

TSA 160 NT
TSA 160 NT F
TSA 160 NT-IS
TSA 160 NT F-IS
TSA 160 NT Z
TSA 160 NT Invers
TSA 160 NT Z Invers

EN Installation and service instructions

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Symbols and illustrations

Warning notices




In these instructions, warnings are used to warn against material damage and injuries.

- ▶ Always read and observe these warnings.
- ▶ Observe all measures marked with the warning symbol and warning word.

Warning symbol	Warning word	Meaning
	WARNING	Danger for individuals. Non-compliance can result in death or serious injuries.

More symbols and illustrations

Important information and technical notes are highlighted to explain correct operation.

Symbol	Meaning
	means "important note". Information to prevent property damage, to understand or optimise the operation sequences.
	means "additional Information"
	Symbol for an action: This means you have to do something. ▶ If there are several actions to be taken, keep to the given order.

Revisions and validity

Valid for software version DCU5 V3.1 or higher.

Product liability

In compliance with the liability of the manufacturer for his products as defined in the German "Product Liability Act", compliance with the information contained in this brochure (product information and intended use, misuse, product performance, product maintenance, obligations to provide information and instructions) must be ensured. Failure to comply releases the manufacturer from his statutory liability.

Further applicable documents

- Wiring diagram

The diagrams are subject to change without notice. Use only the most recent version.

1 Safety notices

1.1 Intended use

The TSA 160 NT swing door drives are designed for the automatic opening and closing of single action swing doors.

The above mentioned door drive is suitable:

- solely for use in dry rooms
- in entrances and indoor areas of pedestrian traffic on commercial premises and in public areas
- in private areas

The TSA 160 NT / TSA 160 NT IS/TS door drive

- may be used in escape and rescue routes
- may **not** be used on fire or smoke protection doors
- may **not** be used for potentially explosive areas

The TSA 160 NT F / TSA 160 NT F-IS door drive

- is designed for use on fire doors or smoke protection doors
- may be used on emergency exit doors
- may **not** be used for potentially explosive areas

The TSA 160 NT Invers door drive

- is designed mainly for use on escape route doors and RWA supply air doors
- may **not** be used for potentially explosive areas

Any improper use such as permanent manual operation, as well as any modification to the product, is not permitted.

1.2 Safety notices

- The mandatory installation, maintenance and repair work must be performed by properly trained personnel authorised by GEZE.
- The country-specific laws and regulations are to be observed during safety-related tests.
- If unauthorised changes are made to the system, GEZE cannot be held liable in any way whatsoever for any resulting damage, and the approval for use in escape and rescue routes ceases.
- GEZE does not accept any warranty for combinations with third-party products.
- Furthermore, only original GEZE parts may be used for repair and maintenance work.
- The connection to the mains voltage must be made by a professional electrician. Perform the power connection and equipment earth conductor test in accordance with VDE 0100 Part 610.
- Use an on-site 10-A overload cut-out as the line-side disconnecting device.
- Protect the display programme switch against unauthorised access.
- In compliance with Machinery Directive 2006/42/EC, a risk analysis must be performed and the door system identified in accordance with CE Marking Directive 93/68/EEC before the door system is commissioned.
- Observe the current status of directives, standards and country-specific regulations, especially:
 - ASR A1.7 "Directives for doors and gates"
 - DIN 18650 "Building hardware - Powered pedestrian doors"
 - VDE 0100; Part 610 "Erection of low-voltage installations"
 - Accident-prevention regulations, especially BGV A1 "General regulations" and BGV A2 "Electrical installations and equipment"
 - DIN EN 60335-2-103 "Safety of electrical devices for home use and similar purposes - Part 2-103: Special requirements for drives for gates, doors and windows"
 - DIN 18263-4 "Building hardware - controlled door closing devices - Part 4: Automatic swing door operators with self-closing function"
 - DIN 18040 "Barrier-free construction"
 - Accident-prevention regulations, especially BGV A1 "Principles of prevention" and BGV A2 "Electrical systems and equipment"
- Observe the specified temperature range.



The product should be installed or incorporated in such a way that effortless access to the product is guaranteed during any repairs and/or maintenance, and that any removal costs do not stand out of proportion to the value of the product.

1.3 Safety-conscious working

- Secure workplace against unauthorised entry.
- Watch the swivelling range of long system parts.
- Never carry out work with a high safety risk (e.g. installing the drive, cover or door leaf) while alone.
- Make sure of sufficient lighting.
- Secure the cover/drive panels against falling.
- Use only the cables prescribed in the cable plan provided. Cables must be shielded in compliance with the wiring diagram.
- Secure loose, internal drive cables with cable ties.
- Before working on the electrical system:
 - Disconnect the drive from the 230 V mains and check to ensure that it is not supplied with power.
 - Note that if an uninterruptible power supply (UPS) is used, the system will still be supplied with voltage despite the fact that the power supply is disconnected.
- Always use insulated wire-end ferrules for wire cores.
- Attach safety stickers to glass door leaves, use safety glass.
- Danger of injury with opened drive. Hair, clothing, cables, etc. can be drawn in by rotating parts.
- Danger of injury caused by unsecured crushing, impact, drawing-in or shearing spots.
- Danger of injury due to broken glass.
- Danger of injury due to sharp edges in the drive.
- Danger of injury during installation through freely moving parts.

1.4 Inspection of the installed system

Measures for protection and prevention of pinching, impact, shearing or drawing-in spots:

- Check the function of safety sensors and movement detectors.
- Check protective earth connection to all metal parts that can be touched.
- Perform a safety analysis (risk analysis).

1.5 Environmentally conscious working

- When disposing of the door system, separate the different materials and have them recycled.
- Do not dispose of batteries and rechargeable batteries with household waste.
- Comply with the statutory regulations when disposing of the door system and the batteries/storage cells.

2 Tools and aids

Tool	Size
Tape measure	
Marking pen	
Drill bit	Ø 4.2
Threading tap	M5
Allen key	<ul style="list-style-type: none"> ▫ 4 mm ▫ 3 mm for adjusting the adjustment valves
Phillips and flat screwdriver	Blade widths: 2.5 mm and 5 mm
Centre punch	
Hammer	
Self-adhesive tape for fixing the drilling template	
Wire stripper	
Crimping pliers for wire-end ferrules	
Open-ended spanner	9 mm; for spring adjustment 8 mm and 10 mm; for wire rope adjustment (2-leaf)

3 Supplied by GEZE and completeness

- ▶ Open packaging units and check for completeness.

3.1 TSA 160 NT door drive

- Drive unit
 - 1 drive
 - 1 set of fixing screws
 - Drilling templates
- Cover

Depending on order:

- Roller guide rail
 - 1 rail
 - 1 roller lever
 - 1 set of fixing screws

or

- Link arm (size depending on reveal depth)

3.2 Accessories (optional)

Activation devices in compliance with the details in the wiring diagram:

- Door stop buffer/integrated opening restrictor (only for roller guide rail)
- Mounting plate(s) with a set of fixing screws
- Adapter for link arm and sensor
- Spindle extension
- Display programme switch
- Service terminal ST220
- Smoke switch control unit
- Manual trigger switch
- IS kit for 2-leaf systems



Additional optional accessories possible.

4 Transportation and storage

- The TSA 160 NT door drive is not built for hard knocks or for falling from a height. Do not throw, do not drop.
- Storage temperatures under -30 °C and above +60 °C can result in damage to the device.
- Protect against humidity.

5 Product description

5.1 System description and technical data

The TSA 160 NT automatic system is an electronically controlled, hydro-mechanical system for the opening and closing of swing doors.

The system is mounted above the door leaf and is suitable for right and DIN left doors with a pulling or pushing function, single leaf or double leaf with intermediate cover or continuous cover.

The swing door drive of the TSA 160 NT operates electro-hydraulically when opening the door. During the opening process a spring stores the energy required for closing. The closing process is controlled hydraulically.

The swing door drive of the TSA 160 NT Invers operates electro-hydraulically when closing the door. During the closing process a spring stores the energy required for opening. The opening process is controlled hydraulically.

TSA 160 NT functional range

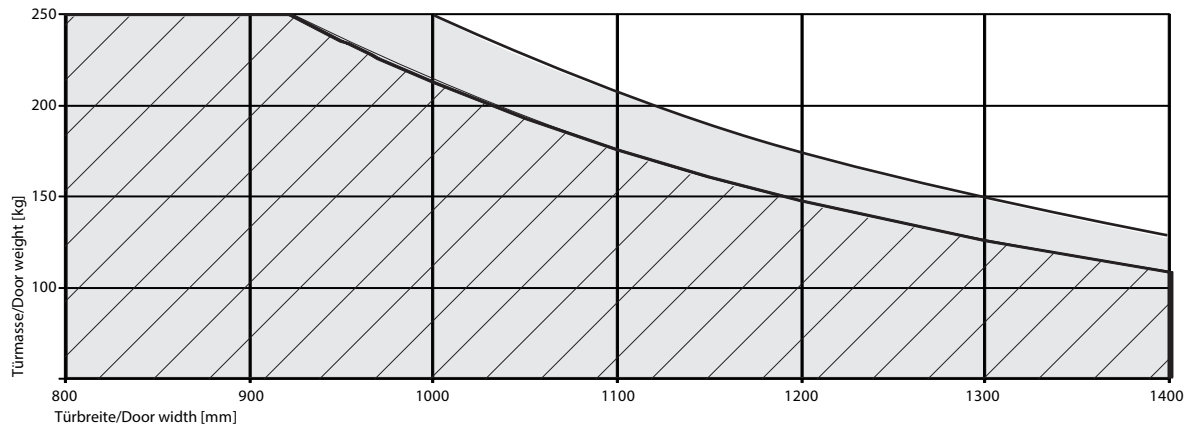
	TSA 160 NT / TSA 160 NT F with link arm	TSA 160 NT Z with roller guide rail
EN closing force	3–6	3–4
Opening torque, automatic	approx. 150 ... 90 Nm	approx. 70 ... 40 Nm
Closing torque with door closed	approx. 20 ... 60 Nm	approx. 8 ... 30 Nm
Opening time* 0–90° door opening angle	min. 4 sec.	min. 4 sec.
Closing time* 90–0° door opening angle	min. 4 sec.	min. 4 sec.
Maximum door opening angle:	115°	see section 6.2.5



TSA 160 NT Invers functional range

	TSA 160 NT Z Invers with link arm	TSA 160 NT Invers with roller guide rail
EN closing force	3–4	3–6
Closing torque, automatic	60 ... 30 Nm	35 ... 20 Nm
Opening torque with door closed	75 ... 150 Nm	30 ... 60 Nm
Opening time* 0–90° door opening angle	min. 4 sec.	min. 4 sec.
Closing time* 90–0° door opening angle	min. 4 sec.	min. 4 sec.
Maximum door opening angle:	115°	see section 6.2.5

* Guideline values - the TSA 160 NT is an electro-hydraulic door drive. The maximum opening or closing times set longer by powerful closing of the valves.

Maximum range of use TSA 160 NT EN3-6



-  Link arm
-  Roller guide rail

Mechanical data

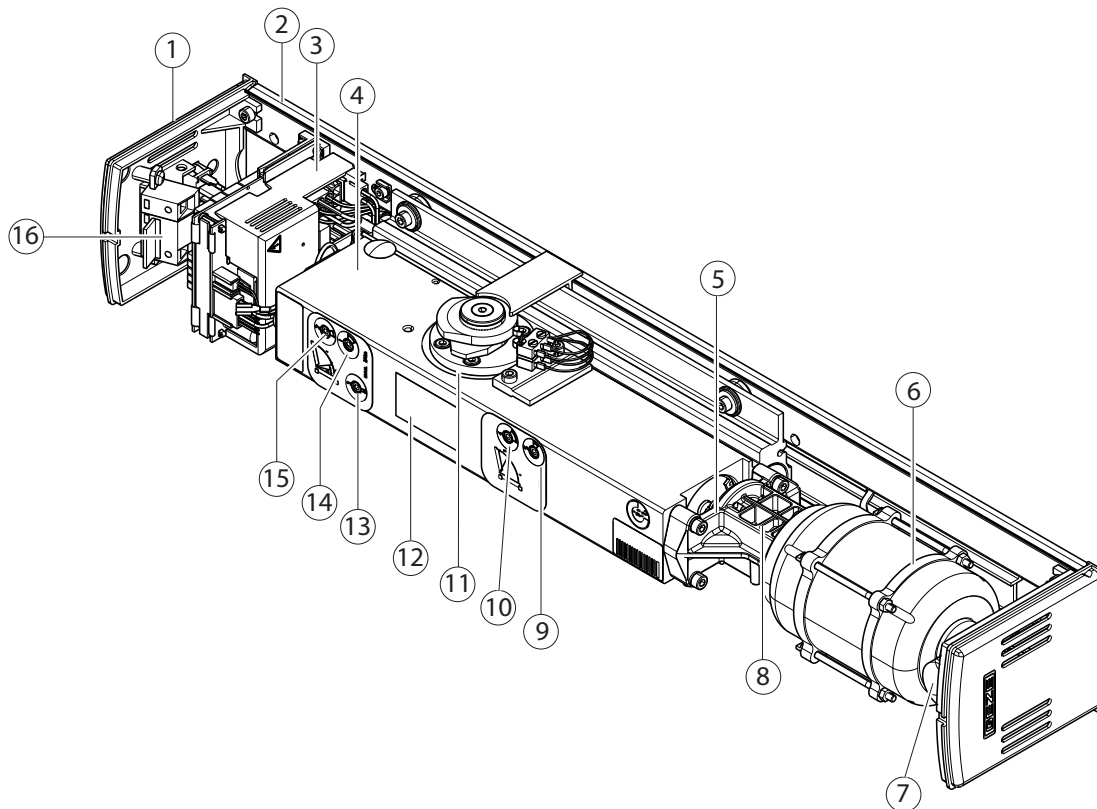
- Dimensions (H x D x L): 100 mm x 120 mm x 690 mm
- Ambient temperature range: -15 °C to +50 °C
- Drive weight: approx. 13 kg

Electrical data

- Mains connection: 230 V, 50 Hz
- Power consumption: max. 300 W
- Externally connectable devices: 24 V DC, max. 1200 mA

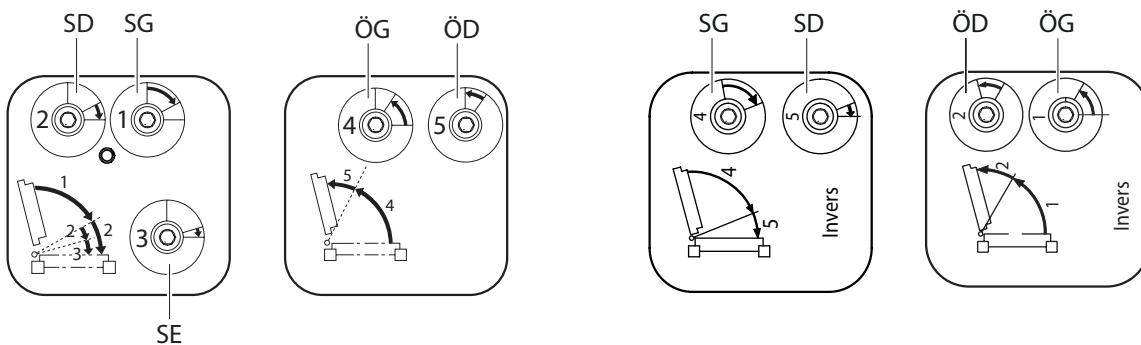
5.2 Basic structure

5.2.1 Drive TSA 160 NT EN 3–6



- | | | | |
|---|---|----|---|
| 1 | Side plate | 10 | Opening speed (ÖD)
(for Invers drives: closing speed (SG)) |
| 2 | Base plate | 11 | Driveshaft |
| 3 | Control unit | 12 | Identification plate |
| 4 | Hydraulic cylinder | 13 | Latching (SE)
(not for Invers drives) |
| 5 | Closing torque adjustment
(for Invers drives: opening torque adjustment) | 14 | Closing speed (SG)
(for Invers drives: opening speed (ÖG)) |
| 6 | Motor | 15 | Latching speed (SD)
(for Invers drives: back check (ÖD)) |
| 7 | Capacitor | 16 | Mains fuse TSA 160 EN 3–6: T1.6A |
| 8 | Pump | | |
| 9 | Back check (ÖD)
(for Invers drives: latching speed (SD)) | | |

for Invers drives



! If the latching action valve (SE) is opened too wide, this will lead to a reduction in opening force.

5.2.2 Link arm

Standard link arm:

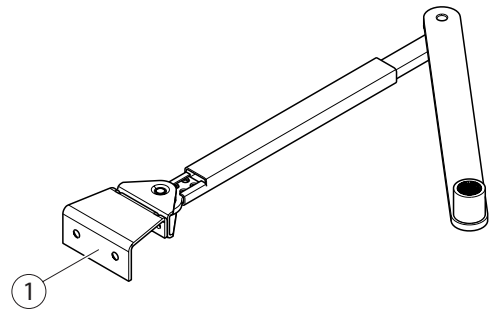
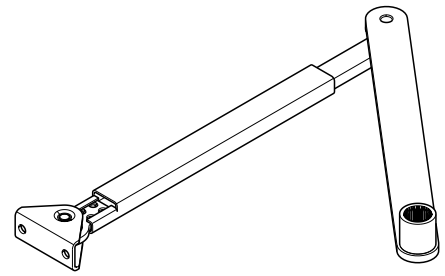
for reveal depth LT*:

- 0-100 mm
- 100-200 mm
- 200-300 mm
- 300-400 mm

* permissible reveal in combination with fire protection doors max. 300 mm

Sensor link arm with link arm adapter:

- 1 Link arm adapter

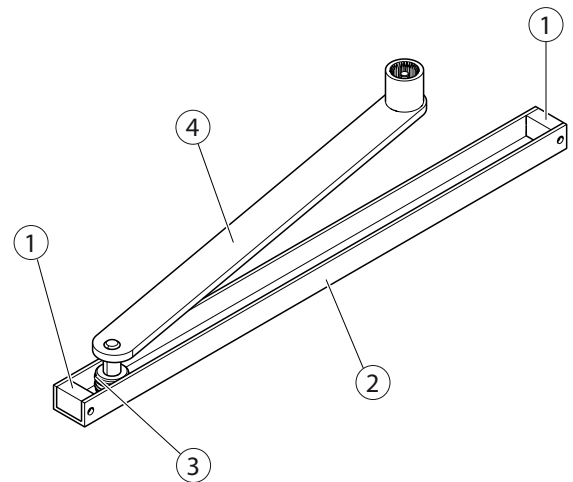


5.2.3 Roller guide rail with roller lever

Installation depends on the type of installation chosen.

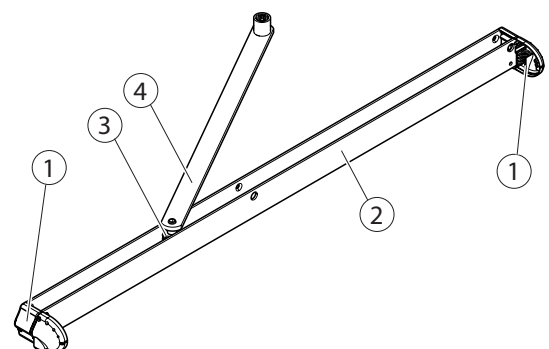
Standard guide rail with roller lever:

- 1 Cap
- 2 Rail
- 3 Roller
- 4 Roller lever



Sensor roller guide rail with roller lever:

- 1 End cap
- 2 Rail
- 3 Roller
- 4 Roller lever

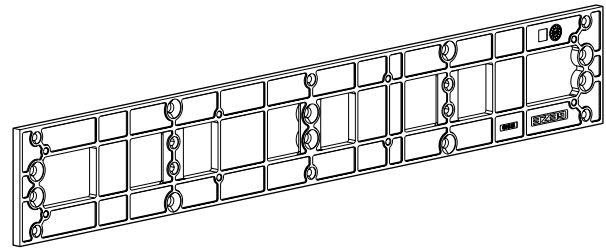


5.2.4 Mounting plate for drives (option)

A mounting plate may be necessary, depending on the installation situation.

A mounting plate is generally recommended to make installation easier.

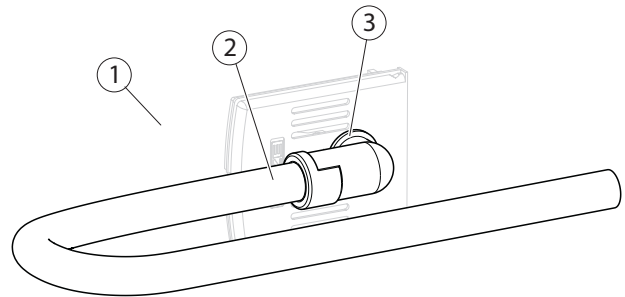
For 2-leaf version also available with continuous or with intermediate mounting plate.



5.2.5 Door transmission cable

Serves as cable protection for use of moving parts to static elements (doors, windows).

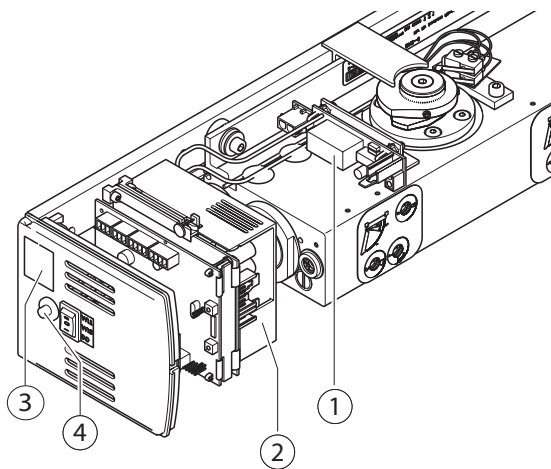
- 1 Side panel
- 2 Door transmission cable
- 3 Nut 2x (on the back)



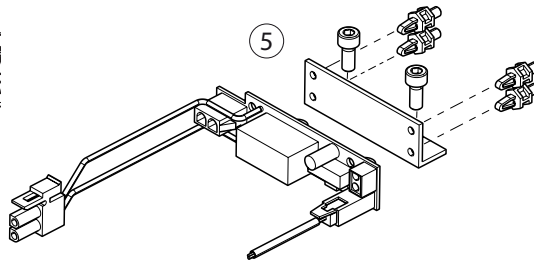
5.2.6 Activation devices (accessories)

See wiring diagram TSA 160 NT

5.2.7 F-printed circuit board as option



- 1 Shut-down board
- 2 DCU5 control
- 3 "Ü" symbol
- 4 Reset switch
- 5 Accessories for TSA 160 NT F



"Ü" symbol

The TSA 160 NT F is designated for use on fire and smoke protection doors. Permitted type of installation:

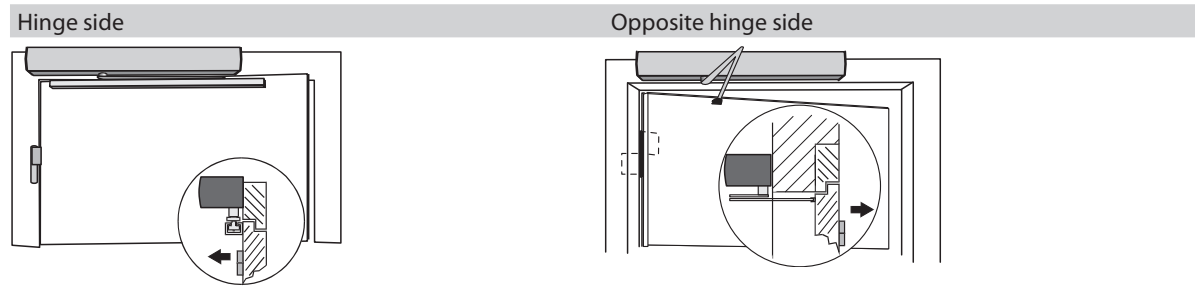
- Transom installation opposite hinge side with link arm (1-leaf / 2-leaf) in the closer size range EN4-6



5.3 Types of installation

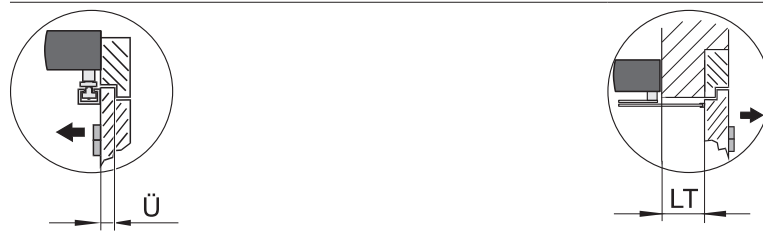
5.3.1 Single leaf

The TSA 160 NT allows the following types of installation, each for DIN left and DIN right doors:



Roller guide rail		Link arm	
TSA 160 NT Z / TSA 160 NT Invers		TSA 160 NT / TSA 160 NT F / TSA 160 NT Z Invers	
Lever length	350.		
Max. reveal depth LT	75 mm *	Max. reveal depth LT	0-100 mm
Max. door overlap O	30 mm *		100-200 mm
			200-300 mm
			300-400 mm

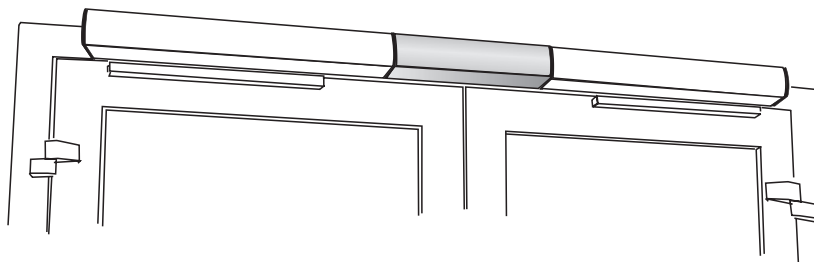
* depending on the door opening angle (see section 6.2.5)



- O Door stop
- LT Reveal depth

5.3.2 Double leaf

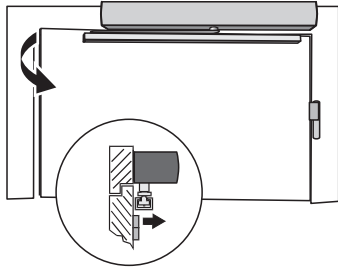
The double leaf version has a mechanical closing sequence control. Alternatively, a continuous cover and opposite hinge side installation is possible.



5.3.3 TSA 160 NT Invers types of installation

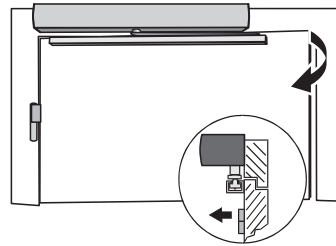
TSA 160 NT Invers

Factory setting DIN right door



DIN right door pulling
Hinge side

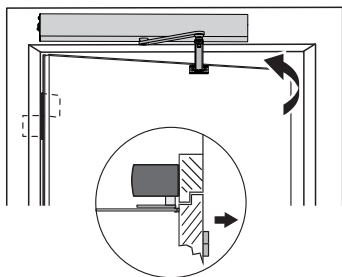
Conversion to DIN left door necessary



DIN left door pulling
Hinge side

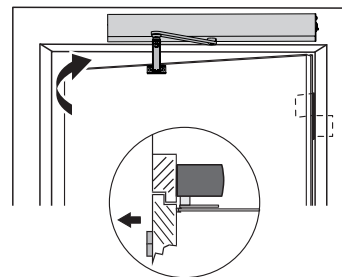
TSA 160 NT Z Invers

Factory setting DIN right door



DIN right door pulling
Opposite hinge side

Conversion to DIN left door necessary



DIN left door pulling
Opposite hinge side

6 Installation

6.1 General installation information

- ▶ After completing installation, check the settings and functionality of the drive.
- ▶ Observe all the instructions.
Incorrect installation can lead to serious injuries and damage to the drive.
- ▶ Observe the specified ambient temperature range at the installation location of the drive (see section 5.1).

6.1.1 Preparations to be made on-site

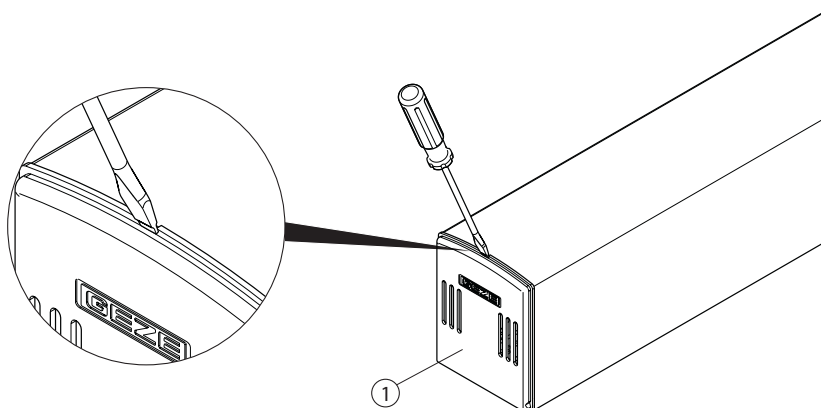
Checking of the location conditions and the required space

-
- ! □ The substructure must ensure safe attachment of the drive.
 - ▶ Only use suitable means of fastening such as wall plugs, riveting nuts, etc.
 - ▶ Drill holes for cable feedthroughs.
 - ▶ Lay cables in accordance with the cable plan.
 - ▶ Check the planned type of installation on the leaf or frame profile (see section 5.3).
-

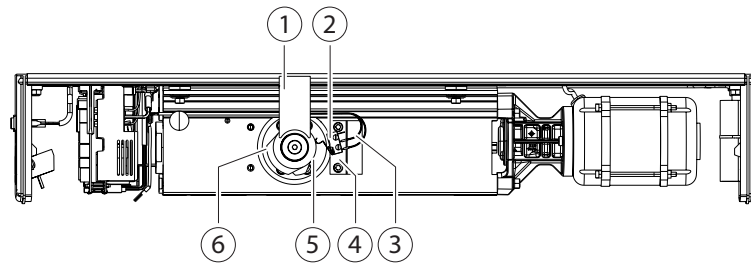
6.1.2 Conversion to DIN left

-
- ! Factory setting is DIN right. If required the drive can be converted to DIN left on site.
-

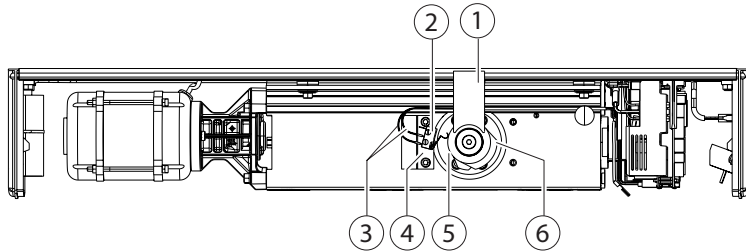
- ▶ Prise the housing cover (1) off using a screwdriver.



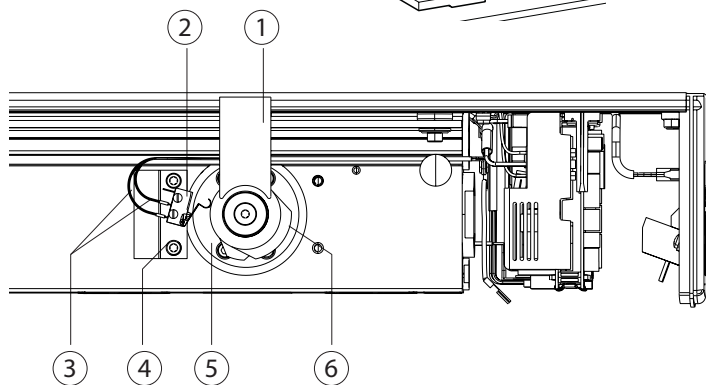
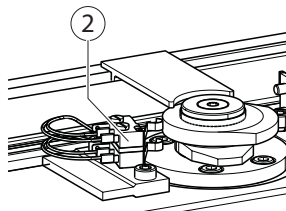
TSA 160 NT / TSA 160 NT Z Invers



DIN right door



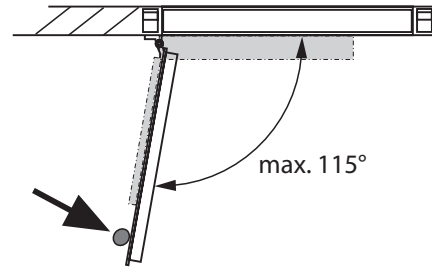
DIN left

**Procedure**

- ▶ Unscrew the limit switch (2), unscrew the limit switch bar (4).
- ▶ Dismantle the blue (5) and yellow (6) cam plates. Bend the black cover plate (1) slightly to one side to do so.
- ▶ Install the blue (5) and yellow (6) cam plates on the other axis side.
- ▶ Lay the cables (3) of the limit switch (2) in the cable duct (see drawing).
- ▶ Install the limit switch group (2), (4) as shown in the sketch (see above).
- ▶ Carry out the fine adjustment of the cam plates for the limit switch and safety sensor.

6.1.3 Checking the door

- ▶ Check the space available.
- ▶ Open and close the door manually.
- ▶ Position the door stop.
- ▶ Check whether the door is in a good mechanical state and can be moved easily.
- ▶ Check whether the door moves easily and safely into and out of the lock latch.



Opening angle depending on the type of installation

- ! A stop buffer is imperative if a TSA 160 NT Invers / TSA 160 NT Z Invers is used.
A stop buffer is recommended if a TSA 160 NT / TSA 160 NT Z is used.

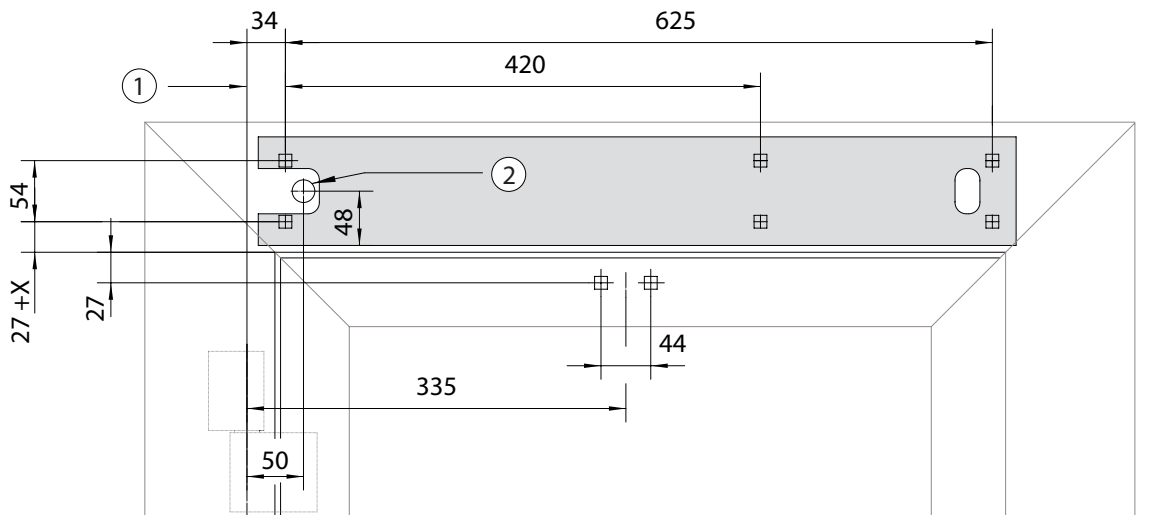
6.2 Fitting dimensions

- ▶ Use the correct fitting template according to the type of installation.
- ▶ Note the type of fastening: Direct fastening or with mounting plate.
- ▶ Align the fitting template parallel to the top of the door.
- ▶ Affix the template with adhesive tape in compliance with the specified installation type.
 - Help: see the type of door sketches on the template.

- ! In the case of doors that do not close smoothly, cut or fold the template along the perforation.

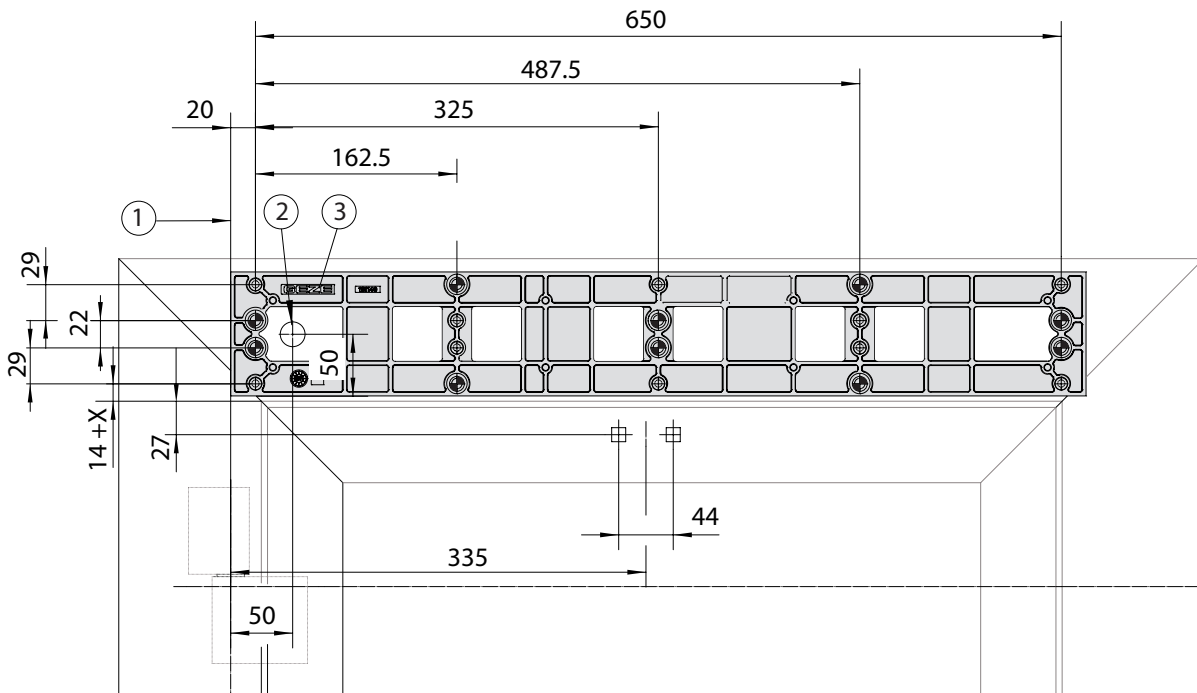
6.2.1 Transom installation opposite hinge side with link arm (single leaf, pushing)

Direct attachment






- 1 Dimensional reference = middle of hinge
- 2 Ø 20, concealed cable routing

Attachment with mounting plate

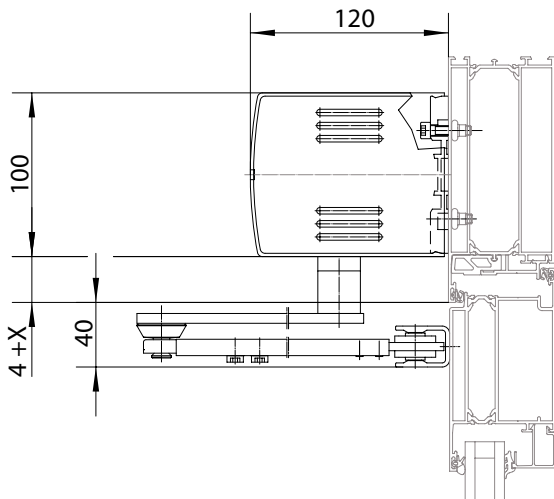


- 1 Dimensional reference = middle of hinge
- 2 Ø 20, concealed cable routing
- 3 GEZE logo facing the hinge side

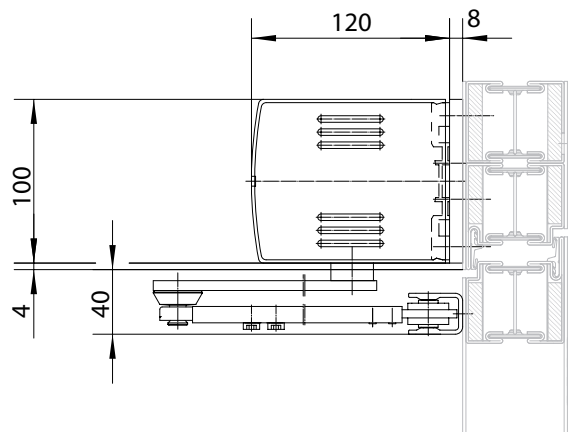
-  Fixing hole Ø 8
-  Fixing hole Ø 6
-  Fixing hole Ø 5

Spindle extension X= 0 (without spindle extension)
 24 mm
 30 mm
 45 mm

With 24 mm spindle extension

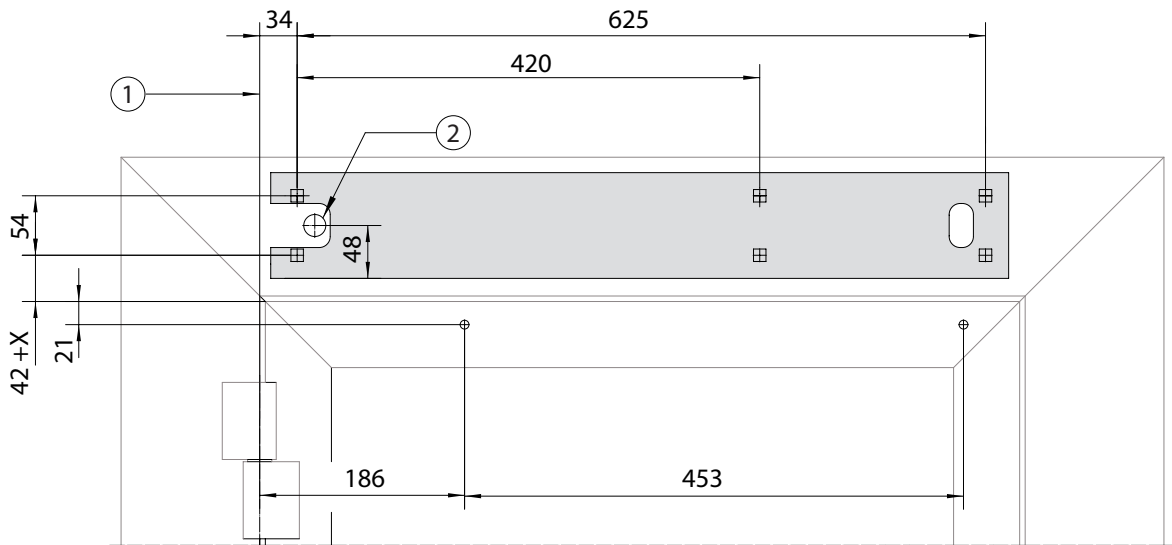


Without spindle extension



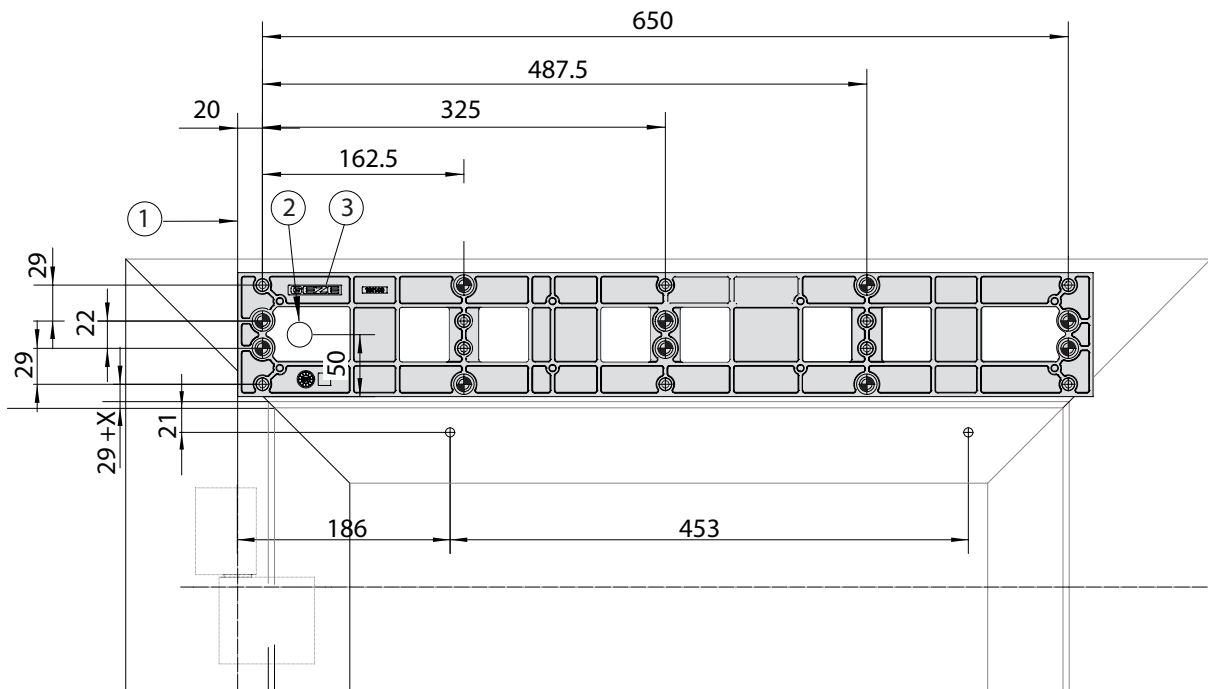
6.2.2 Transom installation hinge side with roller guide rail single leaf

Direct attachment






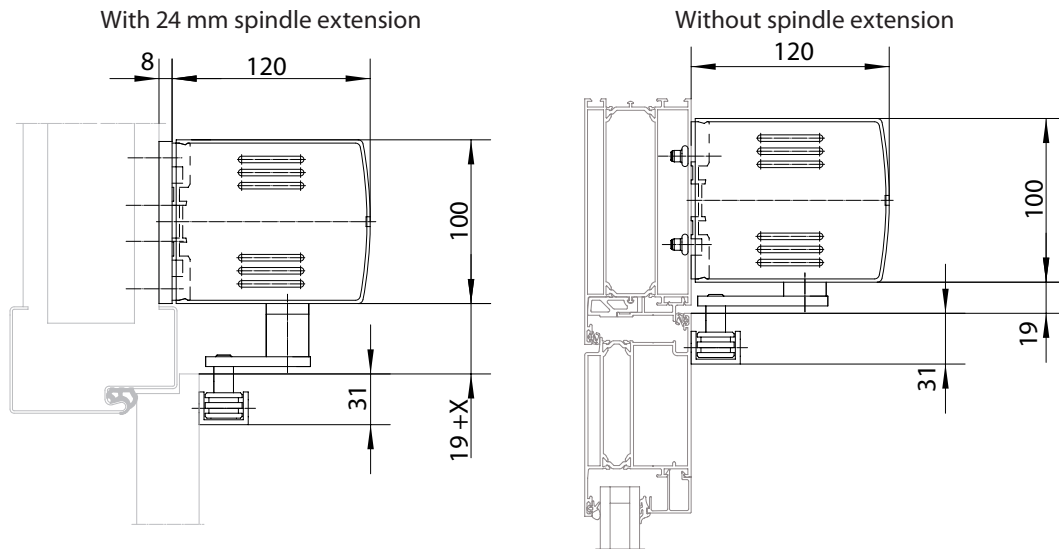
- 1 Dimensional reference = middle of hinge
- 2 Ø 20, concealed cable routing

Attachment with mounting plate



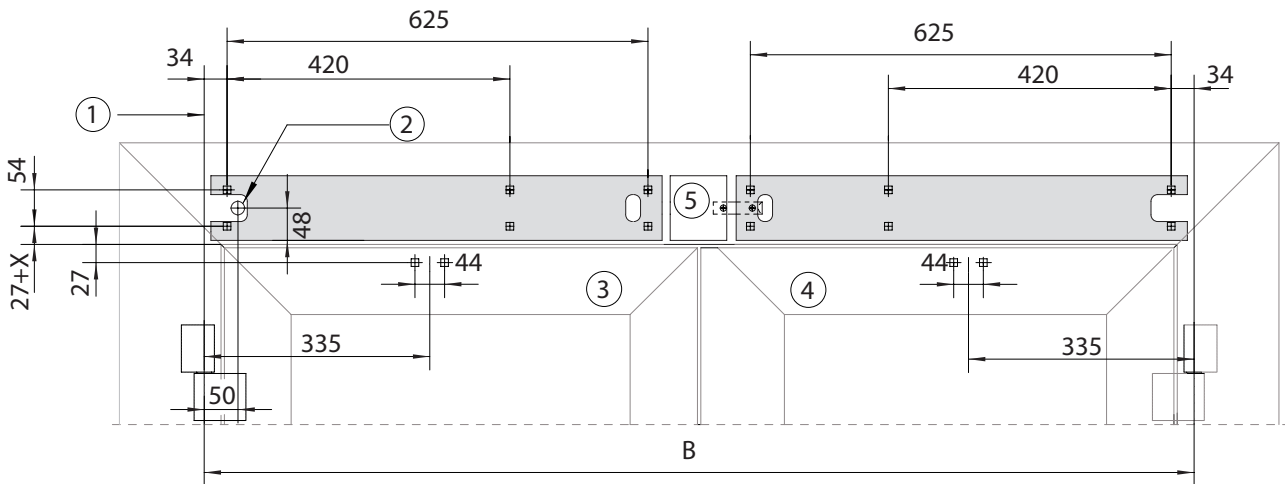
- 1 Dimensional reference = middle of hinge
- 2 Ø 20, concealed cable routing
- 3 GEZE logo facing the hinge side

-  Fixing hole Ø 8
 Spindle extension X= 0 (without spindle extension)
-  Fixing hole Ø 6
 24 mm
-  Fixing hole Ø 5
 30 mm
- 45 mm



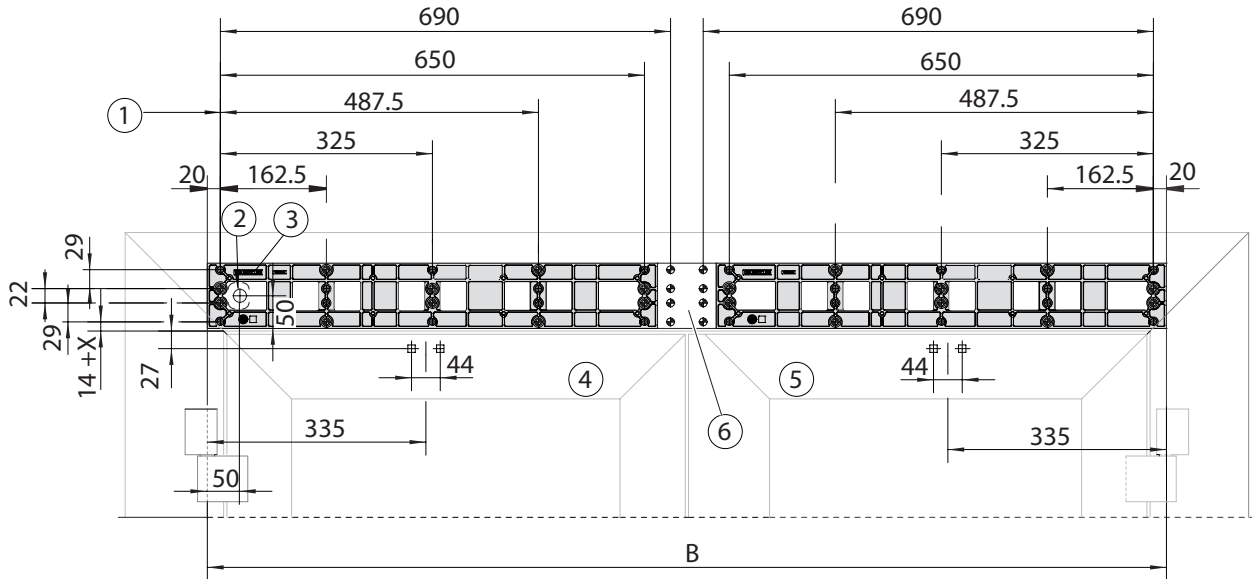
6.2.3 Transom installation opposite hinge side with link arm double leaf

Direct attachment



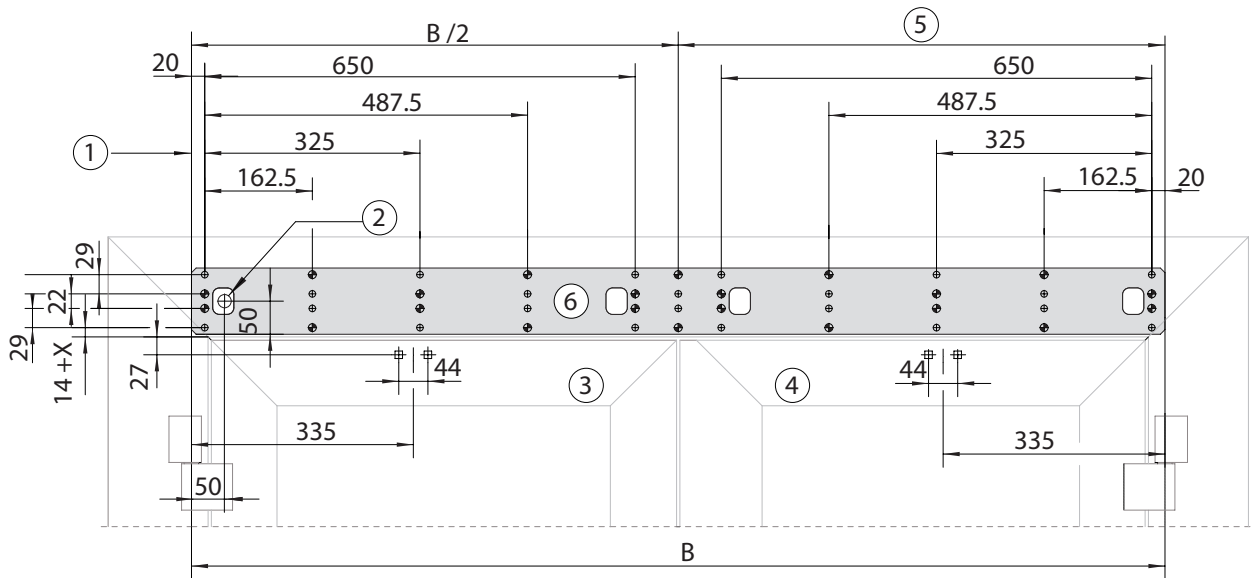
- | | | | |
|---|---|---|-------------------------|
| 1 | Dimensional reference = middle of hinge | 4 | Active leaf |
| 2 | Ø 20, concealed cable routing | 5 | Intermediate base plate |
| 3 | Passive leaf | | |

Fixing with mounting plates






- | | | | |
|---|---|---|-----------------------------|
| 1 | Dimensional reference = middle of hinge | 4 | Passive leaf |
| 2 | Ø 20, concealed cable routing | 5 | Active leaf |
| 3 | GEZE logo facing the hinge side | 6 | Intermediate mounting plate |

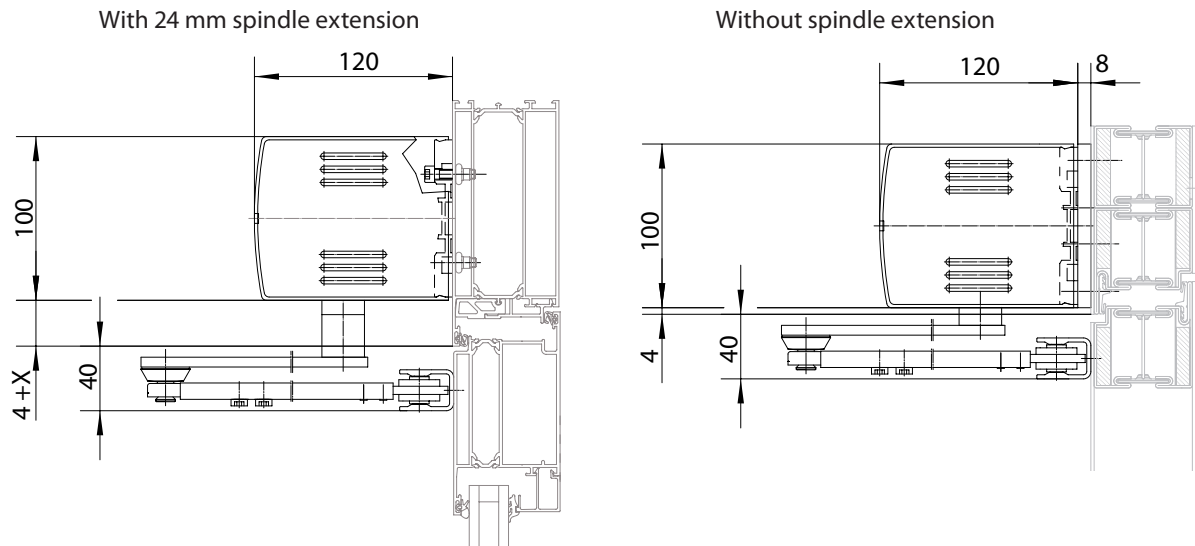
Fixing with continuous mounting plate



- | | | | |
|---|---|---|----------------------------|
| 1 | Dimensional reference = middle of hinge | 4 | Active leaf |
| 2 | Ø 20, concealed cable routing | 5 | Only required for B > 2000 |
| 3 | Passive leaf | 6 | Continuous mounting plate |

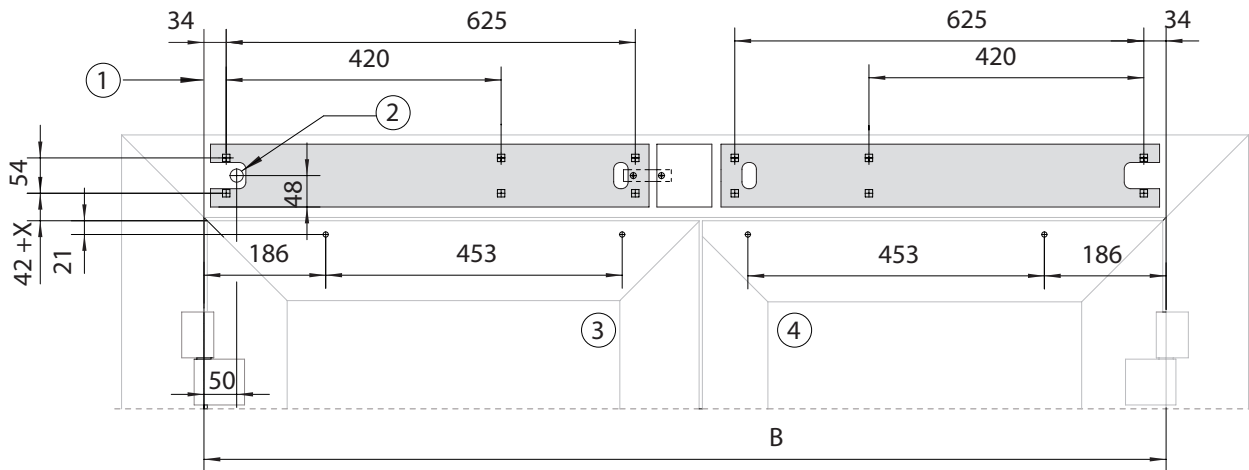
-  Fixing hole Ø 8
-  Fixing hole Ø 6
-  Fixing hole Ø 5

Spindle extension X= 0 (without spindle extension)
 24 mm
 30 mm
 45 mm



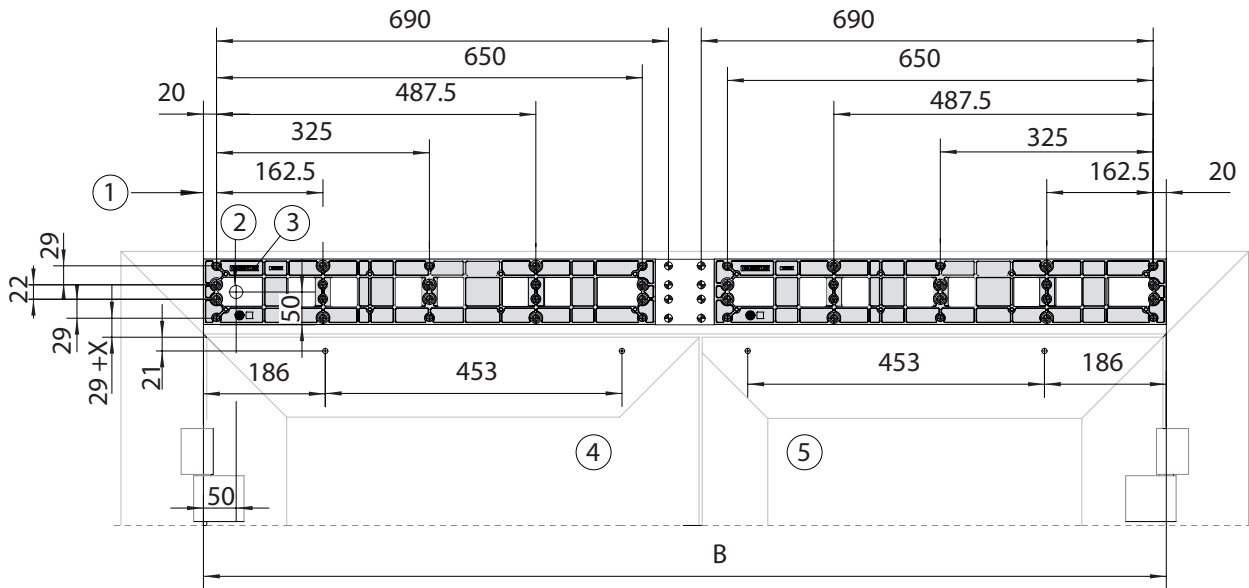
6.2.4 Transom installation hinge side with roller guide rail double leaf

Direct attachment



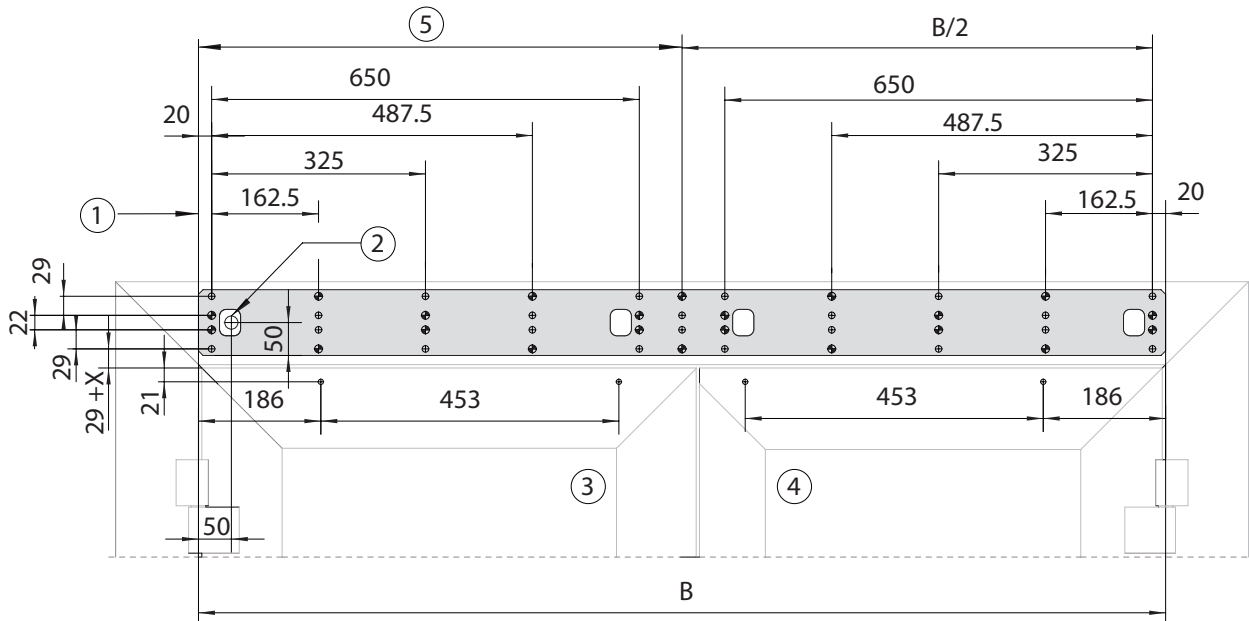
- | | | | |
|---|---|---|--------------|
| 1 | Dimensional reference = middle of hinge | 3 | Passive leaf |
| 2 | Ø 20, concealed cable routing | 4 | Active leaf |

Fixing with mounting plates






- | | | | |
|---|---|---|--------------|
| 1 | Dimensional reference = middle of hinge | 4 | Passive leaf |
| 2 | Ø 20, concealed cable routing | 5 | Active leaf |
| 3 | GEZE logo facing the hinge side | | |

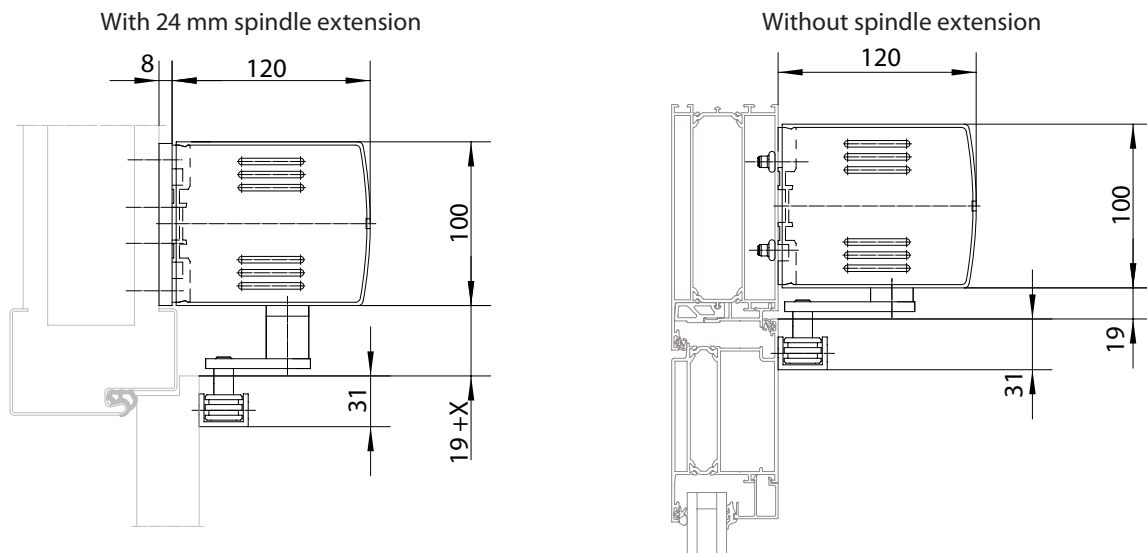
Fixing with continuous mounting plate



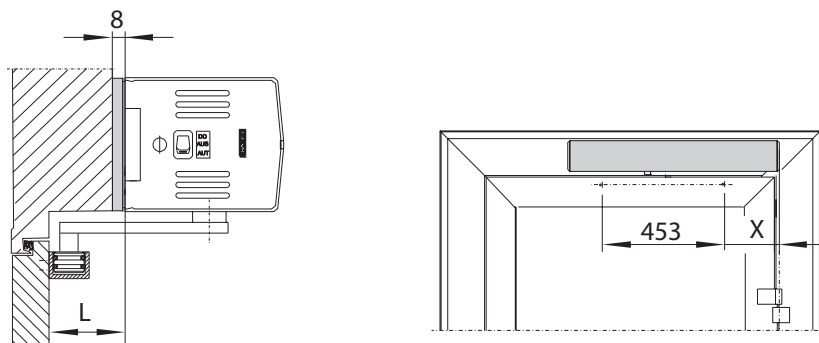
- | | | | |
|---|---|---|----------------------------|
| 1 | Dimensional reference = middle of hinge | 4 | Active leaf |
| 2 | Ø 20, concealed cable routing | 5 | Only required for B > 2000 |
| 3 | Passive leaf | | |

-  Fixing hole Ø 8
-  Fixing hole Ø 6
-  Fixing hole Ø 5

Spindle extension X= 0 (without spindle extension)
 24 mm
 30 mm
 45 mm



6.2.5 Installation of the guide rail with reveal depths



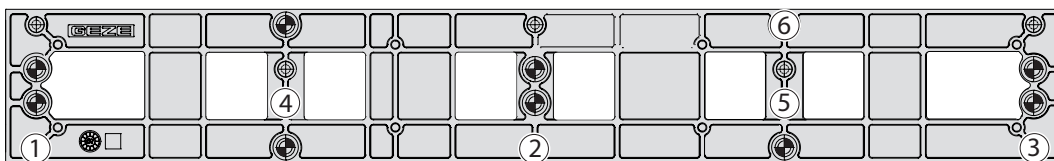
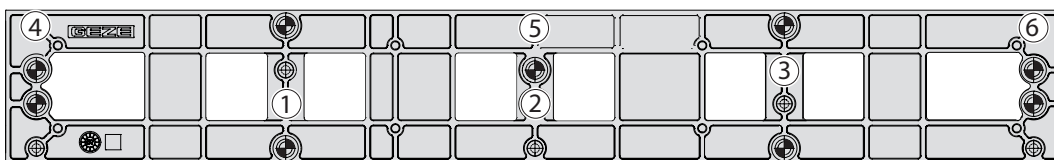
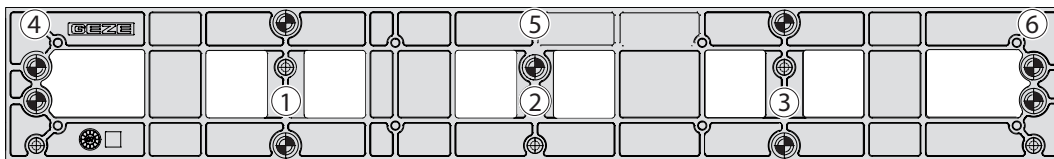
Reveal depth L (from-to)	Dimension X for guide rail with TSA 160 NT Z	Door width (min.)	Opening angle
>0-25 mm	186 mm	690 mm	109°-113°
>25-50 mm	192 mm	690 mm	113°-115°
>50-75 mm	203 mm	690 mm	115°-110°
>75-100 mm	215 mm	690 mm	110°-105°
>100-125 mm	229 mm	690 mm	105°-100°
>125-150 mm	244 mm	703 mm	100°-97°
>150-175 mm	262 mm	721 mm	97°-95°
>175-200 mm	280 mm	739 mm	95°-90°

Fasteners

	Steel/aluminium doors	Wooden doors
Drive attachment without mounting plate (direct attachment)	6 cylinder head screws M6 and riveting nuts	8 wood screws with button head Ø5
Attachment of the mounting plate	At least 6 countersunk screws M5 or M8 and riveting nuts (see diagrams below for examples of even distribution)	8 wood screws with countersunk head Ø5
Drive attachment on mounting plate	6 cylinder head screws M6 × 20	
Standard roller guide rail, deep roller guide rail	2 countersunk screws M5 and riveting nuts	2 wood screws with countersunk head Ø5
Fastening of link arm	2 cylinder head screws M6 and riveting nuts	2 wood screws with button head Ø5

Fasteners (optional)

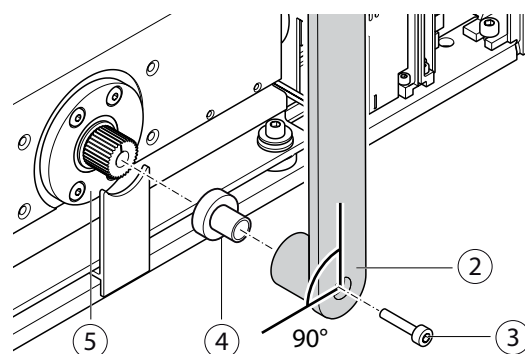
	Steel/aluminium doors	Wooden doors
Attachment of the extension kit without mounting plate (direct attachment)	4 cylinder head screws M5 and riveting nuts	6 wood screws with button head Ø5
Attachment of the extension kit with mounting plate		
▫ Split mounting plate	4 cylinder head screws M5 and riveting nuts	4 wood screws with button head Ø5
▫ Continuous mounting plate	2 cylinder head screws M5 and riveting nuts	2 wood screws with button head Ø5
Attachment of base plate of the extension kit on mounting plate	4 cylinder head screws M5 × 10	4 cylinder head screws M5 × 10

Examples of an even distribution of the screws for mounting plate attachment if only 6 screws can be used

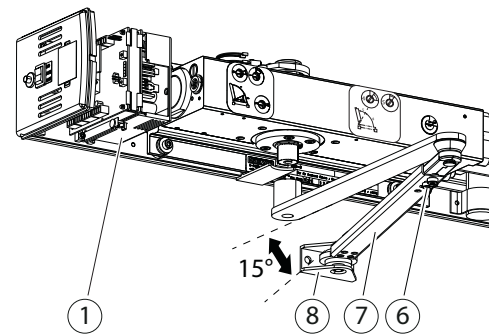
6.3 Installing the drive

6.3.1 Install the drive on the opposite hinge side (pushing; link arm) TSA 160 NT

- ▶ Screw the drive onto the lintel or prepared mounting plate.
- ▶ Press the spacer bush (4) into the lever bush.
- ▶ Slide the link arm onto the drive shaft (5) at an angle of 90° and fasten with the screw M6 (3).
- ▶ Pull the door closed.
- ▶ Loosen the 2 screws (6) at the link arm.

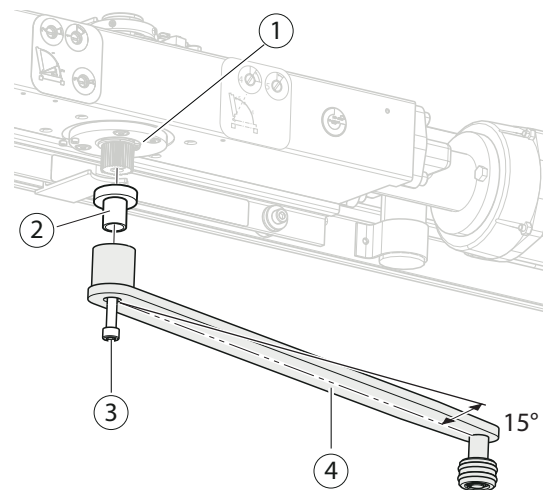


- ▶ Fasten the bearing block (2) on the door leaf with 2 screws M6.
- ▶ Adjust the connecting link arm (7) to length, pre-tension the lever arm manually. The connecting link arm (7) must be positioned perpendicularly (90°) to the door level and the lever arm must be pretensioned by approx. 15°.
- ▶ Tighten the 2 screws (6).

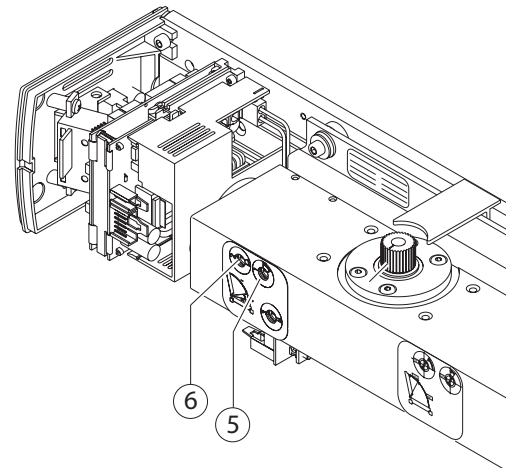


6.3.2 Install the drive on the hinge side (pulling; roller guide rail) TSA 160 NT / TSA 160 NT Z Invers

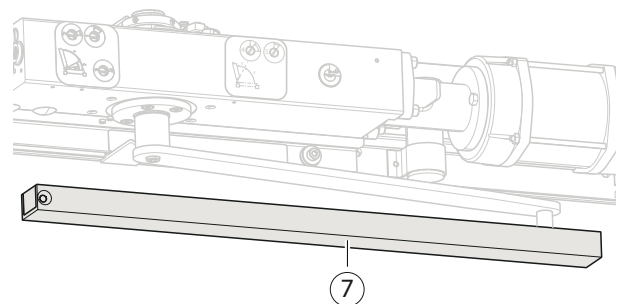
- ▶ Press the spacer bush (2) into the lever bush.
- ▶ Slide the roller lever (4) onto the drive shaft (1) at an angle of 15° to the door level and fasten with the screw M6 (3).



- ▶ Screw valves SG (5) and SD (6) in completely. Note the number of turns required.
- ▶ Turn the roller lever (4) back slightly in the opposite direction. The roller lever stops in this position.



- ▶ Install the roller guide (7) on the door leaf with 2 screws M5.
- ▶ Close door
- ▶ Screw the drive onto the lintel or prepared mounting plate.
- ▶ Return SG (5) and SD (6) valves to their original setting.
- ▶ Lightly push roller lever (4) upwards and allow it to latch into the guide rollers (7).



6.4 Extension TSA 160 NT F and TSA 160 NT F -IS

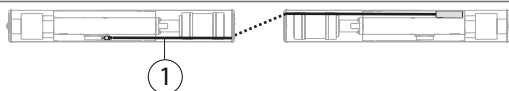
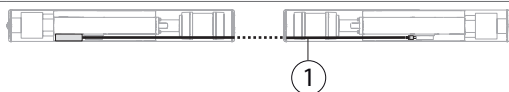
The TSA 160 NT F and TSA 160 NT F-IS automatic systems are automatic swing door drives with an integrated hold-open device for fire protection doors, smoke protection doors and doors that should be self-closing (fire barriers). They are part of a hold-open system.

- The mechanical mounting sequence corresponds to that of the TSA 160 NT drive.
- For electrical connection: see the wiring diagram.

6.5 Extension of the integrated closing sequence control TSA 160 NT -IS, TSA 160 NT F -IS, TSA 160 NT Z -IS, TSA 160 NT IS/TS

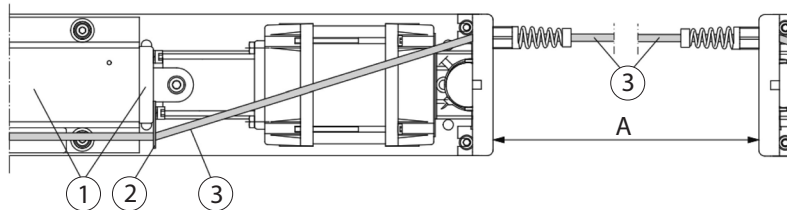
If mounting plates are used:

- ▶ Install the mounting plates and intermediate mounting plate on the frame or sash.
- ▶ Install the swing door drive on the passive leaf.
- ▶ Install the swing door drive (-IS) on the active leaf.

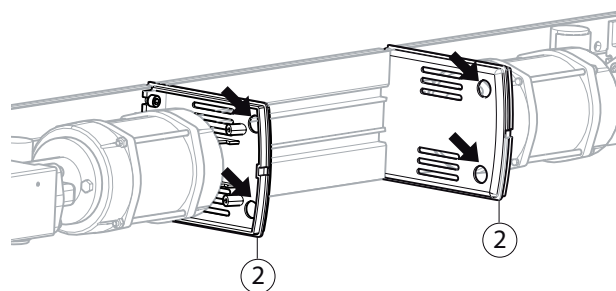
Installation variations	TSA 160 NT F-IS
DIN left	
DIN right door	

Route the Bowden cable close to the drives

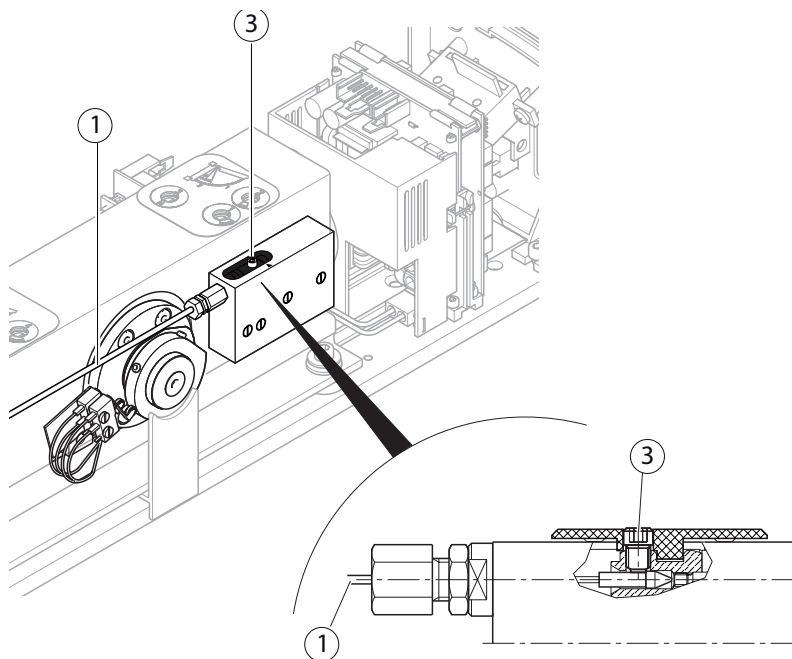
With a distance "A" between the middle side parts of less than 130 mm, the Bowden cable (3) must be routed diagonally over the motor. The retainer plate (2) (mat. no. 108736) has to be attached to the hydraulic unit (1) to guide the Bowden cable.



- ▶ Route the Bowden cable (3) diagonally over the motor.
 - Hinge size $B \leq 1510$ mm (TSA 160, 2-leaf)
 - Hinge size $B \leq 1329$ mm (TSA 160/TS 160, asymmetrical)
- ▶ Lay the wire rope (1) in accordance with the sketch (see above).
- ▶ Break out the side parts (2) where marked.

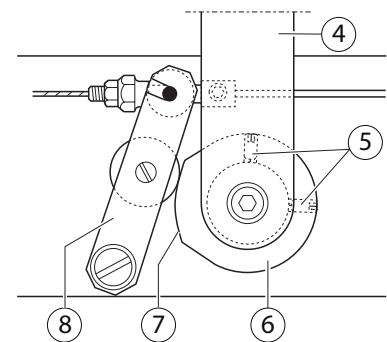


- ▶ Insert the wire rope (1) in the IS block (active leaf) and fasten it with the clamping screw (3).

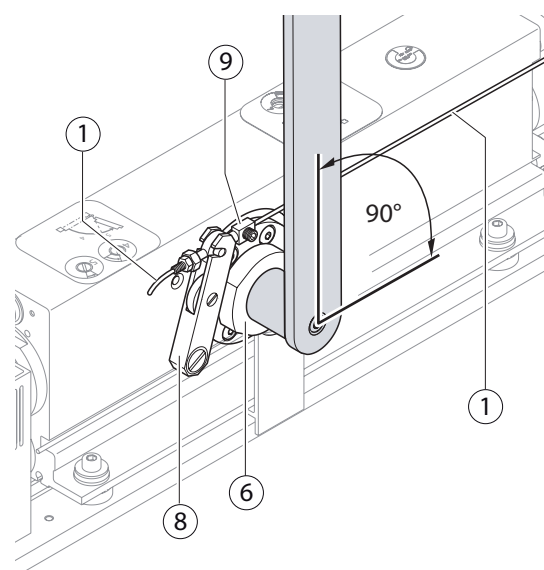


Installation on the passive leaf drive

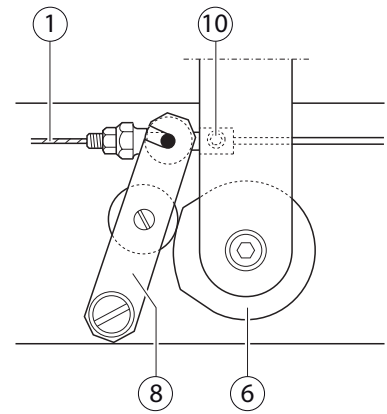
- ▶ Push the cam plate (6) onto the lever (4) of the fixed leaf drive and pre-assemble using the clamping screws (5) as shown in the drawing. The control contour (7) faces the trip rocker.
- ▶ Install the trip rocker (8) as shown in the sketch.
- ▶ Install the link arm or roller guide rail on the passive leaf, see section 8.5.1 or 8.5.2.



- ▶ Guide the wire rope (1) through the spindle (9).
- ▶ Lay the trip rocker (8) against the cam plate (6).
 - The release rocker's maximum deflection is in this position.

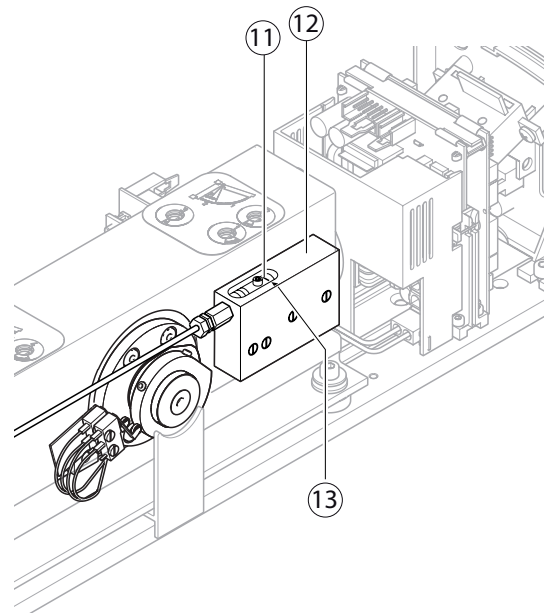


- ▶ Pull the wire rope (1) tight and clamp tight with the clamping screw (10). The trip rocker (8) must continue to lie against the cam plate (6).

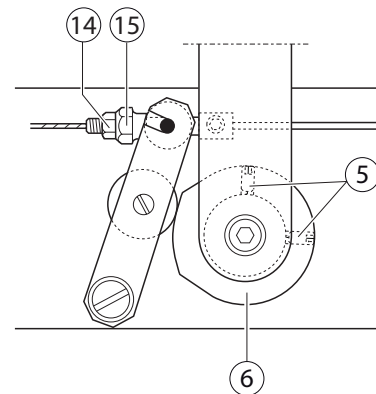


Installation on the active leaf drive

- ▶ Adjust the adjusting nut (15) so that the marking arrow (11) exactly covers the marking notch (13) at the IS valve (12).
- ▶ Then lock with the lock nut (14).



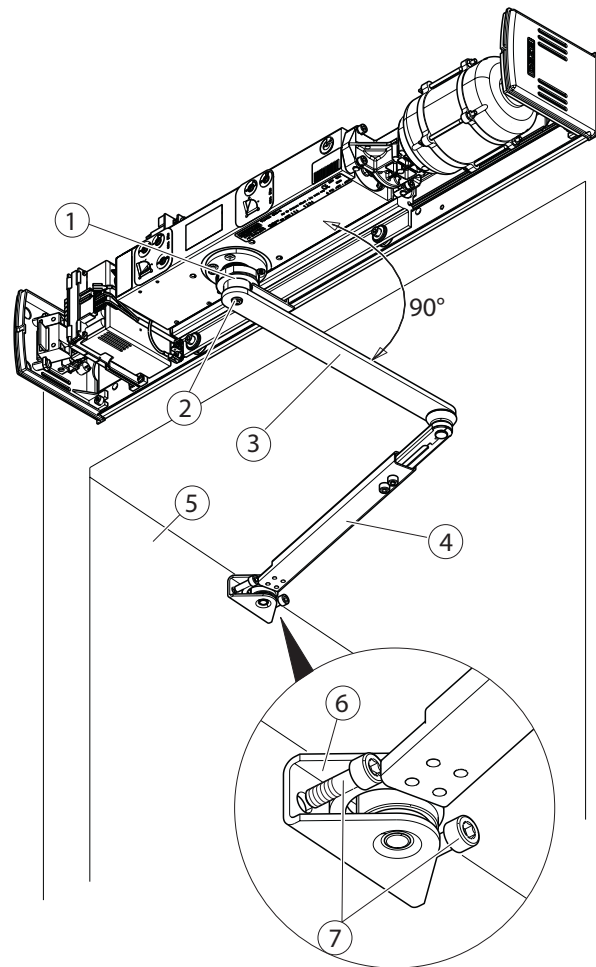
- ▶ Install the link arm or roller guide rail onto the active leaf, see Section 8.5.1 or 8.5.2.
- ▶ Check the IS function: Open both leaves manually and then release.
 - The passive leaf has to close and the active leaf does not begin to close until shortly before the passive leaf closing position (max. 30° open position).
 - The closing start can be changed by adjusting the cam plate (6) on the passive leaf drive.
 - Screw the clamping screws (5) of the cam plate (6) tight.



6.6 Installing TSA 160 NT Invers

6.6.1 Transom installation opposite hinge side with link arm

- ▶ Drill threaded holes on the door frame or mounting plate.
- ▶ Fix the door drive to the door frame or mounting plate.
- ▶ Slide the lever arm (3) onto the drive shaft (2) at an angle of 90° and fasten with the screw M6 (2).
- ▶ Adjust the door leaf (5) to between 90° and 95° opening angle and set a door stop buffer.
- ▶ Fasten the bearing block (6) on the door leaf using 2 screws (7).
- ▶ Connect the connecting link arm (4) to the lever arm (3) and tighten.



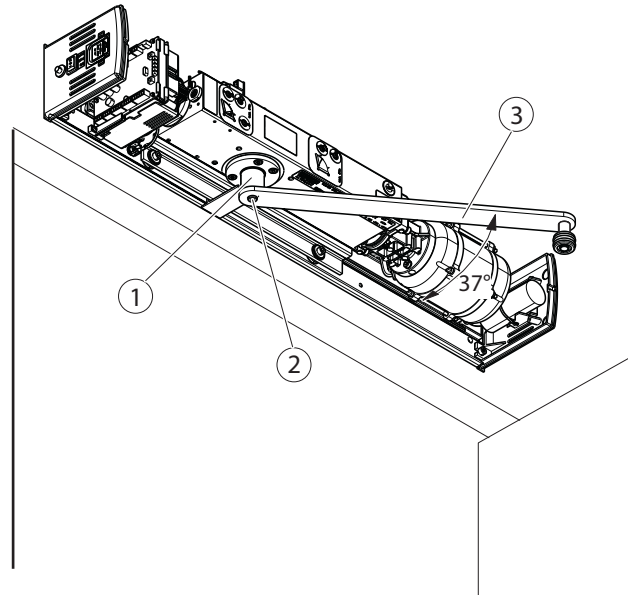
6.6.2 Transom installation hinge side with roller guide rail

**WARNING!**

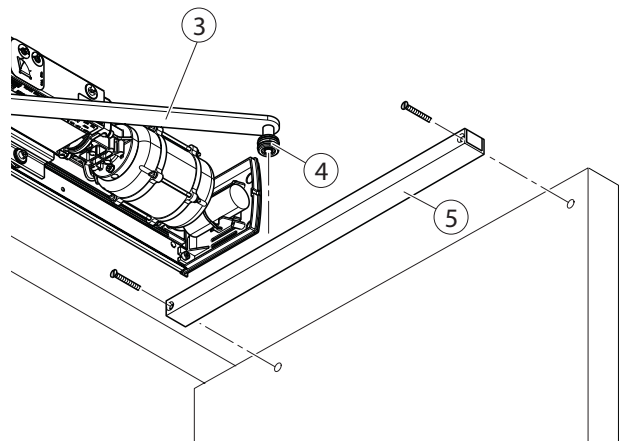
Risk of injury when the door is let go (TSA 160 NT Invers).

- ▶ Fix the door in place if necessary.

- ▶ Drill threaded holes on the door frame or mounting plate.
- ▶ Fix the door drive to the door frame or mounting plate.
- ▶ Slide the roller lever (3) onto the drive shaft (1) at an angle of approx. 37° to the door plane.
- ▶ Fasten using screw M6 (2).



- ▶ Insert the roller guide rail (5) on the roller (4) of the lever (3) and fix to the door leaf using 2 screws M5.
- ▶ Check free movement of the roller in the roller guide by pushing the door closed manually.
- ▶ Set the floor stop buffer in such a way that the door is pressed sufficiently firmly against the floor stop buffer by the spring force.



7 Electrical installation and device settings



For electrical installation and device setting:
See wiring diagram

7.1 Mains connection



DANGER!

Risk of fatal injury due to electric shock!

- ▶ The electrical system (230 V) may only be connected by a qualified electrician.
- ▶ Observe the VDE regulations.
- ▶ Before working on the electrical system, always disconnect the system from the mains.
- ▶ Turn off the main switch provided on site and secure against accidental switching on.

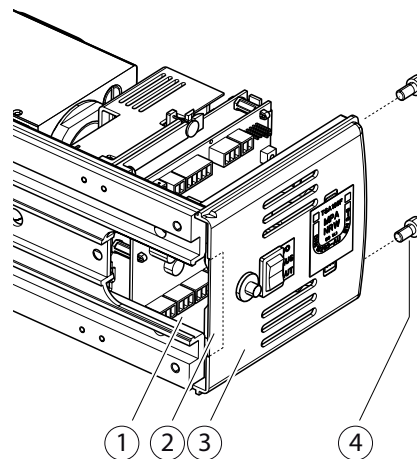


CAUTION!

Damage due to incorrect supply voltage!

- ▶ Before connecting the power cable, ensure that the specifications on the identification plate match the supply voltage and that the fuse has been removed.

- ▶ Pull off the side panel (3) by undoing the cylinder head screws (4).
- ▶ Lay the power cable and supply cable of the control devices as shown in the cable plan and connect as shown in the wiring diagram.
 - Surface mounting: Break out the required recesses (2) of the side panel.
 - Concealed mounting: Cable through the recess (1) in the base plate.

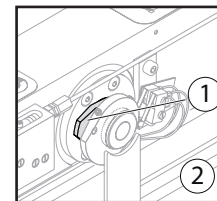
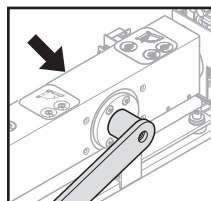


7.2 Settings

7.2.1 Limit stop

Factory setting: 90° door opening angle.

- ▶ Open the door manually up to the required opening angle or buffer and jam (wedge).
- ▶ Set the blue cam plate (1) so that the limit switch is activated in the open position of the door.
- ▶ Lightly tighten the countersunk screw (2) on the end face.

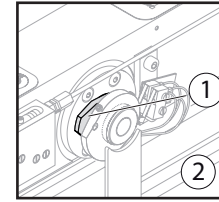
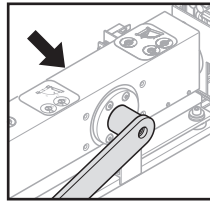


In the case of 2-leaf systems the blue cam plate (1) on the active leaf drive and on the passive leaf drive have to be adjusted.

7.2.2 TSA 160 NT Invers limit stop

Factory setting: 0° door opening angle.

- ▶ Hold the door in the closed position.
- ▶ Set the blue cam plate (1) so that the limit switch is operated in the closed position of the door.
- ▶ Lightly tighten the countersunk screw (2) on the end face.



7.2.3 Safety sensor (SIS, SIO)

The safety sensors (SIS, SIO) of all 1 to 2-leaf door systems have to be connected to the control of the drive belonging to the door leaf.

When an SIS safety sensor is triggered, the closing door leaves reverse and open again.

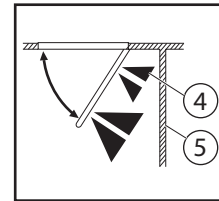
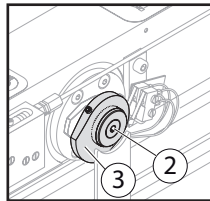
When an SIO safety sensor is triggered the opening door leaf stops before the detected obstacle until the obstacle has been removed from the sensor's field of detection. If the obstacle continues to be detected after a fixed waiting period, the drive closes the door.

The yellow cam plate must be adjusted to hide structural areas (such as a wall) in the opening direction of the respective door leaf.



Alternatively, wall blanking can also be realised by the safety sensor.

- ▶ Open the door manually until the sensor (4) signals the wall (5) by means of an indicator LED.
- ▶ Move the door back until the LED goes out.
- ▶ Jam the door with a wedge.
- ▶ Lightly tighten the countersunk screw (2) at the end face. Turn the yellow cam plate (3) in the opening direction until the corresponding micro-switch switches audibly.
- ▶ Check the function by actuating the door.
- ▶ Tighten the setscrews of the yellow cam plate.

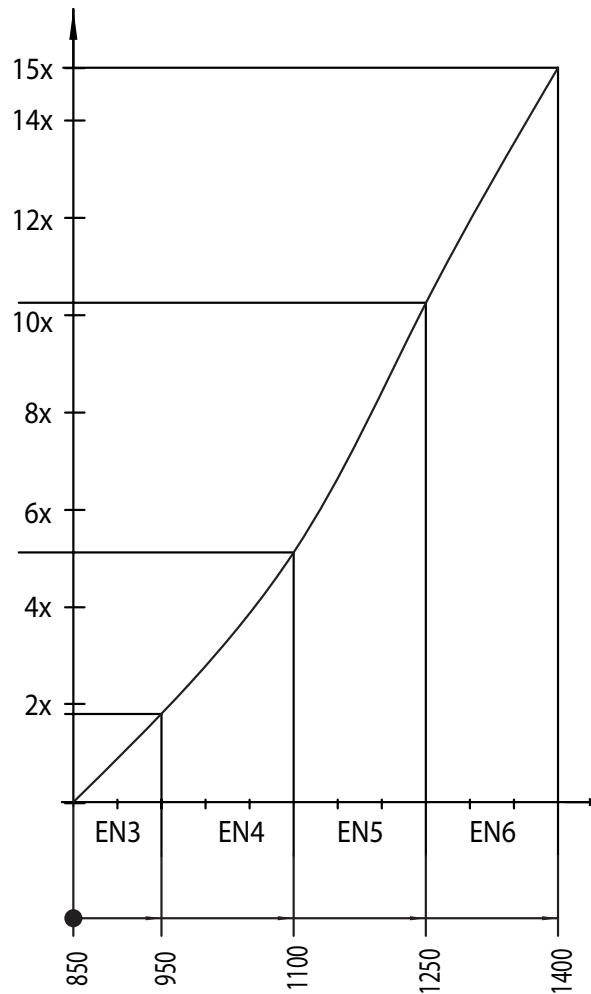


7.2.4 Closing torque for TSA 160 NT F and standard values for other drives

The door closer power size (closing force of the closer) depends on the door width.
The door leaf widths and door closer power sizes specified in EN 1154 are binding for the TSA 160NT F. EN 1154 is a standard value for all other drives.
The next higher size has to be set if necessitated by the structural (door height, door weight) or local (wind influence) conditions. The closing torque can be changed with variable adjustment for variants EN3–EN6 (see diagram and Section 6.1).



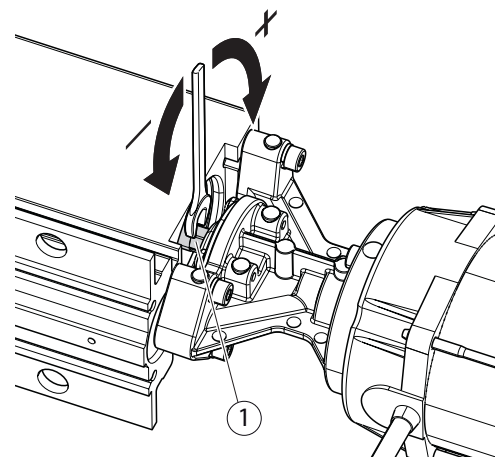
Factory presetting: EN5



If the max. spring pretension has almost been reached, do not turn further to the stop to make sure simple closing is guaranteed.

Adjusting the closing torque (variant EN3–6)

- ▶ Use an open-ended spanner, size 9 to set the closing force at the adjusting point (1) for closing force adjustment as shown in the diagram.

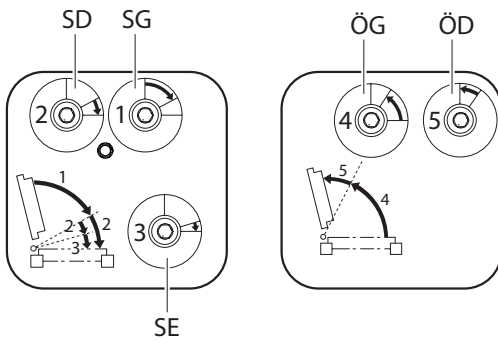


7.2.5 Speed adjustment

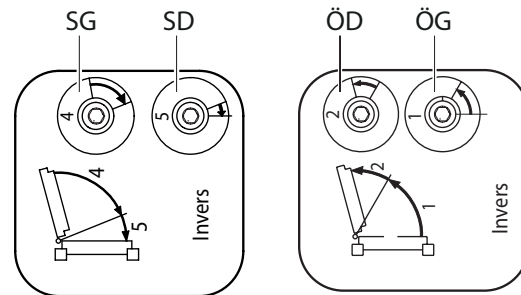
For 2-leaf systems the integrated closing sequence control ensures that the active leaf begins its closing process approx. 1.5 s after the passive leaf. The speeds have to be set so that the passive leaf is closed first.

- ▶ Optimise the closing process with "SG" and "SD".
 - Closing speed SG adjusting screw
 - Latching speed SD adjusting screw
 - Latching SE adjusting screws (not with Invers drives)
- ▶ Optimise the opening process with "ÖG" and "ÖD".
 - Opening speed ÖG adjusting screw
 - Back check ÖD adjusting screw

TSA 160NT EN3-6



TSA 160NT Invers EN3-6



CAUTION!

On opening from the closed position the latching (SE) affects the opening speed (ÖG).

- ▶ Only partially open the latching (SE) valve.

If the latching action valve (SE) is opened too wide, this will lead to a reduction in opening force.

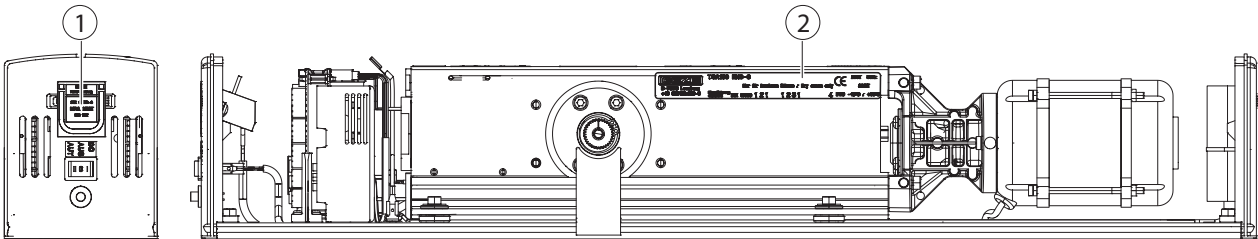
7.3 Entries on the identification plate

Before commissioning of the swing door system set up, markings must be made on the identification plate.



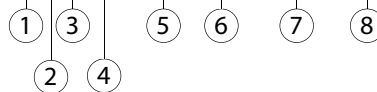
- The entries are also required for configured drives.
- If electrical commissioning does not directly following drive installation, the spring must be set to the smallest pre-load in order to move the drive to low-energy function in accordance with the requirements of the Machinery Directive.
- Within electrical commissioning, the door closing torque of the power storage device must be set in accordance with intended use of the door system as a (fire protection/personal protection door), see chapter 7.2.4.
- ▶ Enter the correct marking on the identification plate.

Position of the plates on the TSA 160 NT



- 1 "Ü" symbol
- 2 Identification plate

 Reinhold-Vöster-Str. 21-29 DE-71229 Leonberg	TSA 160 NT		07 / 2018		 230V AC 50Hz 1,3A 300W					
	999999999999		nur für trockene Räume • Dry areas only			IP20				
	DIN18650-1:2010-06		1	2			1	0	0	2



- ① **Drive type (first character)**
 - 1 Swing door drive (classification factory provided)
- ② **Durability of the drive (second character)**
 - 2 500,000 test cycles, with at least 2,400 cycles/day
- ③ **Type of door design (third character)**
 - 1 Swing door (classification factory provided)
- ④ **Suitability as a fire protection door (fourth character)**

A distinction is made between four classes of fire protection doors:

 - 0 Not suitable as fire protection door
 - 1 Suitable as smoke protection door
 - 2 Suitable as fire protection door
 - 3 Suitable as fire and smoke protection door

Note: Only one class may be specified.
- ⑤ **Safety devices on the drive (fifth character)**
 - 2 Connection for external safety systems which have been approved by the drive manufacturer

⑥ Special requirements made on the drive/functions/installations (sixth character)

Three out of five application classes are relevant for the swing door drive:

- 0 No special requirements
- 2 On escape routes without turn-tilt fittings
- 4 For self-closing fire protection doors without turn-tilt fittings

Note: Only one class may be specified. Black out non-appropriate classes.

⑦ Safety at powered pedestrian doors – version/installation (seventh character)

A distinction is made between five classes of safety devices on door leaves:

- 0 No safety devices
- 1 With sufficiently dimensioned safe distances
- 2 With protection against crushing, shearing and drawing-in of fingers
- 3 With built-in turn-tilt fittings unit
- 4 With sensor-controlled protective devices

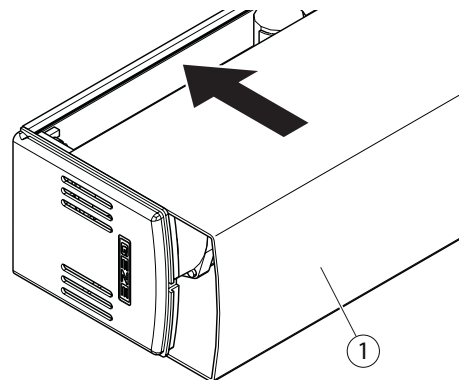
Note: Several classes may be entered.

⑧ Ambient temperature (eighth character)

- 2 -15 °C to +50 °C (classified in the factory)

7.4 Mounting the cover

- ▶ Close the cover (1).



8 Final check

The mandatory installation, maintenance and repair work must be performed by properly trained personnel authorised by GEZE.

Written proof of the test is required.

Safety analysis (risk analysis)

In accordance with Machinery Directive 2006/42/EC and DIN 18650, before commissioning the door, a safety analysis (risk assessment) must be performed and the door system must be labelled in accordance with CE Marking Directive 98/68/EEC.

This includes:

- ▶ Check the safeguards and measures to prevent crushing, impact, shearing or drawing-in.
- ▶ Check the function of the safety and actuation sensors.
- ▶ Check protective earth connection to all metal parts that can be touched.

Test run

- ▶ Disconnect the door drive from the power supply.
- ▶ Manually check that the door moves properly, ensure that it does so.
- ▶ Check for correct installation and closing sequence (of 2-leaf doors) for manual operation.
- ▶ For TSA 160 NT F: Open the door(s), check the closing speed and latching action and adjust if necessary.
A check on the valve settings is recommended for all the other drive types.
- ▶ Switch the power supply back on or plug the connector back in.
- ▶ Check the safeguards and measures to prevent crushing, impact, shearing or trapping points.
- ▶ Check the function of presence sensors and movement detectors.
- ▶ Check protective earth connection to all metal parts that can be touched.

9 Service and maintenance

The maintenance work described below must be performed by an expert on the TSA 160 NT at least once a year or after 500,000 cycles.

If there is a display programme switch, the service display lights up in the display.

- ▶ Service and maintenance should then be carried out promptly.

9.1 Dangers during mechanical service



WARNING!

Risk of fatal injury due to electric shock!

- ▶ Disconnect the power supply from the drive using the on-site main switch and secure it against being switched back on again or disconnect the connector in the drive (see chapter 8.2).



WARNING!

Risk of injury due to falling cover.

Risk of fatal injury due to electric shock!

The cover is held with a catch mechanism at the drive side panels.

- ▶ Unplug the earthing cable (yellow-green) from the cable lug at the cover.
- ▶ When re-installing, plug this earth cable back in at the same point before fitting the cover. Otherwise there is a risk of an electric shock if a short-circuit to earth occurs.



WARNING!

Risk of injury caused by crushing.

- ▶ Ensure that you have no extremities in the swivelling range during swing movements of the lever or of the link arm.



WARNING!

Risk of burns due to hot motor.

The motor in the drive can become very hot after continuous operation or poor ease of movement or other defects.

- ▶ Disconnect the system from the mains before working on the motor.
- ▶ Let the motor cool down.

9.2 Maintenance work on the TSA 160 NT

The TSA 160 NT is maintenance-free to a great extent and no extensive work has to be carried out with the exception of that specified below:

- ▶ Check the roller lever or the link arm for damage, replace if necessary.
- ▶ Check fixing screws for tightness.
- ▶ Tighten the fixing screw for the link arm or roller lever with 15 Nm.
- ▶ Check the O-rings on the roller in the rail, replace if necessary.
- ▶ Clean the inside of the roller guide rail.
- ▶ Check that the door latch functions correctly and is clean, oil lightly if necessary.

Test run

- ▶ Remove the mains plug.
- ▶ Ensure that the door moves properly.
- ▶ Check the correct installation and closing sequence (for 2-leaf doors).
- ▶ Switch on the mains voltage again.

9.3 Electrical service

- ▶ Keep the test documents up-to-date and make them available.

The number of openings, operating hours and remaining time until the next servicing can be queried as described in the wiring diagram (see wiring diagram, chapters "Commissioning and service" and "Service mode").

- ▶ Check the function of the activation and presence sensors and replace if necessary.

9.4 Electrical faults

Fault messages are stored and can be retrieved using the display programme switch, the service terminal ST220 or GEZEconnects.

If a fault is currently active, it is shown every 10 seconds on the display programme switch or the service terminal ST220.

For troubleshooting and fault elimination see the fault table in the wiring diagram, "Fault messages" section.



- ▶ After changes to the drive (spring pre-load, opening width, fitting dimensions, change in the actuation elements) or modifications to the "Open" safety sensor, check the control parameters (see wiring diagram).
-

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