

⚠ IMPORTANT SAFETY INSTRUCTIONS FOR INSTALLATION

WARNING – INCORRECT INSTALLATION CAN LEAD TO SEVERE INJURY FOLLOW ALL INSTALLATION INSTRUCTIONS

Before installing the operator check that the door is in good mechanical condition, and correctly balanced, and that it opens and closes properly.

- Do not use the force adjustments to compensate for a binding or sticking garage door. Excessive force will interfere with the proper operation of the Safety Reverse System or damage the garage door.
- Do not wear rings, watches or loose clothing while installing or servicing a garage door operator.
- To avoid serious personal injury from entanglement, **remove any ropes** connected to the garage door before installing the door operator.
- Install a remote mounted push button within sight of the door but away from any moving parts and at a height of at least 1.5 metres.
- **The safety reverse system test is very important.** The garage door must reverse when obstructed on closing. **Failure to properly adjust the operator may result in serious personal injury from a closing garage door.** Repeat the test once a month and make any needed adjustments (see Level 2, Menu ② and Level 2, Menu ③ on page 13 of this manual).

Installation and wiring must be in compliance with your local building and electrical codes.

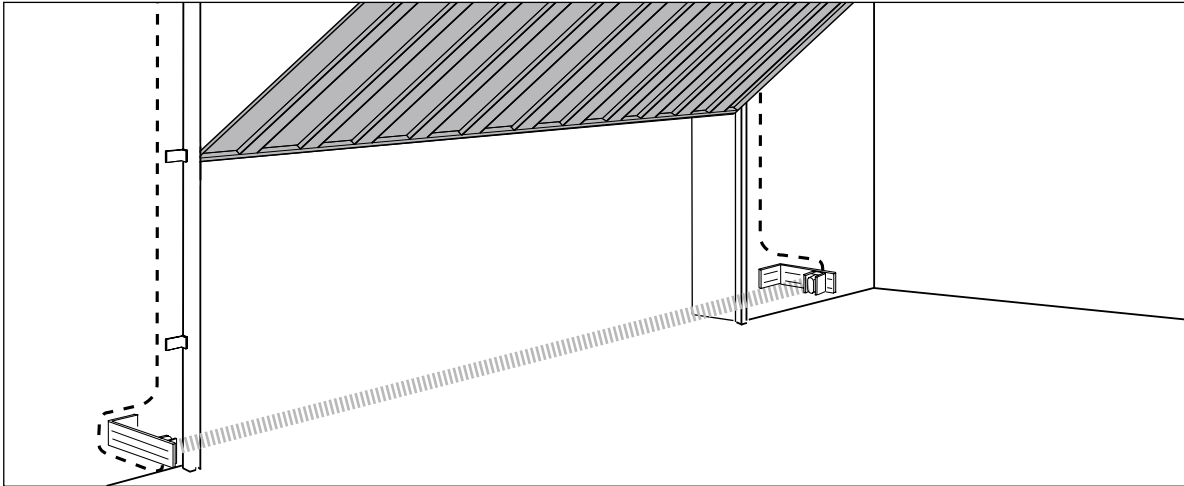
- If the garage has no service entrance door then an exterior release kit **MUST** be fitted. This accessory allows manual operation of the garage door from outside in case of power failure.
- Disconnect electric power to the garage door operator before making repairs or removing covers.
- Use the manual release lever to disengage the motor drive **ONLY** when the drive is switched OFF and, if possible, when the door is fully closed.
- Examine the installation, in particular the cables, spring and mountings, for signs of wear, damage or imbalance. Do not use if repair or adjustment is needed since a fault in the installation or an incorrectly balanced door may cause injury.

IMPORTANT SAFETY NOTE

Only operate the door when the door is in full view, free of obstacles with no persons (particularly children) near the door. Nobody should be allowed to enter or leave the garage whilst the door is in motion.

SAFETY FEATURES

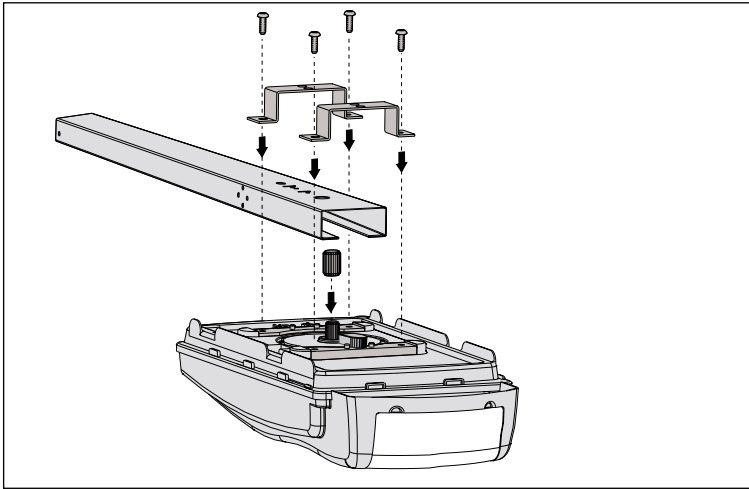
- **Automatic Door Reverse**
An unmodified closing door will automatically reverse within 2 seconds if door is obstructed by person or object.
- **Automatic Time Reverse**
Closing door will automatically reverse if the door is not fully closed within 88 seconds.
- **Safety Stop**
Opening door will immediately stop when obstructed by person or object.
- **Beam Break**
For additional safety we recommend a Beam Break is installed. If the INFRARED BEAM is broken by a person or object whilst the door is closing, it will automatically reverse to the fully open position without actually having touched the closing door itself.



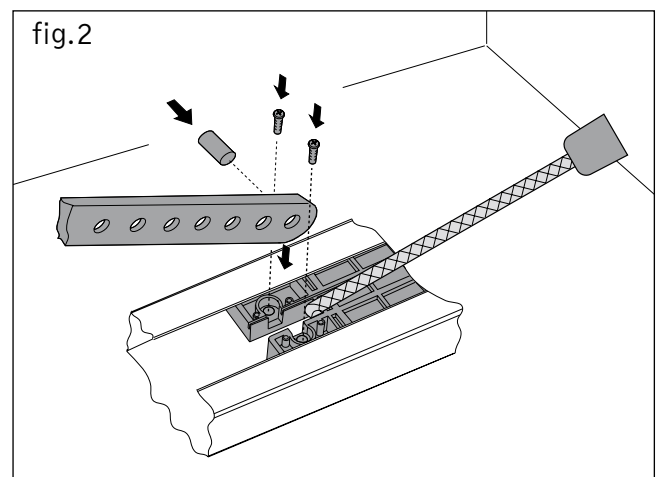
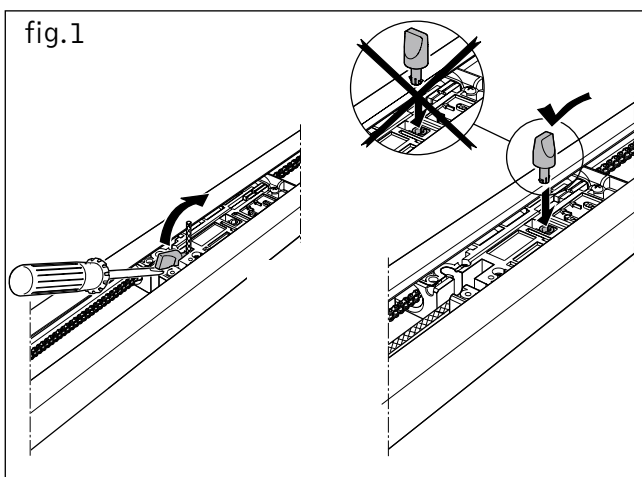
OPERATOR ASSEMBLY

Note: Where the operator has been specified with a 2-piece boom, please refer to the assembly instructions for this item supplied with the boom.

- 1** Install grey motorshaft adapter onto motorshaft.
Bolt rail with brackets and screws to motorhousing.
Make sure the screws are tightly fastened.

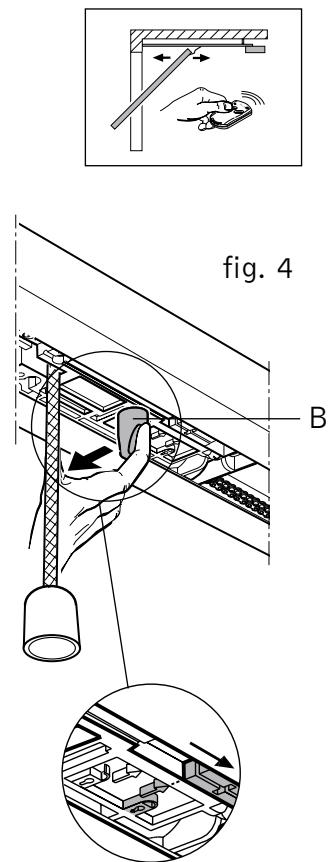
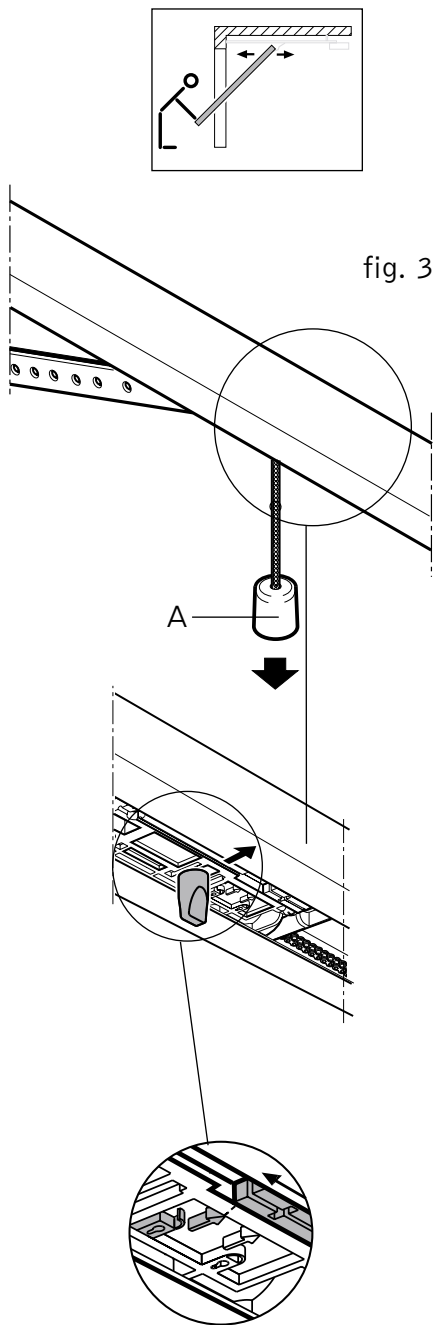


- 2** Fit the red slider that re-engages the emergency release and operator pull bar onto carriage.
 - a. Refer to fig.1 to fit the red slider that re-engages the emergency release knob onto carriage.
 - b. Refer to fig.2 to fit pull bar onto carriage. Note position of emergency release cord to ensure correct cord position after installation.



3 Carriage quick release.

- a. Pull cord "a" to disengage. Carriage re-engage remain disengaged. See fig. 3
- b. Move red slider "b" in direction of arrow to re-engage carriage at next movement. Start operator. See fig. 4.

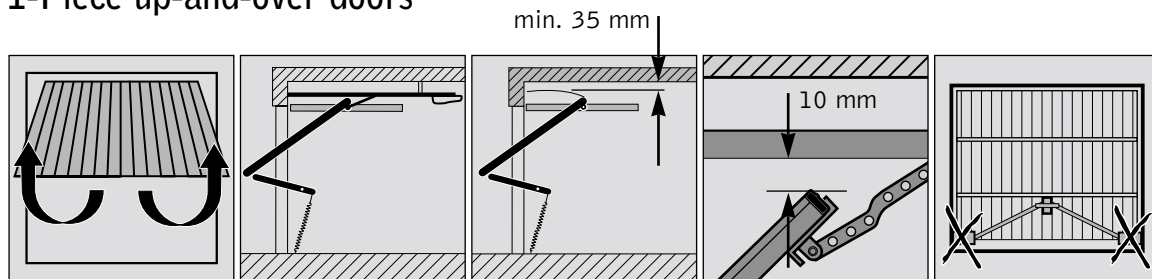


OPERATOR INSTALLATION

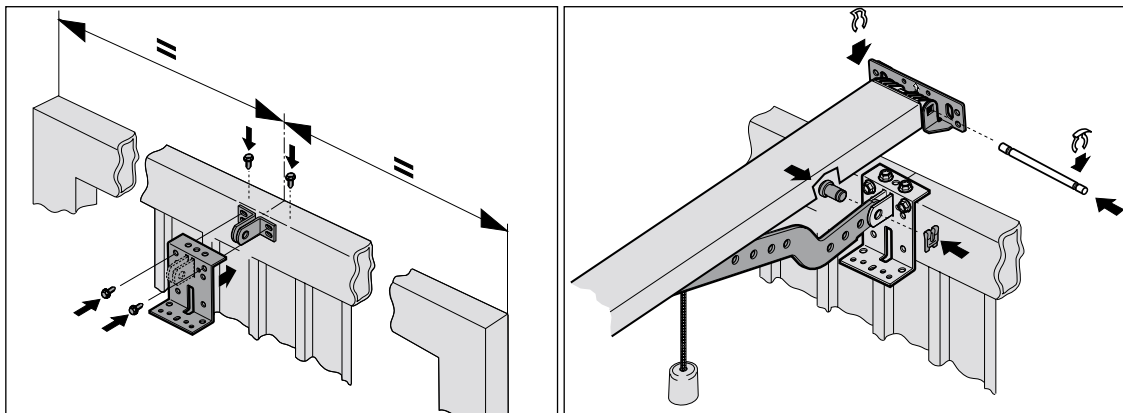
DETERMINE GARAGE DOOR TYPE

Determine your garage door type as indicated in Step **4A**, **4B**, **4C** or **4D**. Follow the individual instructions required for your specific garage door type. If your garage door type is not included, please contact your distributor. Special accessories or operator modifications may be required.

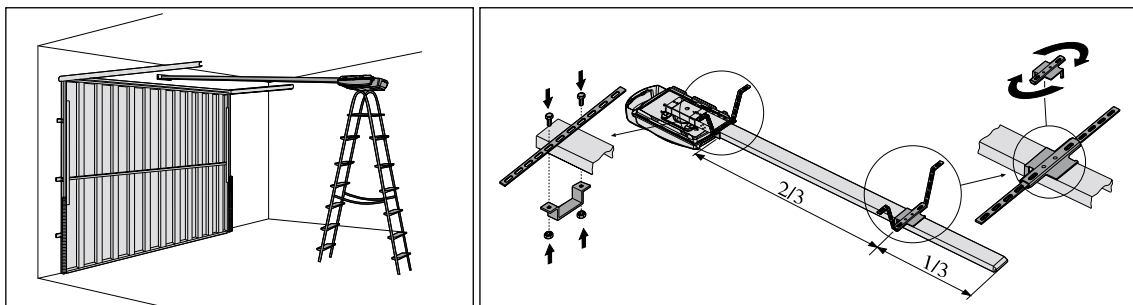
4A 1-Piece up-and-over doors



- Install door bracket at centre position of door and rail bracket on centre position above door. Make sure there is at least 10 mm. clearance between highest travel point of door and rail.

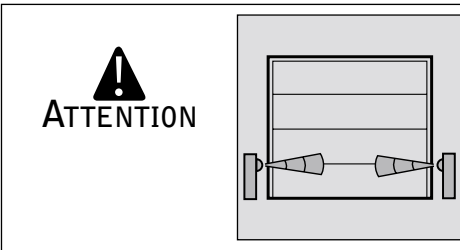
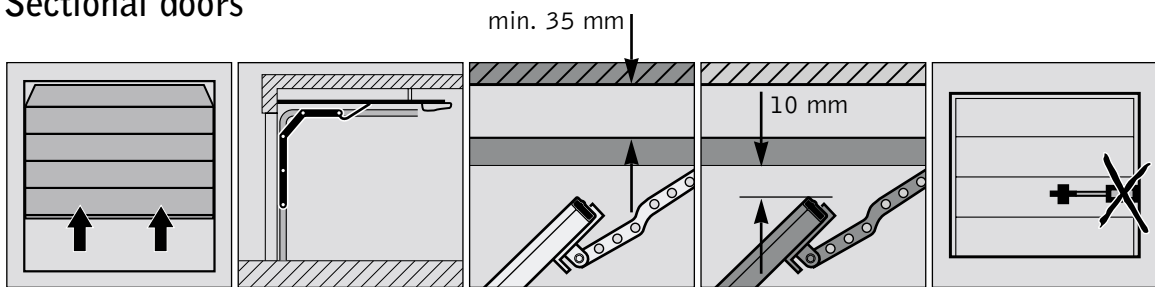


- Level and mount operator.



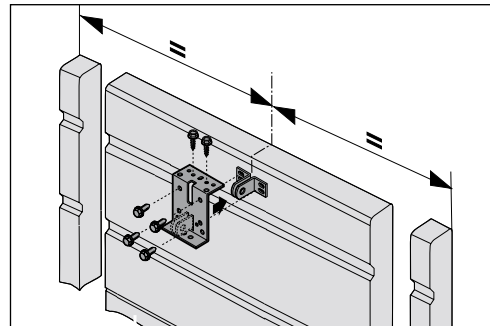
- Disengage carriage from chain or belt! Door may only be moved with moderate speed.
- Connect operator pull bar to door bracket.

Note: Remove or disable all door locks before installation!

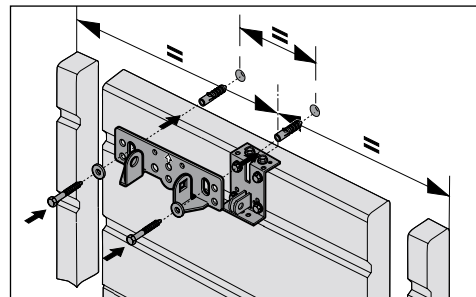
4B**Sectional doors**

A beam break is strongly recommended for use with sectional doors (available separately).

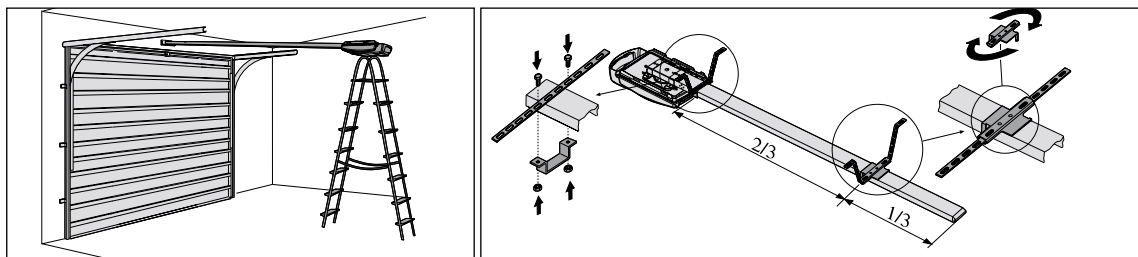
- Fix adjustable door bracket to top section at the centre of the door.



- Install rail bracket on centre position above door. Make sure there is at least 10 mm clearance between highest travel point of door and rail.



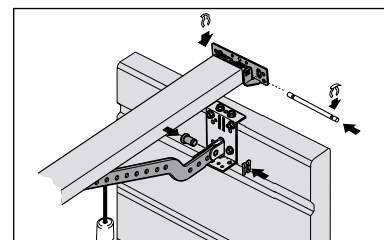
- Level and mount operator.



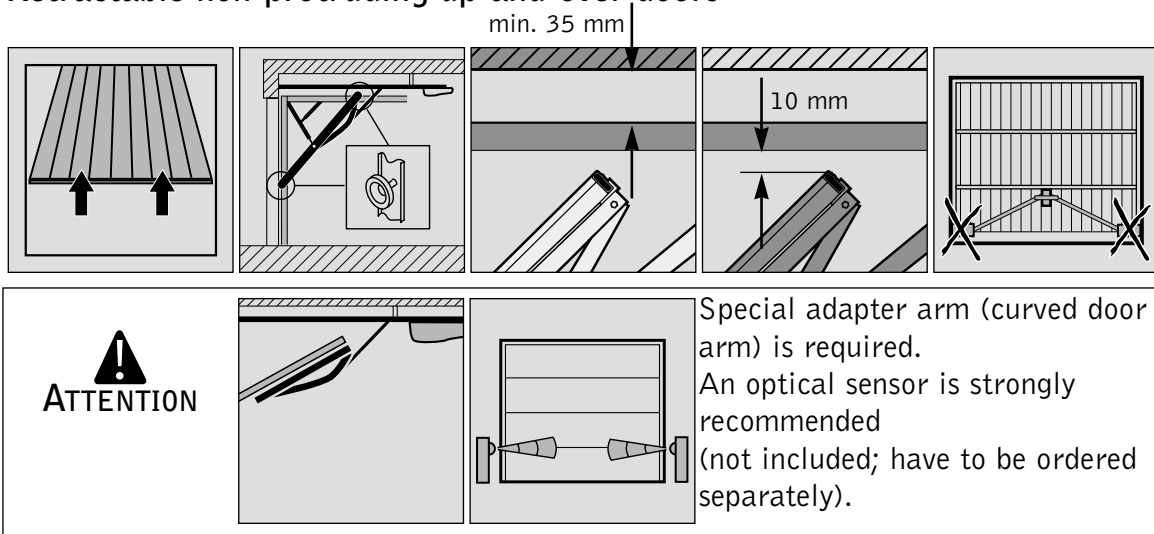
- Disengage carriage from chain or belt. Door may only be moved with moderate speed.

- Connect operator pull bar to door bracket.

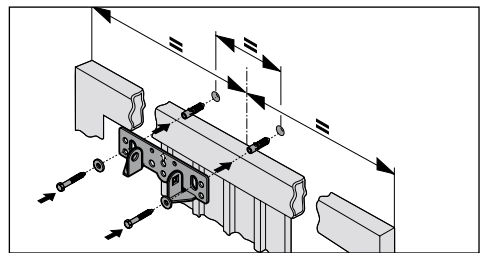
Note: Remove or disable all door locks before installation!



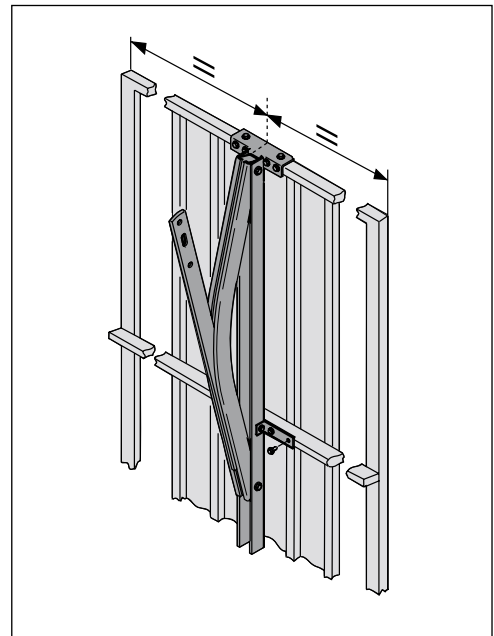
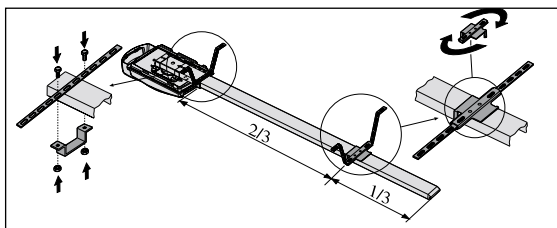
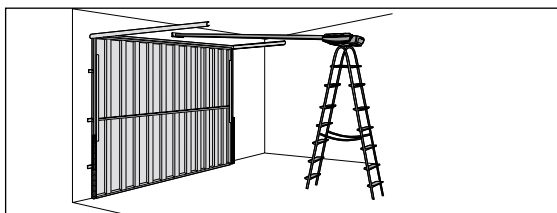
4C Retractable non-protruding up-and-over doors



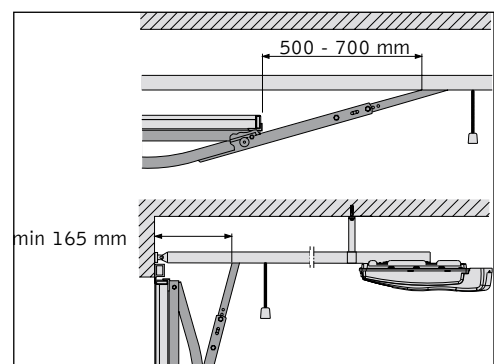
- Install rail bracket on center position above door. Make sure there will be at least 10 mm. clearance between highest travel point of door and rail.



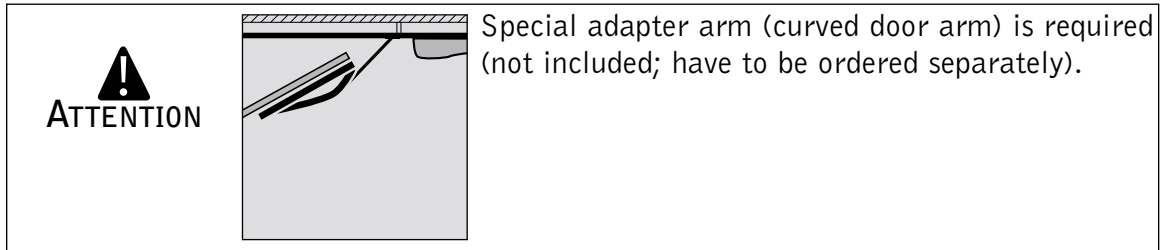
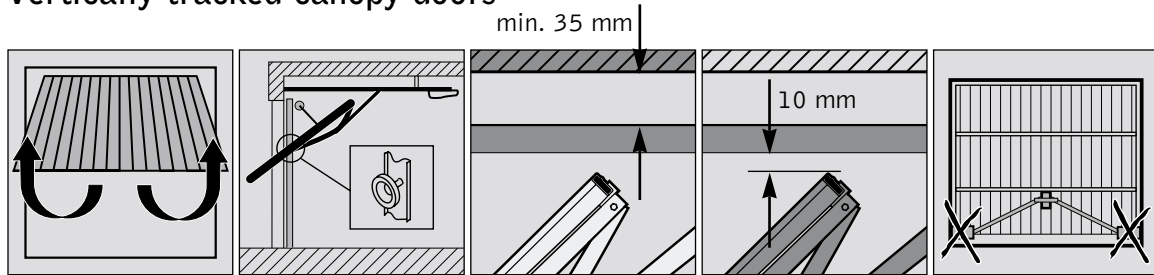
- Fit the adapter arm (curved door arm) according to instructions of adapter arm supplier.
- Level and mount operator.



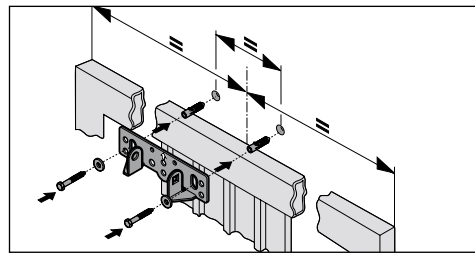
- Disengage carriage from chain or belt! Door may only be moved with moderate speed.
- Fully open garage door and connect pull bar to adapter arm. Manually close door and check if the minimum door-carriage distance of 165 mm. has not been exceeded.



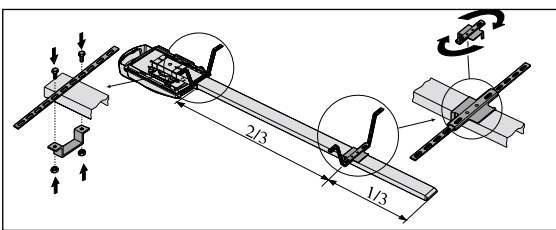
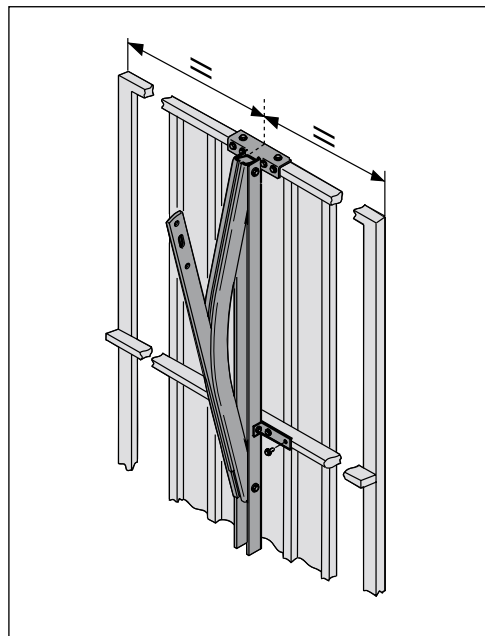
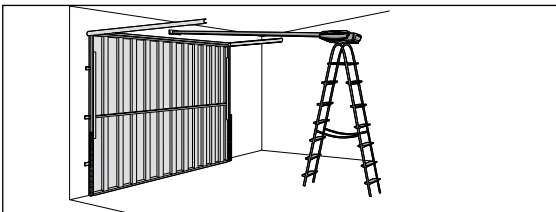
4D Vertically tracked canopy doors



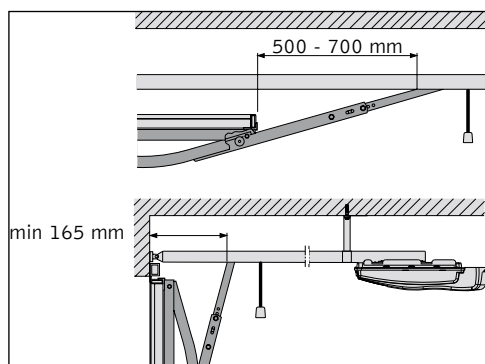
- Install rail bracket on center position above door. Make sure there will be at least 10 mm. clearance between highest travel point of door and rail.



- Fit the adapter arm (curved door arm) according to instructions of adapter arm supplier.
- Level and mount operator.



- Disengage carriage from chain or belt! Door may only be moved with moderate speed.
- Fully open garage door and connect pull bar to adapter arm. Manually close door and check if the minimum door-carriage distance of 165 mm. has not been exceeded.



FOR ALL OTHER DOOR TYPES PLEASE CONTACT YOUR DISTRIBUTOR!

5 Make sure motorhousing and rail are mounted correctly and secured.
Strengthen where needed.





6 Install light bulb.
Type E14, max. 40 Watt (not included).

! Attention: before you start Operator programming please make sure your carriage is engaged to chain or belt and door arm is attached to door.




OPERATOR CONTROL PANEL INDICATIONS

Your automatic door operator is provided with an easy to read LED display panel with 4 light icons and three program buttons.





Light icons


-  1 door fully open
-  2 door fully closed
-  3 operator impulse (slow flash when on vacation lock)
-  4 power on (230V)

Adjustment buttons

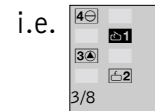
-  Program button "decrease" and CLOSE test button
-  Program button "increase" and OPEN test button
-  Programming button

LEGEND

LED off i.e. 
LED illuminated i.e. 
LED blinking i.e. 
LED rapid blinking i.e. 

Button pressed  or  or 

Default setting:



OPERATOR PROGRAMMING - BASIC SETTINGS

When the door operator is turned on (plug in power cord) it runs a self-test; all 4 LEDs will glow and operator 230V light will illuminate for approximately 2 seconds. When the light is off and LED **4** is illuminated the operator is in normal operating mode.

ADJUSTMENT BUTTONS:

All settings and adjustments can be made with the three adjustment buttons. Press and hold **OP** for approximately 2 seconds to change from operating to programming mode. When all LEDs are illuminated and LED **1** starts to blink, release **OP**. You are now in the programming mode for basic operator menu settings.

Use **+** and **-** to change settings of chosen program menu
OP to store menu setting and go to next menu.

MENU OVERVIEW:

- 1** Set door OPEN position
- 2** Set door CLOSED position
- 3** Program hand transmitter

TO SET UP THE OPERATOR:

Menu **1**

SET DOOR OPEN POSITION **1**

1. Press **OP** for 2 seconds until LED **1** blinks and all others are illuminated.
2. To move the garage door to desired fully OPEN position press & hold the **+** until desired DOOR OPEN position is reached.
For fine-tuning use the **+** (OPEN) and **-** (CLOSE) buttons.
3. Press **OP** to store settings and to go to Menu **2**.

Menu **2**

SET DOOR CLOSE POSITION **2**

1. LED **2** blinks and all others are illuminated.
2. To move the garage door to desired fully CLOSED position press & hold the **-** until desired DOOR CLOSE position is reached. For fine-tuning use the **-** (CLOSE) and **+** (OPEN) buttons.
3. Once door position is correct press **OP** to store and go to Menu **3**.

Menu 3

PROGRAM THE TRANSMITTER CODE 3▲

(Internal receivers only)

Note: Where specified, please install external receiver and program transmitter according to instructions included with your individual radio set.

1. LED 3◉ blinks and all others are illuminated.
2. Press transmitter button until LED 3◉ blinks rapidly

STORE PROGRAMMING:

Press ◉P to store multi-bit transmitter code and to finish basic programming. LEDs will automatically turn off starting at LED 4◉ and ending at LED 1◉.

The operator is now in operational (normal) mode 4◉.

MAKING ADJUSTMENTS:

To change the settings of an individual menu:

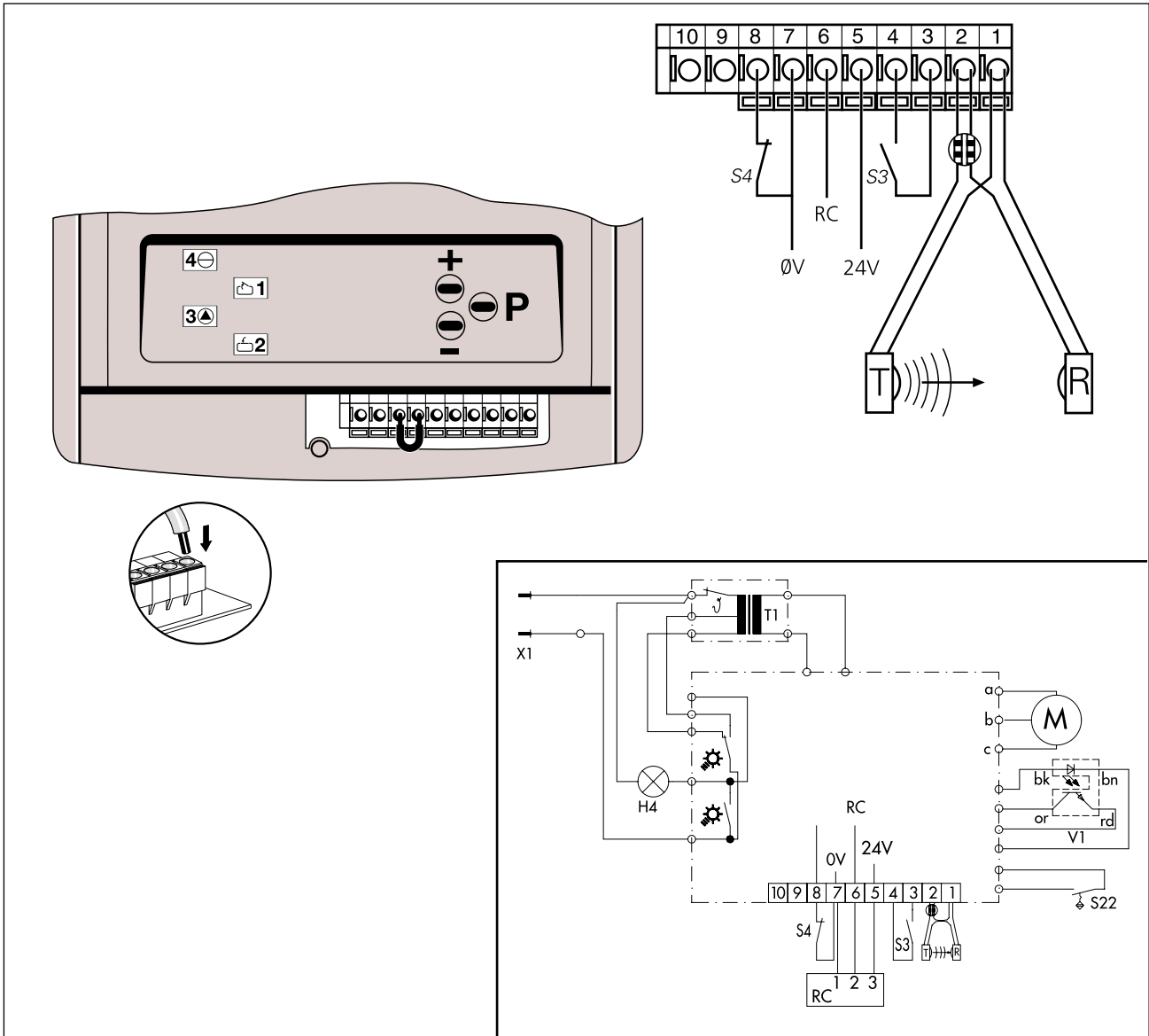
1. Press ◉P for approximately 2 seconds until LED 1◉ blinks
2. Repeatedly press ◉P until desired indicator blinks (e.g. LED 2◉ programming door closed position). If an individual programming menu is skipped its settings remain unchanged.
3. Follow individual instructions for Program menu
4. Repeatedly press ◉P to scroll through the menus. When you reach menu 3 pressing ◉P again will finish the programming cycle. The LEDs will automatically turn off starting at LED 4◉ and ending at LED 1◉.

Please note that the operator will abort Programming mode and return to normal operating state if any of the three program buttons have not been touched for more than 400 seconds (error message 7).

⚠ Warning (Safety Notice):

When programming the door limit positions the operator is set to use maximum lifting and push force. There upon following two (2) open and close cycles are required to 'learn' and set the minimal required lifting and push force. The operator and minimal force setting is only functional after these two (2) full open and close cycles.

EXTERNAL CONNECTIONS



M motor
 T1 transformer
 V1 RPM sensor
 S22 reference point switch
 T photocell transmitter
 R photocell receiver
 S3 push button IMPULSE
 S4 push button STOP
 X1 plug 1~N 220-240V 50Hz
 H4 light bulb (max 40 Watt)

0V Ground
 24V Output 24 VDC, max. 50 Ma.
 RC Relays contact
 bk black
 bn brown
 or orange
 rd red
 a brown
 b green/yellow
 c green

Wall control (push button impulse):

It is possible to either connect a push button or a 3-function wall console with impulse, light on/off and an electronic vacation lock functions. When operator LED 4 burns and LED 3 flashes the 'vacation' lock is activated.

De-activate 'vacation' lock on 3-function wall console or by briefly pressing **P** button on operator.

TROUBLESHOOTING

Fault	Cause	Remedy
Indicator 4 does not glow.	No voltage.	Check mains supply. Check electric socket.
	Thermal protection in mains transformer activated.	Allow mains transformer to cool down.
	Defective control unit.	Cut off mains supply to operator. Remove lamp cover and motor cover. Unscrew control unit, pull slightly forward and withdraw the connecting plug. Remove control unit and have it checked.
Indicator 3 flashes. Fault 5	Automatic cut-out set too sensitively. Door operation too sluggish. Door blocks.	Re-set automatic cut-out to be less sensitive (Level 2, Menu 2 and 3 page 15). Ensure door moves easily.
Indicator 3 flashes. Fault 3 or 7	External photocell defective or interrupted.	Remove obstruction or have photocell checked.
Drive only operates in "OPEN" but not in "CLOSE" direction. Fault 7	Photocell programmed, but not connected (Level 2, Menu 1 page 15).	Reprogramme photocell function or connect photocell.
No response on impulse. Indicator 3 glows.	Connecting terminals for "IMPULSE" button bridged, e.g. due to short-circuit or wrong terminal connection.	Temporarily isolate cabled key switches or interior push buttons from control unit. Remove plug, insert plug and look for cable fault.
No response on impulse. Fault 10	Short-circuit label removed, but "STOP" button not connected.	Connect "STOP" button.
If no external receiver: Indicator does not flash rapidly on impulse from hand transmitter	Hand transmitter coding is not consistent with receiver coding.	Check coding Menu 6, page 12.
	Flat battery.	Insert new 12V A 23 battery. Flashing LED in transmitter indicates battery condition.
	Hand transmitter or control unit defective.	Have both components checked.
Insufficient range of remote control (less than 5 m).	Flat battery in hand transmitter.	Insert new 12V A 23 battery. Flashing LED in transmitter indicates battery condition.
Indicator 3 flashes. Fault 10	RPM sensor defective.	Have operator checked.
	Door too sluggish.	Check door.
Transmitter command does not respond but wall control does (LED 4 on, LED 3 flashes)	Operator is in electronic 'vacation' lock	De-activate 'vacation' lock on 3-function wall console or by briefly pressing EP button on operator.

LED flashes erratically

- 3
- 1
- 2
- 4
- 4 + 1
- 4 + 3
- 4 + 3
- 4 + 3 + 1
- 4 + 3 + 1
- 4 + 3 + 1
- 4 + 3 + 2 + 1

Error number

Fault

3	Photocell actuated
1	Programming aborted
2	Reference point switch defective
4	Defective RPM sensor Anti-lock system actuated
5	Power limit
7	Excess travel stop
7	Photocell self-monitoring unit not o.k.
8	Power limit self-monitoring unit
8	Learned power limit
8	Response sensitivity of power limit
10	Static current circuit broken

Warning:

Programming the advanced settings of this operator must only be undertaken by fully trained and qualified personnel. Please contact your dealer for details.

MENU OVERVIEW Level 2:

- 1 Add Beam Break
- 2 Set maximum opening force
- 3 Set maximum closing force
- 4 Set offset automatic learned force limitation
- 5 Set start-up phase

Level 2 Menu **1**

ADD BEAM BREAK * 1

Operator is in normal operating mode

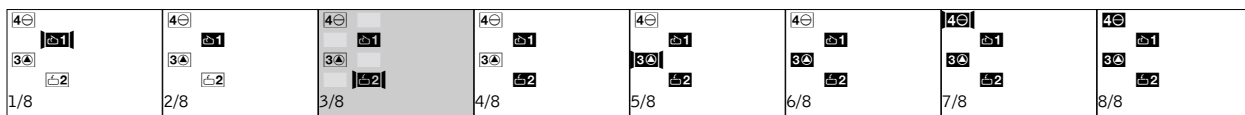
1. Press **P** for 10 seconds until LED 1 start to blink rapid and all other are illuminated.
Note: Keep pressing **P** when after 2 seconds LED 2 starts to blink. One has to continue pressing **P** for some 8 more seconds to enter Level 2 (LED 1 blinks rapid).
2. A: Press **+** of a beam break is to be installed (LED 1 illuminated)
 B: Press **-** if no beam break is to be installed (LED 1 blinks rapid)
3. Press **P** to store settings and go to Level 2 Menu **2**
 * Beam break is an optional accessory

Level 2 Menu **2**

SET MAXIMUM OPENING FORCE 1 AND 3

Whilst your new operator has automatic force learning and maximum force setting it may be required to increase the maximum force.

1. LED 1 and LED 3 blink and all others are illuminated.
2. By pressing **+** and **-** set the desired maximum lifting force.
 There are 8 settings; blinking LED represents 1/8 and illuminated LED 2/8 of maximum total force.



























































3. Once maximum opening force is set press **P** to store and go to Level 2 Menu **3**.

Attention: Set force as sensitive as possible (max. 150 N at closing edge)

Level 2 Menu 3

SET MAXIMUM CLOSING FORCE AND

- LED  and LED  blink and all others are illuminated.
- By pressing  and  set the desired maximum closing force. There are 8 settings; blinking LED represents 1/8 and illuminated LED 2/8 of maximum total force.

TECHNICAL SPECIFICATIONS

KSO-series Garage Door Operator

Connected loads:

230 V
200 W (in operation with lighting)
3.9 W (out of operation without lighting)

Door travel speed:

0.14 m/s with "soft" start and "soft" stop

Push and pull force:

550 N

Excess travel stop:

88 secs.

Lighting:

1 x 40 W E14

Control voltage:

Low voltage below 24 V DC.

Automatic cut-out:

Electronic power limit through microprocessor and power sensor.

Anti-Block system:

Through microprocessor and RPM sensor.

Device to prevent forced opening of door:

Electronic back-drive prevention by permanent protection of the closed door position.
Door will automatic close after ca. 1cm detected unauthorized reverse movement.

Protection category:

For dry buildings only.

⚠ Attention: Observe local regulations!
Always lay mains cable (230V) and control wire (low voltage) seperately.

⚠ Attention: Only operate garage door when certain there is no person or object
in garage door opening and travel path.

Maintenance

This garage door operator is virtually maintenance-free.

However, all movable parts of the door and operator system should be checked regularly and kept in an easily movable condition.

The OPEN and CLOSE automatic cut-out settings should be checked regularly.

The door must be running smoothly and regularly maintained. Check the lifting regularly.

Manufacturers Declaration

We hereby declare that the product referred to below, with reference to its design, construction and to the version as marketed by us, conforms to the relevant safety and health requirements contained in the European Council Directives pertaining to electromagnetic compatibility, machines and low voltage.

This declaration becomes null and void in the event of modification or changes to the product not expressly agreed with us.

E-King KSO-series

Relevant European Council Directives pertaining to electromagnetic compatibility (89/336/EEC, 93/68/EEC and 93/44/EEC), machines (89/392/EEC, 91/368/EEC, 93/68/EEC and 93/44/EEC) and low voltage (73/23/EEC, 93/68/EEC and 93/44/EEC).

To agreed standards: EN55014
EN60555-2
EN60555-3
EN40082-1
EN60335-1

To National standard and technical specification:
ETS300220

July 1, 1998 A.M.Q. Enneking

Date / Signature

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