
	105mm
	+ 26mm
	+ 25mm
2 x	+ 60mm
<hr/>	
=	216mm : 2 = 108mm
<hr/>	
→ L 135	(80-120mm)

Calculation hinge crank

	105mm
	+ 26mm
	+ 25mm
<hr/>	
=	156mm : 2 = 78mm
<hr/>	
→ Gr. 3	(65-100mm)



2.1.2.2 Flush mounted with spacing



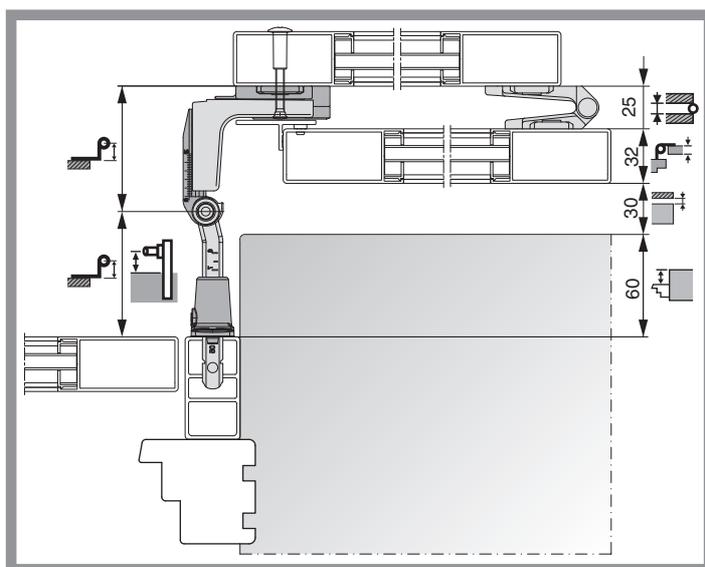
Calculation shutter pin distance

	105mm
	+ 26mm
	+ 25mm
2 x	+ 70mm
	+ 17mm
<hr/>	
=	243mm : 2 = 121,5mm
<hr/>	
→ L 165	(120-140mm)

Calculation hinge crank

	105mm
	+ 26mm
	+ 25mm
	- 17mm
<hr/>	
=	139mm : 2 = 69,5mm
<hr/>	
→ Gr. 3	(65-100mm)

2.1.2.3 Flush



Calculation shutter pin distance = hinge crank

	60mm
	+ 30mm
	+ 32mm
	+ 25mm
<hr/>	
=	147mm : 2 = 73,5mm  =
<hr/>	
→ L 105	
→ hinge without fixing tab Gr. 2	(70-95mm)

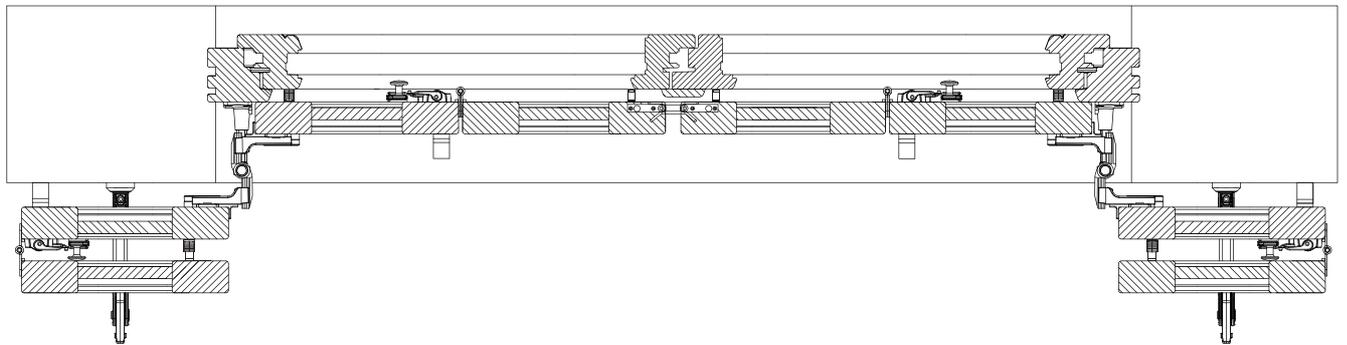
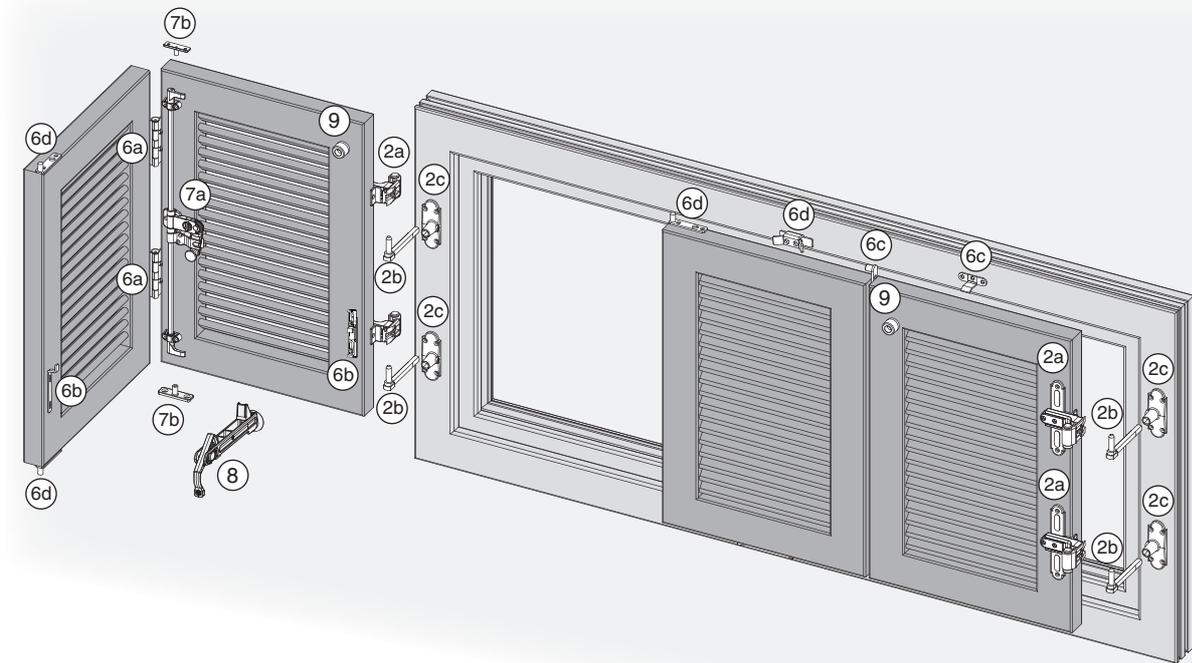
MACO  
RUSTICO



## Frame installation Information for hardware selection



2.1.3 4-sashed with internal pivot point

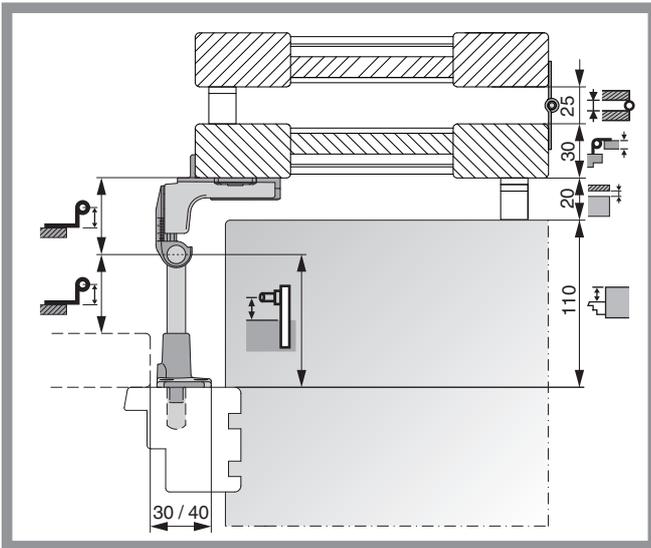


**Selection guide**

**Page**

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2b	2.3.1.2 BLR threaded surface mounted frame hinges straight with lateral adjustment	→54
2c	2.4.1 BLR shutter pin holders	→54
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6b	6.2 Folding shutter couplings	→106
6c	6.5 Shutter suspending run-up block	→107
6d	6.6 Multi-sash locking hooks	→108
7a	7.1.3.2 2F shutter locks with spring-loaded locking hooks	→115
7b	7.3 Striker pin brackets for frame installation	→118
8	8.1.3 Shutter catches "Classic" model with cover disk without fixing bolts	→140
9	9.2 Buffer stops	→146

2.1.3.1 Flush mounted without spacing



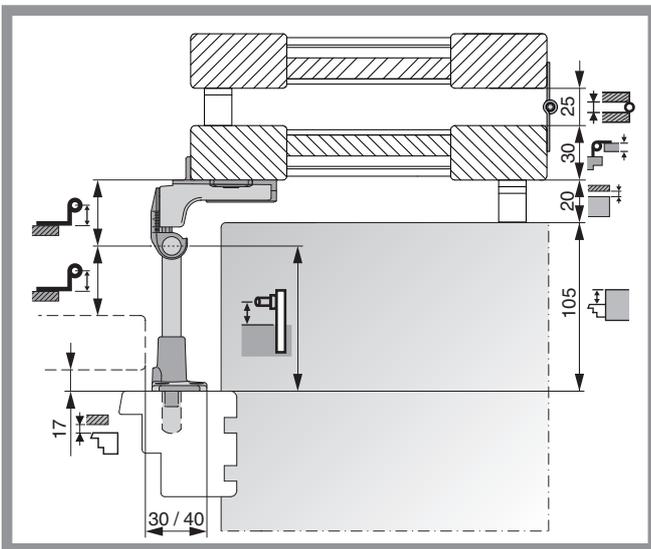
Calculation shutter pin distance

	110mm
	+ 20mm
	+ 30mm
<b>=</b>	160mm : 2 = 80mm
<b>→</b>	L 105 (60-90mm)

Calculation hinge crank

	110mm
	+ 20mm
	- 30mm
<b>=</b>	100mm : 2 = 50mm
<b>→</b>	Gr. 2 (45-70mm)

2.1.3.2 Flush mounted with spacing



Calculation shutter pin distance

	105mm
	+ 20mm
	+ 47mm (shutter thickness 30mm + distance 17mm)
<b>=</b>	172mm : 2 = 86mm
<b>→</b>	L 105 (60-90mm)

Calculation hinge crank

	105mm
	+ 20mm
	- 30mm
	- 17mm
<b>=</b>	78mm : 2 = 39mm
<b>→</b>	Gr. 1 (32-50mm)

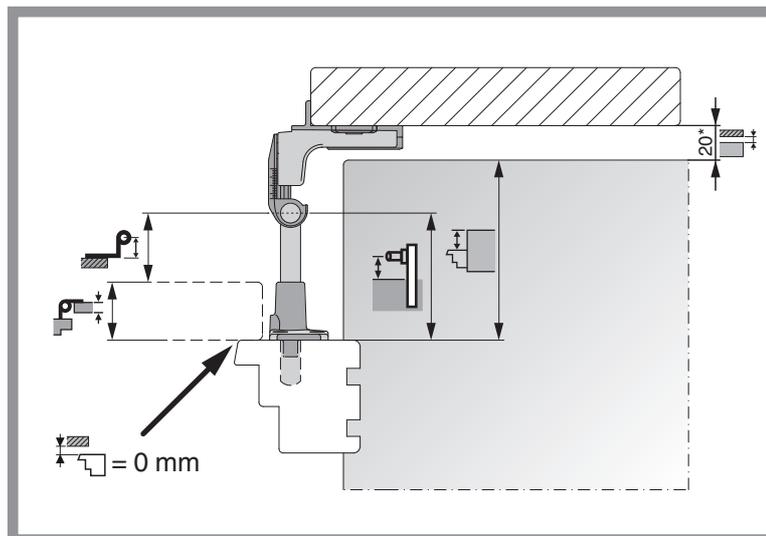
2.1.4 Tables for BLR hardware sizes

for shutter distance 0mm (pin and snap holder sizes apply for installation on timber — see Section 1.5)

Sash hinges - Crank																				Distance	0										
		Reveal-depth in mm																													
		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210								
Shutter thickness	25 mm	0	15	15	15	20	23	28	33	38	43	48	53	58	63	68	73	78	83	88	93	98	0								
	30 mm	0	0	15	15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100								
	35 mm	0	0	15	15	15	20	23	28	33	38	43	48	53	58	63	68	73	78	83	88	93	98								
	40 mm	0	0	0	15	15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95								
	50 mm	0	0	0	0	15	15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90								
		flat					flush					Gr.0					Gr.1					Gr.2					Gr.3				
		Fixed Crank with lateral adjustment										Crank with lateral adjustment																			

Adjustable shutter pin - Distance																													
		Reveal-depth in mm																											
		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210						
Shutter thickness	25 mm	0	40	40	40	45	48	53	58	63	68	73	78	83	88	93	98	103	108	113	118	123	0						
	30 mm	30	30	45	45	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130						
	35 mm	35	35	50	50	50	55	58	63	68	73	78	83	88	93	98	103	108	113	118	123	128	133						
	40 mm	40	40	40	55	55	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135						
	50 mm	50	50	50	50	65	65	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140						
		L59	L75			L85			L95			L105			L115			L125			L135			L150			L165		

Shutter catch - Shutter pin distance																										
		Reveal-depth in mm																								
		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210			
Shutter thickness	25 mm	0	0	0	0	0	54	54	58	63	68	73	78	83	88	93	98	103	108	113	118	123	0			
	30 mm	0	0	0	0	0	59	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	0			
	35 mm	0	0	0	0	0	64	64	68	73	78	83	88	93	98	103	108	113	118	123	128	133	0			
	40 mm	0	0	0	0	0	69	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	0			
	50 mm	0	0	0	0	0	79	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	0			
							L90					L110					L140					L165 always between 2 shutter pins				



\* 20mm for hinges with adjustable crank. 20-50mm for hinges with crank fixing.

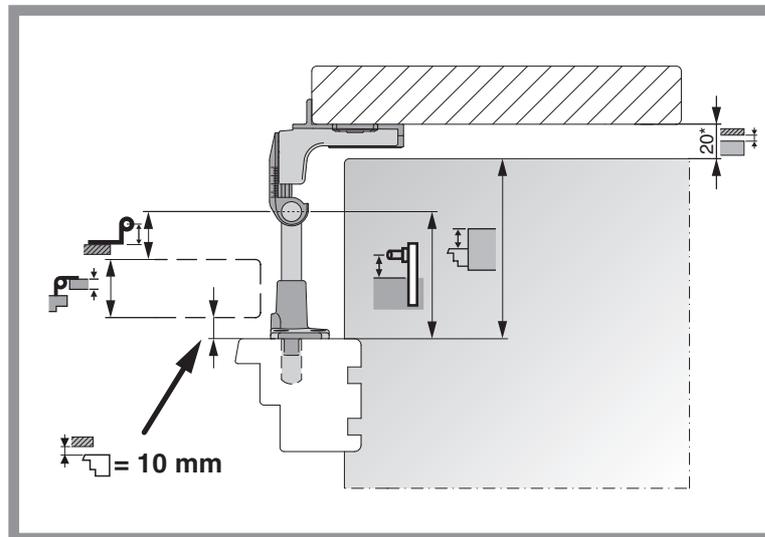
for shutter distance 10mm (pin and snap holder sizes apply for installation on timber — see Section 1.5)

Sash hinges - Crank																					Distance	10							
		Reveal-depth in mm																											
		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210						
Shutter thickness	25 mm	0	15	15	15	20	23	28	33	38	43	48	53	58	63	68	73	78	83	88	93	98							
	30 mm	0	0	15	15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95							
	35 mm	0	0	15	15	15	20	23	28	33	38	43	48	53	58	63	68	73	78	83	88	93							
	40 mm	0	0	0	15	15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90							
	50 mm	0	0	0	0	15	15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90						
flat					flush					Gr.0					Gr.1					Gr.2					Gr.3				
Fixed Crank with lateral adjustment										Crank with lateral adjustment																			



Adjustable shutter pin - Distance																												
		Reveal-depth in mm																										
		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210					
Shutter thickness	25 mm	35	50	50	50	53	58	63	68	73	78	83	88	93	98	103	108	113	118	123	128	133						
	30 mm	40	40	55	55	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135						
	35 mm	45	45	60	60	60	63	68	73	78	83	88	93	98	103	108	113	118	123	128	133	138						
	40 mm	50	50	50	65	65	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140						
	50 mm	60	60	60	75	75	75	80	85	90	95	100	105	110	115	120	125	130	135	140								
L59		L75			L85			L95			L105			L115			L125			L135			L150			L165		

Shutter catch - Shutter pin distance																							
		Reveal-depth in mm																					
		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210
Shutter thickness	25 mm							64	64	68	73	78	83	88	93	98	103	108	113	118	123	128	133
	30 mm							69	69	70	75	80	85	90	95	100	105	110	115	120	125	130	135
	35 mm							74	74	78	83	88	93	98	103	108	113	118	123	128	133	138	
	40 mm							79	79	80	85	90	95	100	105	110	115	120	125	130	135	140	
	50 mm							89	89	90	95	100	105	110	115	120	125	130	135	140			
L90							L110					L140					L165 always between 2 shutter pins						



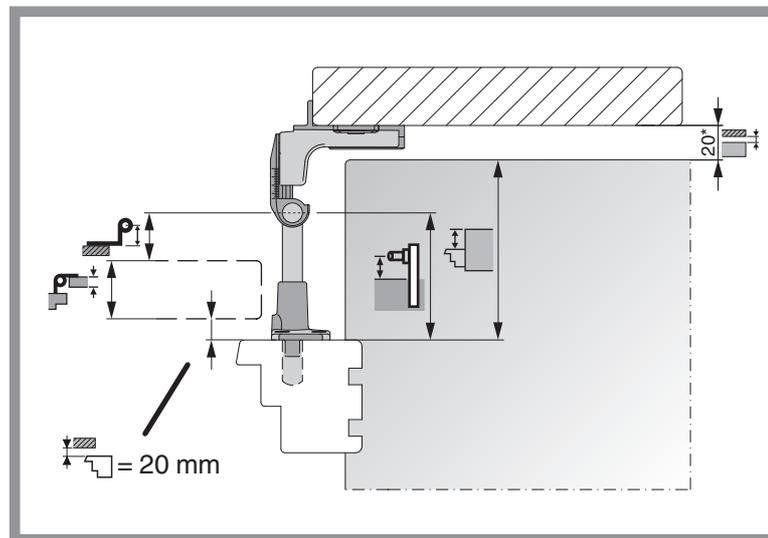
\* 20mm for hinges with adjustable crank. 20-50mm for hinges with crank fixing.

**for shutter distance 20mm** (pin and snap holder sizes apply for installation on timber — see Section 1.5)

Sash hinges - Crank																				Distance	20										
		Reveal-depth in mm																													
		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210								
Shutter thickness	25 mm	0	0	0	15	15	15	20	23	28	33	38	43	48	53	58	63	68	73	78	83	88	93								
	30 mm	0	0	0	0	15	15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90								
	35 mm	0	0	0	0	15	15	15	20	23	28	33	38	43	48	53	58	63	68	73	78	83									
	40 mm	0	0	0	0	15	15	15	20	25	30	35	40	45	50	55	60	65	70	75	80										
	50 mm	0	0	0	0	15	15	15	20	25	30	35	40	45	50	55	60	65	70	75	80										
		flat					flush					Gr.0					Gr.1					Gr.2					Gr.3				
		Fixed Crank with lateral adjustment										Crank with lateral adjustment																			

Adjustable shutter pin - Distance																							
		Reveal-depth in mm																					
		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210
Shutter thickness	25 mm	45	45	45	60	60	60	65	68	73	78	83	88	93	98	103	108	113	118	123	128	133	138
	30 mm	50	50	50	65	65	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	
	35 mm	55	55	55	70	70	70	73	78	83	88	93	98	103	108	113	118	123	128	133	138		
	40 mm	60	60	60	75	75	75	80	85	90	95	100	105	110	115	120	125	130	135	140			
	50 mm	70	70	70	85	85	85	90	95	100	105	110	115	120	125	130	135	140					
		L75	L85		L95		L105			L115		L125		L135		L150		L165					

Shutter catch - Shutter pin distance																								
		Reveal-depth in mm																						
		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	
Shutter thickness	25 mm								74	74	78	83	88	93	98	103	108	113	118	123	128	133	138	
	30 mm								79	79	80	85	90	95	100	105	110	115	120	125	130	135	140	
	35 mm								84	84	88	93	98	103	108	113	118	123	128	133	138			
	40 mm								89	89	90	95	100	105	110	115	120	125	130	135	140			
	50 mm								99	99	100	105	110	115	120	125	130	135	140					
									L110					L140					L165 always between 2 shutter pins					



\* 20mm for hinges with adjustable crank. 20-50mm for hinges with crank fixing.

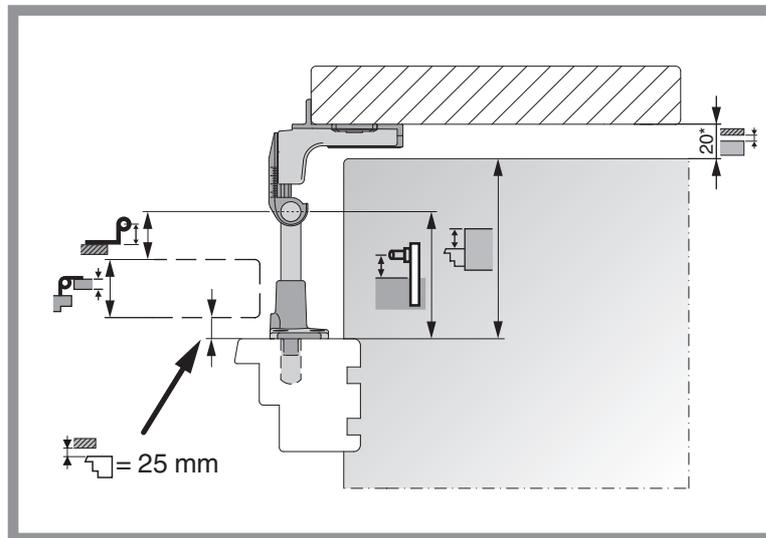
for shutter distance 25mm (pin and snap holder sizes apply for installation on timber — see Section 1.5)

Sash hinges - Crank																				Distance	25		
		Reveal-depth in mm																					
		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210
Shutter thickness	25 mm		0	0	0	15	15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
	30 mm		0	0	0	15	15	15	20	23	28	33	38	43	48	53	58	63	68	73	78	83	
	35 mm			0	0	0	15	15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	
	40 mm				0	0	0	15	15	15	20	23	28	33	38	43	48	53	58	63	68	73	
	50 mm					0	0	0	15	15	15	20	23	28	33	38	43	48	53	58	63		
flat							flush					Gr.0				Gr.1			Gr.2			Gr.3	
Fixed Crank with lateral adjustment										Crank with lateral adjustment													



Adjustable shutter pin - Distance																							
		Reveal-depth in mm																					
		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210
Shutter thickness	25 mm		50	50	50	65	65	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140
	30 mm		55	55	55	70	70	70	75	78	83	88	93	98	103	108	113	118	123	128	133	138	
	35 mm			60	60	60	75	75	75	80	85	90	95	100	105	110	115	120	125	130	135	140	
	40 mm				65	65	65	80	80	80	85	88	93	98	103	108	113	118	123	128	133	138	
	50 mm					75	75	75	90	90	90	95	98	103	108	113	118	123	128	133	138		
L75			L85			L95			L105			L115		L125		L135		L150		L165			

Shutter catch - Shutter pin distance																							
		Reveal-depth in mm																					
		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210
Shutter thickness	25 mm								79	79	80	85	90	95	100	105	110	115	120	125	130	135	140
	30 mm								84	84	88	93	98	103	108	113	118	123	128	133	138		
	35 mm								89	89	90	95	100	105	110	115	120	125	130	135	140		
	40 mm								94	94	98	103	108	113	118	123	128	133	138				
	50 mm										104	104	108	113	118	123	128	133	138				
L110									L140						L165 always between 2 shutter pins								



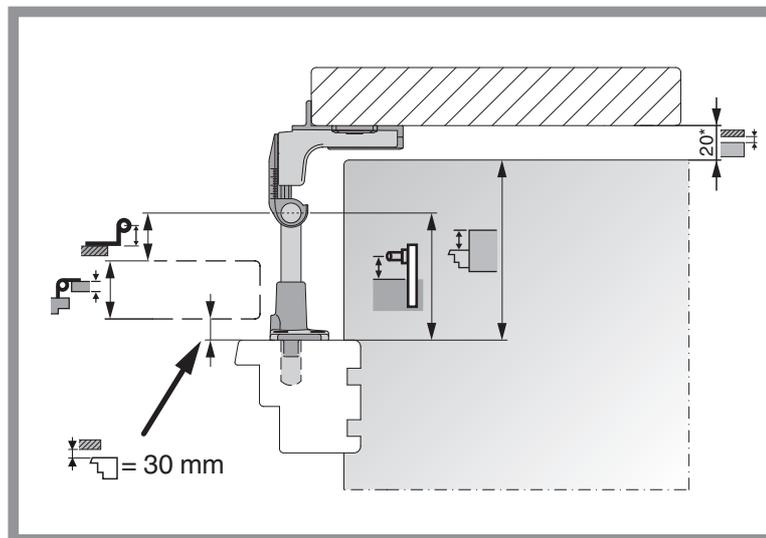
\* 20mm for hinges with adjustable crank. 20-50mm for hinges with crank fixing.

**for shutter distance 30mm** (pin and snap holder sizes apply for installation on timber — see Section 1.5)

Sash hinges - Crank																				Distance	30			
		Reveal-depth in mm																						
		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	
Shutter thickness	25 mm		0	0	0	15	15	15	20	23	28	33	38	43	48	53	58	63	68	73	78	83		
	30 mm			0	0	0	15	15	15	20	23	28	33	38	43	48	53	58	63	68	73	78	83	
	35 mm				0	0	15	15	15	20	23	28	33	38	43	48	53	58	63	68	73		80	
	40 mm					0	0	15	15	15	20	25	30	35	40	45	50	55	60	65	70			
	50 mm						0	0	0	15	15	15	20	25	30	35	40	45	50	55	60			
		flat						flush				Gr.0			Gr.1			Gr.2			Gr.3			
Fixed Crank with lateral adjustment										Crank with lateral adjustment														

Adjustable shutter pin - Distance																						
		Reveal-depth in mm																				
		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
Shutter thickness	25 mm		55	55	55	70	70	70	73	78	83	88	93	98	103	108	113	118	123	128	133	138
	30 mm			60	60	60	75	75	75	80	85	90	95	100	105	110	115	120	125	130	135	140
	35 mm				65	65	65	80	80	80	88	88	93	98	103	108	113	118	123	128	133	138
	40 mm					70	70	70	85	85	85	90	95	100	105	110	115	120	125	130	135	140
	50 mm						80	80	80	95	95	95	100	105	110	115	120	125	130	135	140	
		L75	L85	L95	L105			L115			L125			L135			L150			L165		

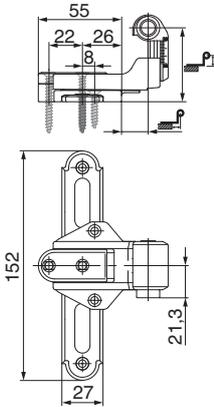
Shutter catch - Shutter pin distance																						
		Reveal-depth in mm																				
		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
Shutter thickness	25 mm							84	84	84	88	93	98	103	108	113	118	123	128	133	138	
	30 mm								89	89	90	95	100	105	110	115	120	125	130	135	140	
	35 mm								94	94	94	98	103	108	113	118	123	128	133	138		
	40 mm									99	99	100	105	110	115	120	125	130	135	140		
	50 mm										109	109	110	115	120	125	130	135	140			
								L110				L140				L165 always between 2 shutter pins						



\* 20mm for hinges with adjustable crank. 20-50mm for hinges with crank fixing.

## 2.2 Hinges

### 2.2.1 Hinges without fixing tab (for flush installation)

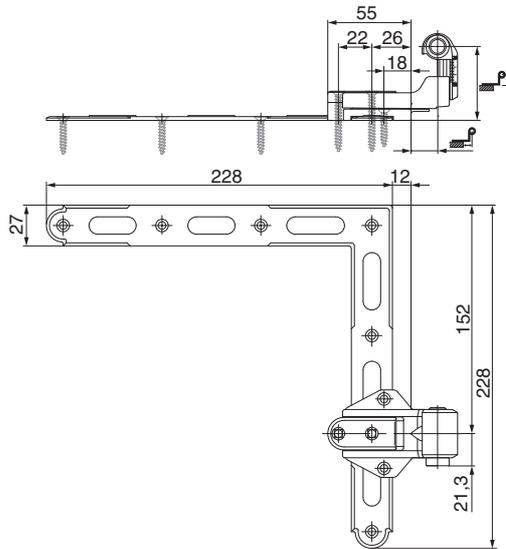


58229



2.2.1.1 BLR cross hinges with variable crank						No
black-S	size 0	60 - 78	40 - 49	16 - 19	20	<b>58223<sup>1</sup></b>
	size 1	80 - 116	50 - 68	16 - 19	20	<b>58226<sup>1</sup></b>
	size 2	120 - 170	70 - 95	16 - 19	20	<b>58229<sup>1</sup></b>
	size 3	150 - 190	85 - 105	16 - 19	20	<b>58232<sup>1</sup></b>
grey-S	size 0	60 - 78	40 - 49	16 - 19	20	<b>210358<sup>1</sup></b>
	size 1	80 - 116	50 - 68	16 - 19	20	<b>210359<sup>1</sup></b>
	size 2	120 - 170	70 - 95	16 - 19	20	<b>210360<sup>1</sup></b>
	size 3	150 - 190	85 - 105	16 - 19	20	<b>210361<sup>1</sup></b>
white-S	size 0	60 - 78	40 - 49	16 - 19	20	<b>58225<sup>1</sup></b>
	size 1	80 - 116	50 - 68	16 - 19	20	<b>58228<sup>1</sup></b>
	size 2	120 - 170	70 - 95	16 - 19	20	<b>58231<sup>1</sup></b>
	size 3	150 - 190	85 - 105	16 - 19	20	<b>58234<sup>1</sup></b>

<sup>1</sup> The specified reveal depths apply to flush installation. Please use the appropriate calculation formula for flush mounted installation.

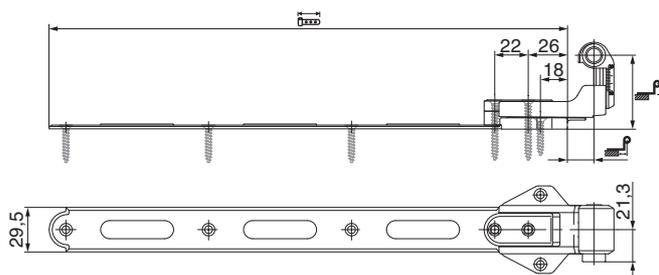


14507

2.2.1.2 BLR corner hinges with variable crank						No
black-S	size 0	60 - 78	40 - 49	16 - 19	10	14501 <sup>1,2</sup>
	size 1	80 - 116	50 - 68	16 - 19	10	14504 <sup>1,2</sup>
	size 2	120 - 170	70 - 95	16 - 19	10	14507 <sup>1,2</sup>
	size 3	150 - 190	85 - 105	16 - 19	10	14510 <sup>1,2</sup>
grey-S	size 0	60 - 78	40 - 49	16 - 19	10	102174 <sup>1,2</sup>
	size 1	80 - 116	50 - 68	16 - 19	10	102175 <sup>1,2</sup>
	size 2	120 - 170	70 - 95	16 - 19	10	102176 <sup>1,2</sup>
	size 3	150 - 190	85 - 105	16 - 19	10	102177 <sup>1,2</sup>
white-S	size 0	60 - 78	40 - 49	16 - 19	10	14503 <sup>1,2</sup>
	size 1	80 - 116	50 - 68	16 - 19	10	14506 <sup>1,2</sup>
	size 2	120 - 170	70 - 95	16 - 19	10	14509 <sup>1,2</sup>
	size 3	150 - 190	85 - 105	16 - 19	10	14512 <sup>1,2</sup>

<sup>1</sup> With corner hinges, a packaging unit consists of 1 piece top corner hinge and 1 piece bottom corner hinge.

<sup>2</sup> The specified reveal depths apply to flush installation. Please use the appropriate calculation formula for flush mounted installation.

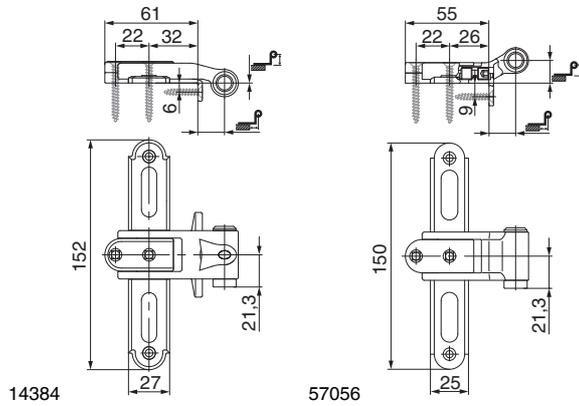


57274

2.2.1.3 BLR long hinges with variable crank						No
black-S	size 0	60 - 78	40 - 49	16 - 19	340	57272 <sup>1</sup>
	size 1	80 - 116	50 - 68	16 - 19	340	57273 <sup>1</sup>
	size 2	120 - 170	70 - 95	16 - 19	340	57274 <sup>1</sup>
	size 3	150 - 190	85 - 105	16 - 19	340	57275 <sup>1</sup>

<sup>1</sup> The specified reveal depths apply to flush installation. Please use the appropriate calculation formula for flush mounted installation.

2.2.2 BLR hinges with fixing tab

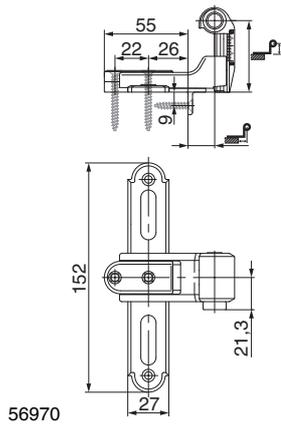


2.2.2.1 BLR cross hinges with fixed crank



No

black-S	straight	0	18	32	20	14384
	flush	15	18	26	20	57056



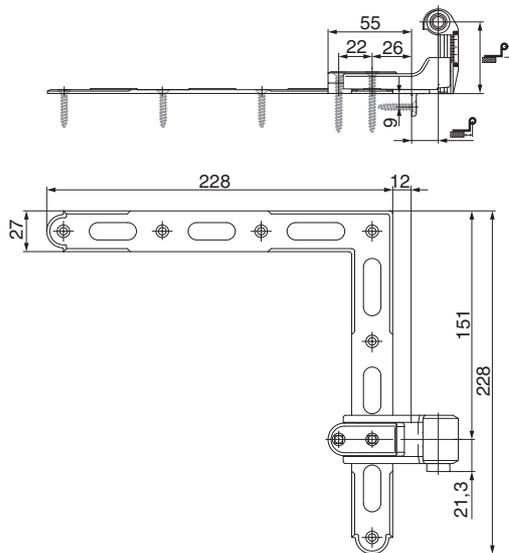
2.2.2.2 BLR cross hinges with variable crank



No

black-S	size 0	50 - 74	20 - 32	18	20	208750 <sup>1</sup>
	size 1	74 - 110	32 - 50	18	20	56966 <sup>1</sup>
size 2	100 - 150	45 - 70	18	20	56970 <sup>1</sup>	
size 3	140 - 210	65 - 100	18	20	56974 <sup>1</sup>	
grey-S	size 0	50 - 74	20 - 32	18	20	210362 <sup>1</sup>
	size 1	74 - 110	32 - 50	18	20	210363 <sup>1</sup>
	size 2	100 - 150	45 - 70	18	20	210364 <sup>1</sup>
	size 3	140 - 210	65 - 100	18	20	210365 <sup>1</sup>
white-S	size 0	50 - 74	20 - 32	18	20	208754 <sup>1</sup>
	size 1	74 - 110	32 - 50	18	20	24988 <sup>1</sup>
	size 2	100 - 150	45 - 70	18	20	24991 <sup>1</sup>
	size 3	140 - 210	65 - 100	18	20	24994 <sup>1</sup>

<sup>1</sup> The specified reveal depths apply to 30mm shutter thickness and 0mm shutter distance, see calculation formula "flush mounted" for other shutter thicknesses.

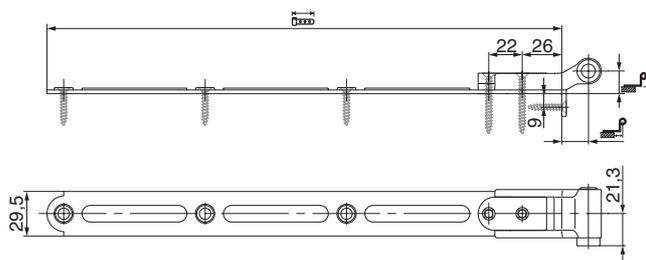


14228

2.2.2.3 BLR corner hinges with variable crank						No
black-S	size 0	50 - 74	20 - 32	18	10	101796 <sup>1,2</sup>
	size 1	74 - 110	32 - 50	18	10	14224 <sup>1,2</sup>
	size 2	100 - 150	45 - 70	18	10	14228 <sup>1,2</sup>
	size 3	140 - 210	65 - 100	18	10	14232 <sup>1,2</sup>
grey-S	size 0	50 - 74	20 - 32	18	10	102181 <sup>1,2</sup>
	size 1	74 - 110	32 - 50	18	10	102182 <sup>1,2</sup>
	size 2	100 - 150	45 - 70	18	10	102183 <sup>1,2</sup>
	size 3	140 - 210	65 - 100	18	10	102184 <sup>1,2</sup>
white-S	size 0	50 - 74	20 - 32	18	10	101797 <sup>1,2</sup>
	size 1	74 - 110	32 - 50	18	10	13168 <sup>1,2</sup>
	size 2	100 - 150	45 - 70	18	10	13169 <sup>1,2</sup>
	size 3	140 - 210	65 - 100	18	10	13170 <sup>1,2</sup>

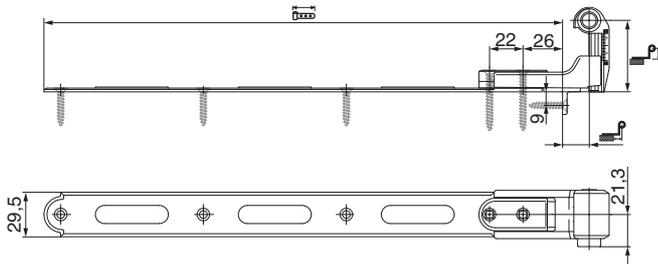
<sup>1</sup> With corner hinges, a packaging unit consists of 1 piece top corner hinge and 1 piece bottom corner hinge.

<sup>2</sup> The specified reveal depths apply to 30mm shutter thickness and 0mm shutter distance, see calculation formula "flush mounted" for other shutter thicknesses.



57100

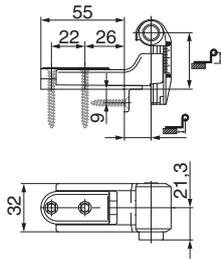
2.2.2.4 BLR long hinges with fixed crank						No	
black-S	flush	15	18	250	26	20	57099
				340	26	20	57100



56982

2.2.2.5 BLR long hinges with variable crank							No
black-S	size 0	50 - 74	20 - 32	18	340	20	208751 <sup>1</sup>
					200	20	208752 <sup>1</sup>
	size 1	74 - 110	32 - 50	18	340	20	56978 <sup>1</sup>
					200	20	56990 <sup>1</sup>
	size 2	100 - 150	45 - 70	18	340	20	56982 <sup>1</sup>
				200	20	56994 <sup>1</sup>	
	size 3	140 - 210	65 - 100	18	340	20	56986 <sup>1</sup>
					200	20	56998 <sup>1</sup>

<sup>1</sup> The specified reveal depths apply to 30mm shutter thickness and 0mm shutter distance, see calculation formula "flush mounted" for other shutter thicknesses.

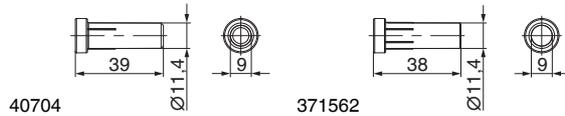


57051

2.2.2.6 BLR short hinges with variable crank						No
black-S	size 0	50 - 74	20 - 32	18	20	208753 <sup>1</sup>
	size 1	74 - 100	32 - 50	18	20	57050 <sup>1</sup>
	size 2	100 - 150	45 - 70	18	20	57051 <sup>1</sup>
	size 3	140 - 210	65 - 100	18	20	57052 <sup>1</sup>

<sup>1</sup> The specified reveal depths apply to 30mm shutter thickness and 0mm shutter distance, see calculation formula "flush mounted" for other shutter thicknesses.

### 2.2.3 Accessories for shutter hinges



#### 2.2.3.1 BLR sleeves and cover caps



**No**

black	closed hinge regulator sleeve	100	<b>40704</b>
	open hinge regulator sleeve	100	<b>371562</b>
	short cover cap	100	<b>41578</b>
grey	closed hinge regulator sleeve	100	<b>465210</b>
	short cover cap	100	<b>465211</b>
white	closed hinge regulator sleeve	100	<b>41149</b>
	short cover cap	100	<b>42845</b>



13327

#### 2.2.3.2 BLR safety levers

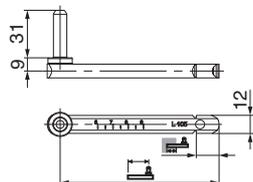


**No**

black	right	20	<b>13328</b>
	left	20	<b>13327</b>
grey	right	20	<b>212599</b>
	left	20	<b>212598</b>
white	right	20	<b>13330</b>
	left	20	<b>13329</b>

## 2.3 Shutter pins

### 2.3.1 BLR threaded surface mounted frame hinges

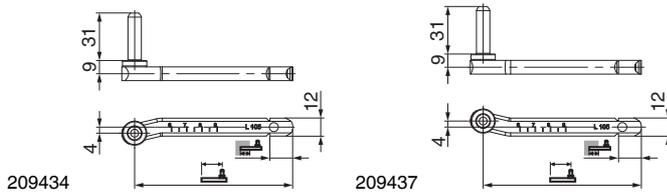


209422



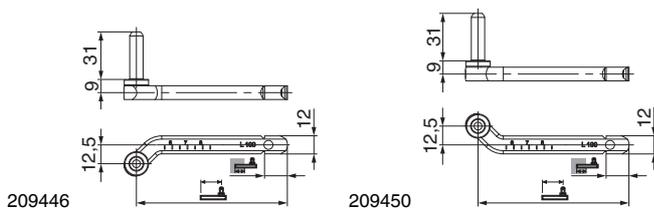
2.3.1.1 BLR threaded surface mounted frame hinges straight without lateral adjustment								No
black-S	L59	30 - 44	15	59	20	20	<b>209935<sup>1</sup></b>	
	L75	30 - 60	15	75	20	20	<b>209936<sup>1</sup></b>	
	L85	30 - 70	15	85	20	20	<b>209422<sup>1</sup></b>	
	L95	45 - 80	15	95	35	20	<b>209937<sup>1</sup></b>	
	L105	50 - 90	15	105	35	20	<b>209423<sup>1</sup></b>	
	L115	65 - 100	15	115	55	20	<b>209938<sup>1</sup></b>	
	L125	70 - 110	15	125	55	20	<b>209471<sup>1</sup></b>	
	L135	80 - 120	15	135	55	20	<b>209424<sup>1</sup></b>	
	L150	95 - 130	20	150	55	20	<b>209939<sup>1</sup></b>	
grey-S	L165	110 - 140	25	165	55	20	<b>209425<sup>1</sup></b>	
	L59	30 - 44	15	59	20	20	<b>210402<sup>1</sup></b>	
	L75	30 - 60	15	75	20	20	<b>210403<sup>1</sup></b>	
	L85	30 - 70	15	85	20	20	<b>210401<sup>1</sup></b>	
	L95	45 - 80	15	95	35	20	<b>210404<sup>1</sup></b>	
	L105	50 - 90	15	105	35	20	<b>210409<sup>1</sup></b>	
	L115	65 - 100	15	115	55	20	<b>210405<sup>1</sup></b>	
	L125	70 - 110	15	125	55	20	<b>210411<sup>1</sup></b>	
	L135	80 - 120	15	135	55	20	<b>210410<sup>1</sup></b>	
white-S	L150	95 - 130	20	150	55	20	<b>210406<sup>1</sup></b>	
	L165	110 - 140	25	165	55	20	<b>210412<sup>1</sup></b>	
	L59	30 - 44	15	59	20	20	<b>209942<sup>1</sup></b>	
	L75	30 - 60	15	75	20	20	<b>209943<sup>1</sup></b>	
	L85	30 - 70	15	85	20	20	<b>209430<sup>1</sup></b>	
	L95	45 - 80	15	95	35	20	<b>209944<sup>1</sup></b>	
	L105	50 - 90	15	105	35	20	<b>209431<sup>1</sup></b>	
	L115	65 - 100	15	115	55	20	<b>209945<sup>1</sup></b>	
	L125	70 - 110	15	125	55	20	<b>209474<sup>1</sup></b>	
L135	80 - 120	15	135	55	20	<b>209432<sup>1</sup></b>		
L150	95 - 130	20	150	55	20	<b>209946<sup>1</sup></b>		
L165	110 - 140	25	165	55	20	<b>209433<sup>1</sup></b>		

<sup>1</sup> Given minimum shutter pin insertion depths apply only to installation on timber (refer to section 1.5)!



2.3.1.2 BLR threaded surface mounted frame hinges with crank 4mm										No
black-S	left	L85	40 - 70	15	85	20	20			209434 <sup>1</sup>
		L105	55 - 90	15	105	35	20			209435 <sup>1</sup>
		L135	80 - 120	15	135	55	20			209436 <sup>1</sup>
	right	L165	110 - 140	25	165	55	20			215469 <sup>1</sup>
		L85	40 - 70	15	85	20	20			209437 <sup>1</sup>
		L105	55 - 90	15	105	35	20			209438 <sup>1</sup>
	L135	80 - 120	15	135	55	20			209439 <sup>1</sup>	
	L165	110 - 140	25	165	55	20			215468 <sup>1</sup>	

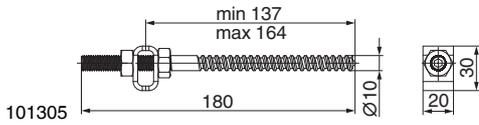
<sup>1</sup> Given minimum shutter pin insertion depths apply only to installation on timber (refer to section 1.5)!



2.3.1.3 BLR threaded surface mounted frame hinges with crank 12.5mm										No
black-S	left	L80	40 - 65	15	80	20	20			209446 <sup>1</sup>
		L100	55 - 85	15	100	35	20			209447 <sup>1</sup>
		L130	75 - 115	15	130	55	20			209448 <sup>1</sup>
	right	L150	95 - 130	20	150	55	20			209449 <sup>1</sup>
		L80	40 - 65	15	80	20	20			209450 <sup>1</sup>
		L100	55 - 85	15	100	35	20			209451 <sup>1</sup>
	L130	75 - 115	15	130	55	20			209452 <sup>1</sup>	
	L150	95 - 130	20	150	55	20			209453 <sup>1</sup>	
white-S	left	L100	55 - 85	15	100	35	20			209463 <sup>1</sup>
		L130	75 - 115	15	130	55	20			209464 <sup>1</sup>
	right	L100	55 - 85	15	100	35	20			209467 <sup>1</sup>
		L130	75 - 115	15	130	55	20			209468 <sup>1</sup>

<sup>1</sup> Given minimum shutter pin insertion depths apply only to installation on timber (refer to section 1.5)!

### 2.3.2 Accessories for shutter pins



101305

#### 2.3.2.1 BLR shutter pin support

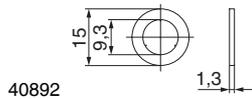


**No**

black-S	shutter pin support, length 180mm	20	<b>101305<sup>1</sup></b>
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<sup>1</sup> These parts are excluded from the 10-year surface guarantee.



40892

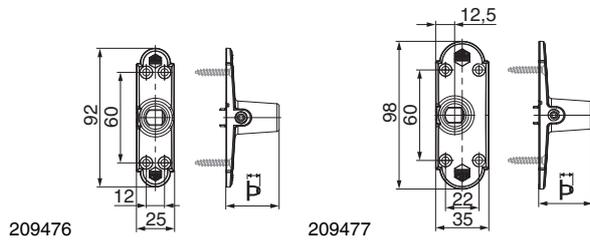
#### 2.3.2.2 Spacers for shutter pin



**No**

black	spacer BLR, for shutter pin	Ø 15mm	1,3	100	<b>40892</b>
grey	spacer BLR, for shutter pin	Ø 15mm	1,3	100	<b>361316</b>

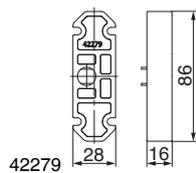
## 2.4 BLR shutter pin holders



2.4.1 BLR shutter pin holders					No	
black-S	for adjustable shutter pin up to	L85	25	20	20	<b>209475</b>
		L105	25	35	20	<b>209476<sup>1</sup></b>
		L165	25	55	20	<b>209479<sup>1</sup></b>
		L105	35	35	20	<b>209477</b>
		L165	35	55	20	<b>209478</b>
grey-S	for adjustable shutter pin up to	L85	25	20	20	<b>210353</b>
		L105	25	35	20	<b>210354<sup>1</sup></b>
		L165	25	55	20	<b>210357<sup>1</sup></b>
		L105	35	35	20	<b>210355</b>
		L165	35	55	20	<b>210356</b>
white-S	for adjustable shutter pin up to	L85	25	20	20	<b>209485</b>
		L105	25	35	20	<b>209486<sup>1</sup></b>
		L165	25	55	20	<b>209488<sup>1</sup></b>
		L105	35	35	20	<b>209487</b>
		L165	35	55	20	<b>209489</b>

<sup>1</sup> Not suitable for use with shutter catches and crank openers.

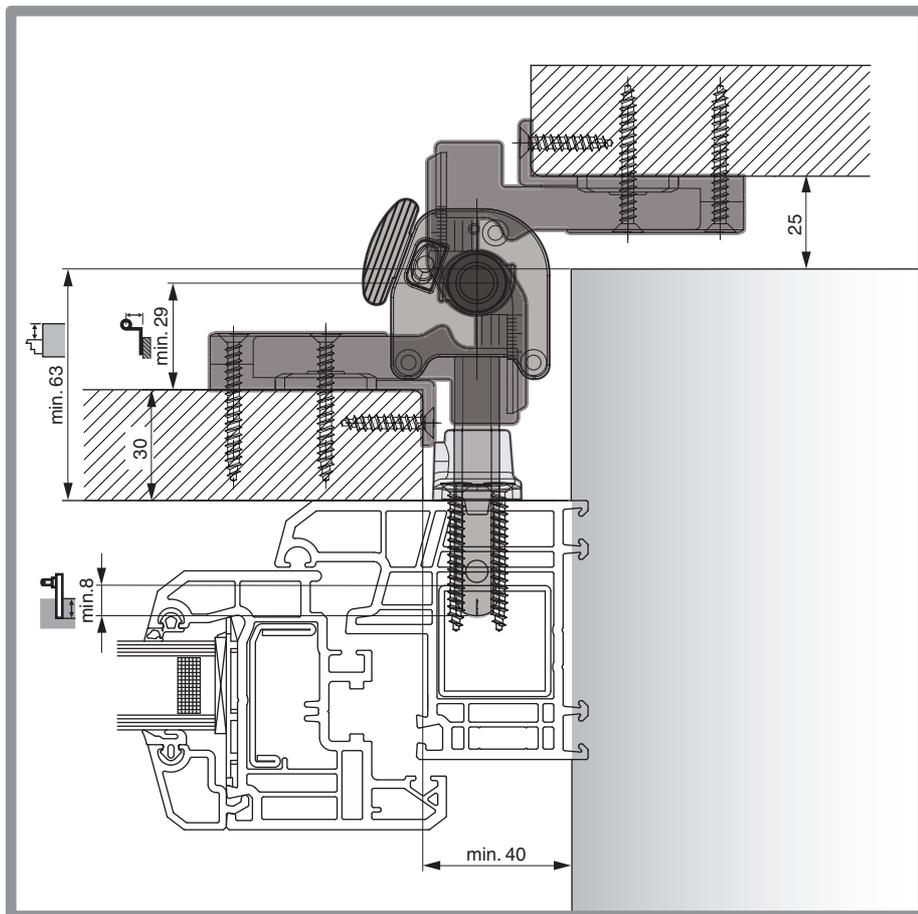
## 2.4.2 Accessories for shutter pin holders



2.4.2.1 Packer for shutter pin holder for timber-aluminium windows			No
packer shutter pin holder 16mm high for timber-alu windows black		100	<b>42279</b>

## 2.5 BLR snap holders

### 2.5.1 Installation example



#### Calculation minimum reveal depth

$$2 \times \text{P}_i (2 \times 29) 58\text{mm}$$

$$+ 30\text{mm}$$

$$- 25\text{mm}$$

---

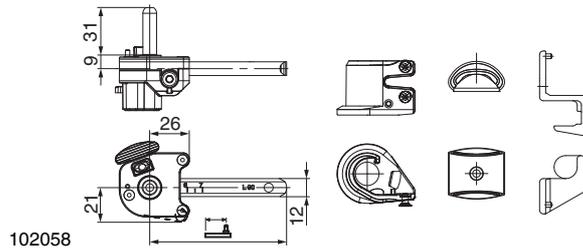
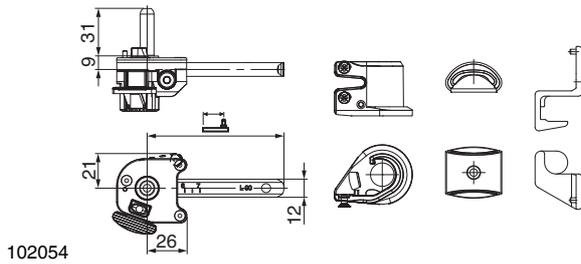

$$= 63\text{mm Minimum reveal depth}$$


---

#### Application ranges for snap holders for pin distance and bracket width

55-70mm		25mm	20mm
70-90mm	25mm	35mm	35mm
90-140mm	25mm	35mm	55mm

The minimum reveal depth shown in the above example applies for installations with shutter thicknesses of 30mm, 25mm distance to wall and installation without clearance to frame.



2.5.2 BLR snap holders straight						No
black-S	left	L90	55 - 70	90	20	<b>102053<sup>1</sup></b>
		L110	55 - 90	110	20	<b>102054<sup>1</sup></b>
		L140	85 - 120	140	20	<b>102055<sup>1</sup></b>
		L165	110 - 140	165	20	<b>102056<sup>1</sup></b>
	right	L90	55 - 70	90	20	<b>102057<sup>1</sup></b>
		L110	55 - 90	110	20	<b>102058<sup>1</sup></b>
		L140	85 - 120	140	20	<b>102059<sup>1</sup></b>
grey-S	left	L90	55 - 70	90	20	<b>102185<sup>1</sup></b>
		L110	55 - 90	110	20	<b>102186<sup>1</sup></b>
		L140	85 - 120	140	20	<b>102187<sup>1</sup></b>
		L165	110 - 140	165	20	<b>102188<sup>1</sup></b>
	right	L90	55 - 70	90	20	<b>102189<sup>1</sup></b>
		L110	55 - 90	110	20	<b>102190<sup>1</sup></b>
		L140	85 - 120	140	20	<b>102191<sup>1</sup></b>
white-S	left	L90	55 - 70	90	20	<b>102061<sup>1</sup></b>
		L110	55 - 90	110	20	<b>102062<sup>1</sup></b>
		L140	85 - 120	140	20	<b>102063<sup>1</sup></b>
		L165	110 - 140	165	20	<b>102064<sup>1</sup></b>
	right	L90	55 - 70	90	20	<b>102065<sup>1</sup></b>
		L110	55 - 90	110	20	<b>102066<sup>1</sup></b>
		L140	85 - 120	140	20	<b>102067<sup>1</sup></b>
		L165	110 - 140	165	20	<b>102068<sup>1</sup></b>

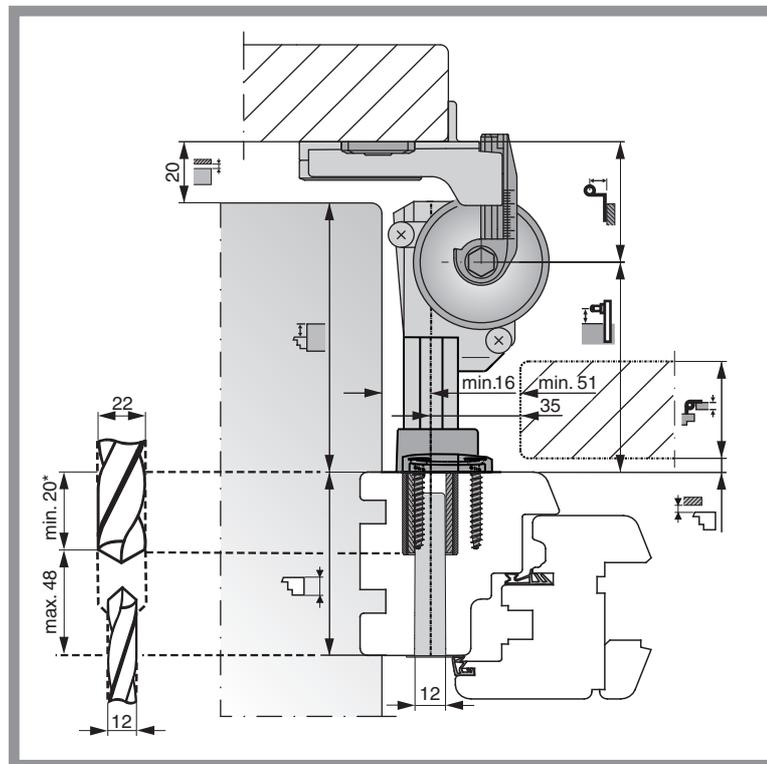
<sup>1</sup> **CAUTION:** Shutters with snap holders have a limited storm resistance. The information in chapter 1.3 Wind Resistance must be observed!

- At peak wind speeds over 60km/h, the shutters have to be closed or locked!
- max. shutter width 600mm
- max. folding shutter width 2 x 600mm
- max. height 2,100mm
- max. sash weight 20kg (applies to folding shutters for the total weight of both sashes)
- Use only in combination with 35mm wide shutter pin holder, except for shutter pin distances of  $\leq 70$ mm.
- The buffer stop must always be installed. When the buffer stop is used, make sure that the facade has sufficient compression strength (e.g. for thermal insulation)!
- A safety catch must be installed on every sash!
- DO NOT use a snap holder L165 as a load-bearing shutter pin!
- **CAUTION:** On multi-sash shutters with an internal rotation-point, no snap holders may be used (risk of falling out during storm)!



## 2.6 Crank openers

### 2.6.1 Installation example with hinge



#### Calculation shutter pin distance

	105mm
	+ 20mm
	+ 30mm
	+ 17mm
<hr/>	
=	172mm : 2 = 86mm

→ L 105 (60-90mm)

#### Calculation hinge crank

	105mm
	+ 20mm
	- 30mm
	- 17mm
<hr/>	
=	78mm : 2 = 39mm

→ Gr. 1 (32-50 mm)

#### Calculation drive gear length

	86mm
Depth (min. 20mm) + 40mm*	
<hr/>	
=	126mm Drive gear length

→ Drive gear L 130

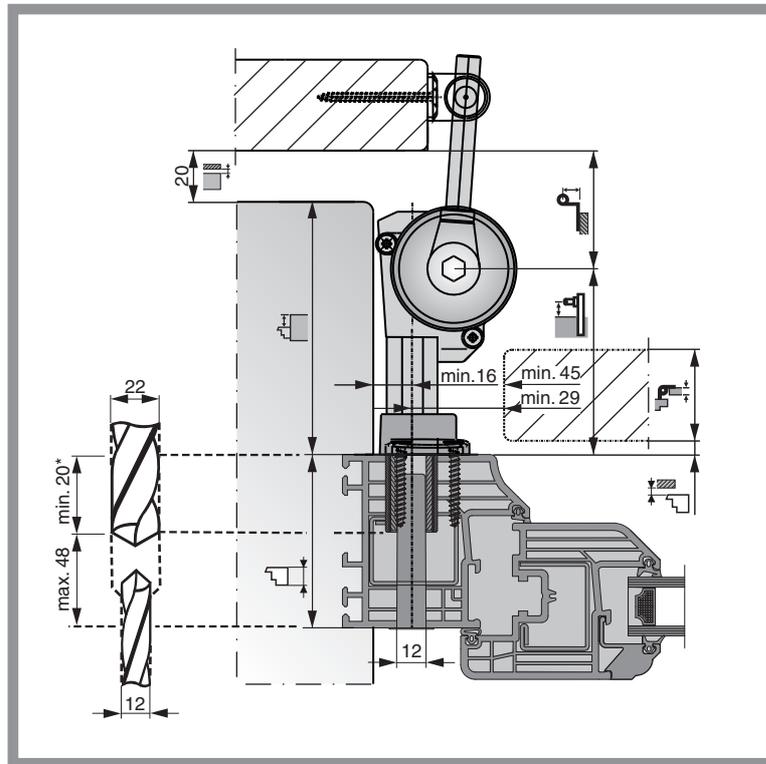
\* Greater depth improves stability.

→ Cut the drive pipe, insulation and rotary arm as necessary!

#### Information on hardware selection:

- The pivot points of the hinge and the inner opener hinge must be exactly in line. This requires a precise drilling and adjustment.
- Storm resistance is higher on the inner opener hinge than on the rotary arm.
- For doors with inner openers, the inner opener hinge can be inserted between two load-bearing hinges. A third supporting hinge is not required.
- The shutter pin holder for the threaded surface mounted frame hinge must be 35mm wide.
- A safety catch must be installed on every sash.
- The information in chapter 1.3 Wind resistance must be observed!

2.6.2 Installation example with rotary arm



Calculation shutter pin distance

	105mm
	+ 20mm
	+ 30mm
	+ 17mm

---

= 172mm : 2 = 86mm 

---

→ L 105 (60-90mm) 

Calculation drive gear length

	86mm
Depth (min. 20mm) + 40mm*	

---

= 126mm Drive gear length

---

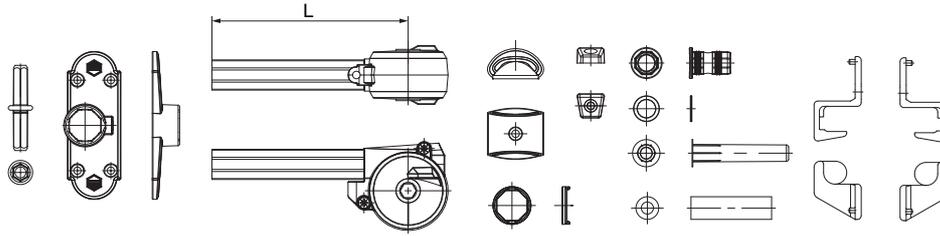
→ Drive gear L 130

\* Greater depth improves stability.

→ Cut the drive pipe, insulation and rotary arm as necessary!

Information on hardware selection:

- The pivot points of the hinge and the rotary arm do not have to be exactly in line. Precise drilling and adjustment is not required. Minor deviations are allowed.
- Storm resistance is lower for the rotary arm than for the inner opener hinge.
- For doors with rotary arm, at least three load-bearing hinges must be used in addition to the inner opener. In the middle, a third supporting hinge is required.
- The gap between the hinge and rotary arm should be as small as possible, and maximum 200mm.
- The shutter pin holder for the threaded surface mounted frame hinge must be 35mm wide.
- A safety catch must be installed on every sash.
- The information in chapter 1.3 Wind resistance must be observed!



105299

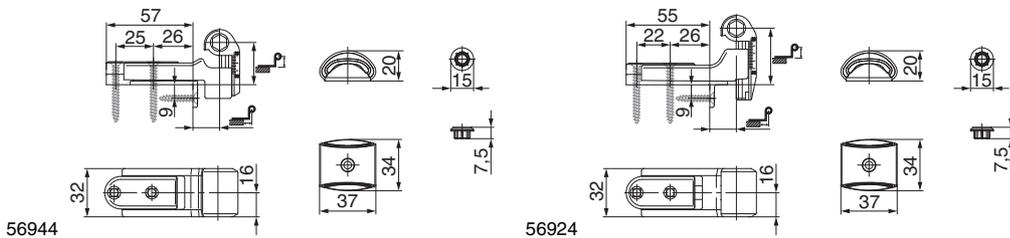
2.6.3 Drive gears for V2 crank openers with octagon				No
black-S	L130	103 - 180	10	105299 <sup>1,2</sup>
	L210	103 - 260	10	105300 <sup>1,2</sup>
	L340	103 - 390	10	105301 <sup>1,2</sup>
grey-S	L130	103 - 180	10	105305 <sup>1,2</sup>
	L210	103 - 260	10	105306 <sup>1,2</sup>
white-S	L130	103 - 180	10	105303 <sup>1,2</sup>
	L210	103 - 260	10	105304 <sup>1,2</sup>

<sup>1</sup> When using shutter hardware for special non-standard designs all responsibility for correct use of hardware parts and safety of the complete design lies entirely with the designer and manufacturer of the special design solution.

<sup>2</sup> **CAUTION:** Shutters with crank opener have a limited storm resistance. The information in chapter 1.3 Wind resistance must be observed!

- At peak wind speeds over 60km/h, the shutters have to be closed or locked!
- max. shutter width 600mm
- max. folding shutter width 2 x 600mm
- max. height 2,100mm
- max. sash weight 20kg (applies to folding shutters for the total weight of both sashes)
- Folding shutters can only be installed with an internal rotation-point and with folding shutter rod.
- Use threaded surface mounted frame hinge only in combination with 35mm wide shutter pin holder.
- The buffer stop must always be installed. When the buffer stop is used, make sure that the facade has sufficient compression strength (e.g. for thermal insulation)!
- A safety catch must be installed on every sash!

## 2.6.4 Hinges for crank openers



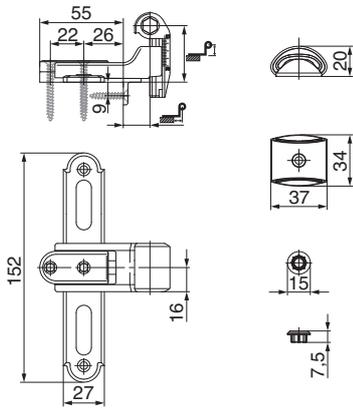
56944

56924

2.6.4.1 Short hinges for crank openers						No
black-S	size 0	58 - 74	24 - 32	18	10	56944 <sup>1,2</sup>
	size 1	74 - 110	32 - 50	18	10	56921 <sup>1,2</sup>
	size 2	100 - 150	45 - 70	18	10	56924 <sup>1,2</sup>
	size 3	140 - 210	65 - 100	18	10	56928 <sup>1,2</sup>
grey-S	size 1	74 - 110	32 - 50	18	10	210066 <sup>1,2</sup>
	size 2	100 - 150	45 - 70	18	10	210067 <sup>1,2</sup>
white-S	size 0	58 - 74	24 - 32	18	10	22691 <sup>1,2</sup>
	size 1	74 - 110	32 - 50	18	10	22060 <sup>1,2</sup>
	size 2	100 - 150	45 - 70	18	10	22063 <sup>1,2</sup>
	size 3	140 - 210	65 - 100	18	10	22066 <sup>1,2</sup>

<sup>1</sup> The specified reveal depths apply to 30mm shutter thickness and 0mm shutter distance, see calculation formula "flush mounted" for other shutter thicknesses.

<sup>2</sup> These shutter hinges may not be used as a load-bearing element!



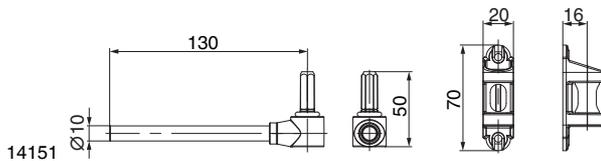
56936

### 2.6.4.2 Cross hinges for crank openers

						<b>No</b>
black-S	size 0	58 - 74	24 - 32	18	10	101448 <sup>1,2</sup>
	size 1	74 - 110	32 - 50	18	10	56932 <sup>1,2</sup>
	size 2	100 - 150	45 - 70	18	10	56936 <sup>1,2</sup>
	size 3	140 - 210	65 - 100	18	10	56941 <sup>1,2</sup>
grey-S	size 0	58 - 74	24 - 32	18	10	102860 <sup>1,2</sup>

<sup>1</sup> The specified reveal depths apply to 30mm shutter thickness and 0mm shutter distance, see calculation formula "flush mounted" for other shutter thicknesses.

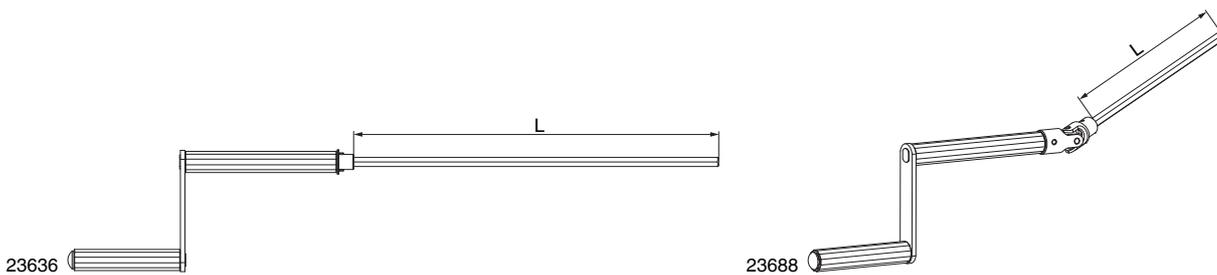
<sup>2</sup> These shutter hinges may not be used as a load-bearing element!



14151

### 2.6.5 Rotary arms for crank openers

			<b>No</b>
black-S		20	14151
white-S		10	102653



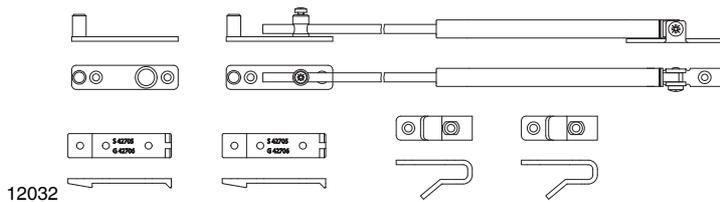
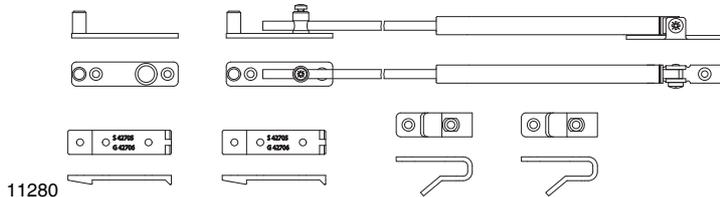
23636

23688

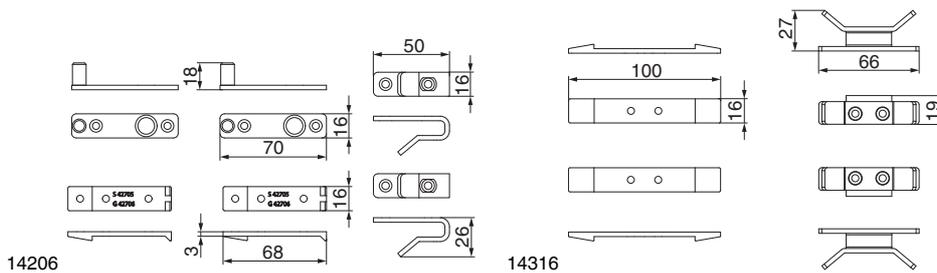
### 2.6.6 Crank arms

		<b>L</b>		<b>No</b>
rigid		240	10	23636
		400	10	23859
		500	10	27438
		950	10	212589
with u-joint		160	10	23688
		240	10	23635

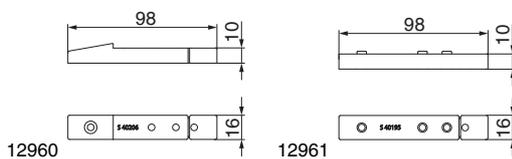
### 2.6.7 Folding shutter rods for crank openers



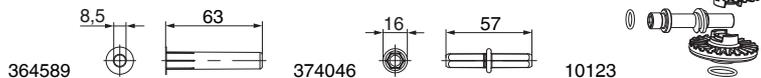
2.6.7.1 Folding shutter rods			No
black-S	folding shutter rods for crank opener for multi-sash shutters	10	11280
white-S	folding shutter rods for crank opener for multi-sash shutters	10	12546
black-S	folding shutter rods for crank opener, 90° opening for multi-sash shutters	10	12032



2.6.7.2 Locking hooks for folding shutter rods			No
black-S	2-sash locking hook	10	14206
grey-S	2-sash locking hook	10	102166
black-S	4-sash locking hook with internal pivot point in pairs	10	14316
white-S	4-sash locking hook with internal pivot point in pairs	10	14801



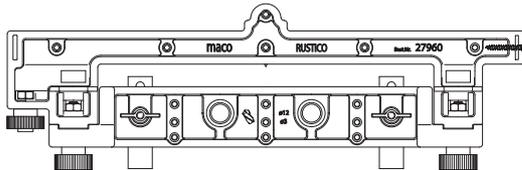
2.6.7.3 Packers for locking hooks			No
black	for locking hook with internal pivot point for 10mm gap	10	12960
	for locking hook with internal pivot point for 20mm and 30mm gap	10	12961
white	for locking hook with internal pivot point for 10mm gap	20	44352
	for locking hook with internal pivot point for 20mm and 30mm gap	20	44353



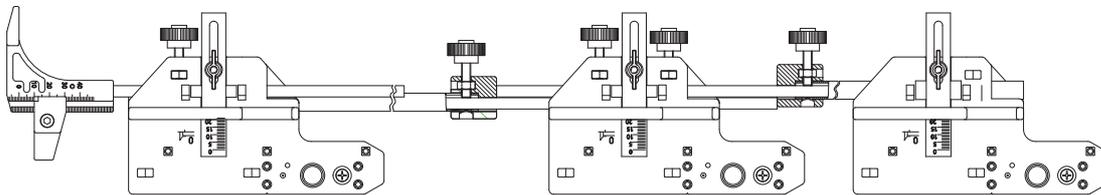
2.6.8 Accessories and single components for crank opener drive gears		No
crank opener cover white	10	41902
crank opener cover grey	20	364589
drive gear bolt Ø 16 x 59 black	10	374046
transmission set for crank opener	50	10123
Insulation for loading inner opener	20	364189
grease gun for crank opener 20ml	10	362833
repair cover for crank opener black-S	20	367887
replacement cover for pivot arm black-S	20	369863



## 2.7 Jigs



27960



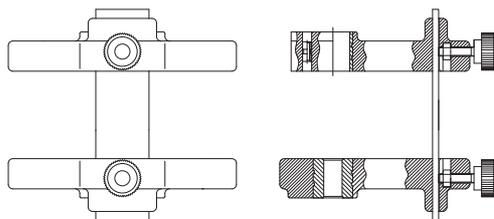
27958

### 2.7.1 Jigs for BLR hardware range



**No**

jig	BLR	for dual installation	hinge with fixing tab, shutter pin holder and straight shutter pin, on frame	1	<b>27960</b>
		for separate installation	hinge with fixing tab, shutter pin holder and straight shutter pin, on frame	1	<b>27958</b>
stop piece			42 high for jig 27958	10	<b>370594</b>
jig	BLR	for dual installation	hinge without fixing tab and 4mm cranked shutter pin, on frame	1	<b>201851</b>
			hinge without fixing tab and 12.5mm cranked shutter pin, on frame	1	<b>28724</b>



102888

### 2.7.2 Jigs for crank openers



**No**

jig	BLR	for dual installation	crank opener with hinge (distance 35)	1	<b>102888</b>
			crank opener with rotary arm (distance min. 29)	1	<b>205649</b>
		for separate installation	crank opener with hinge or rotary arm	1	<b>102889</b>



### 3 Wall cladding installation

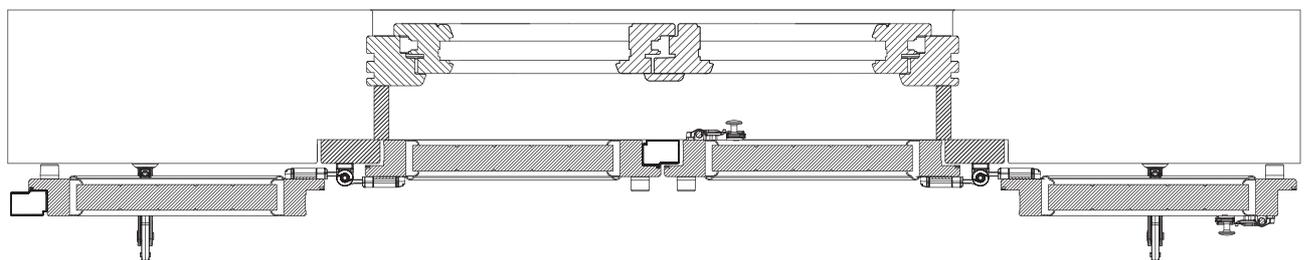
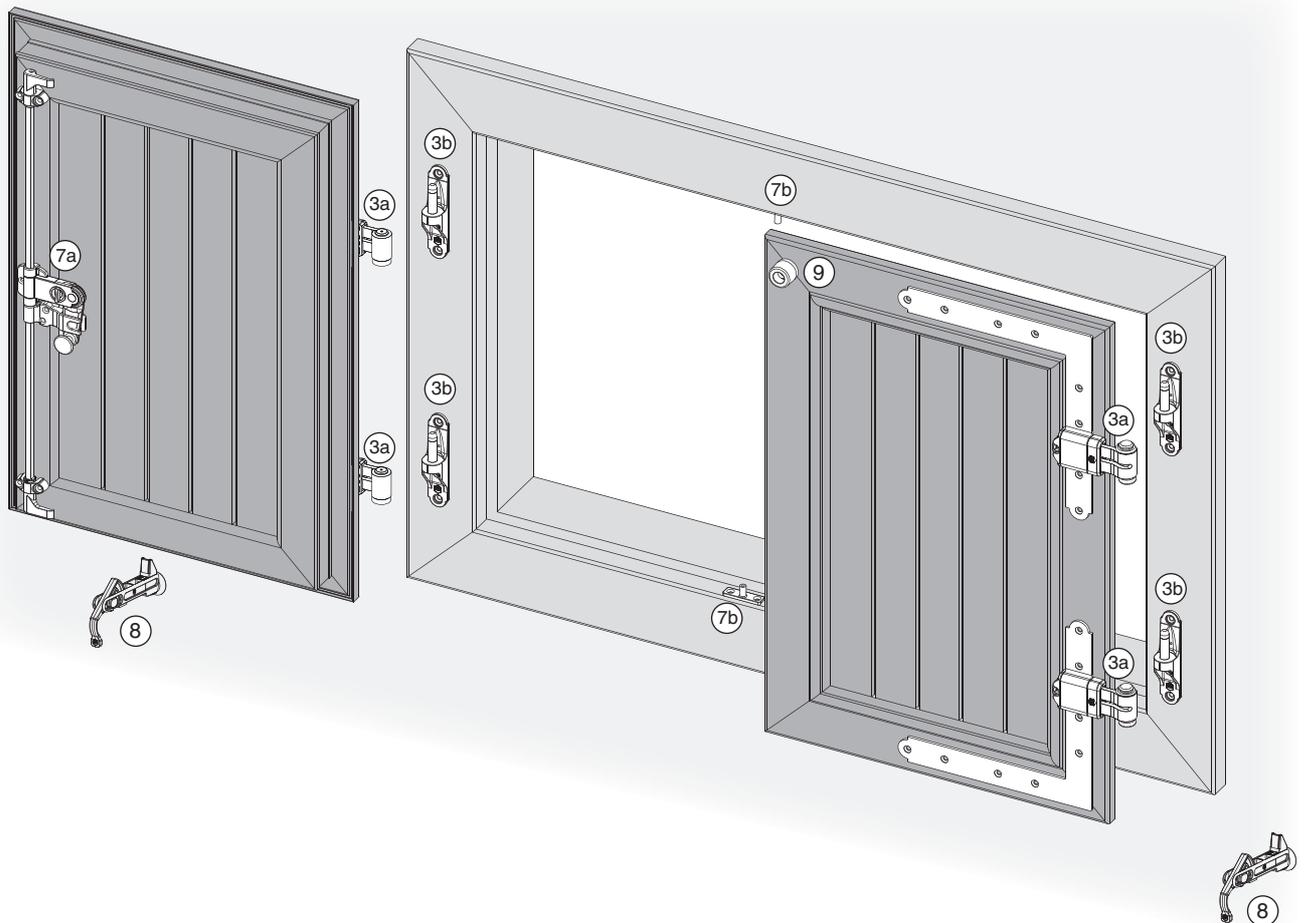
---

<b>3.1</b>	<b>Information for hardware selection</b>	<b>66</b>
3.1.1	2-sashed	66
3.1.2	4-sashed with internal pivot point	68
<b>3.2</b>	<b>Hinges</b>	<b>70</b>
3.2.1	Hinges without fixing tab	70
3.2.2	BLR hinges with fixing tab	73
3.2.3	Accessories for shutter hinges	74
<b>3.3</b>	<b>Shutter pins</b>	<b>75</b>
3.3.1	Surface mounted frame hinges	75
3.3.2	Accessories for shutter pins	77
<b>3.4</b>	<b>Jigs</b>	<b>78</b>
3.4.1	Jigs for surface mounted frame hinges	78

### 3 Wall cladding installation

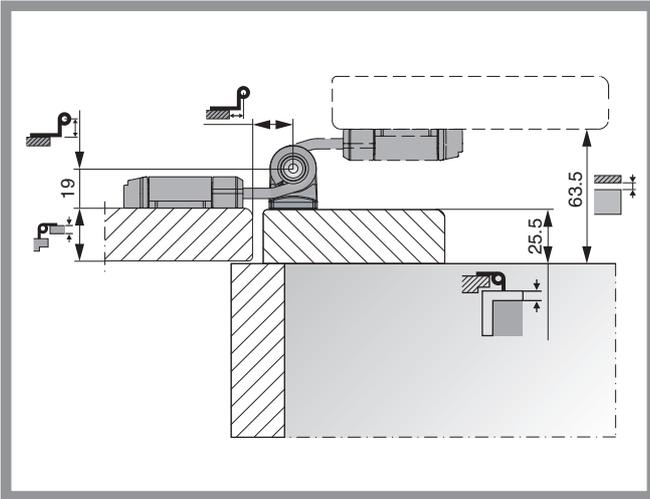
#### 3.1 Information for hardware selection

##### 3.1.1 2-sashed



Selection guide		Page
3a	3.2.1.2 MMV corner hinges	→71
3b	3.3.1.1.1MMV surface mounted frame hinges	→75
7a	7.1.3 2F shutter locks	→114
7b	7.3 Striker pin brackets for frame installation	→118
8	8 Shutter catches	→132
9	9.2 Buffer stops	→146

3.1.1.1 Flush

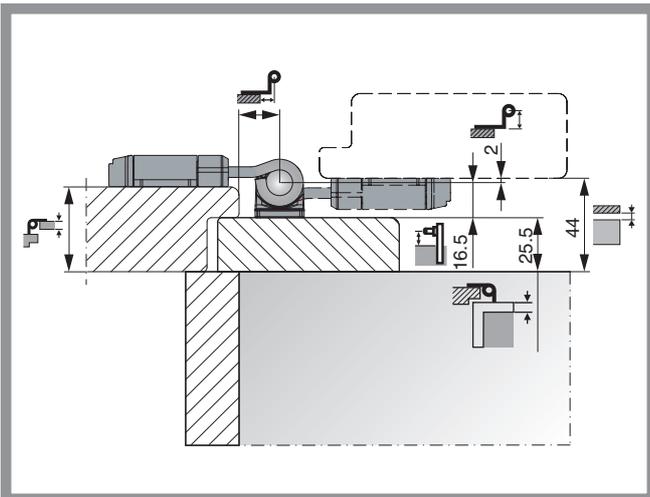


Calculation distance to wall

$$\begin{aligned}
 & 25,5\text{mm} \\
 & 2 \times 38,0\text{mm} \\
 \hline
 & = 63,5\text{mm}
 \end{aligned}$$



3.1.1.2 Shutter with rebate



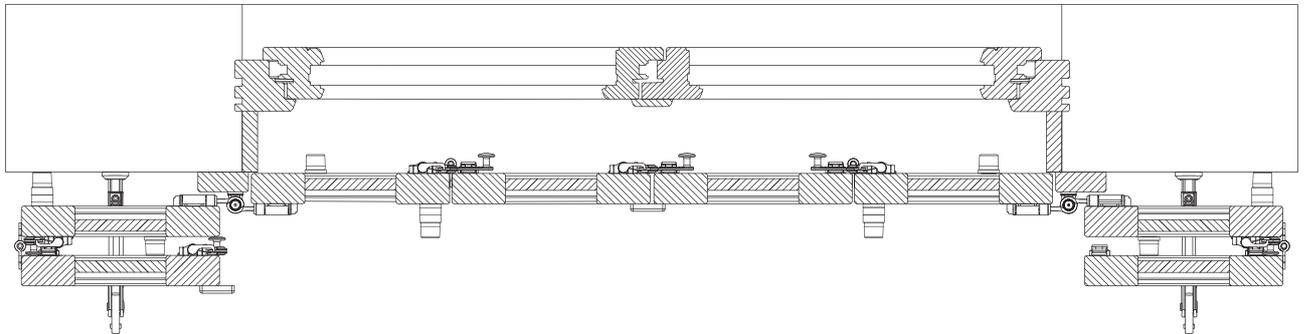
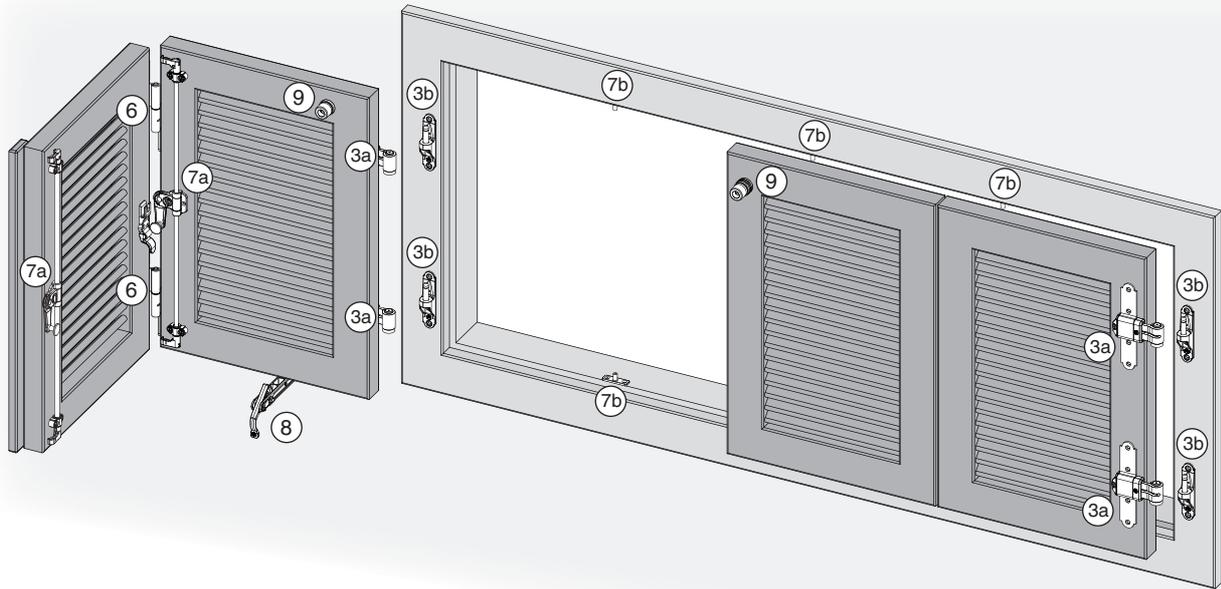
Calculation cladding thickness

$$\begin{aligned}
 & 40,0\text{mm} \\
 & + 2,0\text{mm} \\
 & - 16,5\text{mm} \\
 & - 0,0\text{mm Packer surface-mounted frame hinge} \\
 \hline
 & = 25,5\text{mm}
 \end{aligned}$$

Calculation distance to wall

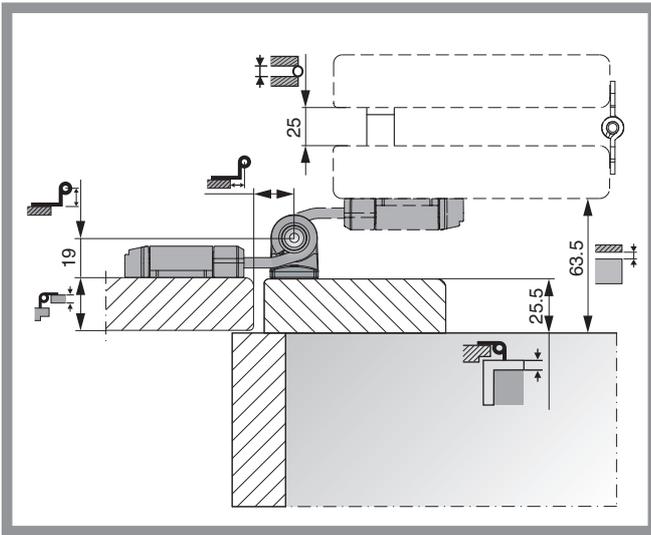
$$\begin{aligned}
 & 25,5\text{mm} \\
 & + 16,5\text{mm} \\
 & + 2,0\text{mm} \\
 \hline
 & = 44,0\text{mm}
 \end{aligned}$$

3.1.2 4-sashed with internal pivot point



Selection guide		Page
3a	3.2.1.1 MMV cross hinges	→70
3b	3.3.1.1.1MMV surface mounted frame hinges	→75
6	6.1.6 Prima MMV centre hinges	→105
7a	7.1.3 2F shutter locks	→114
7b	7.3 Striker pin brackets for frame installation	→118
8	8.1.3 Shutter catches "Classic" model with cover disk without fixing bolts	→140
9	9.2 Buffer stops	→146

3.1.2.1 Flush

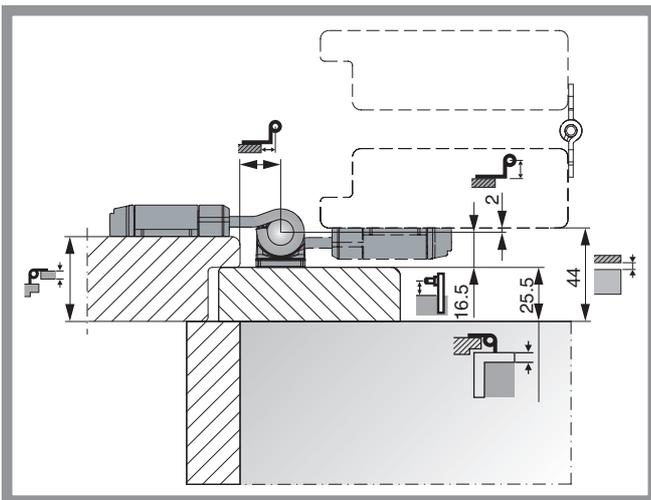


Calculation distance to wall

$$\begin{aligned}
 & 25,5\text{mm} \\
 & 2 \times 19,0\text{mm} \quad +38,0\text{mm} \\
 \hline
 & = 63,5\text{mm}
 \end{aligned}$$



3.1.2.2 Shutter with rebate



Calculation cladding thickness

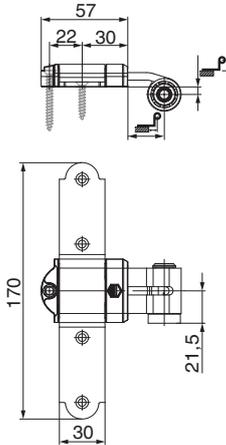
$$\begin{aligned}
 & 40,0\text{mm} \\
 & + 2,0\text{mm} \\
 & - 16,5\text{mm} \\
 & - 0,0\text{mm Packer surface-mounted frame hinge} \\
 \hline
 & = 25,5\text{mm}
 \end{aligned}$$

Calculation distance to wall

$$\begin{aligned}
 & 25,5\text{mm} \\
 & + 16,5\text{mm} \\
 & + 2,0\text{mm} \\
 \hline
 & = 44,0\text{mm}
 \end{aligned}$$

## 3.2 Hinges

### 3.2.1 Hinges without fixing tab



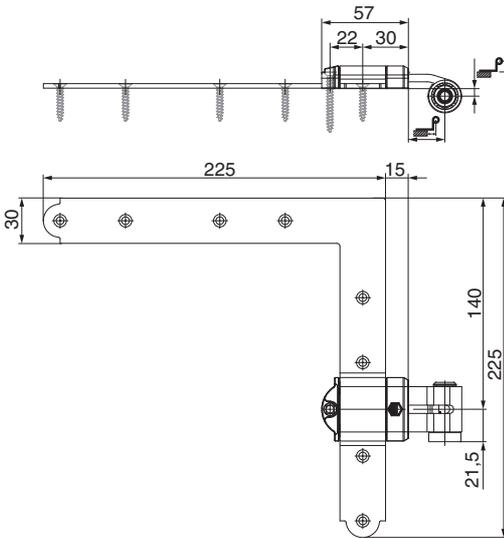
101449

#### 3.2.1.1 MMV cross hinges



**No**

black-S	-5	16 - 24	20	<b>101449</b>
		37 - 45	20	<b>101450</b>
	2	16 - 24	20	<b>100000</b>
		37 - 45	20	<b>100005</b>
	7	16 - 24	20	<b>100001</b>
		37 - 45	20	<b>100006</b>
	12	16 - 24	20	<b>100002</b>
		37 - 45	20	<b>100007</b>
	19	16 - 24	20	<b>100003</b>
		37 - 45	20	<b>100008</b>
grey-S	-5	16 - 24	20	<b>102636</b>
		37 - 45	20	<b>102480</b>
	2	16 - 24	20	<b>102342</b>
		37 - 45	20	<b>102446</b>
	7	16 - 24	20	<b>102253</b>
		37 - 45	20	<b>102255</b>
	12	16 - 24	20	<b>102509</b>
		37 - 45	20	<b>102511</b>
	19	16 - 24	20	<b>102510</b>
		37 - 45	20	<b>102512</b>
white-S	-5	16 - 24	20	<b>102037</b>
		37 - 45	20	<b>102038</b>
	2	16 - 24	20	<b>101359</b>
		37 - 45	20	<b>101364</b>
	7	16 - 24	20	<b>101360</b>
	12	16 - 24	20	<b>101361</b>
	19	16 - 24	20	<b>101362</b>

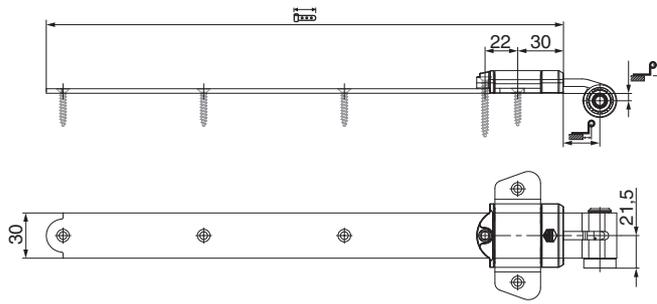


101453

**3.2.1.2 MMV corner hinges**

				<b>No</b>	
black-S	-5	16 - 24	10	<b>101453<sup>1</sup></b>	
		37 - 45	10	<b>101454<sup>1</sup></b>	
	2	16 - 24	10	<b>100020<sup>1</sup></b>	
		37 - 45	10	<b>100025<sup>1</sup></b>	
	7	16 - 24	10	<b>100021<sup>1</sup></b>	
		37 - 45	10	<b>100026<sup>1</sup></b>	
	12	16 - 24	10	<b>100022<sup>1</sup></b>	
		37 - 45	10	<b>100027<sup>1</sup></b>	
	19	16 - 24	10	<b>100023<sup>1</sup></b>	
		37 - 45	10	<b>100028<sup>1</sup></b>	
	grey-S	-5	16 - 24	10	<b>102639<sup>1</sup></b>
			37 - 45	10	<b>102640<sup>1</sup></b>
2		16 - 24	10	<b>102520<sup>1</sup></b>	
		37 - 45	10	<b>102445<sup>1</sup></b>	
7		16 - 24	10	<b>102257<sup>1</sup></b>	
		37 - 45	10	<b>102259<sup>1</sup></b>	
12		16 - 24	10	<b>102521<sup>1</sup></b>	
		37 - 45	10	<b>102523<sup>1</sup></b>	
19		16 - 24	10	<b>102522<sup>1</sup></b>	
		37 - 45	10	<b>102524<sup>1</sup></b>	
white-S		-5	16 - 24	10	<b>102039<sup>1</sup></b>
			37 - 45	10	<b>102040<sup>1</sup></b>
	2	16 - 24	10	<b>101379<sup>1</sup></b>	
		37 - 45	10	<b>101384<sup>1</sup></b>	
	7	16 - 24	10	<b>101380<sup>1</sup></b>	
		37 - 45	10	<b>101385<sup>1</sup></b>	
	12	16 - 24	10	<b>101381<sup>1</sup></b>	
		37 - 45	10	<b>101386<sup>1</sup></b>	
	19	16 - 24	10	<b>101382<sup>1</sup></b>	
		37 - 45	10	<b>101387<sup>1</sup></b>	

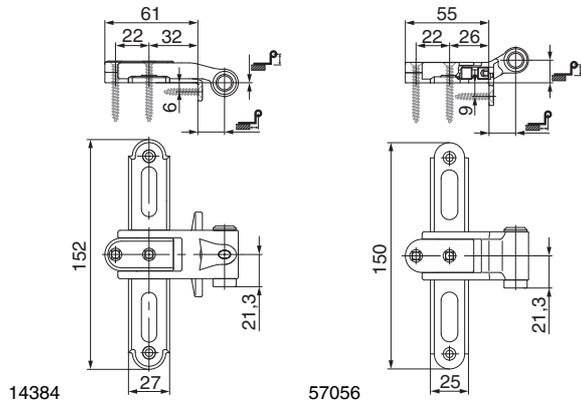
<sup>1</sup> With corner hinges, a packaging unit consists of 1 piece top corner hinge and 1 piece bottom corner hinge.



101451

3.2.1.3 MMV long hinges					No
black-S	-5	16 - 24	340	20	<b>101451</b>
		37 - 45	340	20	<b>101452</b>
	2	16 - 24	340	20	<b>100010</b>
		37 - 45	340	20	<b>100015</b>
	7	16 - 24	340	20	<b>100011</b>
		37 - 45	340	20	<b>100016</b>
	12	16 - 24	340	20	<b>100012</b>
		37 - 45	340	20	<b>100017</b>
	19	16 - 24	340	20	<b>100013</b>
		37 - 45	340	20	<b>100018</b>
grey-S	2	16 - 24	340	20	<b>102513</b>
		37 - 45	340	20	<b>102517</b>
white-S	7	37 - 45	340	20	<b>101375</b>
	19	16 - 24	340	20	<b>101372</b>

3.2.2 BLR hinges with fixing tab



14384

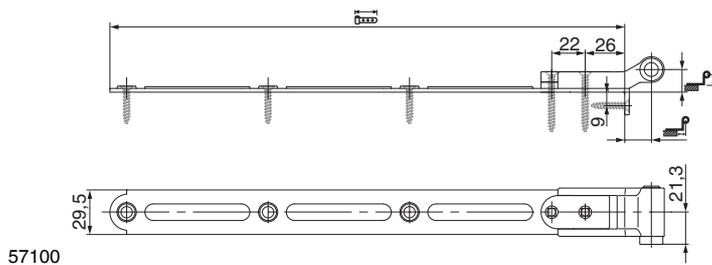
57056

3.2.2.1 BLR cross hinges with fixed crank



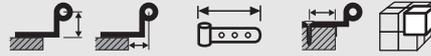
**No**

black-S	straight	0	18	32	20	<b>14384</b>
	flush	15	18	26	20	<b>57056</b>



57100

3.2.2.2 BLR long hinges with fixed crank

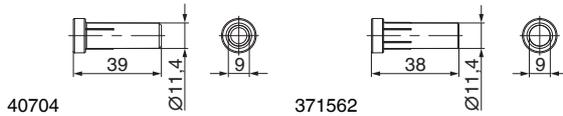


**No**

black-S	flush	15	18	250	26	20	<b>57099</b>
				340	26	20	<b>57100</b>



### 3.2.3 Accessories for shutter hinges



3.2.3.1 BLR sleeves and cover caps				No
black	closed hinge regulator sleeve		100	<b>40704</b>
	open hinge regulator sleeve		100	<b>371562</b>
	short cover cap		100	<b>41578</b>
grey	closed hinge regulator sleeve		100	<b>465210</b>
	short cover cap		100	<b>465211</b>
white	closed hinge regulator sleeve		100	<b>41149</b>
	short cover cap		100	<b>42845</b>



3.2.3.2 MMV sleeves and cover caps				No
black	open hinge regulator sleeve	Ø 10mm	100	<b>44382<sup>1,2</sup></b>
		Ø 9mm	100	<b>44381<sup>1,2</sup></b>
		Ø 8mm	100	<b>44380<sup>1,2</sup></b>
	short cover cap		100	<b>44383<sup>1</sup></b>
	long cover cap		100	<b>44384<sup>2</sup></b>
grey	open hinge regulator sleeve	Ø 10mm	50	<b>465423<sup>1,2</sup></b>
		Ø 8mm	50	<b>465422<sup>1,2</sup></b>
	long cover cap		100	<b>360382<sup>2</sup></b>
white	open hinge regulator sleeve	Ø 10mm	100	<b>454977<sup>1,2</sup></b>
		Ø 9mm	100	<b>454976<sup>1,2</sup></b>
		Ø 8mm	100	<b>454975<sup>1,2</sup></b>
	short cover cap		100	<b>454978<sup>1</sup></b>
	long cover cap		100	<b>454979<sup>2</sup></b>

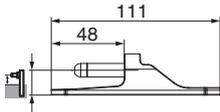
<sup>1</sup> For hinges with fixed crank.

<sup>2</sup> For hinges with variable crank 32-55mm.

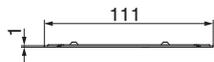
### 3.3 Shutter pins

#### 3.3.1 Surface mounted frame hinges

##### 3.3.1.1 MMV surface mounted frame hinges

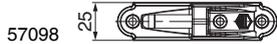
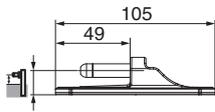


3.3.1.1.1 MMV surface mounted frame hinges					No
black-S		16,5	23	20	<b>202223</b>
		19,5	23	20	<b>202224</b>
		22,5	23	20	<b>202225</b>
		25,5	23	20	<b>202226</b>
grey-S		16,5	23	20	<b>211811</b>
		19,5	23	20	<b>212742</b>
		22,5	23	20	<b>211230</b>
		25,5	23	20	<b>212743</b>
white-S		16,5	23	20	<b>201813</b>
		19,5	23	20	<b>201814</b>
		22,5	23	20	<b>201815</b>
		25,5	23	20	<b>201816</b>



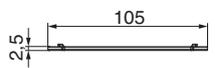
3.3.1.1.2 Packers for MMV surface mounted frame hinges				W	L		No
black	surface mounted frame hinge MMV	stackable	1	23	111	100	<b>441782</b>
grey	surface mounted frame hinge MMV	stackable	1	23	111	100	<b>360816</b>

**3.3.1.2 BLR surface mounted frame hinges**



57098

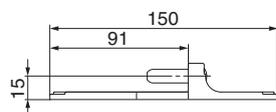
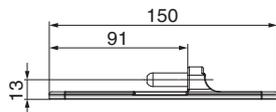
3.3.1.2.1 BLR surface mounted frame hinges						No
black-S			15	25	20	<b>57098</b>
			20	25	20	<b>56891</b>
grey-S			20	25	20	<b>212649</b>
white-S			20	25	20	<b>29267</b>



43957

3.3.1.2.2 Packers for BLR surface mounted frame hinges				W	L		No
black	for short surface mounted frame hinge		2,5	25	105	100	<b>43957</b>

**3.3.1.3 MV surface mounted frame hinges**

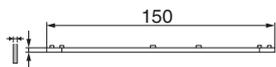


14076



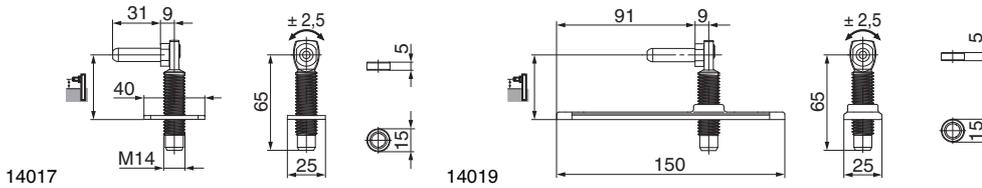
56839

3.3.1.3.1 MV surface mounted frame hinges						No
black-S	surface mounted frame hinge		13	25	20	<b>14076</b>
	surface mounted frame hinge		15	20	20	<b>56839</b>

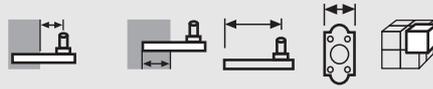


41882

3.3.1.3.2 Packers for MV surface mounted frame hinges				W	L		No		
black	for surface mounted frame hinge - 13mm distance	stackable	3	25	150	100	<b>41882</b>		
			5	25	150	100	<b>41811</b>		
			8	25	150	100	<b>41810</b>		
grey	for surface mounted frame hinge - 15mm distance	stackable	2	20	150	100	<b>40436</b>		
		white	for surface mounted frame hinge - 15mm distance	stackable	2	20	150	100	<b>361315</b>
			for surface mounted frame hinge - 13mm distance	stackable	3	25	150	100	<b>42837</b>
	for surface mounted frame hinge - 15mm distance	stackable	2	20	150	100	<b>44108</b>		



**3.3.1.4 MV surface mounted frame hinges with thread and lateral adjustment**

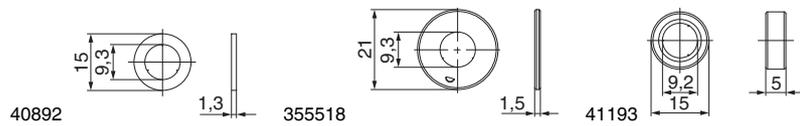


**No**

black-S	15 - 50	15	65	25	20	<b>14017<sup>1</sup></b>
	22 - 50	15	65	25	20	<b>14019<sup>1</sup></b>
grey-S	22 - 50	15	65	25	20	<b>102173<sup>1</sup></b>

<sup>1</sup> Permissible only for installation on timber!

**3.3.2 Accessories for shutter pins**



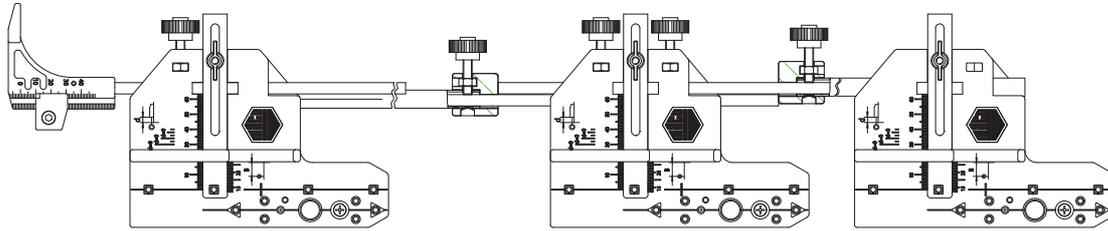
**3.3.2.1 Spacers for shutter pin**



**No**

black	spacer BLR, for shutter pin	Ø 15mm	1,3	100	<b>40892</b>
	spacer MMV, for shutter pin	Ø 22mm	1,5	100	<b>355518</b>
	spacer MV	Ø 15mm	5,3	50	<b>41193</b>
grey	spacer BLR, for shutter pin	Ø 15mm	1,3	100	<b>361316</b>
	spacer MMV, for shutter pin	Ø 22mm	1,5	50	<b>363286</b>
	spacer MV	Ø 15mm	5,3	50	<b>360379</b>
white	spacer MMV, for shutter pin	Ø 22mm	1,5	100	<b>363323</b>
	spacer MV	Ø 15mm	5,3	50	<b>41198</b>

### 3.4 Jigs



101263

#### 3.4.1 Jigs for surface mounted frame hinges



**Nº**

jig	MV	for dual installation	hinge with 26mm screw-fixing distance, surface mounted frame hinge on masonry cladding	1	<b>24081</b>
	BLR	for dual installation	Straight hinge with 32mm screw-fixing distance, short surface mounted frame hinge	1	<b>55905</b>
	MMV	for separate installation	hinge and surface mounted frame hinge	1	<b>101263</b>



## 4 Masonry installation

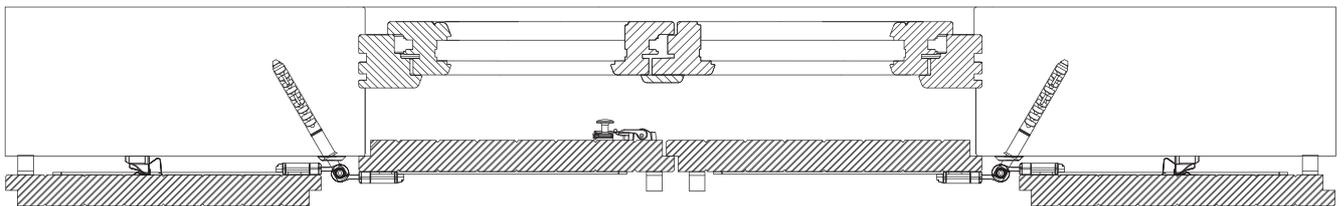
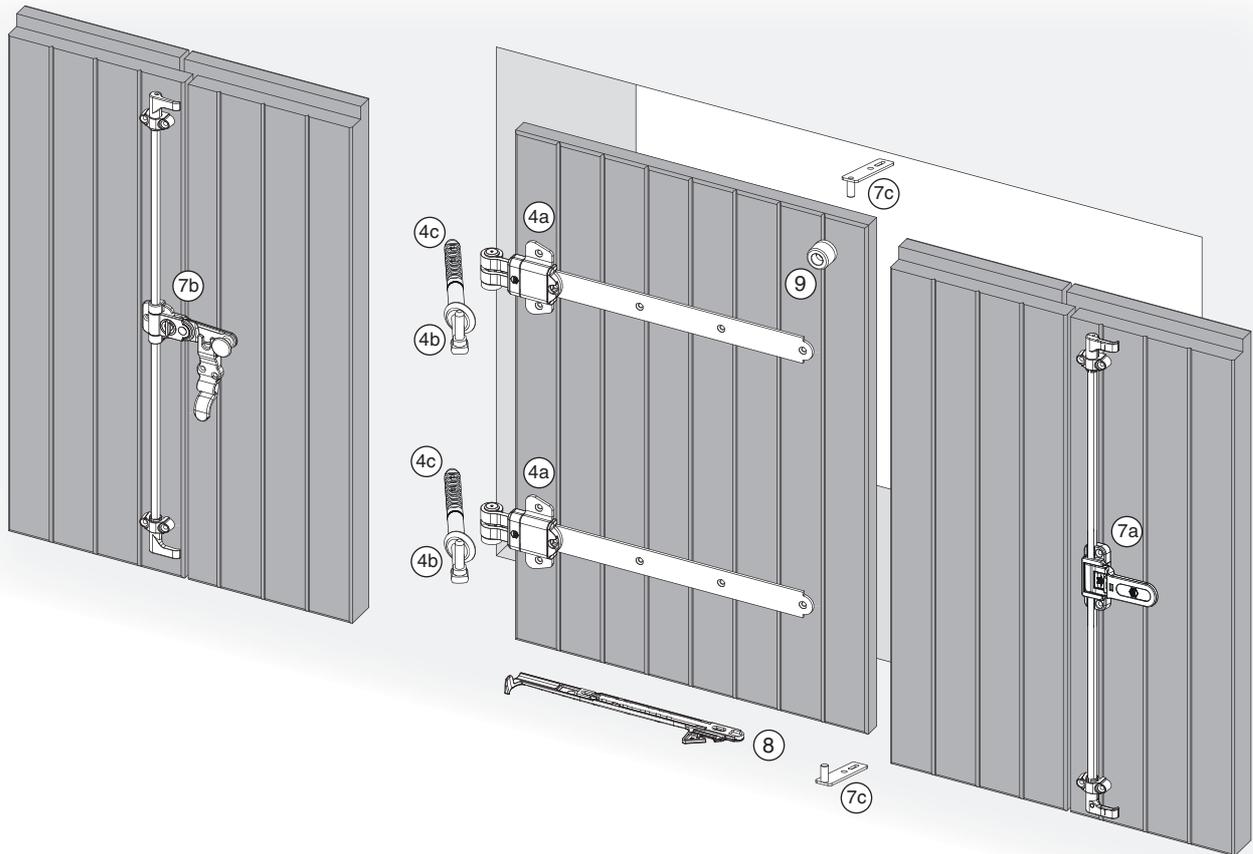
---

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## 4 Masonry installation

### 4.1 Information for hardware selection

#### 4.1.1 2-sashed, with universal shutter pin

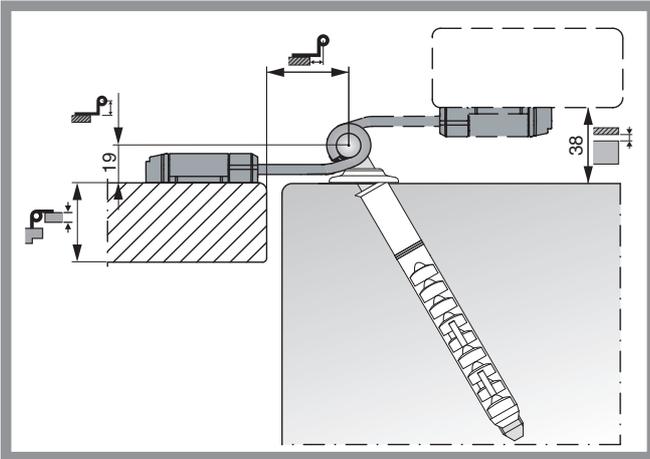


#### Selection guide

#### Page

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4c	4.4.1.2.1 Rawplugs for universal shutter pins	→91
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8	8.4.1 Comfort shutter catches for windows	→137
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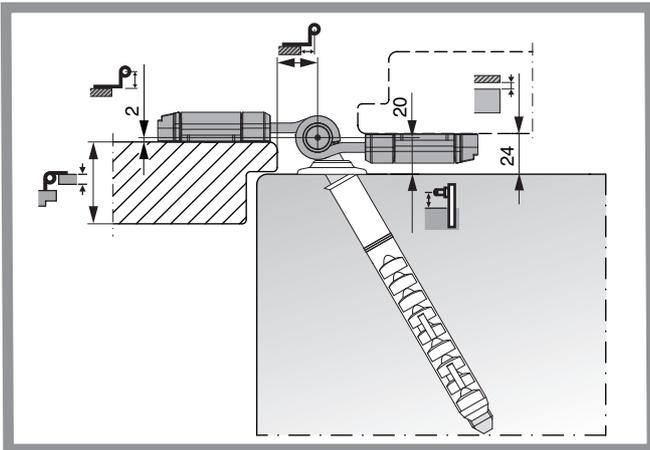
4.1.1.1 Flush



Calculation distance to wall

$$\begin{aligned}
 & 2 \times \text{[Hardware Icon]} && 38\text{mm} \\
 = & && 38\text{mm} \text{ [Wall Icon]}
 \end{aligned}$$

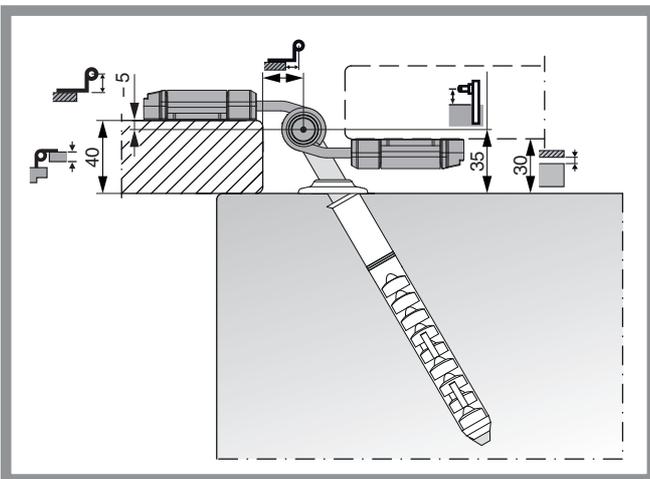
4.1.1.2 Shutter with rebate



Calculation distance to wall

$$\begin{aligned}
 & 2 \times \text{[Hardware Icon]} && 4\text{mm} \\
 & \text{[Rebate Icon]} && + 20\text{mm} \\
 = & && 24\text{mm} \text{ [Wall Icon]}
 \end{aligned}$$

4.1.1.3 Flush mounted

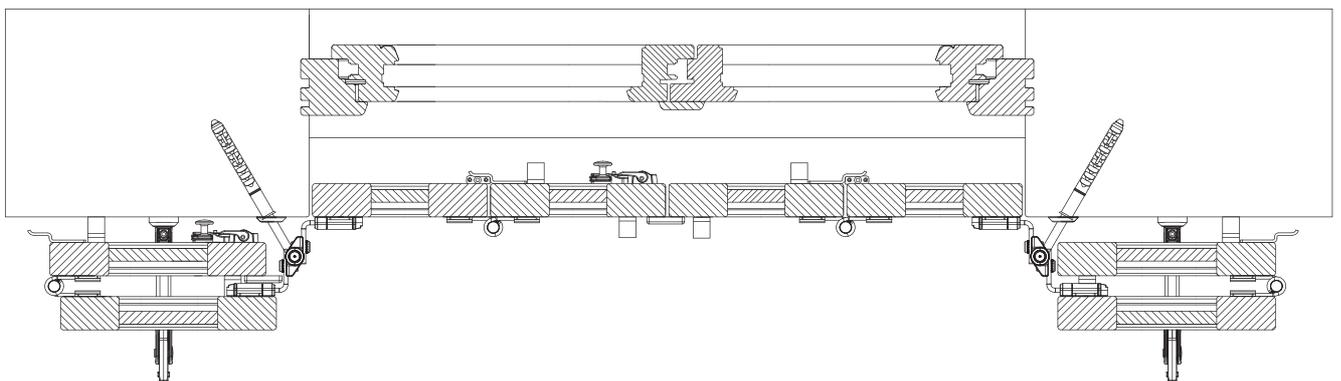
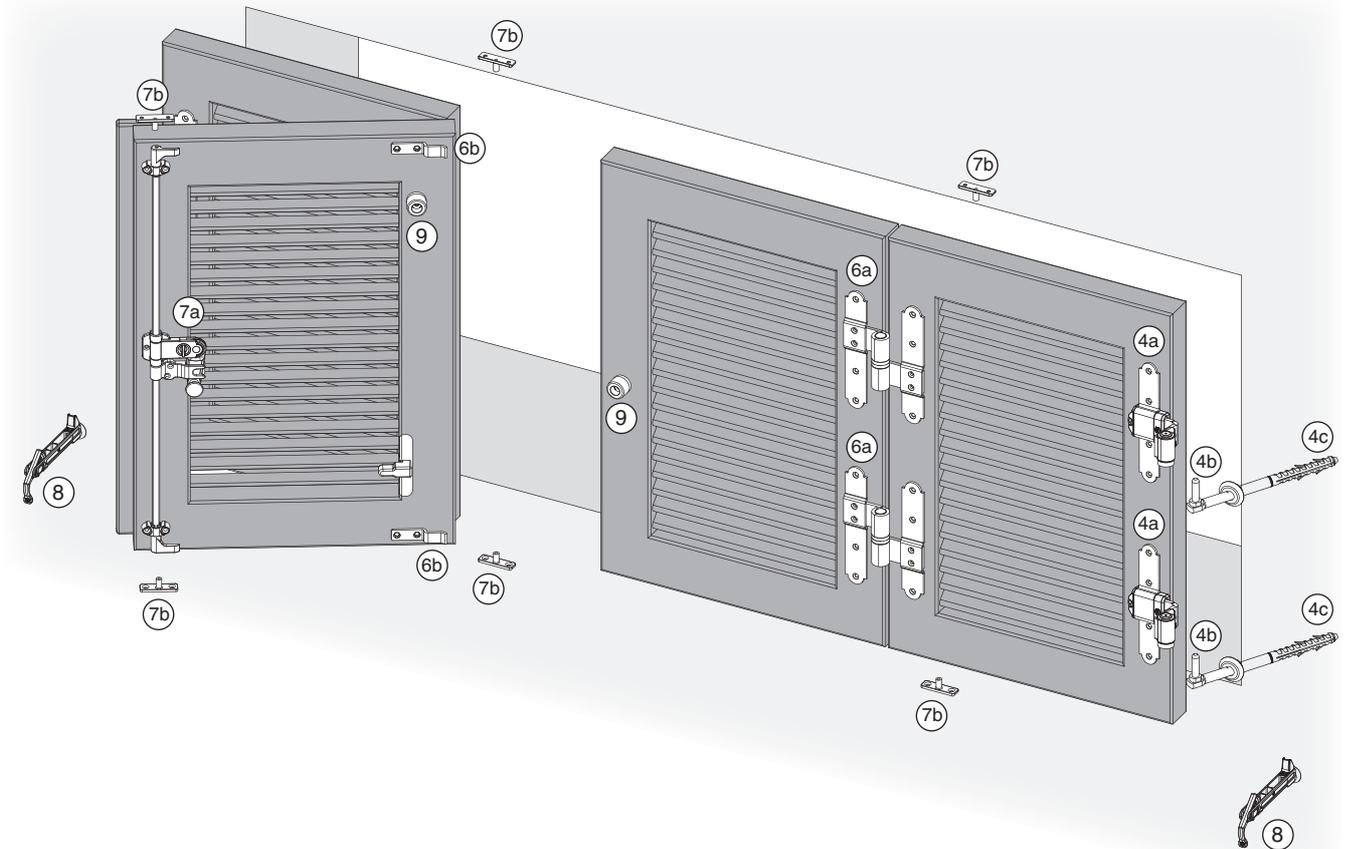


Calculation distance to wall

$$\begin{aligned}
 & \text{[Hardware Icon]} && 40\text{mm} \\
 & + 2 \times \text{[Hardware Icon]} && - 10\text{mm} \\
 = & && 30\text{mm} \text{ [Wall Icon]}
 \end{aligned}$$



4.1.2 4-sashed with external pivot point, with universal shutter pin

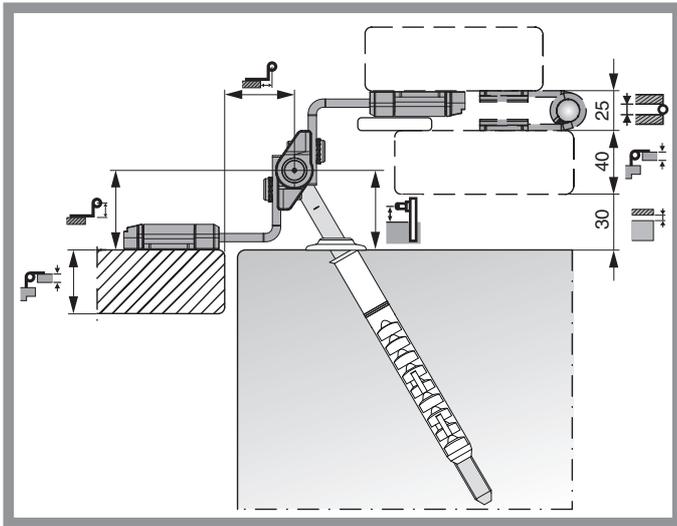


**Selection guide**

**Page**

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8	8.1.3 Shutter catches "Classic" model with cover disk without fixing bolts	→140
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4.1.2.1 Flush



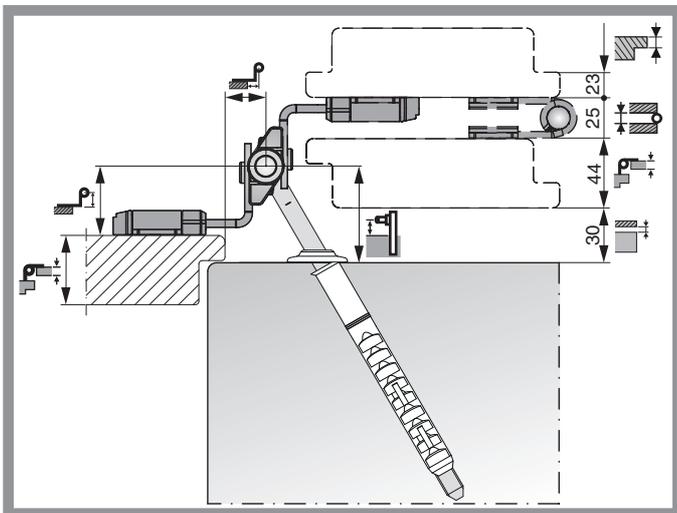
Calculation shutter pin distance

	25mm
	+ 40mm
	+ 30mm
<hr/>	
=	95mm : 2 = 47,5mm

Calculation hinge crank

	25mm
	+ 40mm
	+ 30mm
<hr/>	
=	95mm : 2 = 47,5mm

4.1.2.2 Shutter with rebate



Calculation shutter pin distance

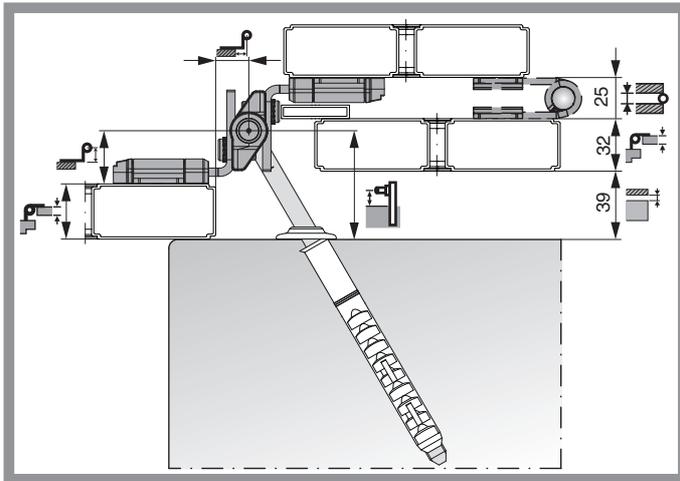
	23mm
	+ 25mm
	+ 44mm
	+ 30mm
<hr/>	
=	122mm : 2 = 61mm

Calculation hinge crank

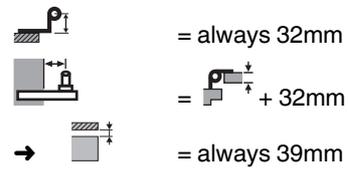
	25mm
	+ 44mm
	+ 30mm
	- 23mm
<hr/>	
=	76mm : 2 = 38mm

→ Calculation for flush mounted shutters ==>  
see next page!

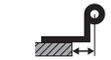
4.1.2.3 Flush mounted



Calculation shutter pin distance/hinge crank/  
distance to wall

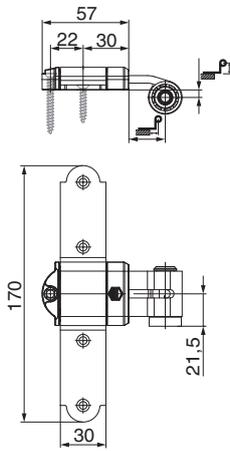


4.2 Overview of hardware variants

	 16-24 mm	 37-45 mm
 -5 mm		
 2 mm		
 7 mm		
 12 mm		
 19 mm		
 32-55 mm		

### 4.3 Hinges

#### 4.3.1 Hinges without fixing tab

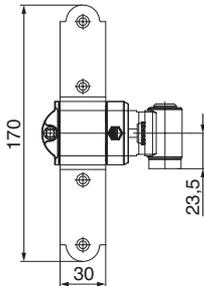
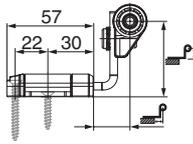


101449

##### 4.3.1.1 MMV cross hinges

				<b>Nº</b>
black-S	-5	16 - 24	20	<b>101449</b>
		37 - 45	20	<b>101450</b>
	2	16 - 24	20	<b>100000</b>
		37 - 45	20	<b>100005</b>
	7	16 - 24	20	<b>100001</b>
		37 - 45	20	<b>100006</b>
	12	16 - 24	20	<b>100002</b>
		37 - 45	20	<b>100007</b>
	19	16 - 24	20	<b>100003</b>
		37 - 45	20	<b>100008</b>
grey-S	-5	16 - 24	20	<b>102636</b>
		37 - 45	20	<b>102480</b>
	2	16 - 24	20	<b>102342</b>
		37 - 45	20	<b>102446</b>
	7	16 - 24	20	<b>102253</b>
		37 - 45	20	<b>102255</b>
	12	16 - 24	20	<b>102509</b>
		37 - 45	20	<b>102511</b>
	19	16 - 24	20	<b>102510</b>
		37 - 45	20	<b>102512</b>
white-S	-5	16 - 24	20	<b>102037</b>
		37 - 45	20	<b>102038</b>
	2	16 - 24	20	<b>101359</b>
		37 - 45	20	<b>101364</b>
	7	16 - 24	20	<b>101360</b>
	12	16 - 24	20	<b>101361</b>
	19	16 - 24	20	<b>101362</b>





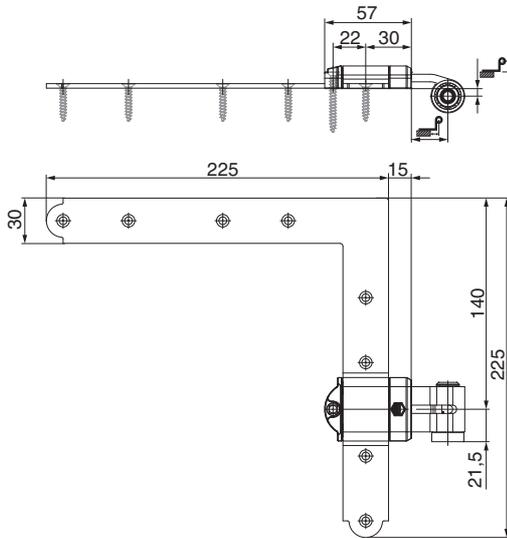
100004

**4.3.1.2 MMV cross hinges with variable crank**



**No**

black-S	32 - 55	16 - 24 37 - 45	20 20	<b>100004</b> <b>100009</b>
grey-S	32 - 55	16 - 24 37 - 45	20 20	<b>102254</b> <b>102256</b>
white-S	32 - 55	16 - 24	20	<b>101363</b>

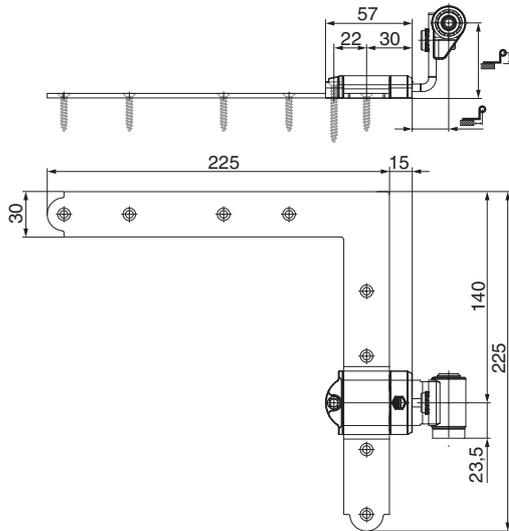


101453

**4.3.1.3 MMV corner hinges**

				<b>No</b>	
black-S	-5	16 - 24	10	<b>101453<sup>1</sup></b>	
		37 - 45	10	<b>101454<sup>1</sup></b>	
	2	16 - 24	10	<b>100020<sup>1</sup></b>	
		37 - 45	10	<b>100025<sup>1</sup></b>	
	7	16 - 24	10	<b>100021<sup>1</sup></b>	
		37 - 45	10	<b>100026<sup>1</sup></b>	
	12	16 - 24	10	<b>100022<sup>1</sup></b>	
		37 - 45	10	<b>100027<sup>1</sup></b>	
	19	16 - 24	10	<b>100023<sup>1</sup></b>	
		37 - 45	10	<b>100028<sup>1</sup></b>	
	grey-S	-5	16 - 24	10	<b>102639<sup>1</sup></b>
			37 - 45	10	<b>102640<sup>1</sup></b>
2		16 - 24	10	<b>102520<sup>1</sup></b>	
		37 - 45	10	<b>102445<sup>1</sup></b>	
7		16 - 24	10	<b>102257<sup>1</sup></b>	
		37 - 45	10	<b>102259<sup>1</sup></b>	
12		16 - 24	10	<b>102521<sup>1</sup></b>	
		37 - 45	10	<b>102523<sup>1</sup></b>	
19		16 - 24	10	<b>102522<sup>1</sup></b>	
		37 - 45	10	<b>102524<sup>1</sup></b>	
white-S		-5	16 - 24	10	<b>102039<sup>1</sup></b>
			37 - 45	10	<b>102040<sup>1</sup></b>
	2	16 - 24	10	<b>101379<sup>1</sup></b>	
		37 - 45	10	<b>101384<sup>1</sup></b>	
	7	16 - 24	10	<b>101380<sup>1</sup></b>	
		37 - 45	10	<b>101385<sup>1</sup></b>	
	12	16 - 24	10	<b>101381<sup>1</sup></b>	
		37 - 45	10	<b>101386<sup>1</sup></b>	
	19	16 - 24	10	<b>101382<sup>1</sup></b>	
		37 - 45	10	<b>101387<sup>1</sup></b>	

<sup>1</sup> With corner hinges, a packaging unit consists of 1 piece top corner hinge and 1 piece bottom corner hinge.

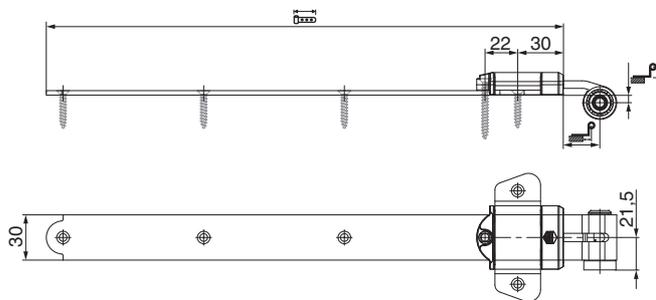


100024

**4.3.1.4 MMV corner hinges with variable crank**

				<b>No</b>
black-S	32 - 55	16 - 24	10	<b>100024<sup>1</sup></b>
		37 - 45	10	<b>100029<sup>1</sup></b>
grey-S	32 - 55	16 - 24	10	<b>102258<sup>1</sup></b>
		37 - 45	10	<b>102260<sup>1</sup></b>
white-S	32 - 55	16 - 24	10	<b>101383<sup>1</sup></b>
		37 - 45	10	<b>101388<sup>1</sup></b>

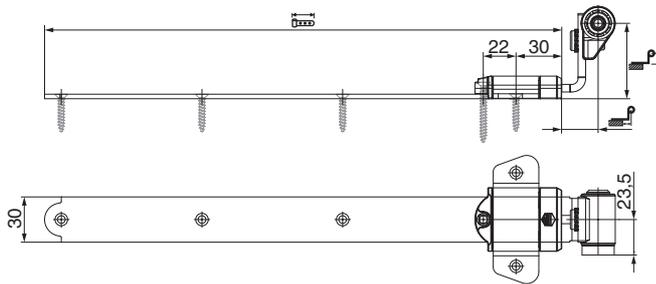
<sup>1</sup> With corner hinges, a packaging unit consists of 1 piece top corner hinge and 1 piece bottom corner hinge.



101451

**4.3.1.5 MMV long hinges**

					<b>No</b>
black-S	-5	16 - 24	340	20	<b>101451</b>
		37 - 45	340	20	<b>101452</b>
	2	16 - 24	340	20	<b>100010</b>
		37 - 45	340	20	<b>100015</b>
	7	16 - 24	340	20	<b>100011</b>
		37 - 45	340	20	<b>100016</b>
	12	16 - 24	340	20	<b>100012</b>
		37 - 45	340	20	<b>100017</b>
19	16 - 24	340	20	<b>100013</b>	
	37 - 45	340	20	<b>100018</b>	
grey-S	2	16 - 24	340	20	<b>102513</b>
		37 - 45	340	20	<b>102517</b>
white-S	7	37 - 45	340	20	<b>101375</b>
		19	16 - 24	340	20



100014

4.3.1.6 MMV long hinges with variable crank					No
black-S	32 - 55	16 - 24	340	20	<b>100014</b>
		37 - 45	340	20	<b>100019</b>
white-S	32 - 55	16 - 24	340	20	<b>101373</b>



### 4.3.2 Accessories for shutter hinges



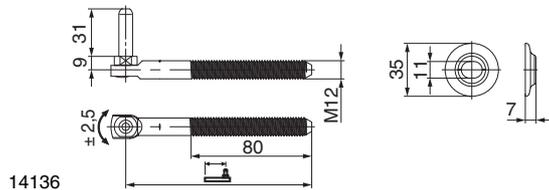
4.3.2.1 MMV sleeves and cover caps				<b>No</b>
black	open hinge regulator sleeve	Ø 10mm	100	<b>44382<sup>1,2</sup></b>
		Ø 9mm	100	<b>44381<sup>1,2</sup></b>
		Ø 8mm	100	<b>44380<sup>1,2</sup></b>
	short cover cap		100	<b>44383<sup>1</sup></b>
	long cover cap		100	<b>44384<sup>2</sup></b>
grey	open hinge regulator sleeve	Ø 10mm	50	<b>465423<sup>1,2</sup></b>
		Ø 8mm	50	<b>465422<sup>1,2</sup></b>
	long cover cap		100	<b>360382<sup>2</sup></b>
white	open hinge regulator sleeve	Ø 10mm	100	<b>454977<sup>1,2</sup></b>
		Ø 9mm	100	<b>454976<sup>1,2</sup></b>
		Ø 8mm	100	<b>454975<sup>1,2</sup></b>
	short cover cap		100	<b>454978<sup>1</sup></b>
	long cover cap		100	<b>454979<sup>2</sup></b>

<sup>1</sup> For hinges with fixed crank.

<sup>2</sup> For hinges with variable crank 32-55mm.

## 4.4 Shutter pins

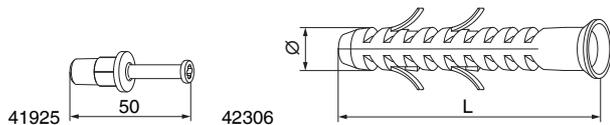
### 4.4.1 M12 universal shutter pins with lateral adjustment



14136

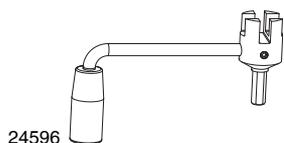
4.4.1.1 MMV universal shutter pins with lateral adjustment			No	
black-S	size 1	122	20	<b>14136</b>
	size 2	147	20	<b>14140</b>
	size 3	172	20	<b>14144</b>
	size 4	250	20	<b>14148</b>
grey-S	size 1	122	20	<b>102448</b>
	size 2	147	20	<b>102449</b>
	size 3	172	20	<b>102545</b>
white-S	size 2	147	20	<b>11781</b>
	size 4	250	20	<b>101028</b>

### 4.4.1.2 Accessories for M12 universal shutter pins



41925 50 42306 L Ø

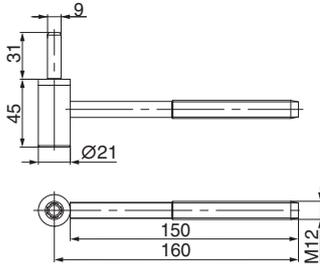
4.4.1.2.1 Rawlplugs for universal shutter pins	Ø	L		No
installation aid for plastered-in rawlplug			20	<b>41925</b>
rawlplug for shutter pin	16	100	20	<b>42306</b>
		140	20	<b>42308</b>



24596

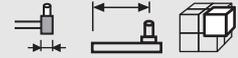
4.4.1.2.2 Screw-driving tool		No
screw-driving tool with crank handle for universal shutter pin	1	<b>24596</b>

#### 4.4.2 M12 masonry shutter pins



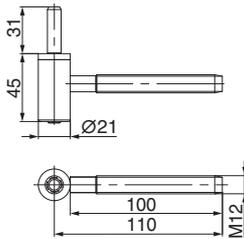
477945

##### 4.4.2.1 MMV M12 masonry shutter pins with locking washer



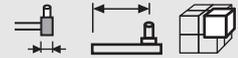
**No**

black-S	L110	21	110	24	<b>477944</b>
	L160	21	160	24	<b>477945</b>
grey-S	L110	21	110	24	<b>477968</b>
	L160	21	160	24	<b>477969</b>
white-S	L110	21	110	24	<b>477965</b>
	L160	21	160	24	<b>477966</b>



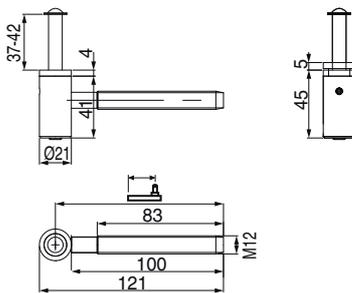
477972

##### 4.4.2.2 MMV M12 masonry shutter pins with height adjustment and locking washer



**No**

black-S	L90	21	90	24	<b>477971</b>
	L110	21	110	24	<b>477972</b>
	L160	21	160	24	<b>477973</b>



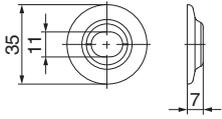
477979

##### 4.4.2.3 MMV M12 masonry shutter pins with height adjustment and safety catch



**No**

black-S	L90	21	90	24	<b>477978</b>
	L110	21	110	24	<b>477979</b>
	L160	21	160	24	<b>477980</b>
grey-S	L110	21	110	24	<b>477983</b>
	L160	21	160	24	<b>477984</b>
white-S	L110	21	110	24	<b>477981</b>
	L160	21	160	48	<b>477982</b>



42454

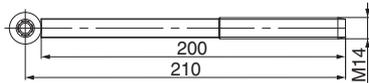
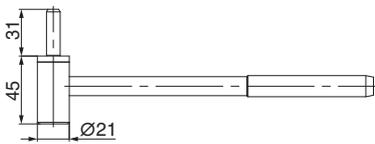
**4.4.2.4 Cover disks for M12 shutter pins**



**No**

black	100	<b>42454</b>
grey	100	<b>465285</b>
white	20	<b>42844</b>

**4.4.3 M14 masonry shutter pins**



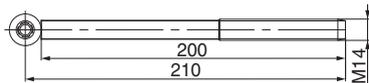
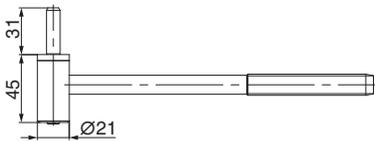
477946

**4.4.3.1 MMV M14 masonry shutter pins with locking washer**



**No**

black-S	L210	21	210	24	<b>477946</b>
grey-S	L210	21	210	24	<b>477970</b>
white-S	L210	21	210	24	<b>477967</b>



477974

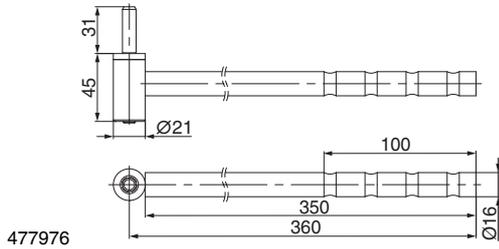
**4.4.3.2 MMV M14 masonry shutter pins with height adjustment and locking washer**



**No**

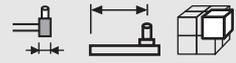
black-S	L210	21	210	24	<b>477974</b>
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4.4.4 Ø16 masonry shutter pins



477976

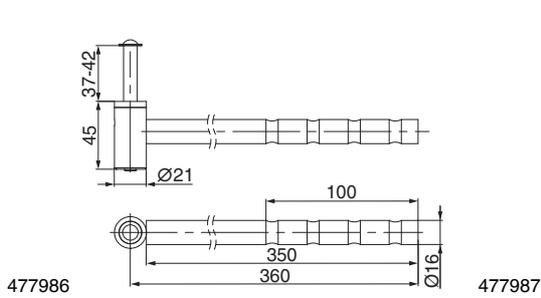
4.4.4.1 MMV Ø16 masonry shutter pins with height adjustment and locking washer



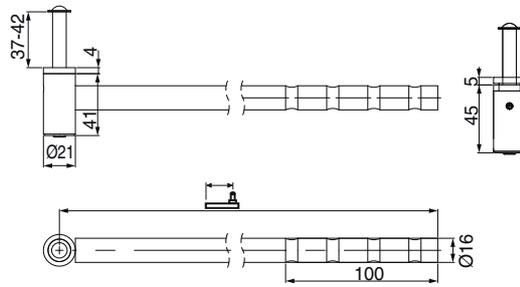
No

black-S

L260	21	260	20	<b>477975</b>
L360	21	360	16	<b>477976</b>
L460	21	460	16	<b>477977</b>

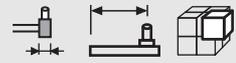


477986



477987

4.4.4.2 MMV Ø16 masonry shutter pins with height adjustment and safety catch



No

black-S

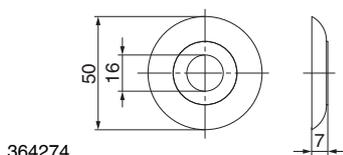
L260	21	260	20	<b>477985</b>
L360	21	360	16	<b>477986</b>
L460	21	460	16	<b>477987</b>

grey-S

L360	21	360	16	<b>477989</b>
------	----	-----	----	---------------

white-S

L360	21	360	16	<b>477988</b>
------	----	-----	----	---------------



364274

4.4.4.3 Cover disks for Ø16 masonry shutter pins



No

black

100

**364274**

grey

50

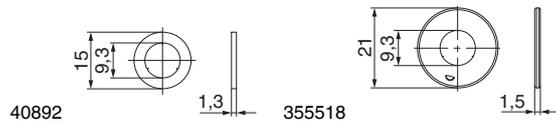
**365880**

white

50

**367600**

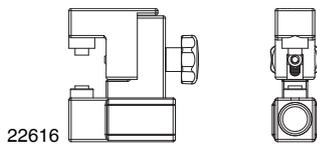
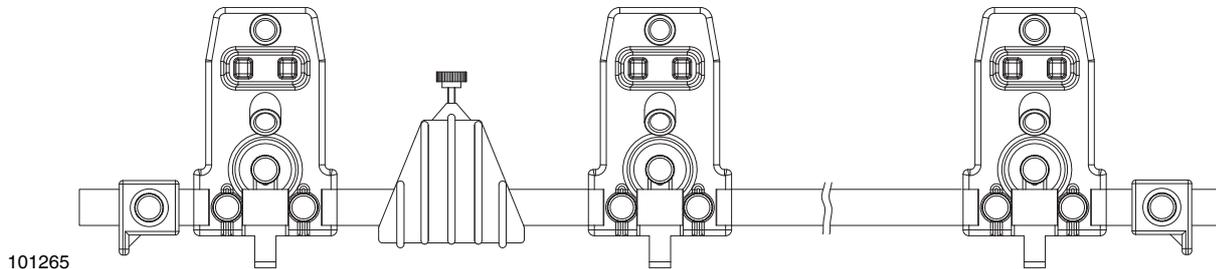
#### 4.4.5 Accessories for shutter pins



4.4.5.1 Spacers for shutter pin					<b>Nº</b>
black	spacer BLR, for shutter pin	Ø 15mm	1,3	100	<b>40892</b>
	spacer MMV, for shutter pin	Ø 22mm	1,5	100	<b>355518</b>
grey	spacer BLR, for shutter pin	Ø 15mm	1,3	100	<b>361316</b>
	spacer MMV, for shutter pin	Ø 22mm	1,5	50	<b>363286</b>
white	spacer MMV, for shutter pin	Ø 22mm	1,5	100	<b>363323</b>



4.5 Jigs



4.5.1 Jigs for MMV shutter pins masonry installation



**Nº**

jig	MMV	for universal shutter pin	30° sloped drillhole AT=16-24, 2 rods + 3 drilling blocks	1	<b>101265</b>
		for shutter pin with separate pin	drill hole Ø 16mm	1	<b>22616</b>
				1	<b>27054</b>



## 5 Padovana / Vicentina installation

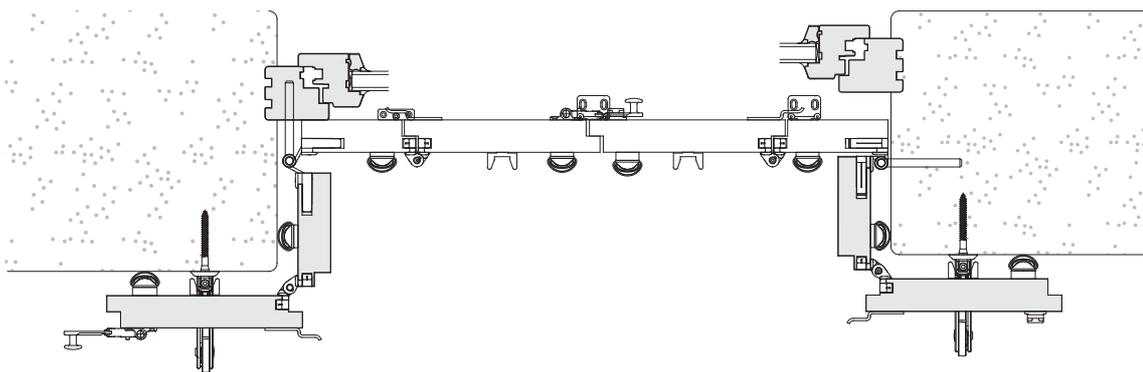
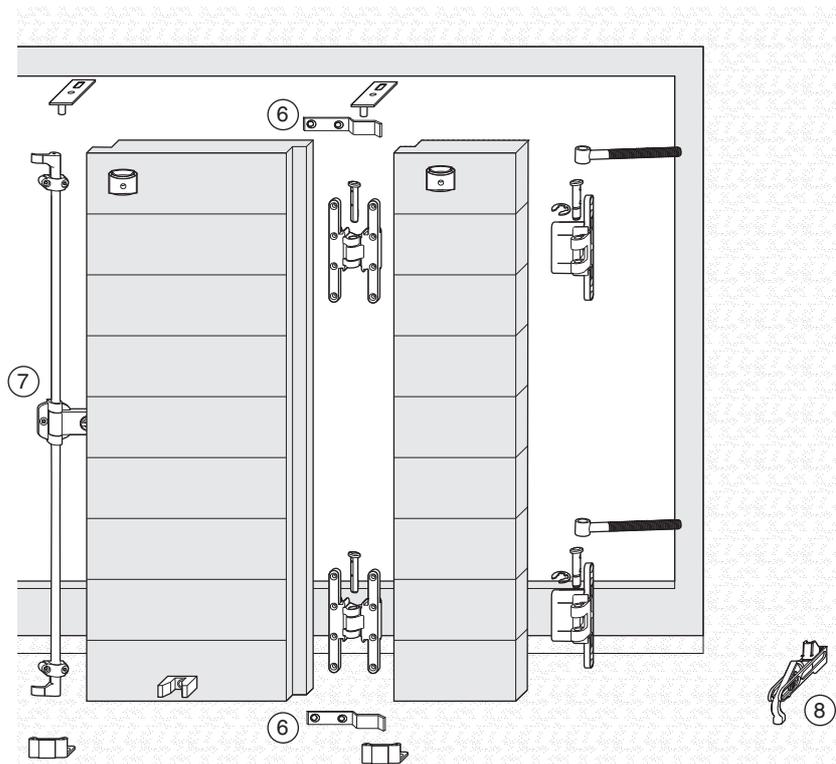
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<b>5.2</b>	<b>Hinges</b>	<b>99</b>
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5.2.2	Accessories for shutter hinges	99
<b>5.3</b>	<b>Shutter pins</b>	<b>100</b>
5.3.1	Shutter pins for PAD shutter hinges	100

## 5 Padovana / Vicentina installation

### 5.1 Information for hardware selection

#### 5.1.1 2-sashed, with masonry shutter pins and shutter pins in frame



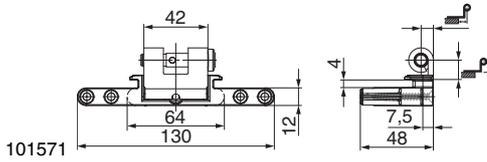
#### Selection guide

#### Page

6	6.6	Multi-sash locking hooks	→108
7	7	Shutter locks	→110
8	8	Shutter catches	→132

## 5.2 Hinges

### 5.2.1 Concealed hinges with lateral adjustment



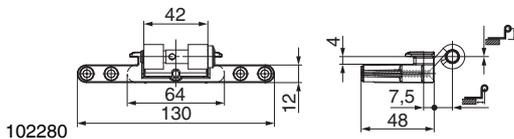
101571

#### T 5.2.1.1 PAD hinges for masonry installation



**No**

black-S	13	-8	20	<b>101571</b>
grey-S	13	-8	20	<b>102139</b>



102280

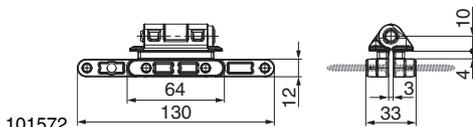
#### T 5.2.1.2 PAD hinges for frame installation



**No**

black-S	12	20	<b>102280</b>
grey-S	12	20	<b>102352</b>

### 5.2.1.3 Shutter centre hinges



101572

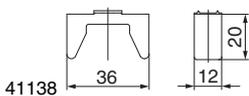
#### T 5.2.1.3.1 PAD shutter centre hinges



**No**

black-S	21	20	20	<b>101572</b>
grey-S	21	20	20	<b>102158</b>

### 5.2.2 Accessories for shutter hinges



41138

#### 5.2.2.1 Stop for PAD shutter catches

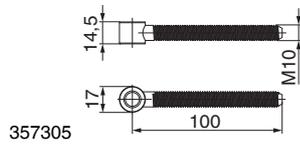


**No**

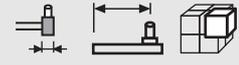
black	50	<b>41138</b>
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### 5.3 Shutter pins



#### T 5.3.1 Shutter pins for PAD shutter hinges



**No**

black-S	17	100	20	<b>357305</b>
grey-S	17	100	20	<b>359885</b>



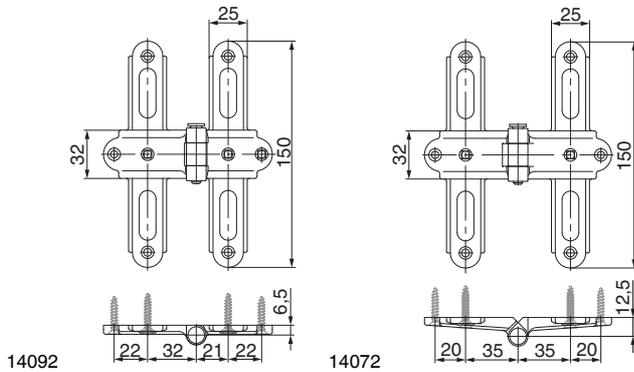
## 6 Accessories for folding shutters

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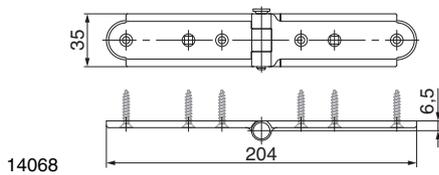
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## 6 Accessories for folding shutters

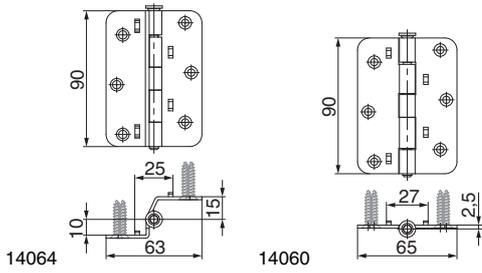
### 6.1 Centre hinges for folding shutters in sight



6.1.1 BLR centre cross hinges						No
black-S	asymmetrical	21-32	0-25	13	20	<b>14092</b>
	symmetrical	34-34	0	25	20	<b>14072</b>
grey-S	asymmetrical	21-32	0-25	13	20	<b>102332</b>
	symmetrical	34-34	0	25	20	<b>102159</b>
white-S	asymmetrical	21-32	0-25	13	20	<b>27746</b>
	symmetrical	34-34	0	25	20	<b>20293</b>



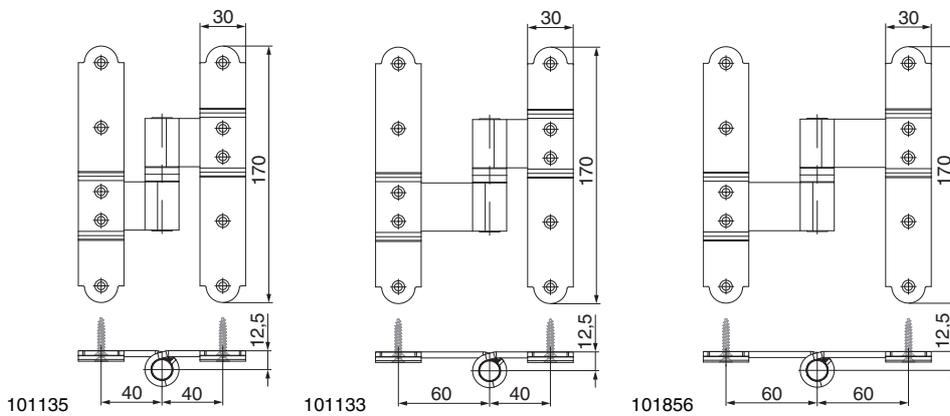
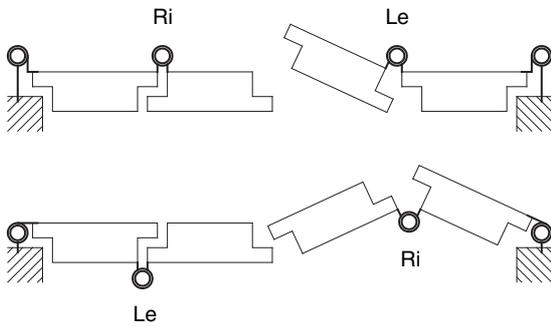
6.1.2 BLR batten hinges					No
black-S	symmetrical	26	13	20	<b>14068</b>



<b>6.1.3 BLR centre hinges straight/cranked</b>						<b>Nº</b>
black-S	asymmetrical	20 (24)	25	25	20	<b>14064</b>
	symmetrical	22 (26)	0	27	20	<b>14060</b>
grey-S	symmetrical	22 (26)	0	27	20	<b>102490</b>
white-S	asymmetrical	20 (24)	25	25	20	<b>10107</b>
	symmetrical	22 (26)	0	27	20	<b>21883</b>



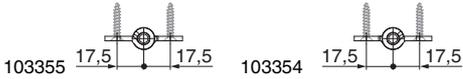
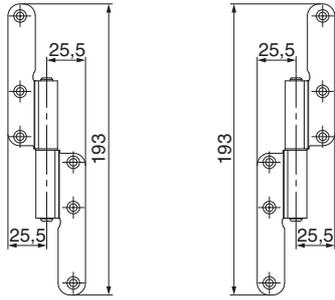
6.1.4 Centre hinges for folding shutters with opening direction left or right



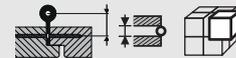
6.1.5 MMV centre cross hinges



										No
black-S	asymmetrical	left	60-40	0-80	25	20			101133	
		right	60-40	0-80	25	20			101134	
	symmetrical	left	40-40	0-40	25	20			101135	
			60-60	0-40	25	20			101856	
		right	40-40	0-40	25	20			101136	
			60-60	0-40	25	20			101883	
grey-S	asymmetrical	left	60-40	0-80	25	20			102525	
		right	60-40	0-80	25	20			102526	
	symmetrical	left	40-40	0-40	25	20			102261	
		right	40-40	0-40	25	20			102262	
white-S	asymmetrical	left	60-40	0-80	25	20			101257	
		right	60-40	0-80	25	20			101258	
	symmetrical	left	40-40	0-40	25	20			101259	
			60-60	0-40	25	20			101884	
		right	40-40	0-40	25	20			101260	
			60-60	0-40	25	20			101885	



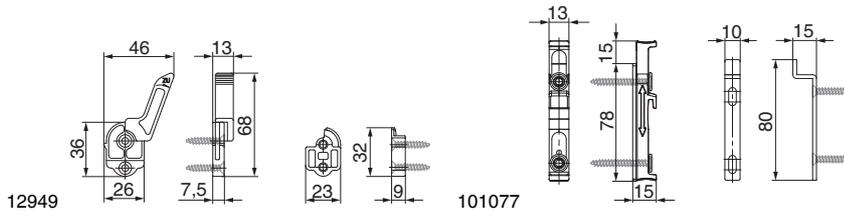
**6.1.6 Prima MMV centre hinges**



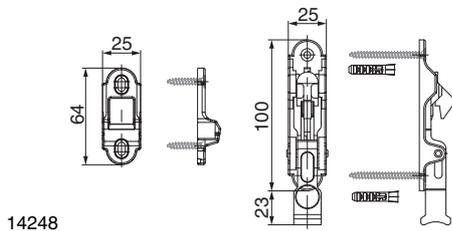
**Nº**

black-S	left	17.5	15	20	<b>103355</b>
		21	25	20	<b>103288</b>
		22.5	25	20	<b>103357</b>
	right	27.5	35	20	<b>103359</b>
		17.5	15	20	<b>103354</b>
		21	25	20	<b>103289</b>
grey-S	left	22.5	25	20	<b>103356</b>
		27.5	35	20	<b>103358</b>
		21	25	20	<b>105782</b>
white-S	right	27.5	35	20	<b>105783</b>
		21	25	20	<b>104105</b>
		27.5	35	20	<b>103365</b>
white-S	left	21	25	20	<b>104114</b>
		27.5	35	20	<b>103364</b>
		21	25	20	<b>104114</b>
white-S	right	21	25	20	<b>104114</b>
		27.5	35	20	<b>103364</b>
		27.5	35	20	<b>103364</b>

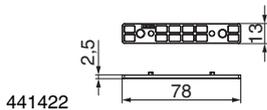




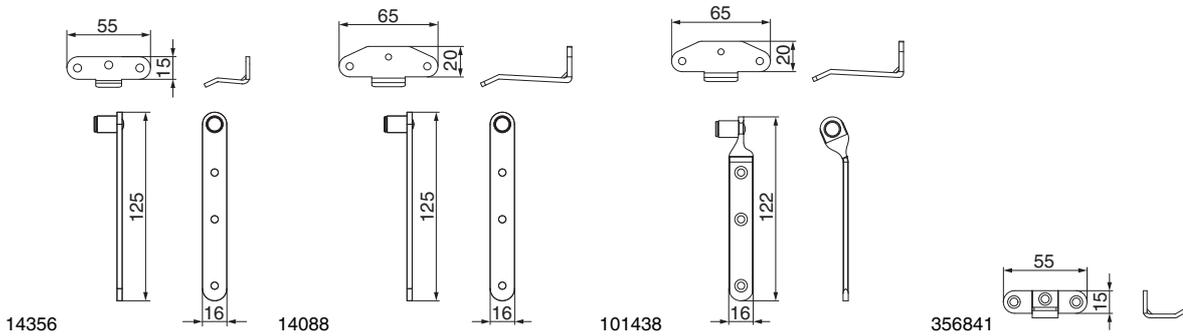
6.2 Folding shutter couplings				No
black	with lever	for 13mm distance	20	12949
		for 25mm distance	20	13101
black-S	small	for 20mm distance	20	101799
		for 25mm distance	20	101077
white	with lever	for 25mm distance	20	10223
white-S	small	for 25mm distance	20	101261



6.3 Door shutter catches as folding shutter coupling				No
black-S			20	14248
grey-S			20	102147
white-S			20	13110

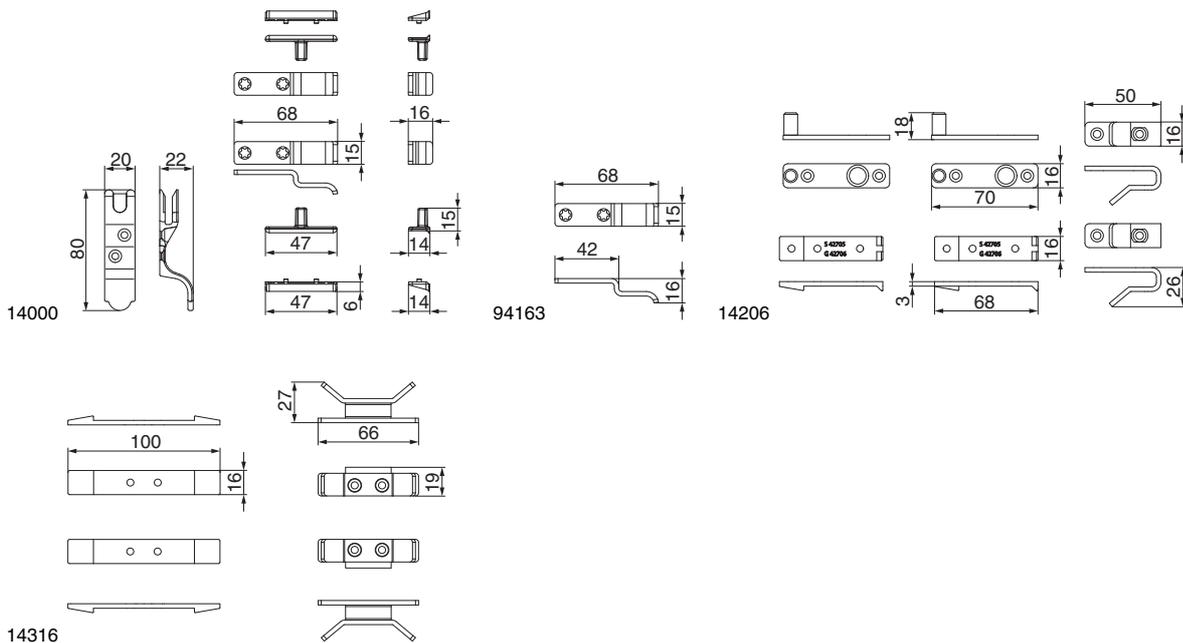


6.4 Packers for folding shutter couplings				No
black	for folding shutter coupling - slimline		2,5 50	441422
white	for folding shutter coupling - slimline		2,5 50	454768



<b>6.5 Shutter suspending run-up block</b>				<b>No</b>
black-S	shutter suspending run-up block	for 0-5mm shutter distance	20	<b>14356</b>
		for 5-32mm shutter distance	20	<b>14088</b>
	shutter suspending run-up block cranked	20	<b>101438</b>	
	shutter suspending run-up block bottom	50	<b>356841</b>	
	Shutter run-up block plate	for 0-5mm shutter distance	50	<b>360812</b>
grey-S	shutter suspending run-up block	for 5-32mm shutter distance	50	<b>360398</b>
		for 0-5mm shutter distance	20	<b>102138</b>
white-S	shutter suspending run-up block	for 5-32mm shutter distance	20	<b>102491</b>
		for 0-5mm shutter distance	20	<b>10235</b>
	shutter suspending run-up block bottom	for 5-32mm shutter distance	20	<b>101304</b>
		for 0-5mm shutter distance	20	<b>101695</b>
	shutter suspending run-up block bottom		50	<b>356842</b>



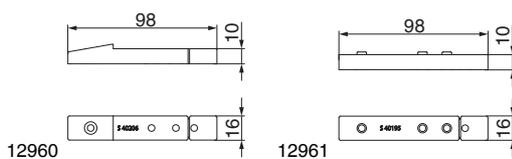


### 6.6 Multi-sash locking hooks



**No**

black-S	in pairs, multi-sashed, external pivot point	with striker pin brackets and packers	20	<b>14000</b>
	single multi-sashed external pivot point		200	<b>94163</b>
	in pairs, multi-sashed, internal pivot point	with striker pin brackets and packers	10	<b>14206</b>
	4-sash locking hook with internal pivot point in pairs		10	<b>14316</b>
grey-S	in pairs, multi-sashed, external pivot point	with striker pin brackets and packers	20	<b>102165</b>
	single multi-sashed external pivot point		200	<b>359871</b>
	in pairs, multi-sashed, internal pivot point	with striker pin brackets and packers	10	<b>102166</b>
white-S	in pairs, multi-sashed, external pivot point	with striker pin brackets and packers	20	<b>12537</b>
	single multi-sashed external pivot point		200	<b>365862</b>
	in pairs, multi-sashed, internal pivot point	with striker pin brackets and packers	10	<b>101554</b>
	4-sash locking hook with internal pivot point in pairs		10	<b>14801</b>



### 6.7 Packers for locking hooks with inside pivot point



**No**

black	for locking hook with internal pivot point for 10mm gap		10	<b>12960</b>
	for locking hook with internal pivot point for 20mm and 30mm gap		10	<b>12961</b>
white	for locking hook with internal pivot point for 10mm gap		20	<b>44352</b>
	for locking hook with internal pivot point for 20mm and 30mm gap		20	<b>44353</b>

## 7 Shutter locks

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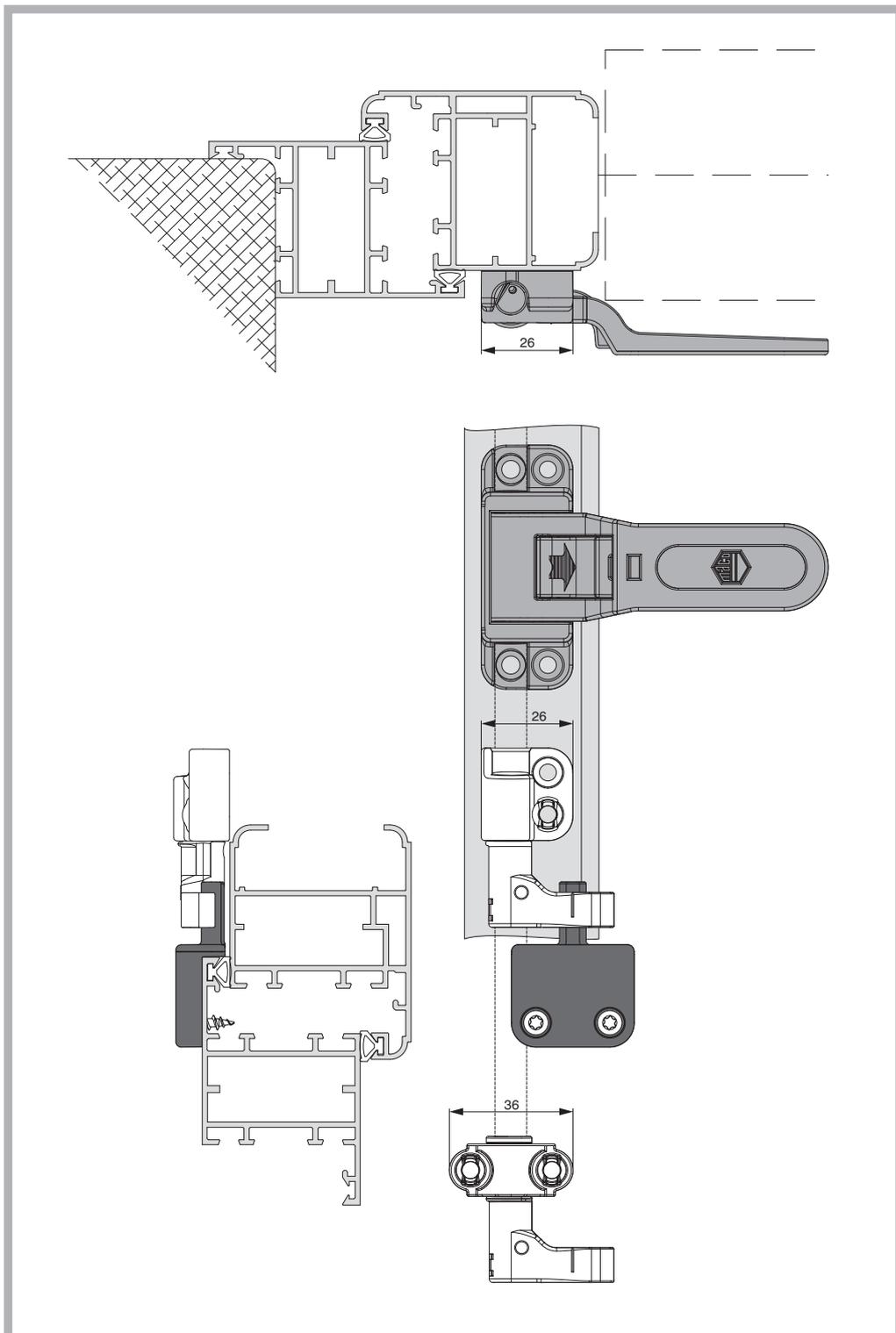
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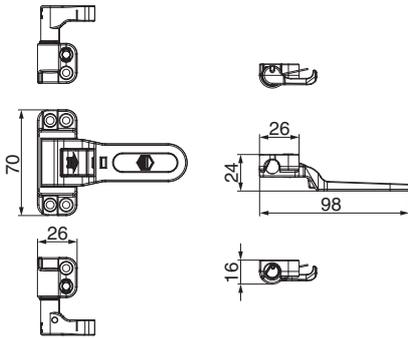


## 7 Shutter locks

### 7.1 Snap locks packages

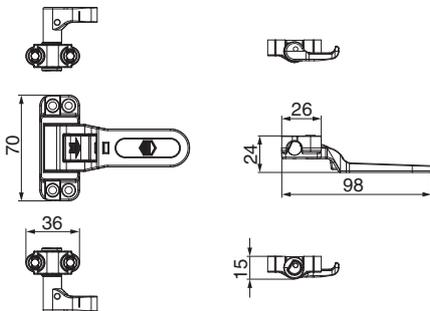
#### 7.1.1 Snap locks 26mm wide





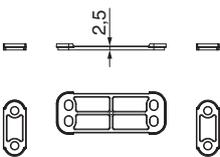
104033

7.1.1.1 Snap locks 26mm wide with spring-loaded locking hooks 26mm wide		L		No
black-S	with 26mm wide spring-loaded locking hooks	98	20	<b>104033</b>



104035

7.1.1.2 Snap locks 26mm wide with locking hooks 36mm wide		L		No
black-S	with 36mm wide locking hooks	98	20	<b>104035</b>
	with 36mm wide spring-loaded locking hooks	98	20	<b>104037</b>
grey-S	with 36mm wide locking hooks	98	20	<b>104056</b>
white-S	with 36mm wide locking hooks	98	20	<b>104053</b>
	with 36mm wide spring-loaded locking hooks	98	20	<b>104055</b>

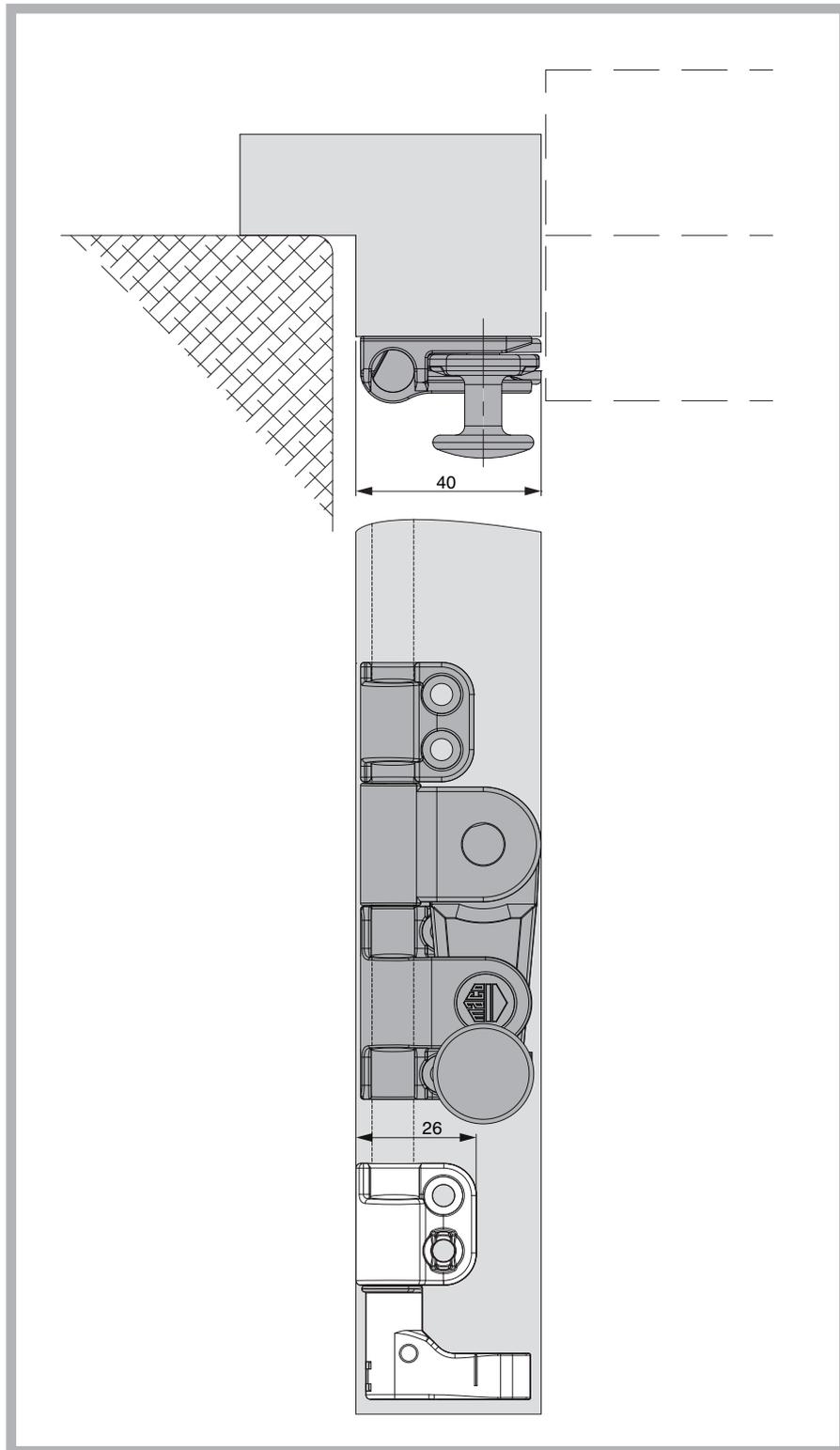


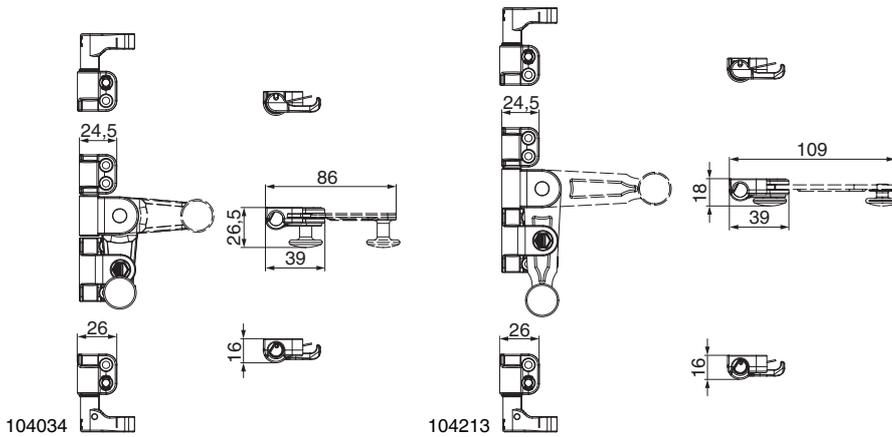
368162

7.1.1.3 Packers for snap lock and locking hooks					No
black	for snap lock and 36mm wide locking hooks	stackable 2.5mm high	2,5	50	<b>368162</b>
grey	for snap lock and 36mm wide locking hooks	stackable 2.5mm high	2,5	50	<b>368213</b>
white	for snap lock and 36mm wide locking hooks	stackable 2.5mm high	2,5	50	<b>368212</b>

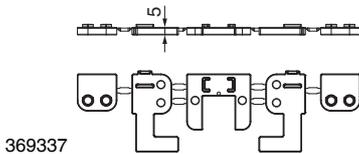


7.1.2 1F shutter locks 40mm wide





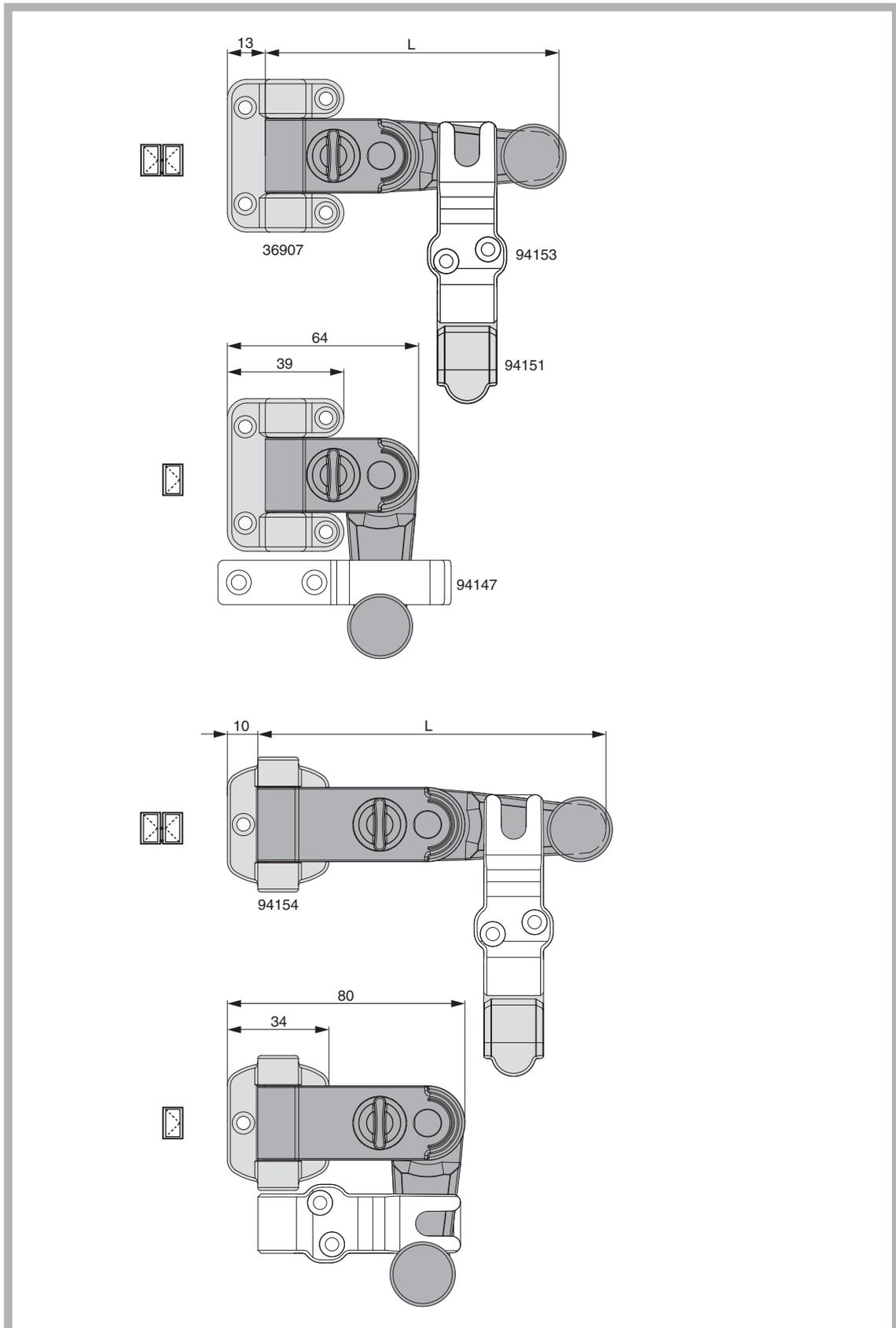
<b>7.1.2.1 1F shutter locks with spring-loaded locking hooks 26mm wide</b>				<b>L</b>		<b>No</b>
black-S	shutter lock 1F without striker pin brackets without protective block	left/right	40 wide	86	20	<b>104034</b>
	shutter lock 1F with low head without striker pin brackets without protective block	left/right	40 wide	109	20	<b>104213</b>
grey-S	shutter lock 1F without striker pin brackets without protective block	left/right	40 wide	88	20	<b>104624</b>
white-S	shutter lock 1F without striker pin brackets without protective block	left/right	40 wide	86	20	<b>104654</b>
	shutter lock 1F with low head without striker pin brackets without protective block	left/right	40 wide	109	20	<b>104617</b>

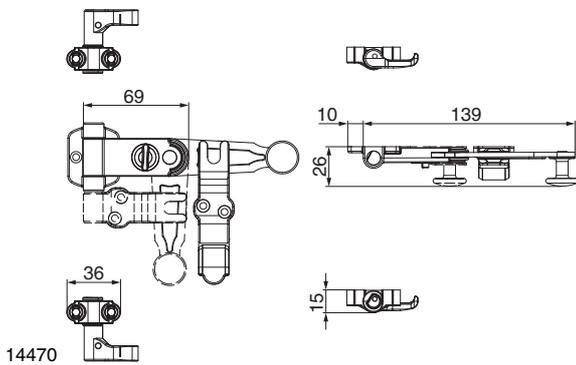
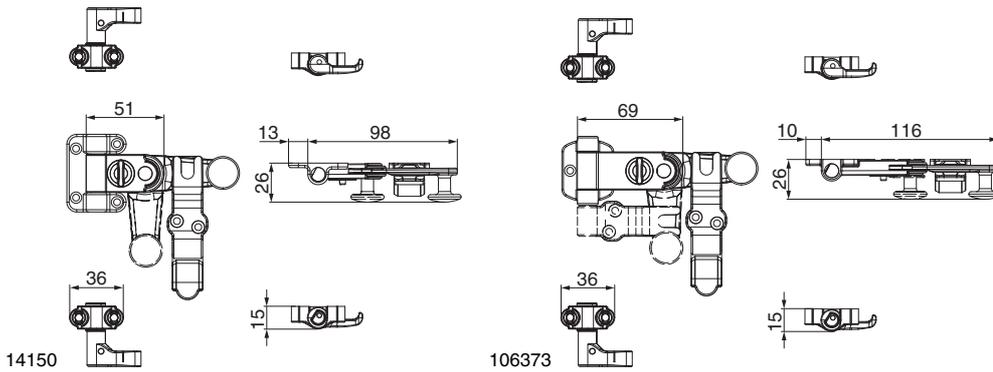


<b>7.1.2.2 Packer 1F shutter lock, locking hooks and rod guide</b>						<b>No</b>
black	for shutter lock 1F and 26mm wide locking hooks and rod guide		stackable 5mm high	5	50	<b>369337</b>

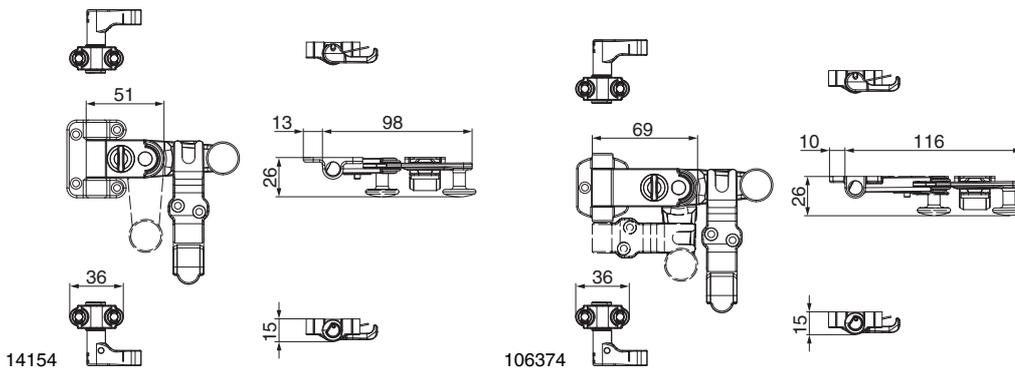


7.1.3 2F shutter locks



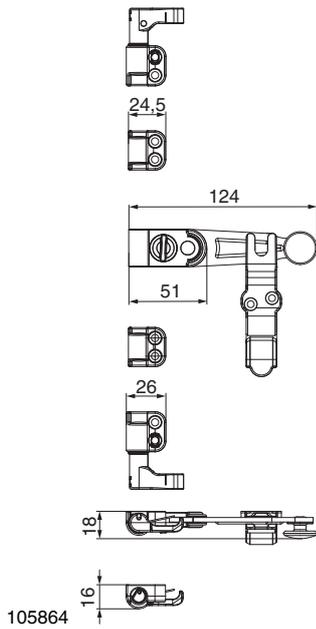


7.1.3.1 2F shutter locks with locking hooks			L		Nº
black-S	with short crank handle	with 36mm wide locking hooks	98	20	<b>14150</b>
	with long crank handle	with 36mm wide locking hooks	139	20	<b>14470</b>
	with standard crank handle	with 36mm wide locking hooks	116	20	<b>106373</b>
grey-S	with short crank handle	with 36mm wide locking hooks	98	20	<b>102251</b>
	with long crank handle	with 36mm wide locking hooks	139	20	<b>102252</b>
	with standard crank handle	with 36mm wide locking hooks	116	20	<b>102481</b>
white-S	with long crank handle	with 36mm wide locking hooks	139	20	<b>100040</b>
	with standard crank handle	with 36mm wide locking hooks	116	20	<b>13267</b>



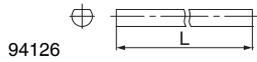
7.1.3.2 2F shutter locks with spring-loaded locking hooks			L		Nº
black-S	with short crank handle	with 36mm wide spring-loaded locking hooks	98	20	<b>14154</b>
	with long crank handle	with 36mm wide spring-loaded locking hooks	139	20	<b>14364</b>
	with standard crank handle	with 36mm wide spring-loaded locking hooks	116	20	<b>106374</b>
grey-S	with short crank handle	with 36mm wide spring-loaded locking hooks	98	20	<b>102477</b>
	with long crank handle	with 36mm wide spring-loaded locking hooks	139	20	<b>102483</b>
	with standard crank handle	with 36mm wide spring-loaded locking hooks	116	20	<b>102152</b>





7.1.3.3 2F shutter lock with spring-loaded/slim locking hooks			L		N <sub>o</sub>
black-S	with low knob with crank handle	with 26mm wide spring-loaded locking hooks	121	20	105864

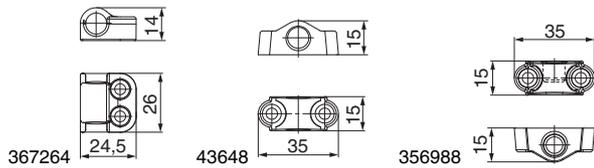
## 7.2 Locking rods



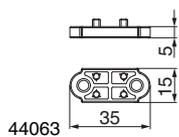
94126

7.2.1 Locking rods		L		Nº
black-S		1.400	10	<b>94126</b>
		2.200	10	<b>94130</b>
		2.600	10	<b>94134</b>
grey-S		1.400	10	<b>465217</b>
		2.200	10	<b>465218</b>
		2.600	10	<b>465220</b>
white-S		1.400	10	<b>30053</b>
		2.200	10	<b>36860</b>
		2.600	10	<b>97509</b>

## 7.2.2 Rod guides



7.2.2.1 Rod guides			Nº
black	26mm wide	50	<b>367264</b>
	36mm wide	100	<b>43648</b>
		closed	20
grey	36mm wide	100	<b>359888</b>
		closed	20
white	36mm wide	100	<b>43649</b>
		closed	20



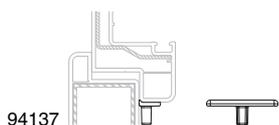
44063

7.2.2.2 Packers rod guides				Nº
black	for 36mm wide rod guide	5	100	<b>44063</b>
		8	100	<b>364330</b>
grey	for 36mm wide rod guide	5	100	<b>359901</b>
white	for 36mm wide rod guide	5	100	<b>44072</b>



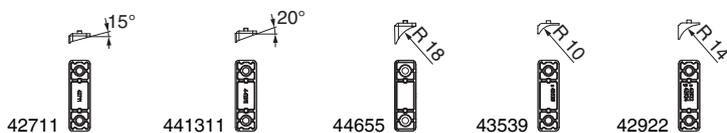
## 7.3 Striker pin brackets for frame installation

### 7.3.1 R1 striker pin brackets for frame installation



94137

7.3.1.1 R1 striker pin brackets for frame installation				<b>No</b>
black-S	single		50	<b>94137</b>
grey-S	single		50	<b>212479</b>
white-S	single		50	<b>39020</b>



42711

441311

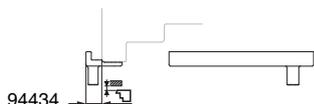
44655

43539

42922

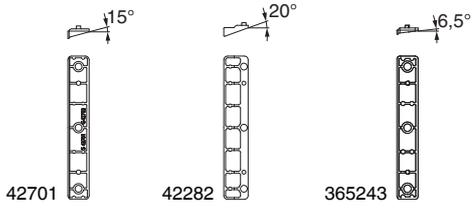
7.3.1.2 Packers for R1 striker pin brackets for frame installation			<b>L</b>		<b>No</b>
black		15° pitched	47	100	<b>42711</b>
		20° pitched	47	100	<b>441311</b>
		Alphacan R18	47	100	<b>44655</b>
		r = 10	47	100	<b>43539</b>
		r = 14	47	500	<b>42922</b>
grey		15° pitched	47	100	<b>360166</b>
white		15° pitched	47	100	<b>40044</b>
		20° pitched	47	100	<b>44422</b>
		Alphacan R18	47	100	<b>44654</b>

### 7.3.2 R2 striker pin brackets for frame installation

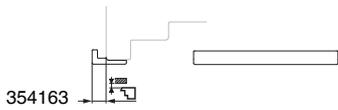


94434

7.3.2.1 R2 striker pin brackets for frame installation					<b>No</b>	
black-S	single		left	10	50	<b>94433</b>
			right	10	50	<b>94434</b>
			left	17	50	<b>97500</b>
			right	17	50	<b>94184</b>
			left	34	20	<b>97501</b>
			right	34	20	<b>97502</b>
grey-S	in pairs	with 15° packer and protective block		10	20	<b>102377</b>
white-S	single		left	10	50	<b>36862</b>
			right	10	50	<b>36864</b>



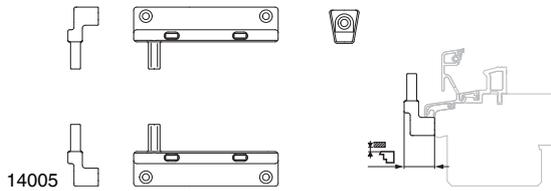
<b>7.3.2.2 Packers for R2 striker pin brackets for frame installation</b>		<b>L</b>		<b>Nº</b>
black	15° pitched	95	200	<b>42701</b>
	20° pitched	95	200	<b>42282</b>
	6.5° pitched	95	200	<b>365243</b>
white	15° pitched	95	100	<b>40043</b>



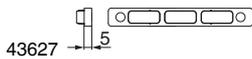
<b>7.3.2.3 R2 arm fixing brackets for frame installation</b>				<b>Nº</b>
black-S	single	10	50	<b>94141</b>
		17	50	<b>94143</b>
white-S	single	17	50	<b>354163</b>



**7.3.3 R3 striker pin brackets for frame installation**



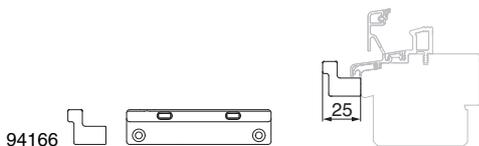
<b>7.3.3.1 R3 striker pin brackets for frame installation</b>					<b>No</b>
black-S	in pairs	with protective block	17	20	<b>14005</b>
			20	20	<b>14008</b>
			25	20	<b>14011</b>
grey-S	in pairs	with protective block	17	20	<b>102757</b>
white-S	in pairs	with protective block	17	20	<b>10327</b>
			20	20	<b>10330</b>
			25	20	<b>10333</b>



<b>7.3.3.2 Packers for R3 striker pin brackets for frame installation</b>				<b>L</b>		<b>No</b>
black			5	95	100	<b>43627</b>
white			5	95	100	<b>43851</b>

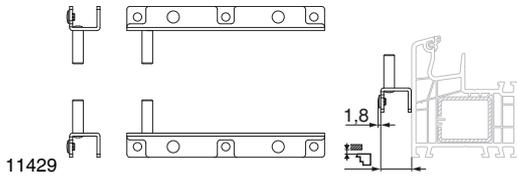


<b>7.3.3.3 Buffers for R3 striker pin brackets for frame installation</b>				<b>No</b>
black	1.3mm high		100	<b>42911</b>
white	1.3mm high		100	<b>44277</b>



<b>7.3.3.4 R3 arm fixing brackets for frame installation</b>					<b>No</b>
black-S	single		17	20	<b>360441</b>
			25	20	<b>94166</b>

**7.3.4 R4 striker pin brackets for frame installation**

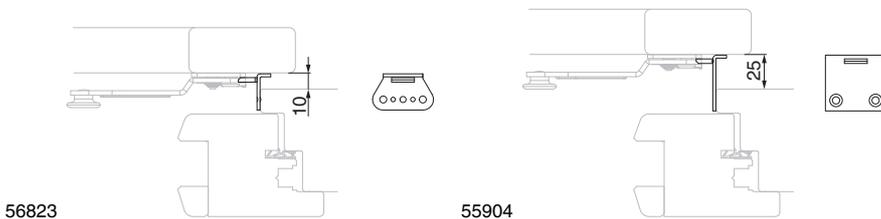


7.3.4.1 R4 striker pin brackets for frame installation					<b>Nº</b>
black-S	in pairs	with buffer 1.8mm	15	50	<b>11429</b>
			20	20	<b>11459</b>
			25	20	<b>11465</b>
			30	20	<b>11467</b>
white-S	in pairs	with buffer 1.8mm	15	50	<b>11456</b>
			20	20	<b>11462</b>
			25	20	<b>11466</b>

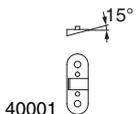


7.3.4.2 Buffers for R4 striker pin brackets for frame installation				<b>Nº</b>
black		1.8mm high	100	<b>44333</b>

**7.3.5 R5 striker pin brackets for frame installation**



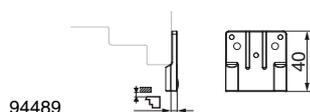
7.3.5.1 R5 striker pin brackets for frame installation					<b>Nº</b>
black-S			0	100	<b>56819</b>
			10	100	<b>56823</b>
			17	100	<b>56827</b>
			25	100	<b>55904</b>
white-S			0	100	<b>28828</b>
			10	100	<b>28829</b>
			17	100	<b>28830</b>



7.3.5.2 Packers for R5/R7/R11 striker pin brackets for frame installation			<b>L</b>		<b>Nº</b>
black	15° pitched		40	100	<b>40001</b>
grey	15° pitched		40	100	<b>465213</b>
white	15° pitched		40	100	<b>43850</b>

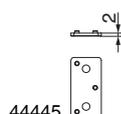


### 7.3.6 R6 striker pin brackets for frame installation



94489

7.3.6.1 R6 striker pin brackets for frame installation				No
black-S	40mm high	4	50	94489
	50mm high	4	50	202366



44445

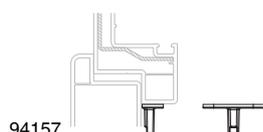
7.3.6.2 Packers for R6 striker pin brackets for frame installation			L		No
black	stackable	2	40	100	44445
white	stackable	2	40	100	44455



44333

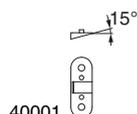
7.3.6.3 Buffers for R6 striker pin brackets for frame installation			No
black	1.8mm high	100	44333

### 7.3.7 R7 striker pin brackets for frame installation



94157

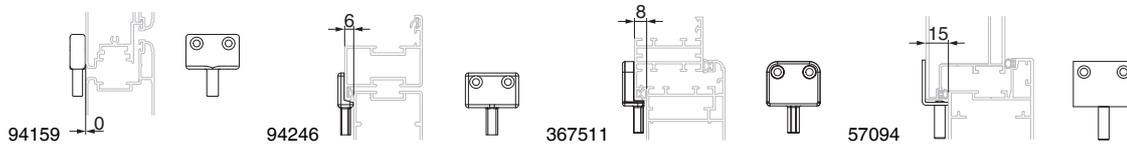
7.3.7.1 R7 striker pin brackets for frame installation			No
black-S		50	94157
grey-S		50	359870
white-S		50	97531



40001

7.3.7.2 Packers for R5/R7/R11 striker pin brackets for frame installation		L		No
black	15° pitched	40	100	40001
grey	15° pitched	40	100	465213
white	15° pitched	40	100	43850

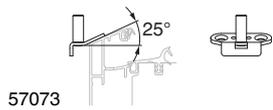
**7.3.8 R8 striker pin brackets for frame installation**



**7.3.8.1 R8 striker pin brackets for frame installation**

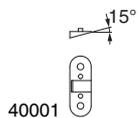
			<b>Nº</b>
black-S	rebate leg 0	50	<b>94159</b>
	rebate leg 6	50	<b>94246</b>
	rebate leg 8	50	<b>367511</b>
	rebate leg 15	100	<b>57094</b>
grey-S	rebate leg 0	50	<b>361183</b>
	rebate leg 15	100	<b>211809</b>
white-S	rebate leg 0	50	<b>364275</b>

**7.3.9 R11 striker pin bracket for frame installation**



**7.3.9.1 R11 striker pin bracket for frame installation**

			<b>Nº</b>
black-S	25° pitched	200	<b>57073</b>

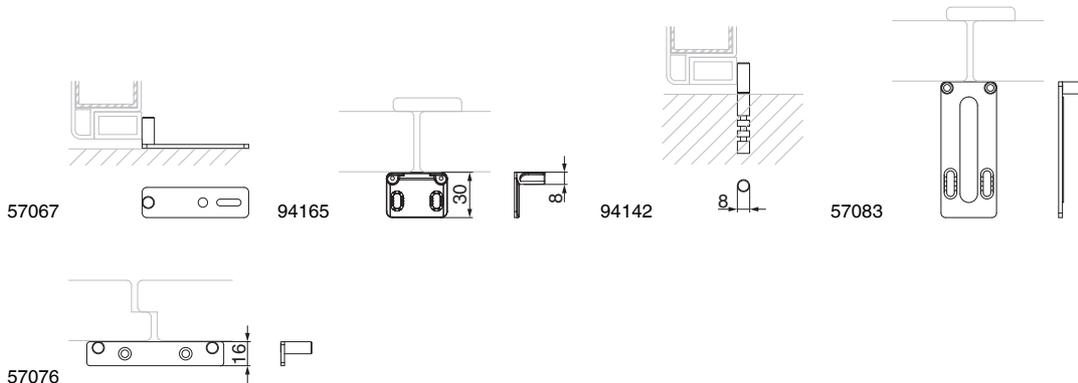


**7.3.9.2 Packer for R5/R7/R11 striker pin brackets for frame installation**

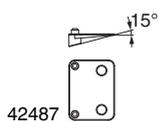
		<b>L</b>		<b>Nº</b>
black	15° pitched	40	100	<b>40001</b>



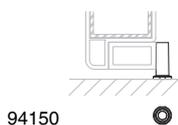
## 7.4 Striker pin brackets for masonry installation



7.4.1 Striker pin brackets for masonry installation				No
black-S	M1	single	50	57067
	M2,d=8	single	50	94165
	M3	single	50	94142
	M4, size 1 (40-60)	single	20	57083
	M4, size 2 (60-80)	single	20	57082
	M5	single	50	57076
grey-S	M2,d=8	single	50	359867
	M4, size 1 (40-60)	single	20	211578
	M4, size 2 (60-80)	single	20	211960
	M5	single	50	211506
white-S	M1	in pairs with screws and rawplugs	20	14025
	M2,d=8	single with rawplug	20	14026
	M4, size 1 (40-60)	single	20	206077
	M5	single	50	57215

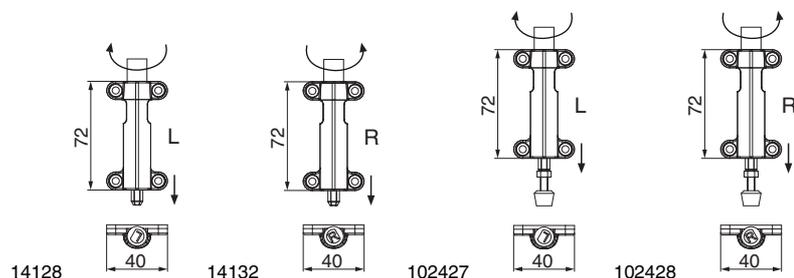


7.4.2 Packers for M2 striker pin brackets for masonry installation			L		No
black	M2	15° pitched	40	100	42487



7.4.3 Screwing bushes				No
Rustico screwing bush black-S			50	94150
Rustico screwing bush grey-S			50	361320

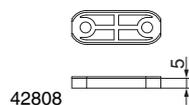
## 7.5 Shutter lock end pieces



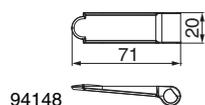
7.5.1 Shutter lock end pieces				No
black-S	shutter lock end piece with shootbolt protrusion	locking to the left	20	14128 <sup>1</sup>
		locking to the right	20	14132 <sup>1</sup>
	shutter lock end piece with shootbolt protrusion and rubber buffer	locking to the left	20	102427 <sup>1,2</sup>
		locking to the right	20	102428 <sup>1,2</sup>
grey-S	shutter lock end piece with shootbolt protrusion	locking to the left	20	102140 <sup>1</sup>
		locking to the right	20	102141 <sup>1</sup>
white-S	shutter lock end piece with shootbolt protrusion	locking to the left	20	11248 <sup>1</sup>
		locking to the right	20	11249 <sup>1</sup>
	shutter lock end piece with shootbolt protrusion and rubber buffer	locking to the left	20	102470 <sup>1,2</sup>
		locking to the right	20	102471 <sup>1,2</sup>

<sup>1</sup> These parts are excluded from the 10-year surface guarantee.

<sup>2</sup> Using gasket compression to latch does not produce a high resistance to storms.



7.5.2 Packers for shutter lock end pieces				No
black	for shutter lock end piece with shootbolt protrusion		5 100	42808
			8 100	364332
grey	for shutter lock end piece with shootbolt protrusion		5 100	359900
white	for shutter lock end piece with shootbolt protrusion		5 100	363325



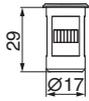
7.5.3 Stop tabs for shutter lock end pieces				No
black-S	stop tab for shutter lock end piece		20	94148
grey-S	stop tab for shutter lock end piece		20	359859
white-S	stop tab for shutter lock end piece		20	358473
black	buffer for self-adhesive stop tab		50	370103



7.5.4 Turn-alignment for shutter lock end pieces				No
silver	turn-alignment for left-handed shutter lock end piece on folding shutters		100	39126 <sup>1</sup>
	turn-alignment for right-handed shutter lock end piece on folding shutters		100	39125 <sup>1</sup>

<sup>1</sup> Required for folding shutters with shutter end piece.





59432

**7.5.5 Shootbolt locking bush for shutter lock end pieces**



**N<sub>0</sub>**

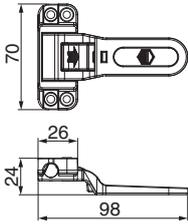
shootbolt locking bush with lid/spring-loaded cover silver

20

**59432<sup>1</sup>**

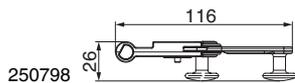
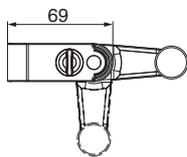
<sup>1</sup> This part is excluded from the 10-year guarantee.

## 7.6 Multi-point locking rods separate parts



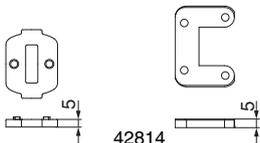
219841

7.6.1 Snap locks - loose		L		No
black-S	snap lock 26 wide	98	50	219841
grey-S	snap lock 26 wide	98	20	225586
white-S	snap lock 26 wide	98	20	225585



250798

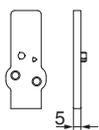
7.6.2 Crank handle for 2F shutter lock - loose		L		No
black-S	crank handle for shutter lock	116	50	250798



41514

42814

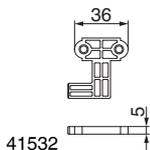
7.6.3 Packers 2F rod guides				No
black	for 2-sash rod guide for crank handle	5	100	41514
	for 2-sash rod guide for short crank handle	8	100	44184
grey	for 2-sash rod guide for crank handle	5	100	359899
white	for 2-sash rod guide for crank handle	5	100	355950



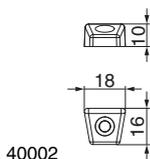
41521

7.6.4 Packers 2F locking brackets				No
black	for multi-purpose double-sashed shutter latch	5	100	41521
	for multi-purpose double-sashed shutter latch	8	100	44182
grey	for multi-purpose double-sashed shutter latch	5	100	359894
white	for multi-purpose double-sashed shutter latch	5	100	355951



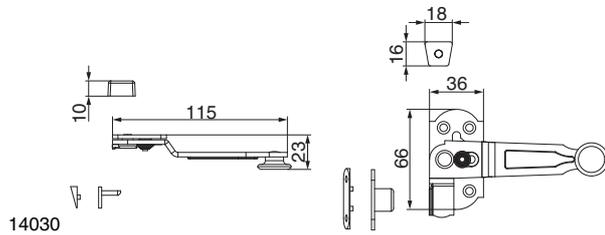


<b>7.6.5 Packers locking hooks</b>			<b>W</b>		<b>Nº</b>
black	for 36mm wide locking hook	5	36	100	<b>41532</b>
		8	36	100	<b>44180</b>
grey	for 36mm wide locking hook	5	36	100	<b>359898</b>
white	for 36mm wide locking hook	5	36	100	<b>35952</b>



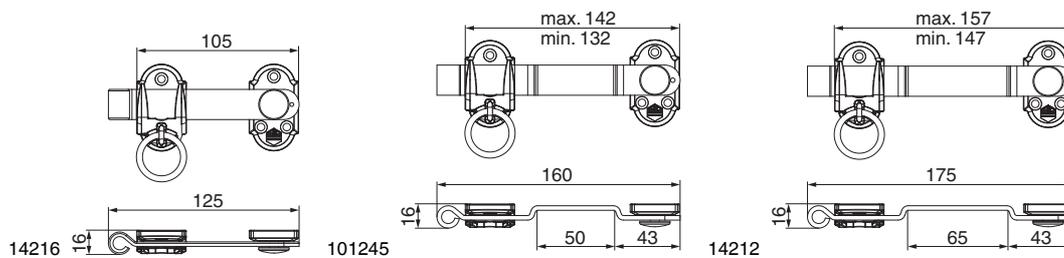
<b>7.6.6 Protective blocks</b>			<b>Nº</b>
dark brown	10mm high	100	<b>40002</b>
	20mm high	100	<b>40418</b>
	30mm high	20	<b>41632</b>
grey	10mm high	100	<b>359892</b>
	20mm high	100	<b>357950</b>
white	10mm high	100	<b>40058</b>
	20mm high	100	<b>40571</b>

**7.7 Centre locks**



14030

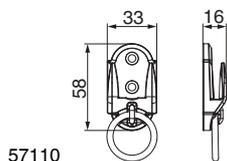
<b>7.7.1 for 1-sashed shutters</b>					<b>No</b>
black-S	with striker pin brackets and packers with protective block	right	20		<b>14027</b>
		left	20		<b>14030</b>
grey-S	with striker pin brackets and packers with protective block	right	20		<b>102150</b>
		left	20		<b>102151</b>
white-S	with striker pin brackets and packers with protective block	right	20		<b>13095</b>
		left	20		<b>13096</b>



14216 101245

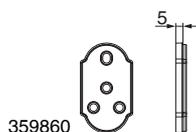
14212

<b>7.7.2 for 2-sashed shutters, with ring part</b>		<b>L</b>		<b>No</b>
black-S	with short crank handle	125	20	<b>14216</b>
	with 160mm offset crank handle	160	20	<b>101245</b>
	with 175mm offset crank handle	175	20	<b>14212</b>
grey-S	with short crank handle	125	20	<b>102149</b>
	with 175mm offset crank handle	175	20	<b>102148</b>
white-S	with short crank handle	125	20	<b>13308</b>
	with 160mm offset crank handle	160	20	<b>101247</b>
	with 175mm offset crank handle	175	20	<b>13187</b>



57110

<b>7.7.3 Locking plates for double-sash shutter lock</b>			<b>No</b>
black-S	locking plate for double-sash shutter lock	20	<b>57110</b>



359860

<b>7.7.4 Packers for centre lock</b>			<b>No</b>
black	stackable 5mm high	5 100	<b>359860</b>
white	stackable 5mm high	5 100	<b>361191</b>

MACO  
RUSTICO



Shutter Locks



## 8 Shutter catches

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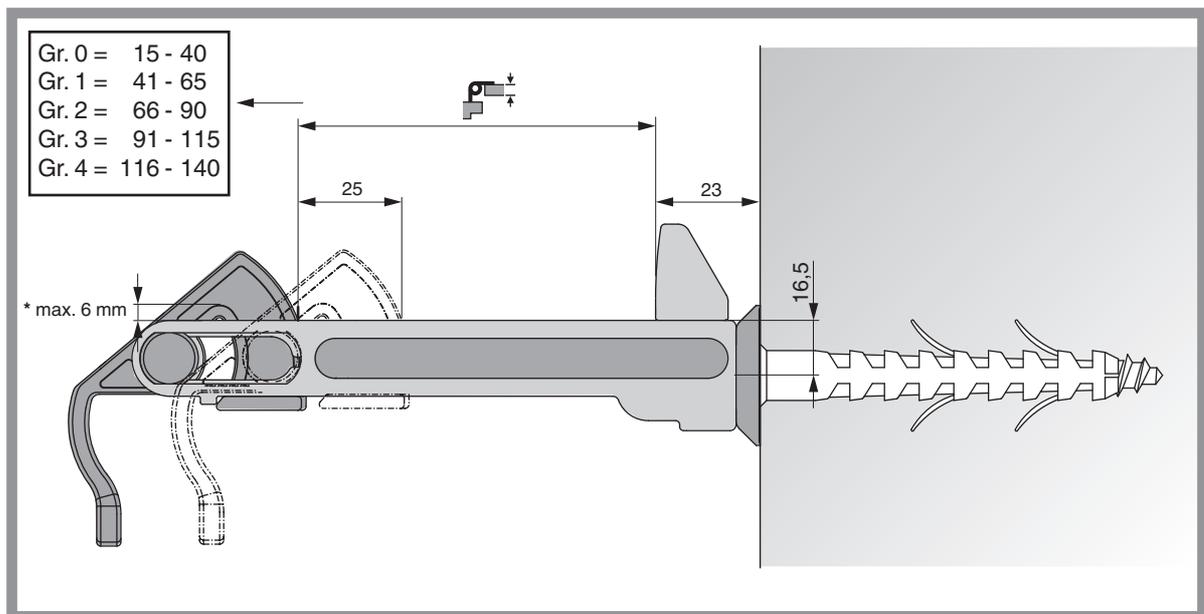
<b>8.1</b>	<b>Shutter catches "Classic" model</b> _____	<b>132</b>
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## 8 Shutter catches

### 8.1 Shutter catches "Classic" model

#### 8.1.1 Application range with default setting

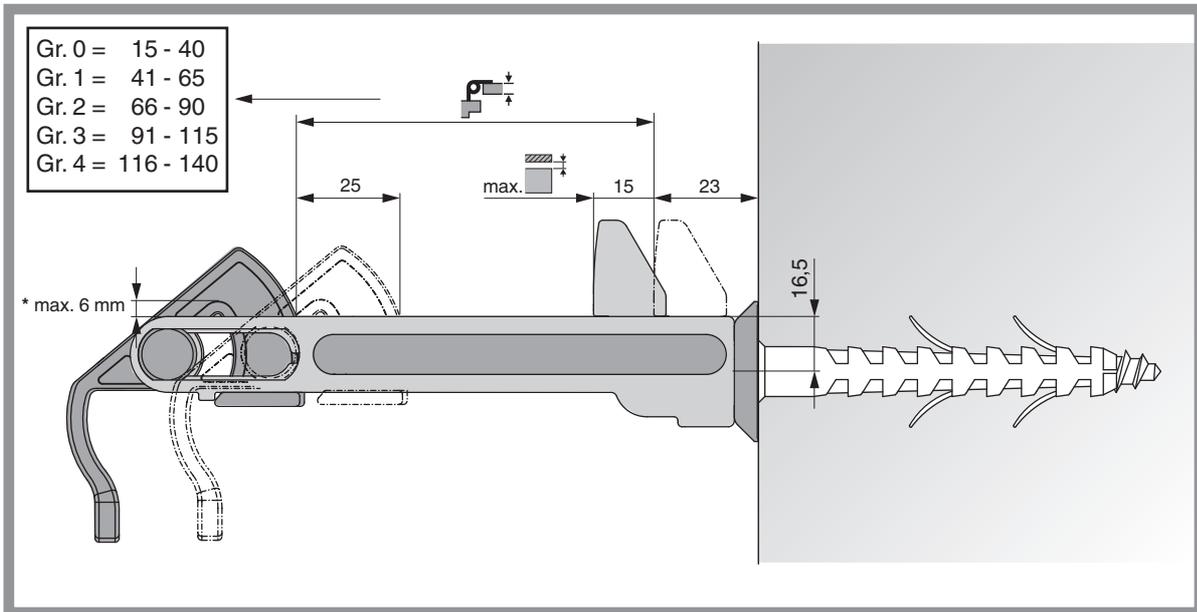


\* max. 6mm distance to bottom edge of shutter

#### Calculation of application range with default setting

35mm	Shutter thickness
+ 0mm	Additional distance to wall
<hr/>	
= 35mm	Application range
<hr/>	
→	Shutter catch size 0 (15-40mm)

8.1.2 Application range with additional distance to wall

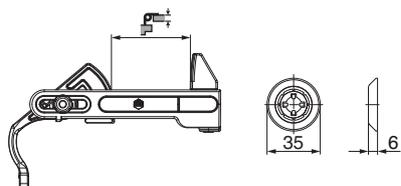


\* max. 6mm distance to bottom edge of shutter

**Calculation of application range with additional wall distance**

35mm	Shutter thickness
+ 15mm	Additional distance to wall
<hr/>	
= 50mm	Application range
<hr/>	
→	Shutter catch size 1 (41-65mm)





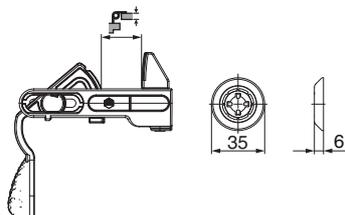
10860

**8.1.3 Shutter catches "Classic" model with cover disk without fixing bolts**



**№**

black-S	size 0	15 - 40	20	<b>10860</b>
	size 1	41 - 65	20	<b>10865</b>
	size 2	66 - 90	20	<b>10868</b>
	size 3	91 - 115	20	<b>10871</b>
grey-S	size 4	116 - 140	20	<b>10874</b>
	size 0	15 - 40	20	<b>102142</b>
	size 1	41 - 65	20	<b>102143</b>
	size 2	66 - 90	20	<b>102144</b>
white-S	size 3	91 - 115	20	<b>102145</b>
	size 4	116 - 140	20	<b>102146</b>
	size 0	15 - 40	20	<b>10862</b>
	size 1	41 - 65	20	<b>10867</b>
	size 2	66 - 90	20	<b>10870</b>
	size 3	91 - 115	20	<b>10873</b>
	size 4	116 - 140	20	<b>10876</b>



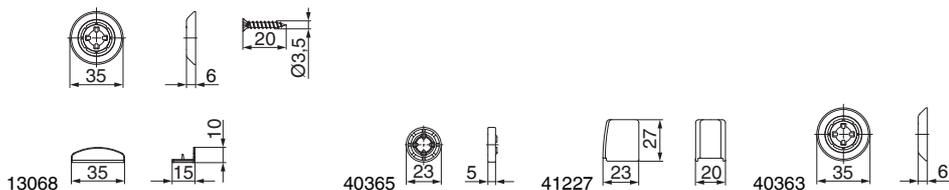
106366

**8.1.4 Shutter catches "Classic" model with "Fir cone head"**



**№**

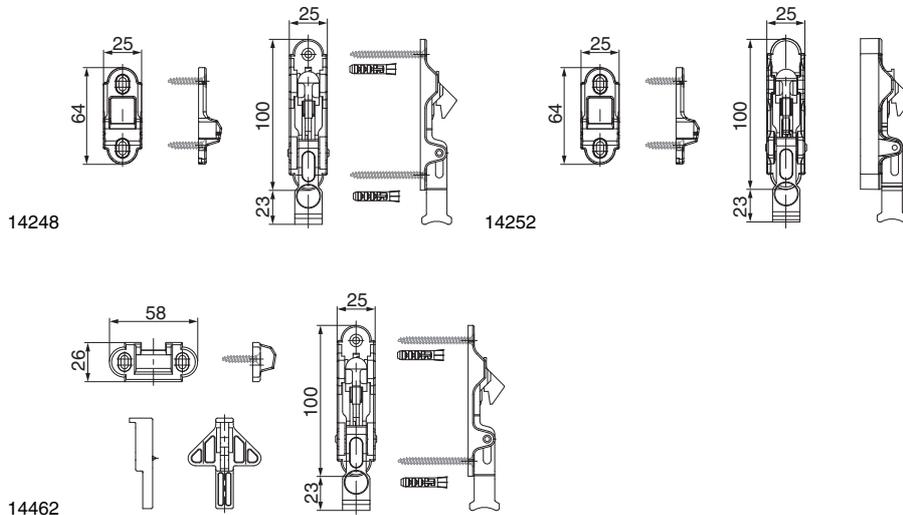
black-S	size 0	15 - 40	20	<b>106366</b>
	size 1	41 - 65	20	<b>106367</b>
	size 2	66 - 90	20	<b>106368</b>
	size 3	91 - 115	20	<b>106369</b>



8.2 Installation accessories for shutter catches "Classic" and "Fir cone head" models				No
black	accessories pack for shutter catches		20	<b>13068</b>
	spacer for shutter catches	5mm	50	<b>40365</b>
		10mm	50	<b>40370</b>
	clip-on component for shutter catch fir cone	15mm	50	<b>41227</b>
	cover disk for shutter catches	Ø 35x6mm	100	<b>40363</b>
grey	spacer for shutter catches	10mm	50	<b>361313</b>
	cover disk for shutter catches	Ø 35x6mm	100	<b>465212</b>
white	accessories pack for shutter catches		20	<b>13078</b>
	spacer for shutter catches	10mm	50	<b>40644</b>
	cover disk for shutter catches	Ø 35x6mm	20	<b>40642</b>



### 8.3 Door shutter catches

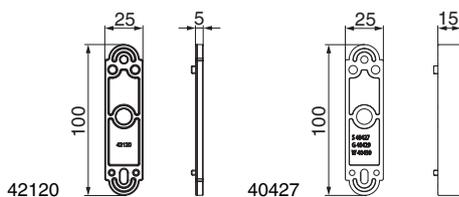


#### 8.3.1 Package door shutter catches

					<b>No</b>
black-S	door shutter catch	25	20		<b>14248<sup>1</sup></b>
	door shutter catch for fixing bolt	35	20		<b>14252<sup>2</sup></b>
	door shutter catch with short locking console	25	20		<b>14462<sup>1</sup></b>
grey-S	door shutter catch	25	20		<b>102147<sup>1</sup></b>
	door shutter catch for fixing bolt	35	20		<b>102376<sup>2</sup></b>
white-S	door shutter catch	25	20		<b>13110<sup>1</sup></b>
	door shutter catch for fixing bolt	35	20		<b>13111<sup>2</sup></b>

<sup>1</sup> Packaging contents: 1 shutter catch for doors, 2 chipboard screws 4,5x25, 2 rawlplugs S6, 2 chipboard screws 4,5x50.

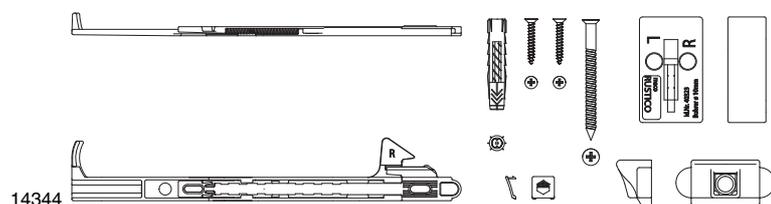
<sup>2</sup> Packaging contents: 1 shutter catch for doors, 2 chipboard screws 4,5x25.



#### 8.3.2 Packers for door shutter catches

			<b>W</b>	<b>L</b>		<b>No</b>
black	for door shutter catches	stackable 5mm high	5	25	100	<b>42120</b>
		stackable 15mm high	15	25	100	<b>40427</b>
grey	for door shutter catches	stackable 5mm high	5	25	100	<b>360621</b>
		stackable 15mm high	15	25	100	<b>360619</b>
white	for door shutter catches	stackable 5mm high	5	25	100	<b>42122</b>
		stackable 15mm high	15	25	100	<b>40430</b>

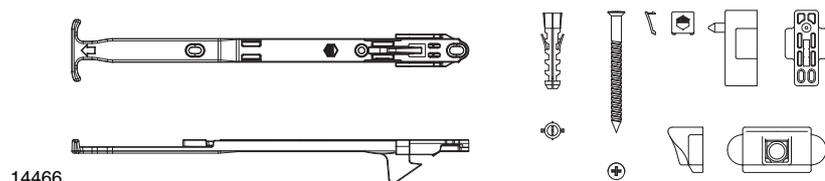
## 8.4 Comfort shutter catches



8.4.1 Comfort shutter catches for windows					No
black-S	with screws and Ø10mm rawlplugs	right	25	20	14344 <sup>1,2</sup>
		left	25	20	14348 <sup>1,2</sup>
grey-S	with screws and Ø10mm rawlplugs	right	25	20	102315 <sup>1,2</sup>
		left	25	20	102316 <sup>1,2</sup>
white-S	with screws and Ø10mm rawlplugs	right	25	20	13003 <sup>1,2</sup>
		left	25	20	13004 <sup>1,2</sup>

<sup>1</sup> Application ranges: max. shutter weight 20kg, with MMV 30kg.

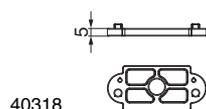
<sup>2</sup> Package contents: 1 shutter catch for windows, 3 screws 4x30 / 4,5x30 / 70x80, 1 rawlplug S10, 1 locking console, 1 jig.



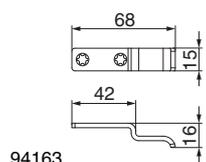
8.4.2 Comfort shutter catches for doors					No
black-S	with screws and Ø10mm rawlplugs	33	20	14466 <sup>1,2</sup>	
grey-S	with screws and Ø10mm rawlplugs	33	20	102317 <sup>1,2</sup>	
white-S	with screws and Ø10mm rawlplugs	33	20	10791 <sup>1,2</sup>	

<sup>1</sup> Package contents: 1 shutter catch for doors, 4 screws 4x25 / 4,5x25 / 7x80, 1 rawlplug 10x50, 1 locking console, 1 jig.

<sup>2</sup> Max. shutter weight 20kg. Use of item no. 94163 increases the permissible shutter weight to 30kg.



8.4.3 Packers for comfort shutter catches			W	L		No	
black	for comfort shutter catch	stackable 5mm high	5	25	100	50	40318
		stackable 20mm high	20	25	100	50	40377
grey	for comfort shutter catch	stackable 5mm high	5	25	100	50	361190
		stackable 20mm high	20	25	100	50	361314
white	for comfort shutter catch	stackable 5mm high	5	25	100	50	40319
		stackable 20mm high	20	25	100	50	40378

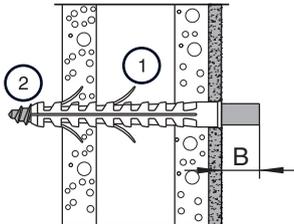


8.4.4 Reinforcing corner brackets for comfort shutter catches for doors				No
black-S		200	94163	
grey-S		200	359871	
white-S		200	365862	

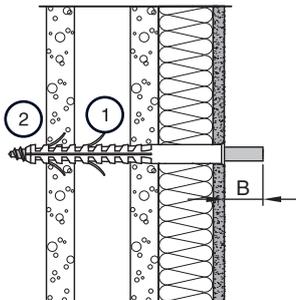
## 8.5 Fixing material for shutter catches

### 8.5.1 Assembly instructions for fixing bolts

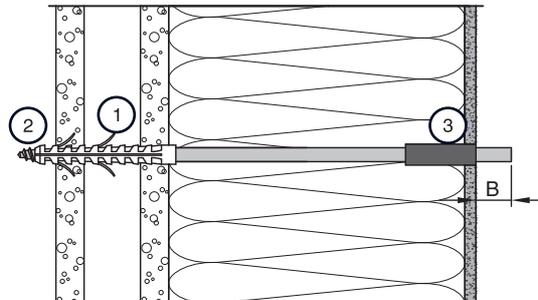
**Without wall insulation**  
Fixing bolt L96 and L140



**With wall insulation**  
Fixing bolt L180, L215 and L265



Fixing bolt L350 and L450



B = Fixing bolt distance

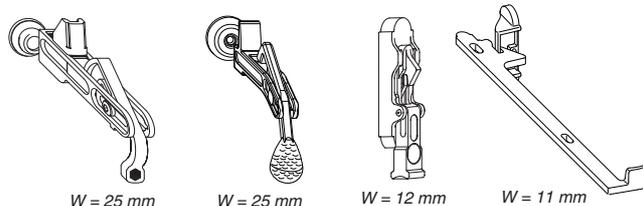
- 1 The dowel pin must be long enough to penetrate through two brick walls. It must be ensured that the dowel pin spreads vertically. Otherwise, the brick could break.
- 2 The fixing bolt must be fastened through the dowel pin.
- 3 When using L350 and L450 fixing bolts, it must be ensured that the support pipe included can rest on the masonry plaster and masonry insulation. To do this, push the support pipe onto the fixing bolt flush with the plaster.

Fixing bolt	Insulation thickness	Rawplug	Drilling-Ø	Support pipe
L96	0	50	10	-
L140	0	100	14	-
L180	20 - 45	135	14	-
L215	45 - 95	185	14	-
L265	95 - 140	230	14	-
L350	140 - 215	100 (without flush)	14	ja
L450	215 - 315	100 (without flush)	14	ja

Values in mm

Selection of the correct rawplug is essential for the stability of the fixing bolt.

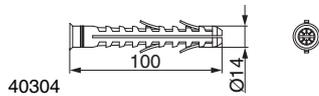
When using L350 and L450 fixing bolts, it is essential to use the included support pipe.



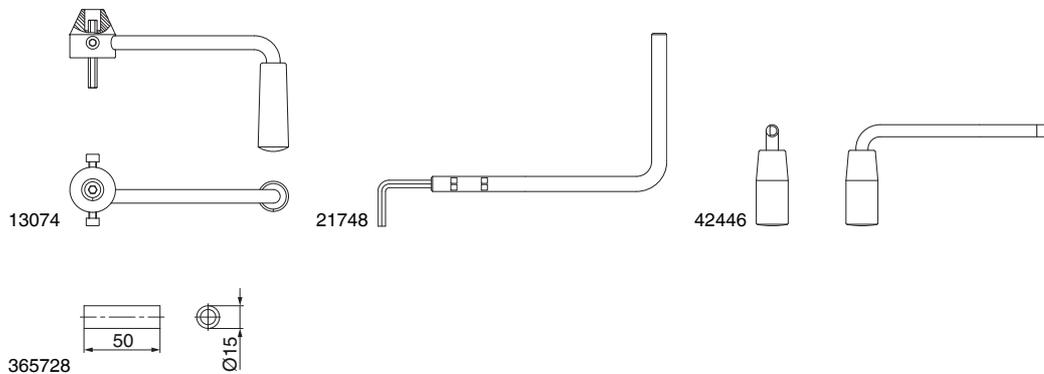
8.5.2 Fixing bolts and accessories



8.5.2.1 Fixing bolts			∅		N <sup>o</sup>
black	L96	0	7,7	20	<b>43823</b>
	L140	0	10	20	<b>40226</b>
	L180	20 - 45	10	20	<b>40227</b>
	L215	45 - 95	10	20	<b>40232</b>
	L265	95 - 140	10	20	<b>40234</b>
	L350	140 - 215	10	20	<b>103318</b>
	L450	215 - 315	10	20	<b>103319</b>

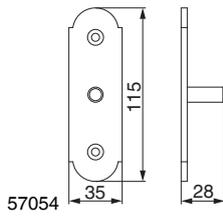


8.5.2.2 Rawplugs for fixing bolts		∅	L		N <sup>o</sup>
rawplug	for fixing bolt L96	10	50	20	<b>40013</b>
	for fixing bolt L140	14	100	20	<b>40304</b>
	for fixing bolt L180	14	135	20	<b>40305</b>
	for fixing bolt L215	14	185	20	<b>40306</b>
	for fixing bolt L265	14	230	20	<b>365607</b>
rawplug without collar	for fixing bolt L350 + L450	14	100	20	<b>365729</b>

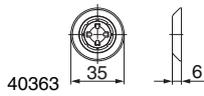


8.5.2.3 Accessories for fixing bolts			N <sup>o</sup>
drill adapter for fixing bolts		1	<b>13074</b>
screw-driving tool with crank handle for fixing bolts with 5mm allen key		20	<b>21748</b>
crank handle for drill adapter for fixing bolt		1	<b>42446</b>
grub screw for fixing bolt with thermal barrier M10X50 black		20	<b>364520</b>
support pipe 50mm for fixing bolt grey		50	<b>365728</b>

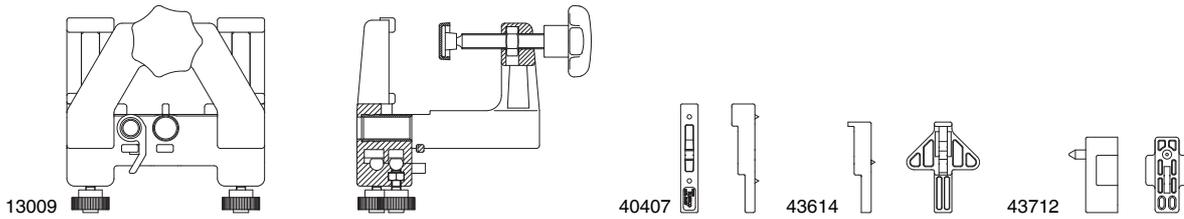




<b>8.5.3 Support plates for shutter catches</b>			<b>Nº</b>
black-S		20	<b>57054</b>



<b>8.5.4 Cover disks for shutter catches</b>			<b>Nº</b>
black	Ø 35x6mm	100	<b>40363</b>
grey	Ø 35x6mm	100	<b>465212</b>
white	Ø 35x6mm	20	<b>40642</b>



8.6 Jigs for shutter catches				<b>Nº</b>
drill jig	for shutter catches	Classic and Comfort for windows	1	<b>13009</b>
marking jig	for door shutter catches		50	<b>40407</b>
		short base-plate	50	<b>43614</b>
		for comfort shutter catch on balcony doors	50	<b>43712</b>
disposable jig	for comfort shutter catch on windows		50	<b>40323</b>



MACO  
RUSTICO



Shutter catches



## 9 Accessories

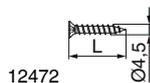
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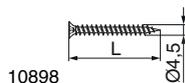
## 9 Accessories

### 9.1 Screws



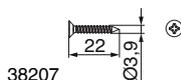
9.1.1 Hardware screws 4.5mm stainless steel (guarantee)		Ø	L		N <sup>o</sup>
stainless steel black	Pozidrive	4,5	25	100	<b>12472<sup>1</sup></b>
			30	100	<b>12473<sup>1</sup></b>
			40	100	<b>12474<sup>1</sup></b>
			60	100	<b>101549<sup>1</sup></b>
stainless steel grey	Pozidrive	4,5	25	100	<b>104346<sup>1</sup></b>
			30	100	<b>104348<sup>1</sup></b>
			40	100	<b>104349<sup>1</sup></b>
stainless steel white	Pozidrive	4,5	25	100	<b>12577<sup>1</sup></b>
			30	100	<b>12578<sup>1</sup></b>
			40	100	<b>12579<sup>1</sup></b>

<sup>1</sup> These parts are necessary for the 10-year surface guarantee. For high demands and particularly for processing in aluminium.



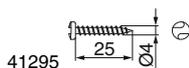
9.1.2 Hardware screws 4.5mm galvanized		Ø	L		N <sup>o</sup>
black	Pozidrive	4,5	25	100	<b>11185<sup>1</sup></b>
			30	100	<b>11434<sup>1</sup></b>
			35	100	<b>14022<sup>1</sup></b>
			40	100	<b>11186<sup>1</sup></b>
			50	100	<b>10898<sup>1</sup></b>

<sup>1</sup> These parts are excluded from the 10-year surface guarantee.



9.1.3 Self-tapping screws		Ø	L		N <sup>o</sup>
black	cross recess	3,9	22	100	<b>38207<sup>1</sup></b>
white	cross recess	3,9	22	100	<b>38208<sup>1</sup></b>

<sup>1</sup> These parts are excluded from the 10-year surface guarantee.



9.1.4 One-way security screws		Ø	L		N <sup>o</sup>
black	slot	4	25	100	<b>41295<sup>1</sup></b>

<sup>1</sup> These parts are excluded from the 10-year surface guarantee.

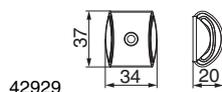


9.1.5 M5 fastening screws with female threaded sleeve		Ø	L		No
black-S	22 - 26	5	23	100	<b>11431<sup>1</sup></b>
	26 - 38	5	35	100	<b>11432<sup>1</sup></b>
	36 - 48	5	45	100	<b>11433<sup>1</sup></b>
	43 - 53	5	50	100	<b>11207<sup>1</sup></b>
	53 - 63	5	60	100	<b>11208<sup>1</sup></b>
grey-S	26 - 38	5	35	100	<b>102550<sup>1</sup></b>
	36 - 48	5	45	100	<b>102551<sup>1</sup></b>
white-S	22 - 26	5	23	100	<b>12543<sup>1</sup></b>
	26 - 38	5	35	100	<b>12544<sup>1</sup></b>
	36 - 48	5	45	100	<b>12545<sup>1</sup></b>

<sup>1</sup> The dimensions for the shutter thickness increase by 6mm for hinges without side regulation!



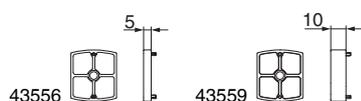
## 9.2 Buffer stops



42929

9.2.1 Buffer stops for snap holder			No
black	20mm high	20	42929 <sup>1</sup>
grey	20mm high	20	359891 <sup>1</sup>
white	20mm high	20	42932 <sup>1</sup>

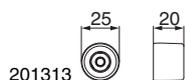
<sup>1</sup> The buffer stop must always be installed. When the buffer stop is used, make sure that the facade has sufficient compression strength (e.g. for thermal insulation).



43556

43559

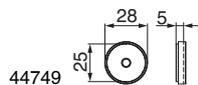
9.2.2 Packers for buffer stop snap holder			No
black	stackable 5mm high	100	43556
	10mm high, stackable	50	43559
grey	stackable 5mm high	100	360559
	10mm high, stackable	50	361317
white	stackable 5mm high	100	43558
	10mm high, stackable	50	43561



201313

9.2.3 Buffer stops soft			No
black	20mm high	20	201313 <sup>1</sup>
grey	20mm high	20	216813 <sup>1</sup>
white	20mm high	20	201314 <sup>1</sup>

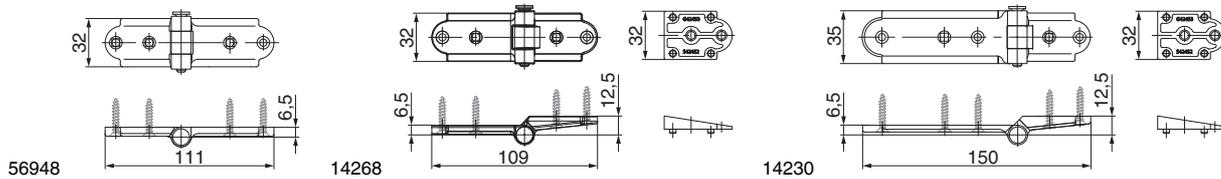
<sup>1</sup> The buffer stop must always be installed. When the buffer stop is used, make sure that the facade has sufficient compression strength (e.g. for thermal insulation).



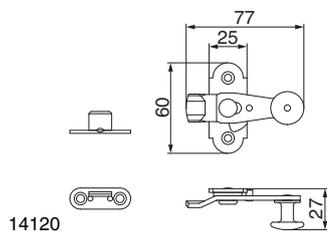
44749

9.2.4 Packers for buffer stop soft			No
black	stackable 5mm high	100	44749
grey	stackable 5mm high	100	359893
white	stackable 5mm high	50	44750

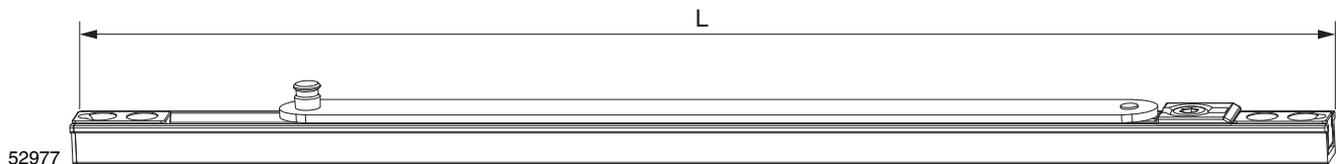
### 9.3 Accessories for projecting shutter-inserts



9.3.1 Hinges for projecting shutter-inserts				No
black-S	hinge for projecting shutter-insert	flush	20	<b>56948</b>
		with 13mm rebate leg packer	20	<b>11583</b>
		with 15mm rebate leg packer	20	<b>14268</b>
white-S	hinge for projecting shutter-insert	long hinge for projecting shutter-insert with 15mm rebate leg packer	10	<b>14230</b>
		hinge for projecting shutter-insert with 13mm rebate leg packer	20	<b>101986</b>

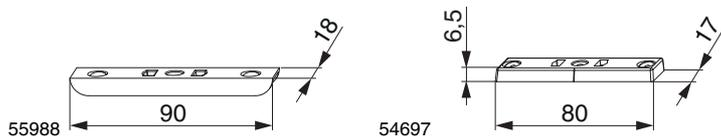


9.3.2 Locking mechanisms for projecting shutter-inserts				No
black-S			20	<b>14120</b>
grey-S			20	<b>102476</b>
white-S			20	<b>101988</b>



9.3.3 Opening restrictor for projecting shutter-inserts			L		No
silver	opening restrictor with brake	arm length 250mm	333	20	<b>52977<sup>1</sup></b>

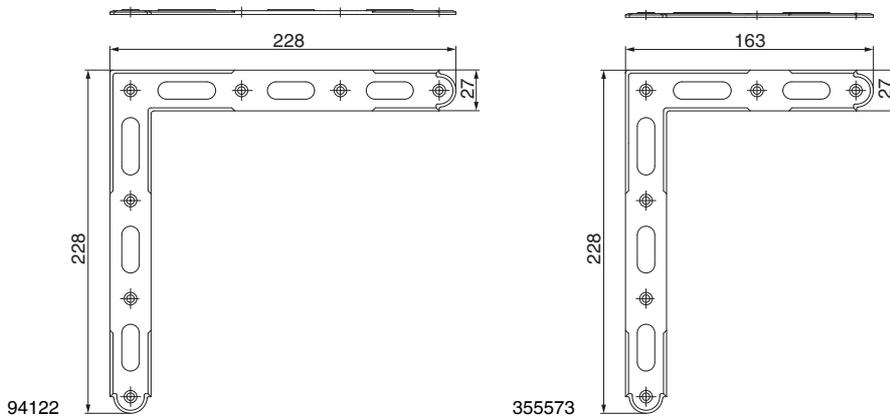
<sup>1</sup> These parts are excluded from the 10-year surface guarantee.



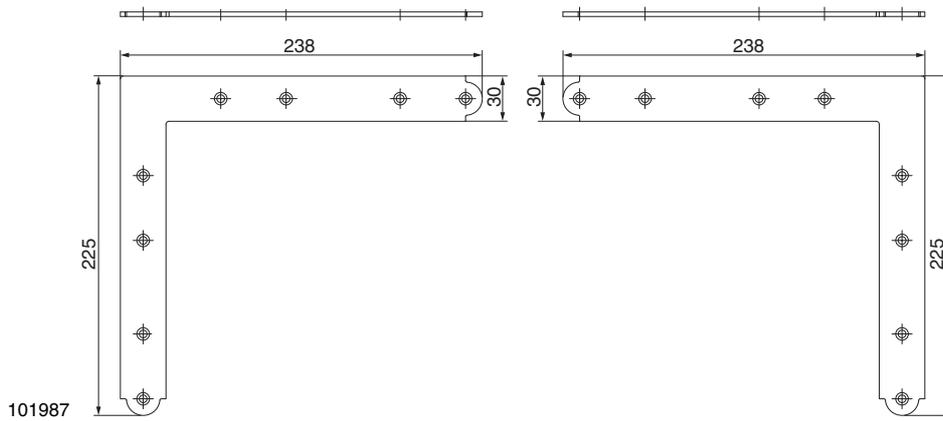
9.3.4 Strikers for opening restrictors				No
silver	frame component for opening restrictor for 4mm air gap 9mm offset	angled screw-fixing	50	<b>55988<sup>1</sup></b>
		angled screw-fixing	50	<b>54697<sup>1</sup></b>

<sup>1</sup> These parts are excluded from the 10-year surface guarantee.

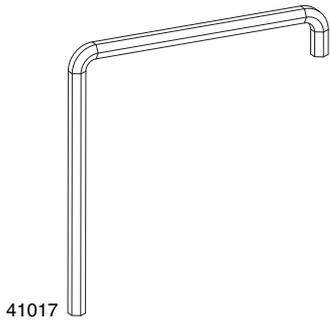
**9.4 Decorative corner brackets**



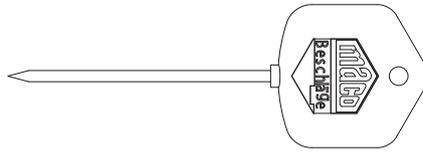
<b>9.4.1 Decorative corner-brackets for BLR hardware range</b>			<b>Nº</b>
black-S	decorative corner-bracket	20	<b>94122</b>
	decorative corner-bracket SL 228x163	20	<b>355573</b>
white-S	decorative corner-bracket	left top	<b>355575</b>
		right top	<b>32410</b>



<b>9.4.2 Decorative corner-brackets for MMV hardware range</b>			<b>Nº</b>
black-S	in pairs	10	<b>101987</b>



41017



42465

### 9.5 Adjusting key and marking pin



**No**

adjusting spanner/key allen key, bent twice, 75 mm long SW 4  
scriber

50  
100

41017<sup>1</sup>  
42465<sup>1</sup>

<sup>1</sup> Can also be supplied in quantities less than one packaging unit.





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100002	20	70,85	101549	100	144	102176	10	46
100003	20	70,85	101554	10	108	102177	10	46
100004	20	86	101571	20	99	102178	10	79
100005	20	70,85	101572	20	99	102179	10	48,76
100006	20	70,85	101587	20	92	102180	10	78
100007	20	70,85	101588	20	92	102181	10	48
100008	20	70,85	101589	20	98	102182	10	48
100009	20	86	101590	20	92	102183	10	48
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100011	20	72,88	101592	20	98	102185	20	56
100012	20	72,88	101596	20	92	102186	20	56
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100025	10	71,87	101885	20	104	102254	20	86
100026	10	71,87	101986	20	147	102255	20	70,85
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100028	10	71,87	101988	20	147	102257	10	71,87
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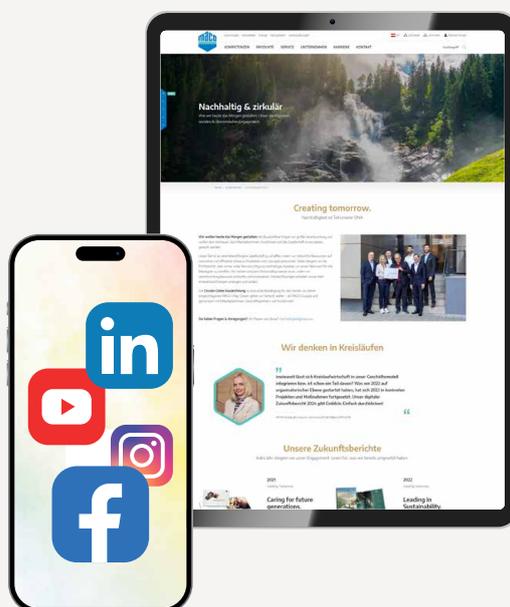


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