

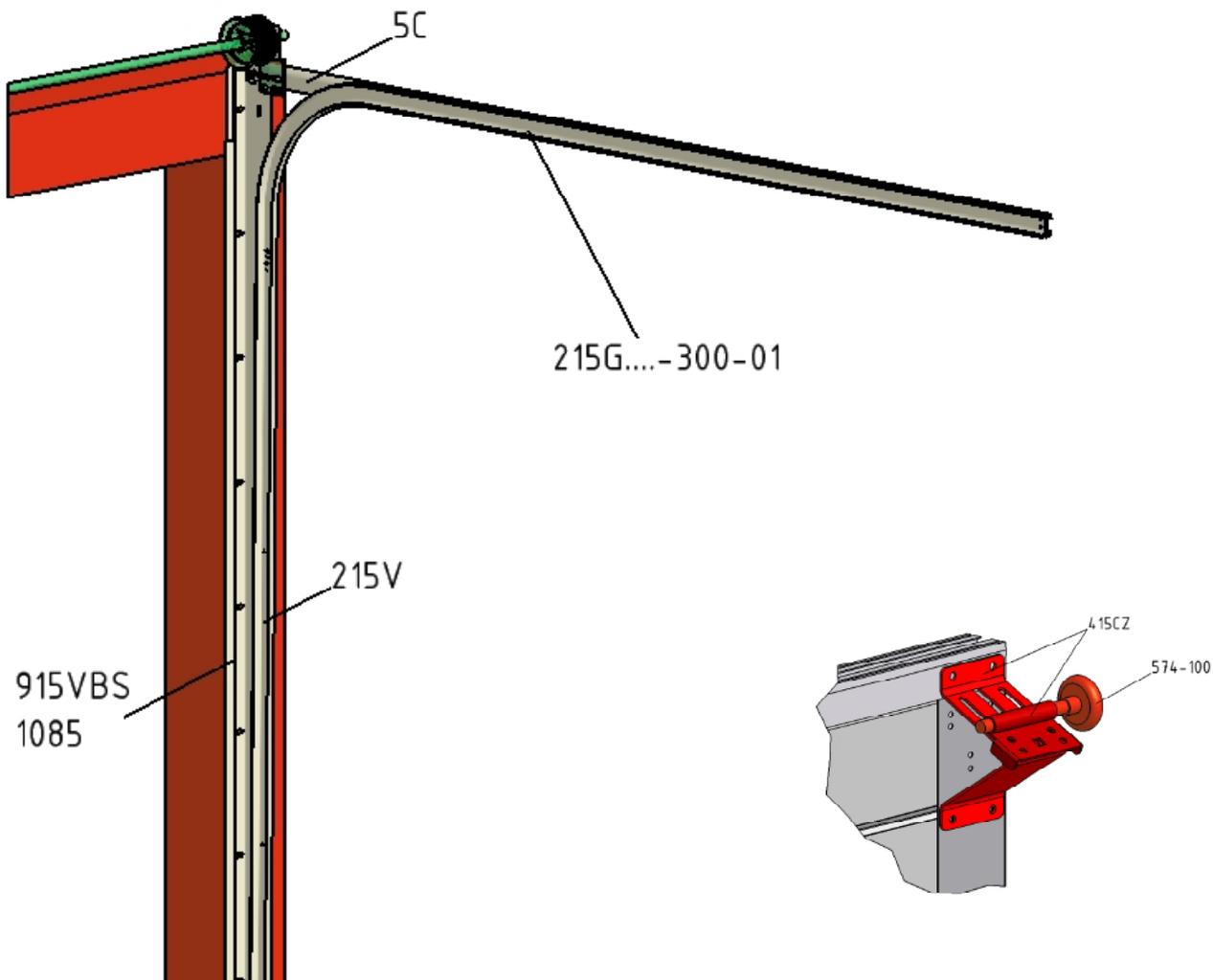
# RES350



hardware set residential  
(garage) overhead doors  
built in dimensions 350mm

## INSTALLATION / MAINTENANCE

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## ATTENTION! GENERAL WARNINGS!



To install, use and maintain this hardware set safely, a number of precautions must be taken. For the safety of all concerned pay heed to the warnings and instructions given below! If in doubt, contact your supplier.



Special safety warnings or remarks in this manual are indicated with this symbol: read these warnings carefully.

- ✓ This manual has been written for use by experienced fitters and as such is not suitable for d.i.y. purposes or for use by trainee fitters.
- ✓ This manual describes the installation of the hardware set components, door sections (panels) and refers to installation manuals of the electrical operator. Be sure to supplement this manual if needed with instructions for any additional components not described in this manual.
- ✓ Before starting, read this manual carefully!
- ✓ Certain components may be sharp or have jagged edges. As such you are advised to wear safety gloves.
- ✓ All the components which have been supplied are designed for use with this specific overhead door. Replacement or adding additional components may have an adverse effect on the safety of, and the guarantee on, the door. Also the CE-approval which has been granted to this door will be cancelled when components are changed or installation is not done according to this manual! Installer is responsible for this.
- ✓ During tensioning, springs can exert large forces. Work carefully. Use the proper equipment. Ensure that you are standing in a steady position.
- ✓ Ensure that there is sufficient light during installation. Remove obstacles and dirt. Make sure that there is no one else present other than the fitters. Other people (children!) may get in the way or endanger themselves during the installation.

## GARANTIE, CONDITIES EN VOORWAARDEN

The general terms and conditions of delivery and payment issued by the Metaalunie and designated as METAALUNIE CONDITIONS are fully applicable to all our quotations, contracts and their implementation. We expressly reject all other terms and conditions. On request we will send you a copy of these terms and conditions free of charge. A copy may also be downloaded from our website [www.flexiforce.nl](http://www.flexiforce.nl).

## CONTACT

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Additional information

## INTRODUCTION

Flexi-Force has a complete programme of hardware sets, especially for residential (garage) overhead doors. The set RES350 includes the following features:

- Suitable for single and double garages to CW > 5000mm, 160 kg
- Springs in front at lintel/Enkele horizontale rails
- Fitted with cable within the tracks and spring break device meeting CE standards
- installation height 350mm

In this handbook we shall restrict our instructions for the proper assembly of our hardware set parts. For the installation of the complete door, including any components added by the supplier, as well as for a user handbook, we refer you to the supplier of the complete overhead door who is also responsible for the correct CE marking of the door.

- ✓ The track set (vertical and horizontal)
- ✓ Standard parts and/or fixing material. (including spring break device)
- ✓ Fittings (hinges, ground console, top roller holder etc.) in version selected
- ✓ The cable set
- ✓ Tube shaft
- ✓ Torsion springs (galvanized or powder coated) in version selected
- ✓ Connection /suspension profiles for horizontal track set
- ✓ Top seal for on the lintel
- ✓ Electric drive (RES-E-500) drawbar type
- ✓ 1 box packaging
- ✓ Warning labels

We wish you every success with the installation of this hardware set. If anything is unclear or should you have queries, you should of course contact Flexi-Force B.V.

## TOOLS REQUIRED FOR CORRECT AND RAPID ASSEMBLY

(Battery) drill with	Bit 4.0 mm
	Bit 4.5 mm
	Bit 6.5 mm
	Plug 10 mm
	Plug 13 mm
Hexagonal key	4 mm
Ring /open ended spanner	10 mm
Ring /open ended spanner	13 mm
Ring /open ended spanner	15 mm
Ring /open ended spanner	17 mm
Socket wrench	with 1/4" square
Wrench	
Gluing clamp	
Cord	
Water level (hose)	
2 blocks of ca. 20 en 40mm in height	

## CHECKING DIMENSIONAL DETAILS

Before assembling the set the details below should be checked on the basis of this figure.

Figure

- A = Clear width
- B = Clear height
- C = Side area
- D = Top area

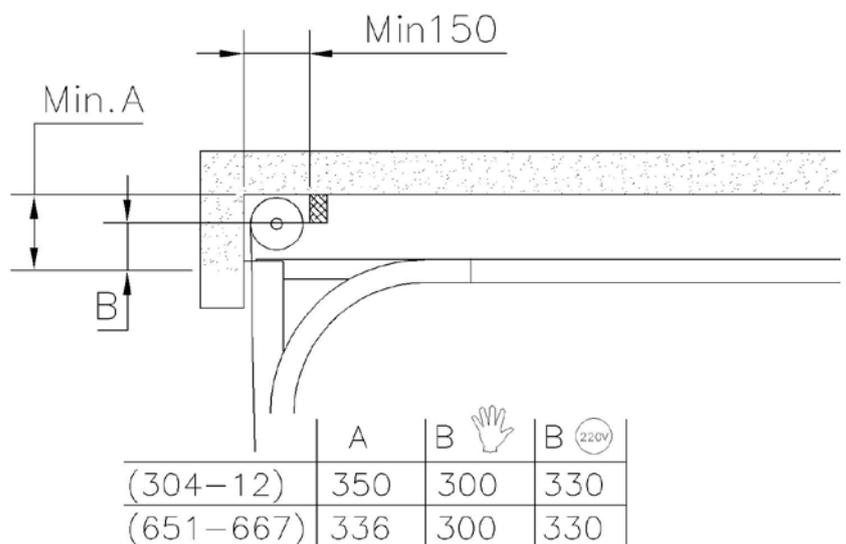
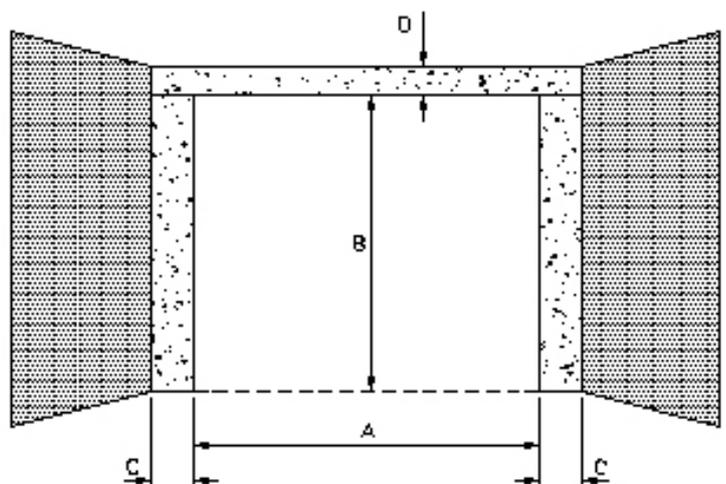
Panel assembly  
See enclosure A

Installation area required  
Side area C: minimum 85 mm  
(117 mm when using hook 2602)

Clear passage height based on manually operated flat panel:DMH

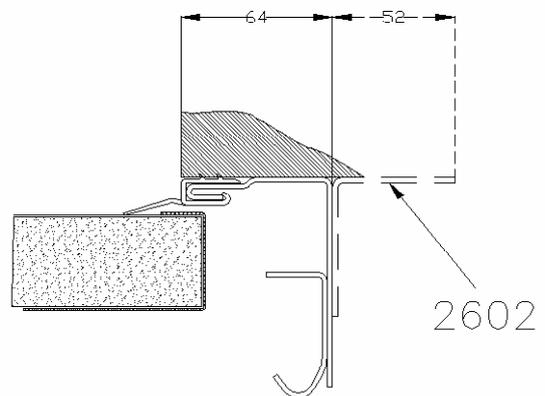
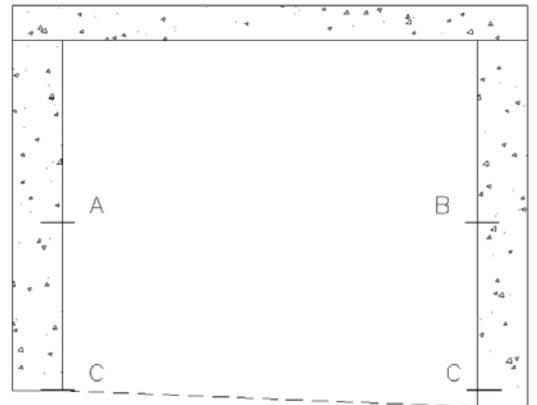
Re 1) When you have a minimum installation height behind the spring package (above the hor. extension tracks) we advise you to fir the top seal to the lintel, see "assembly top seal".

Re 2) The upper area required will depend on the height of the drive rod of the electrical drive.



## ASSEMBLY VERTICAL TRACK SET

- 1 First mark "A" en "B" on both piers using a spirit level or water level hose and then mark "C" (Figure)
- 2 Fit both vertical tracks with the lower surface on mark line C and the edge 64 mm along the pennant (Figure). The two bearing tracks should be parallel to one another.  
For fitting to brickwork a angle bracket (2602) may be used.
- 3 For sloping floors, one of the bearing tracks may be compensated (for example with a wedge).

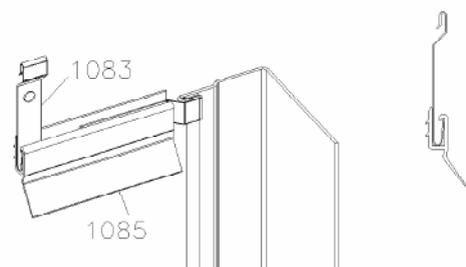
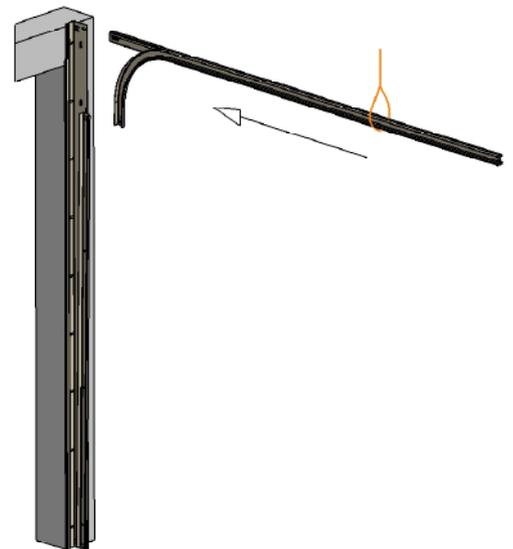


## ASSEMBLY HORIZONTAL TRACK SET

- 4 Attach a piece of cord to the ceiling or the roof structure to maintain the elevation of the rear side of the horizontal tracks during the assembly process.
- 5 Fit the horizontal tracks to the vertical bearing tracks. See figure. the extremity of the bend in line with the horizontal tracks. Fit the M6 flanged nuts (1062M) and secure them hand-tight.

## ASSEMBLY TOP SEAL

- 6 Fit the sealing profile (1085) to the lintel using the 4 spring clips (1083) (figure).  
4 pieces for DMB < 3000,  
6 pieces for DMB > 3000.  
The top sealing profile (1085) replaces the top rubber 1036-36. This prevents the top rubber (1036-36) scraping along the ceiling.



## FITTING TO FIXED POINT.

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Depending on the option selected, one of the following instructions will be appropriate.

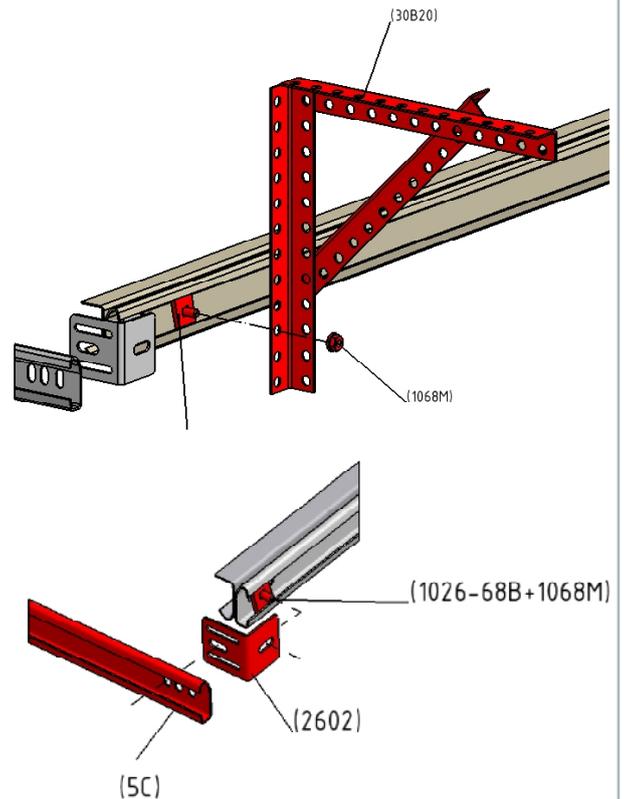
The construction (and fitting) for suspension of the horizontal tracks will depend on others.

### With suspension profile for horizontal tracks to ceiling or roof structure (Figure ).

Make using the perforated angle line (30B0750) a connection between the track fastening plate and ceiling /roof structure.

### With horizontal interconnecting profile between the horizontal tracks (Figure ).

Fit the angle bracket (2602) with 2x press bolt (1062B) and 2x flanged nut (1062M) to the end of the upper horizontal tracks

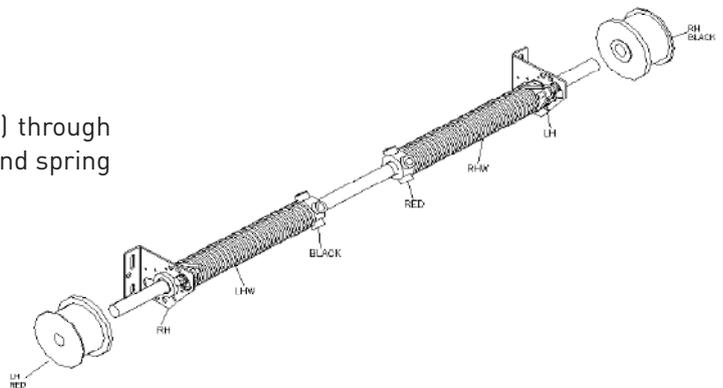


## Assembly and fitting of spring package

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CW < 3000 en CH < 2500

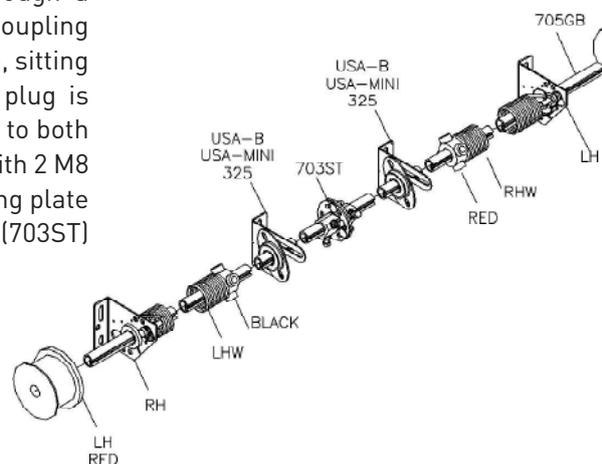
Slide the tube spindle (CH < 2500 701, CW > 2500 705GB) through both springs. The tension plug of the anti-clockwise wound spring is coded black and should be fitted on the left. See figure



9

CW > 3000

Slide each of the two cottared tube shafts (705GB) through a spring. The tube shafts are of unequal lengths to avoid the coupling (703ST) from the centre, and when there is an electric drive, sitting under the drawbar. The tension plug of the left-wound plug is coded black and should be fitted on the left. See figure. Fit to both shafts a bearing (USA-B) and a bearing holder (325) each with 2 M8 pressed bolts and nuts (1070-3.5B and 1068M) to the bearing plate (USA-MINI). Then fit disassembled halves of the coupler (703ST) (711A-38).



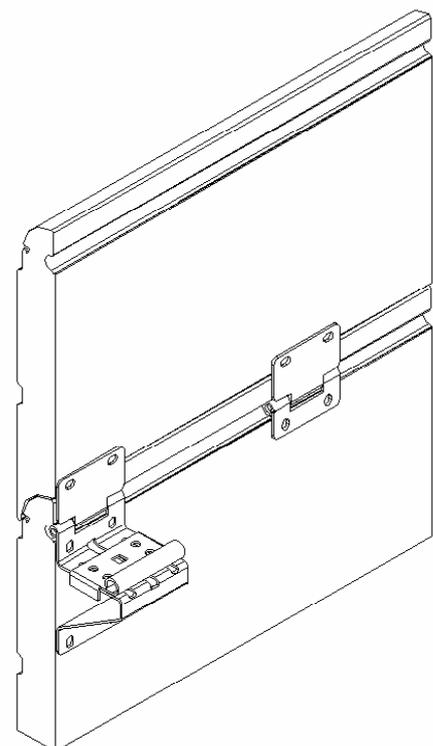
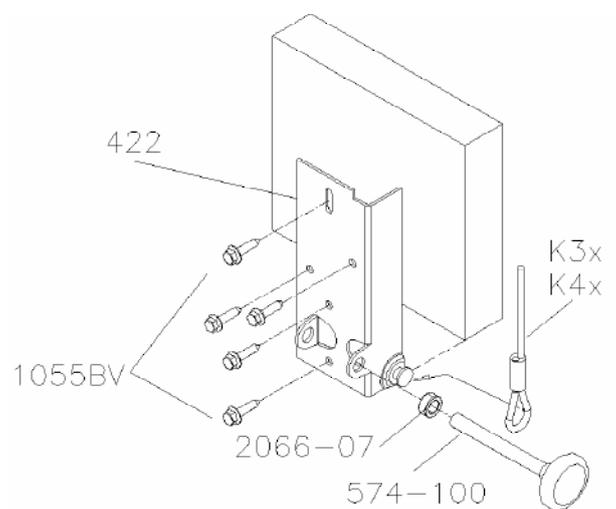
- 10 Fit the spring break devices (651LH/RH or 667LH/RH) to the stationary spring plugs, following the drawings that are included in the packaging with every spring break device.  
! See handbook enclosed for the 651/667 spring break device.
- 11 Slide on both sides a cable drum (FF-4X8 or FF-4-13) onto the shaft.  
The cable drum coded RH, should be fitted on the left side. Turn the securing bolts of the cable drum to secure these hand-tight to the tube shaft.  
Secure each cable drum FF-4-13 with a cotter (711A-75).
- 12 Fit the bearing plate/spring rupture protection assemblies with a spring package on the wall

## FITTING THE DOOR PANELS

### General

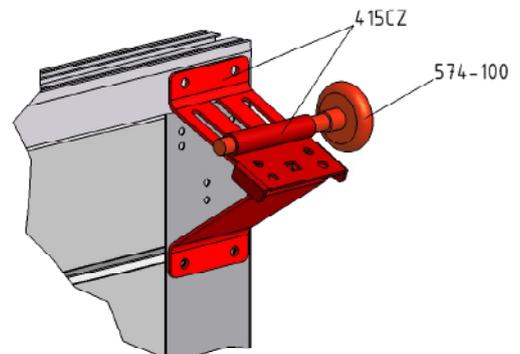
In order to insert the self-tapping screws into the panels holes have to be drilled. The diameter of the holes will depend on the panel material. Guideline value for steel insulated panels is 4.5 mm.

- 13 Place the bottom panel truly level between the bearing tracks on ca 20 to 40 mm high blocks.
- 14 Hook the loop of the lifting cable ( k3....) to the pin intended for that purpose on the bottom bracket. Insert the shaft of the bearing roller (574-100) through the spacer (2066-07) and the holes of the bottom bracket (422LH/RH) intended for that purpose. Place then the bearing roller first in the bearing track and then secure the bottom brackets with the self-tapping screws (1055BV) Figure.
- 15 Place the remaining panels and secure the side and central hinges (may be pre-fitted) to the panels (Figure)  
DMB < 3000 1 central spring per section, DMB > 3000 and < 5000 several central springs depending on the panel type and clear width.  
See appendix in order to determine which type of hinge may be employed.



**16** Adjust the bearing roller to the side hinge such that the nylon-bearing roller is located in the rounding of the track and that the play between panel and side seal is at a minimum. The shaft of the bearing roller should remain capable of turning by hand.

**17** Slide the shaft of the bearing roller (574-100) into the sleeve of the top roller holder. Place the bearing roller in the shortened bend and fix the top roller holder (417) to the upper side of the top panel with 4 self-tapping screws (1055BV) (Figure).



## FITTING CABLE AND TENSIONING THE SPRING PACKAGE

**18** Align the shaft.

**19** Guide the cable from the bottom bracket, behind the bearing roller shafts to the cable drum. See fig.

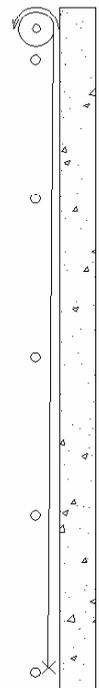
**20** Hook the end of the cable with the end of the pressure clamp (circular) into the cable drum and turn the cable drum until the lifting cable is taut. Align the cable drum in such fashion that the lifting cable is free to wind up. Secure finally the drum with the hexagon bolts to the shaft without keyway (tightening moment 10Nm). For a tube shaft with a keyway the drum must be secured with a cotter (711A-75) and bolts.

**21** Block the shaft with for example a wrench.

**22** Secure the other cable in the same fashion. Both cables must be tensioned equally while the door panel is truly level.

**23** Ensure that the door does not elevate. You can do this for example by placing wrenches in the vertical bearing tracks.

**24** Tension the springs by the prescribed number of turns (see packaging list in the box), pull the spring  $\pm 5$  mm apart (to reduce friction) and secure the spring to the tube shaft using the screws of the tension plug (17 Nm).



### CAUTION!

**Torsion springs are subject to considerable tension. Proceed at all times with extreme caution. Installation, maintenance and repair should be carried out only by experienced and properly trained overhead door fitters. Use correctly fitting and properly maintained tension levers.**

Tensioning the spring

- Make sure that the marking strip on the spring forms a sharp line
- Insert the 1st tension lever completely into the tensioning slot.

- c. Turn the 1st tension lever a quarter turn such the spring is tensioned.
- d. Insert the 2nd tension lever completely into the following tensioning slot.
- e. Take over the tension of the spring from the 1st tension lever to the 2nd tension lever.
- f. Remove the 1st tension lever from the slot.
- g. Turn the 1st tension lever a quarter turn such the spring is tensioned.
- h. Repeat steps 2 through 7 until the spring has realized the prescribed number of turns.
- i. Secure the spring plug on the shaft by turning the bolts in the tension plug in the tube shaft.
- j. Remove the final tension lever.
- k. Check the number of turns by counting the number of turns that the marking strip has made.

Number of turns spring:

CH	4 panels	5 turns
2100	7.1 turns	6.8 turns
2125	7.6 turns	7.3 turns
2250	8.0 turns	7.7 turns
2375	8.4 turns	8.7 turns
2500	8.5 turns	9.2 turns

25

Remove the restriction from the door in the tracks and from the shaft and check whether the door is properly balanced. When this is not the case you should correct this by tensioning or relaxing by at most 1 turn per spring. Make sure when doing this that both springs are equally corrected.

Correction of the spring tension

- a. Insert the 1st tension lever completely into the tension slot.
- b. Take over the tension from the spring with this tension lever.
- c. Loosen the bolts in the tension plug.
- d. Turn the 1st tension lever in the direction required.
- e. Insert the 2nd tension lever completely in the next tension slot.
- f. Take over the tension of the spring from the 1st tension lever to the 2nd tension lever.
- g. Remove the 1st tension lever from the slot.
- h. Turn the 2nd tension lever a quarter turn in the direction required.
- i. Insert the 1st tension lever completely into the next tension slot.
- j. Take over the tension of the spring from the 1st tension lever to the 2nd tension lever.
- k. Repeat steps 4 through 10 until the correction required has been realized.
- l. Secure the spring plug on the shaft by turning the bolts in the tension plug in the tube shaft.
- m. Remove the final tension lever.

26

When the door panel is not hanging completely horizontally in the lifting cables in (almost) closed conditions there are three options for fine adjustment.

- A. Loosen slightly from the bearing plate the securing bolts of the spring break device and adjust the bearing plate upwards or downwards.
- B. Loosen the securing bolts of the cable drum and the drum relative to the tube shaft.
- C. When a coupling is employed this may be adjusted to ensure a better horizontal setting.

27

Close the door and secure the door panel. Press the top panel against the side (upper) seal and slide the top roller holder as far as possible (minimum play between door panel and seal).

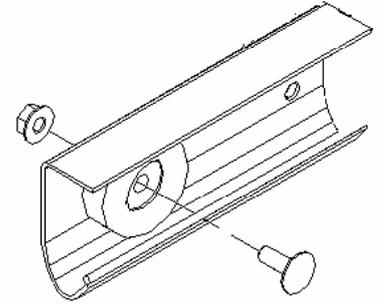
## FINISHING THE DOOR

28

Fit any additional accessories that you have ordered separately such as: Handgrip, Lock, Bolt, a bolt may not be fitted to an electrically driven door.

29

Fit the rubber doorstop supplied with a pressed bolt M6x16 (1062B) and nut M6 1062M), to the end of the horizontal tracks (Figure).



30

Lubricate all hinges and bearing rollers with a drop of oil.

31

Grease the cables.

32

Grease the bearing roller shafts.

33

The torsion springs are already lightly oiled.

34

Place your CE identification plate on the door together with any warning labels required.



**NB! Place a warning label on the lower curve because fingers or hands could be trapped between curve and panel when the door is moving.**

35

Hand over necessary documents to the end-user:

- 1 User manual
- 2 Dismantling instructions (included in this manual)
- 3 Maintenance instructions (included in the user manual)
- 4 Service log book
- 5 Declaration of conformity Ila declaring the door is according to EN-13241-1.



**NB! WITH THIS DOOR NO ROPE IS BEING SUPPLIED. DO NOT INSTALL A ROPE WITH A POWER OPERATED DOOR AT ANY TIME!! THIS CAN CAUSE SERIOUS INJURIES OR DANGER TO THE USER OF THE DOOR!**

### OPTION ELECTRICAL DRIVE

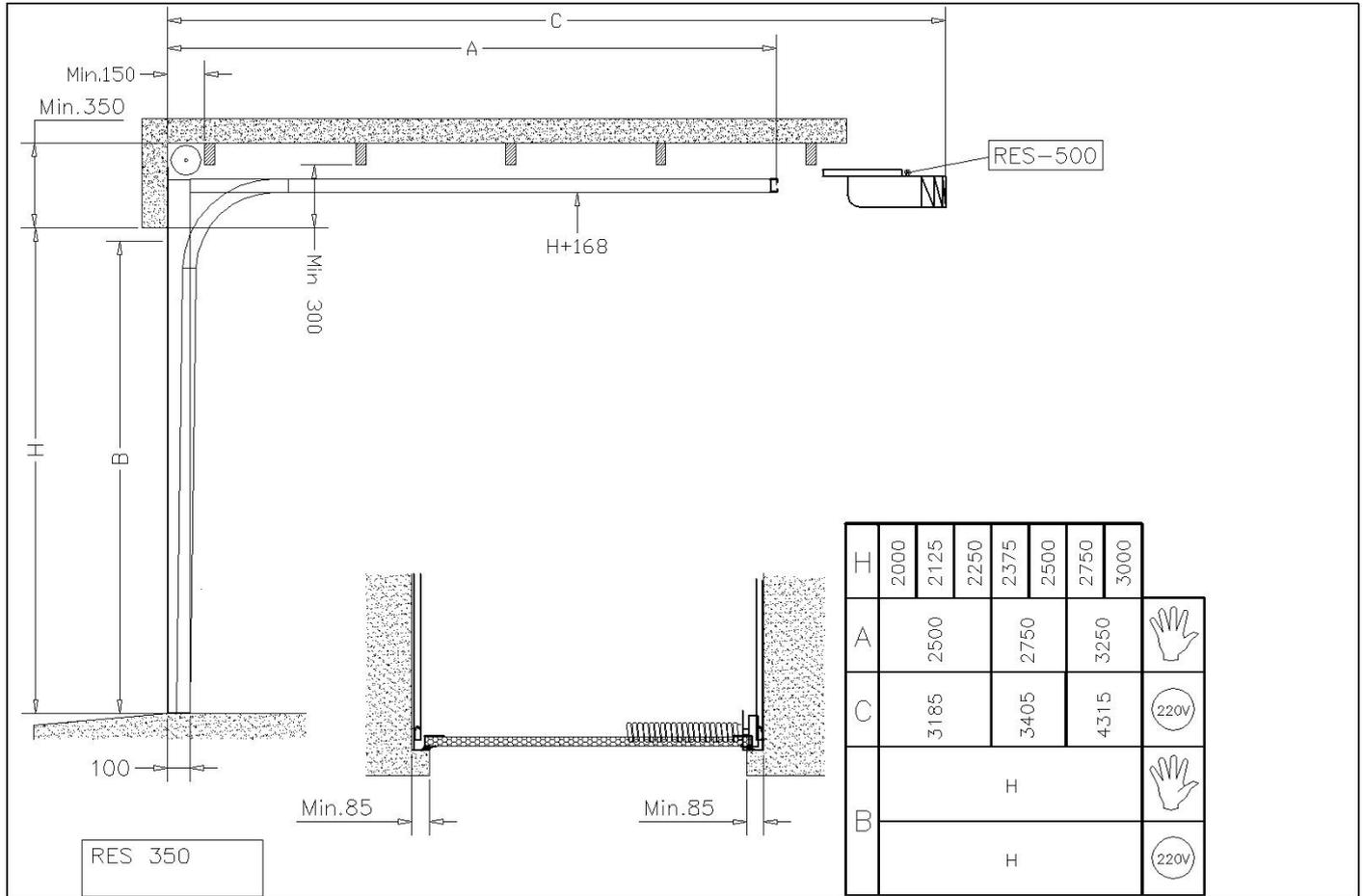
When you have selected option I. Electrical drive (RES-E-500), then this should be assembled in conformity with the handbook supplied with the drive. You should clearly follow the instructions for electrical operation in this handbook.

In order to maintain the closing force of the door within the standards set the attachment (97014) point of the drawbar should be 230 mm from the upper hinge point.

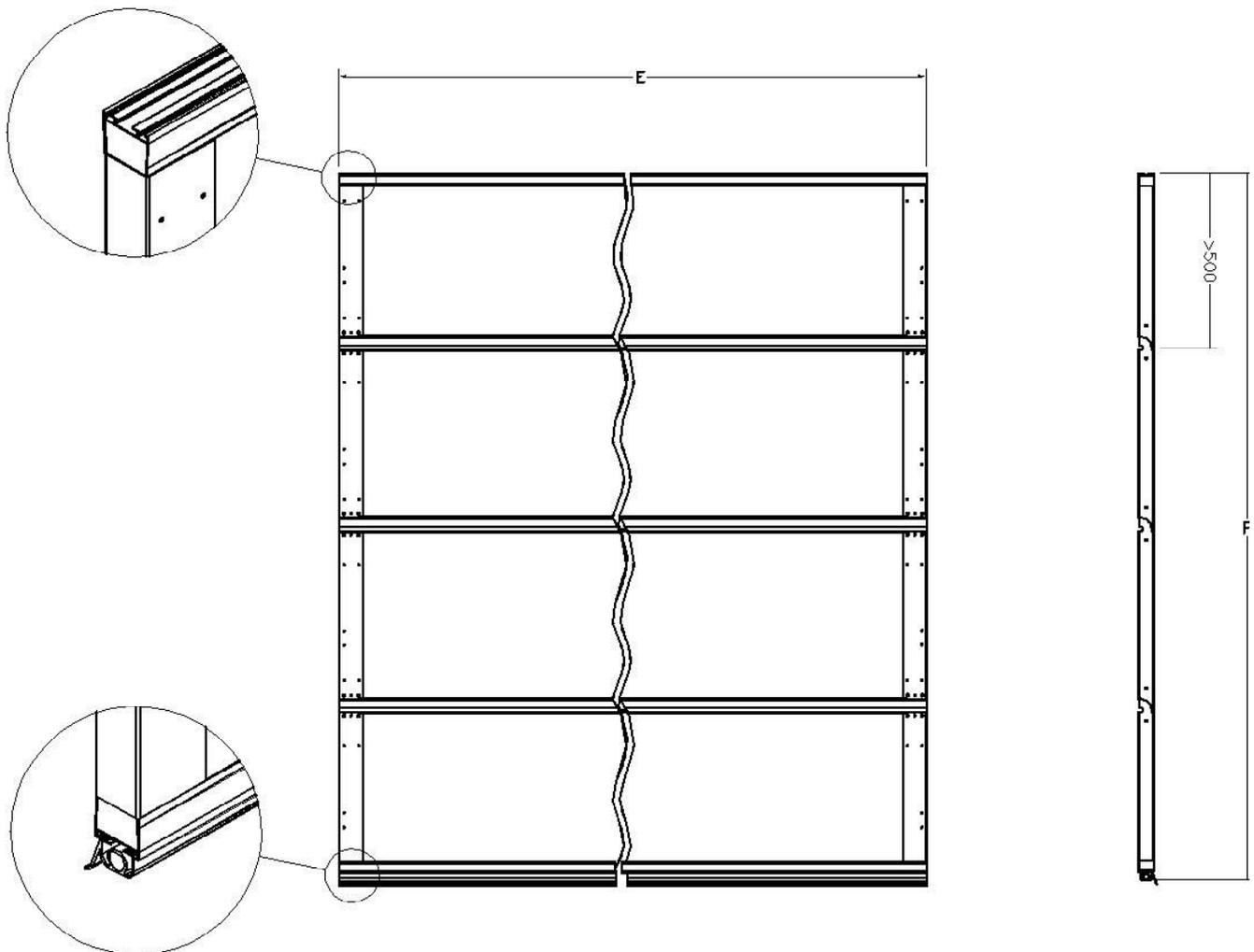


**NB! De persoon die de deur installeert dient grondig te controleren of deze deur veilig met de gekozen aandrijving kan worden gecombineerd. (ITT REPORT 0402-CPD-402201.) Denk daarbij aan de maximale piekkracht die toegestaan is als de deur wordt gesloten. Er kunnen mensen gewond raken als de software-instellingen of de installatie van de aandrijving, of de geselecteerde aandrijving voor deze deur niet goed zijn gecontroleerd!!**

## GENERAL SYSTEM DRAWING



50 248 00 0 dd 06-10-2006



$E = A + 45$  (See also figure )

$F = B + 15$  (See also figure )

Enclosure A

NB! Make sure that the bottom panel will not be cut for adjusting the panel or door height. This should be done with the top section only! The attachment of the bottom bracket, which is holding the complete door weight, is relying on the construction of the panel. Danger can occur if the panel is cut at this point.

## TROUBLESHOOTING :

What should be checked if the door is not balanced properly?

When a door is not well in balance, then it is necessary to check first the following details :

1. Is the given information correct :
  - weight of the door leaf (including hardware)
  - is the division of the weight equal on each panel, or are there panels with a different weight than the others, for instance by the application of different panels (glass, pass door with heavy profiles).
2. Were the correct parts supplied and fitted?
  - especially the drums and springs are important :
  - correct dimensions supplied ?
3. Is the door properly installed?
  - horizontal tracks really horizontally and not with inclination.
4. Were modifications made afterwards ?
  - check if any changes were made during the fitting, or if a pass door was fitted later, or any reinforcement profiles fitted etc.
5. Is the e-operator installed and selected properly?
  - Is the installed e-operator suitable for this door?
  - Is the e-operator power adjusted properly for this door? (See installation manual operator)
  - Is the connection of the drawbar to the top-panel on the right position? (See attachment and manual operator).

## WHAT TO DO AFTER CABLE BREAK OR SPRING BREAK?

**NB! Also make sure to instruct the user about this.**

After spring breaking the door will be stopped by the 651LH/RH or 667LH/RH spring break device. The end user must contact immediately a qualified overhead door mechanic. The spring breaking device is a so called "one-shot" device. After it has acted, it must be replaced, together with all other possibly damaged components of the door, such as torsion springs, spring plugs, bearing plates etc. The door has to be inspected thoroughly.

We refer to the separate manual for the 651/667 spring break devices on our website: [www.flexiforce.com / downloads / manuals](http://www.flexiforce.com/downloads/manuals).

After cable breaking, the door will be stopped by the second cable, which is designed to be strong enough to hold the weight of the door. Again, qualified overhead door mechanics must inspect the door and replace all possibly damaged components, such as: bottom brackets, cable, roller carriers, rollers, etc.

## DISMANTLING THE OVERHEAD DOOR



### ATTENTION! WARNING!

To dismantle an existing overhead door, a number of precautions must be taken. For the safety of all concerned pay heed to the warnings and instructions given below! If in doubt, contact your supplier.

Dismantling should only be carried out by experienced fitters. This manual is not suitable for d.i.y. purposes or for use by trainee fitters.

This manual only describes the installation/dismantling of hardware for overhead doors and as such must be supplemented with instructions for any additional components.

FOR ANY DETAILS ON THESE DISMANTLING INSTRUCTIONS, WE REFER TO THE INSTALLATION CHAPTERS OF THIS MANUAL WHERE DRAWINGS AND DETAILS ARE DISPLAYED.

### STEP 1. De-tensioning the torsion spring(s)



### CAUTION !

Torsion springs and bottom brackets are under high tension.  
Exercise at all times great caution. Use properly fitting and maintained tension irons (see drawing).

Start dismantling of the door by closing the door and securing its movement with a clamp on the vertical track.

First the tension on the torsions springs and cable has to be released. Do this by following these instructions :

- 1 Insert the 1st tensioning iron fully into the tensioning aperture.
- 2 Take over the tension of the spring with this tensioning iron.
- 3 Loosen the bolts in the tensioning plug and remove the key.
- 4 Turn the 1st tensioning iron in the direction required.
- 5 Insert the 2nd tensioning iron fully into the next tensioning aperture.
- 6 Take over the tensioning of the spring from the 1st tensioning iron with the 2nd tensioning iron.
- 7 Remove the 1st tensioning iron from the aperture.
- 8 Turn the 2nd tensioning iron a quarter turn in the direction required.
- 9 Insert the 1st tensioning iron fully into the tensioning aperture.
- 10 Take over the tensioning of the spring from the 2nd tensioning iron with the 1st tensioning iron.
- 11 Repeat steps 4 through 10 until all tension is released.
- 12 Remove the last tensioning iron.

**STEP 2.** Disconnect the electrical operator. Follow any instructions given in the separate manual of the operator.

**STEP 3.** Loosen the cable drums and remove the keys. Act carefully, there might be some tension left on the cable. Check if the cable is slack. Remove the cable by disconnecting it from the bottom bracket and cable drum.

**STEP 4.** Dismantle the horizontal track construction.

**STEP 5.** Remove the panels one by one from the vertical track construction, starting with the top panel. Do this by loosening the hinges and rollers first.

**STEP 6.** Remove the shaft construction from the lintel, after you have dismantled the E-operator from the shaft. If the shaft is divided and connected with a coupler, first disconnect the coupler and carefully remove both halves of the shaft system.



Attention ! Watch out for parts that might slide of the shaft, such as cable drums, bearings or keys

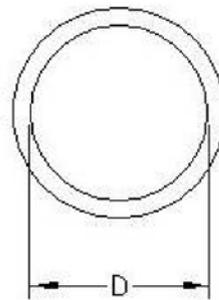
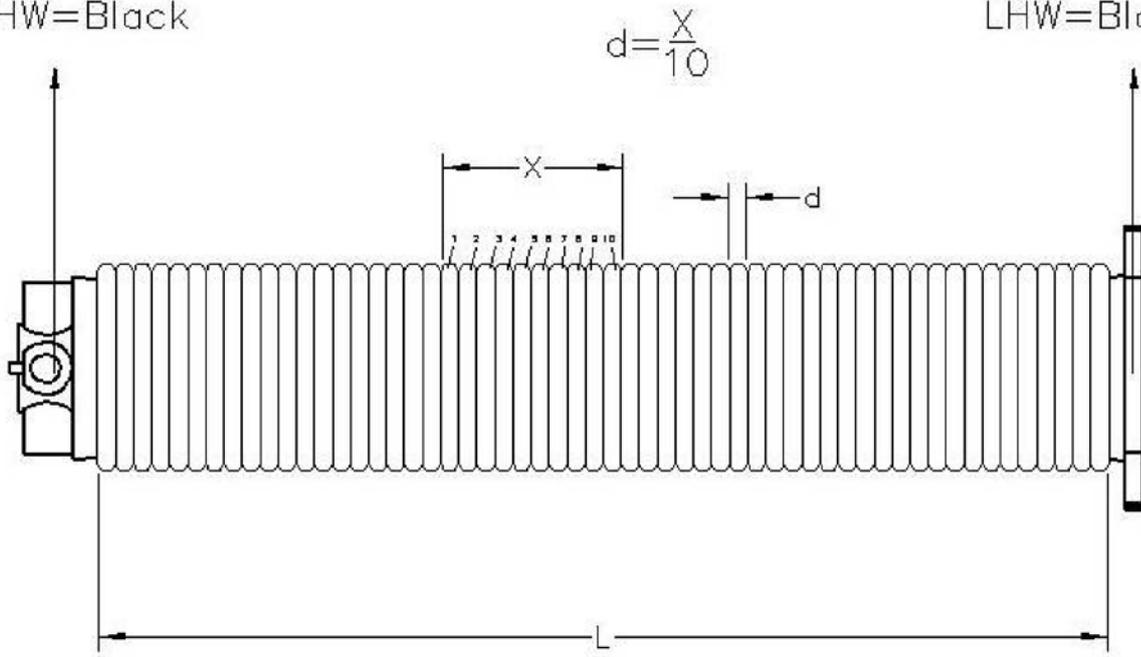
**STAP 7.** Remove vertical tracks and angles from the building construction.

**STAP 8.** Make sure that you remove all the parts and panels in an environment kindly way. Check with your local authorities where and how you can leave this as garbage.

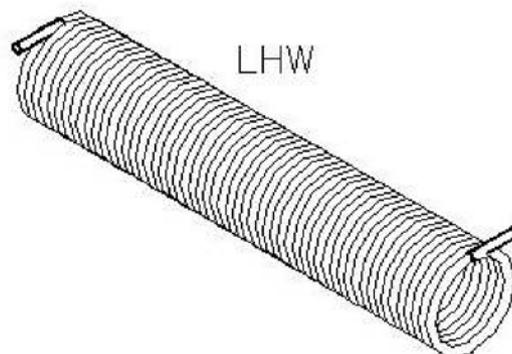
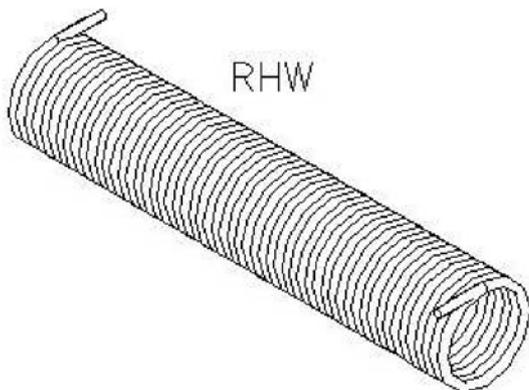
## SPRING IDENTIFICATION

RHW=Red  
LHW=Black

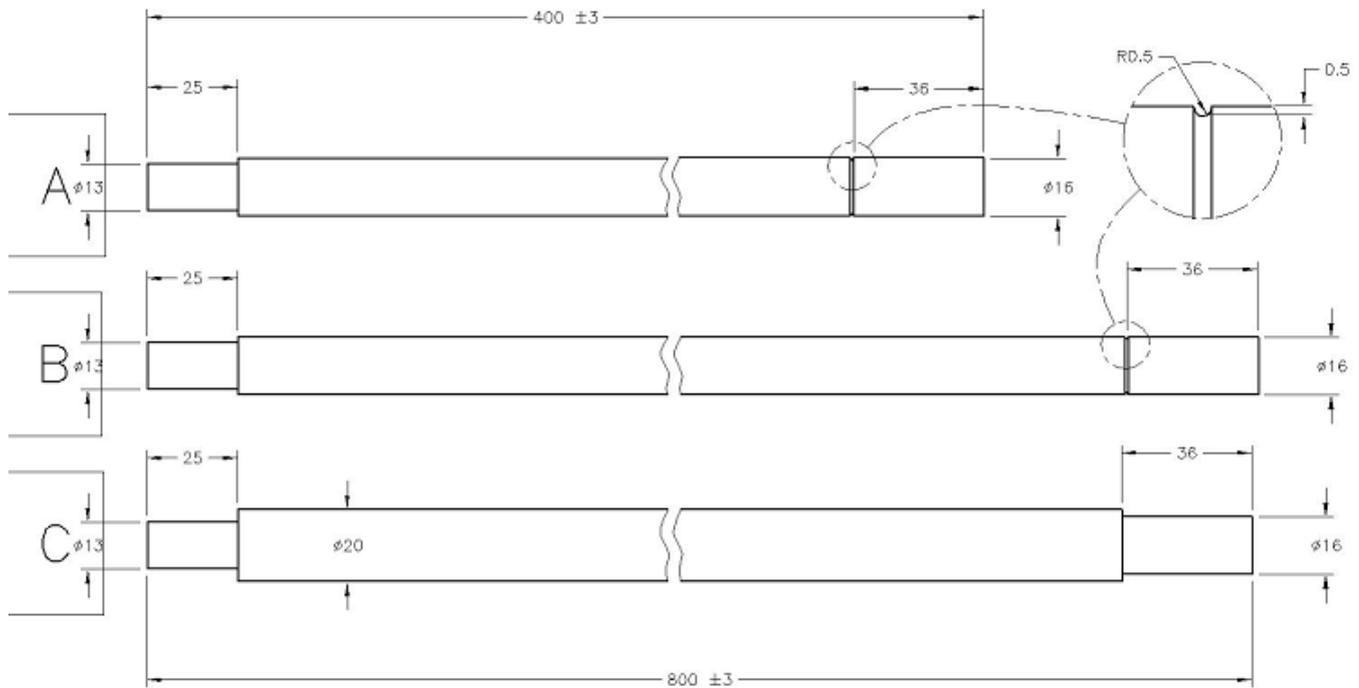
RHW=Red  
LHW=Black



2" = 51mm  
2 5/8" = 67mm

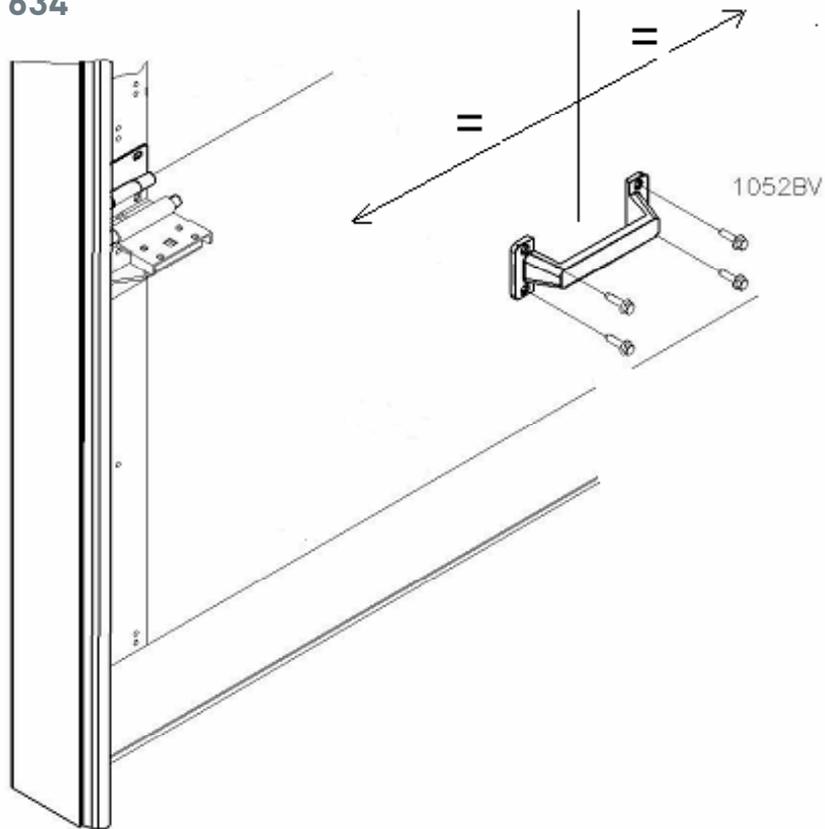


## TENSIONING IRONS (SPANNERS)



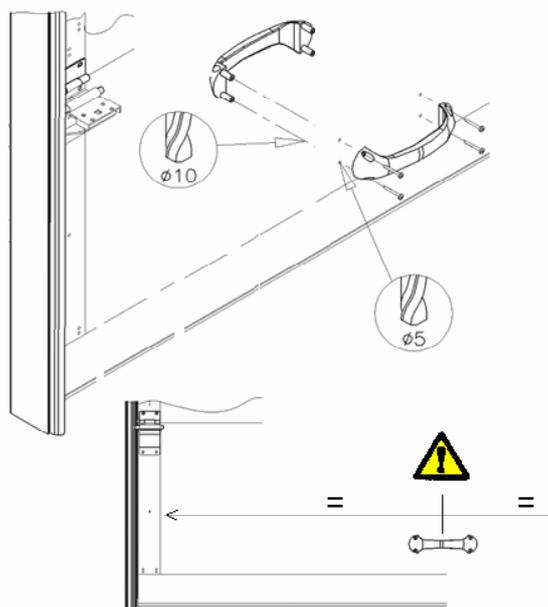
$\phi 13$  : FF-2.00, FF-2.63TAI, FSW51, FSW67

## INSTALLING GRIP TYPE 634



NB! For safety reasons always install the grip in the center of a door. In that way, when opening the door manually, there is less risk of injuring hands between the track and rollers!

## INSTALLING GRIP 639BL

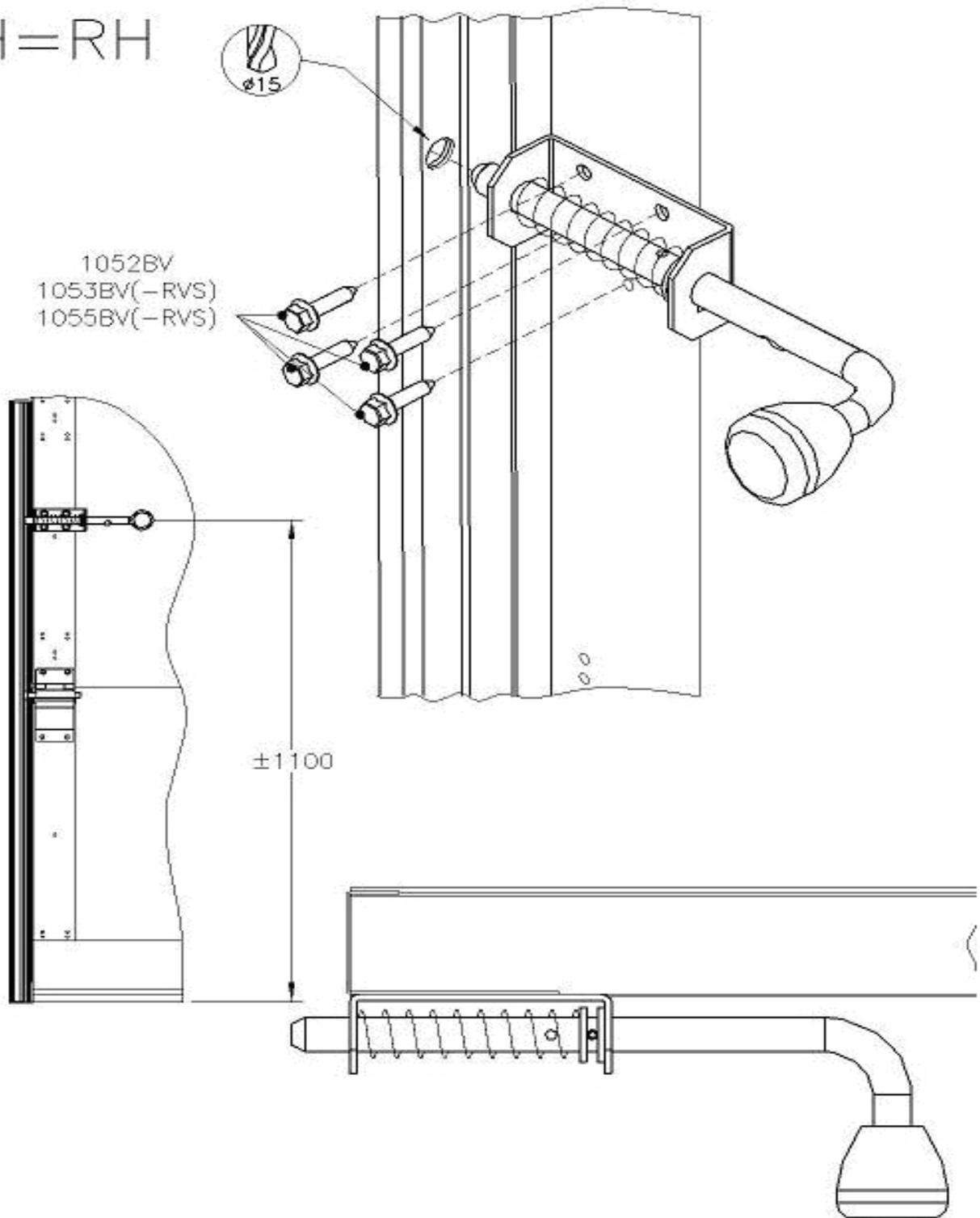




## INSTALLING SLIDE BOLT 638L

NB! Do not install a slide bolt in combination with an e-operator!

LH=RH



## MAINTENANCE AND REPLACEMENT OF PARTS RESIDENTIAL DOORS

An overhead door should be maintained and checked regularly to ensure safe operation and use. This is described in the EN-norms.

### GENERAL:

- 1 Torsion springs, brackets and other components which are attached to the springs and cables, are under extreme tension. If not handled properly, injuries or damages might occur!  
So, working on these components may only be carried out by qualified overhead door mechanics!
- 2 Replacement of broken or weared components should always be done by qualified overhead door mechanics.
- 3 When checking the door, always disconnect the electrical main power supply. Make sure that it is blocked against re-engaging without you knowing it.

### REGULAR MAINTENANCE:

#### After installation:

- |  |          |
|--|----------|
| 1. Grease running part of the tracks         | MECHANIC |
| 2. Grease the bearings of the rollers        | MECHANIC |
| 3. Grease the shafts of the rollers          | MECHANIC |
| 4. Grease the bearings of the shaft          | MECHANIC |
| 5. Grease the hinge pins                     | MECHANIC |
| 6. Grease the lock                           | MECHANIC |
| 7. Protect the panels with carwax            | USER     |
| 8. Grease the rubbers slightly with vasaline | USER     |

#### After 3 months:

- |  |          |
|--|----------|
| 1. Complete inspection visually                    | MECHANIC |
| 2. Check balancing system and adjust if needed     | MECHANIC |
| 3. Grease all the above mentioned points if needed | MECHANIC |

#### Every 6 months (or after every 750 cycles):

- |  |      |
|--|------|
| 1. Check side seals on damage or wear and tear             | USER |
| 2. Check top seal on damage or wear and tear               | USER |
| 3. Check bottom seal on damage or wear and tear            | USER |
| 4. Grease all above mentioned points                       | USER |
| 5. Clean the panels  | USER |
| 6. Clean the windows (only water wash, do not use cloth)   | USER |
| 7. Remove dirt and waste from the door or its surroundings | USER |

#### Every 12 months (or after every 1500 cycles):

- |  |          |
|--|----------|
| 1. Check or test the fixation of the springs to the fittings       | MECHANIC |
| 2. Check the balance of the door and adjust if needed              | MECHANIC |
| 3. Check the cables for damage or wear and tear                    | MECHANIC |
| 4. Check the cable connection points on drums and bottom bracket   | MECHANIC |
| 5. Check the roller on wear and free moving space                  | MECHANIC |
| 6. Check the hinges on breaking                                    | MECHANIC |
| 7. Check the panels on damage, wear and roust                      | MECHANIC |
| 8. Check the spring breaking device acc. to instructions in manual | MECHANIC |
| 9. Check and test the safety edge system with operator             | MECHANIC |
| 10. Check the manual operation of the door                         | MECHANIC |
| 11. Grease the springs   | MECHANIC |

**After two years (or after every 3000 cycles):**

- |  |          |
|--|----------|
| 1. Grease all the above mentioned points                           | MECHANIC |
| 2. Check or test the fixation of the springs to the fittings       | MECHANIC |
| 2. Check the balance of the door and adjust if needed              | MECHANIC |
| 3. Check the cables for damage or wear and tear                    | MECHANIC |
| 4. Check the cable connection points on drums and bottom bracket   | MECHANIC |
| 5. Check the roller on wear and free moving space                  | MECHANIC |
| 6. Check the hinges on breaking                                    | MECHANIC |
| 7. Check the panels on damage, wear and roust                      | MECHANIC |
| 8. Check the spring breaking device acc. to instructions in manual | MECHANIC |
| 9. Check and test the safety edge system with operator             | MECHANIC |
| 10. Check the manual operation of the door                         | MECHANIC |
| 11. Grease the springs   | MECHANIC |
| 12. Check side seals on damage or wear and tear                    | MECHANIC |
| 13. Check top seal on damage or wear and tear                      | MECHANIC |
| 14. Check bottom seal on damage or wear and tear                   | MECHANIC |
| 15. Check the shaft on wear and tear or damage                     | MECHANIC |
| 16. Check the bottom bracket on wear and tear and damage           | MECHANIC |
| 17. Check the connection of the drum to the shaft (keys!)          | MECHANIC |
| 18. Check and re-fix the bolt of the coupler                       | MECHANIC |
| 19. Check the connections of the track system                      | MECHANIC |
| 20. Check the suspension of the door to the lintel and ceiling     | MECHANIC |

**After spring break:**

See instructions in this manual and look into the manual of the spring breaking device 651/667 (download manual from internet [www.flexiforce.com](http://www.flexiforce.com))

NB! Do not touch any connection or part of the door after spring break. Wait until qualified mechanics arrive at the scene!

**After cable break:**

See instructions in this manual and look into the manual of the cable break device 440-600etc. (download manual from internet [www.flexiforce.com](http://www.flexiforce.com))

NB! Do not touch any connection or part of the door after cable break. Wait until qualified mechanics arrive at the scene!

- |                  |  |
|------------------|--|
| Use for greasing | : PTFE or SAE20 or WD40  |
| Use for cleaning | : : Soft soap with water. Do not use aggressive soap or cloth. |

## HINGE-PANEL-END CAP OVERVIEW. APPROVED COMBINATIONS

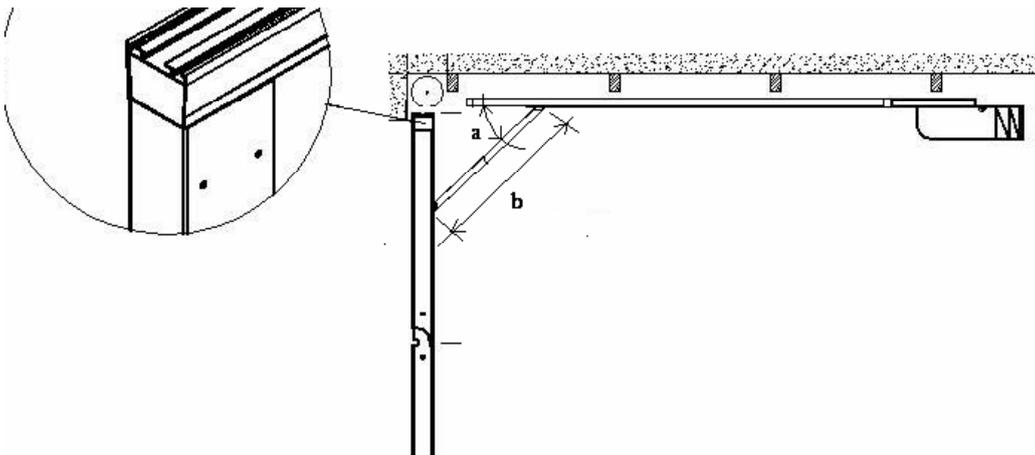
In the Initial Type Testing with SP-institute, the following combinations of hinges were approved.

### Overview fingersafe residential panels <> Flexi-Force hinges

Panel	Intermediate hinge	Side hinge		Endcaps
Bremet Secuwall	420HZ+10RES	420CZ+10RES		40E500(W), 40E610(W)
ThyssenKruppHoesch	450HZ+10	450CZ+10REV		40E500(W), 40E610(W)
Tecsedo new panel	420HZ+10RES	420CZ+10RES		40E500(W), 40E610(W)
Tecsedo old panel	450HZ+10	450CZ+10		40E500(W), 40E610(W)
Kingspan (Apco)	423HZ	423CZ+10R	500mm section	40ES500L/R
			500mm section	40ES500WL/R
			610mm section	40ES610L/R
			610mm section	40ES610WL/R
			prototype	40E500(W), 40E610(W)
Ryterna	450HZ	450CZREV	prototype	40E500(W), 40E610(W)
Lindab	450HL	450CL	prototype	40E500(W), 40E610(W)
IDL	450HZ+10	450CZ+10		40E500(W), 40E610(W)
Tekla	450HZ+10	450CZ+10REV		40E500(W), 40E610(W)

## INSTALLATION OF THE OPERATOR BRACKET TO THE TOP PANEL. APPROVED COMBINATIONS

The point on which the drawbar bracket is attached to the top panel, and the angle of the bracket is critical for the operated peak force of the e-operator. During Initial Type Testing the following instructions and connections were approved. NB! If you need more information, ask your operator supplier for their instructions.



The dimensions that effect the test results is :

**a** = the horizontal angle between the centre of the fastening bolt in the top panel to the centre of the fastening bolt connected to the operator

**b**= the horizontal distance between the same bolts

Given the minimal in-build dimensions of the systems, the a and b values should be:

	<b>a°</b>	<b>B mm</b>	<b>Remark</b>
Marantec Comfort	211	45	370
Marantec Comfort	220	32	300
Marantec Comfort	250	45	370 With bracket
Marantec Comfort	252	45	370 With bracket
Compact Marantec	45	370	With bracket
Marathon 800 SL	45	360	With bracket
Marathon 1100 SL	45	360	With bracket
Duo 650 SL	45	360	With bracket
Liftmaster 60	32	215	
Liftmaster 800	15	480	With bracket + special astragal
Liftmaster 1000	15	480	With bracket
Liftmaster 5580	15	480	With bracket
Bernal S 401-120	45	500	With bracket
Novoferm Tormatic GTA 701	30	300	With bracket
Novoferm Tormatic GTA 702	30	300	With bracket + safety edge filled with foam
FAAC 531 EM 600 N	23	435	
FAAC 576 EM 1000 N	23	435	
Marantec Comfort 220	45	360	Lindab door
	15	485	(new test with different config.)
Marantec Comfort 250	32	300	Lindab door
Marantec Comfort 252	32	300	Lindab door