

TSA 160 NT
TSA 160 NT F
TSA 160 NT -IS
TSA 160 NT Invers
TSA 160 NT Z
TSA 160 NT Z Invers
TSA 162

Automatic drive for swing doors

GB Mounting and service instructions

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1 Symbols and means of representation

Warnings



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

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

Warning symbol	Warning word	Meaning
	DANGER	Danger for persons. Non-compliance will result in death or serious injuries.
	WARNING	Danger for persons. Non-compliance can result in death or serious injuries.
	CAUTION	Danger for persons. Non-compliance can result in minor injuries.
-	CAUTION	Information on avoiding material damage, understanding a concept or optimising the processes.

Further symbols and means of representation

Important information and technical notes are emphasised in order to illustrate the correct operation.

Symbol	Meaning
	means "important note"
	means "additional information"
▶	Symbol for an action: Here you have to do something. ▶ Observe the sequence if there are several action steps.

2 Product liability

In accordance with the liability of manufacturers for their products as defined in the German "Produkthaftungsgesetz" (Product Liability Act), the information contained in these instructions (product information and proper use, misuse, product performance, product maintenance, obligations to provide information and instructions) is to be observed. Non-compliance releases the manufacturer from its statutory liability.

3 Safety

3.1 Intended use

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

The above-mentioned door drive is suitable for use:

- solely for use in dry rooms
- in entrances and interior areas of pedestrian traffic in commercial plants and public areas
- in private areas

The door drive TSA 160 NT

- may be used at escape and rescue routes
- may **not** be used at fire or smoke proof doors
- may **not** be used externally

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

- is designed for use at fire or smoke proof doors
- may be used at escape and rescue route doors
- may **not** be used externally

The door drive TSA 160 NT Invers

- is designed mainly for use at escape doors and RWA incoming air doors
- may **not** be used externally

The door drive TSA 162

- may **not** be used at fire or smoke proof doors
- is designed solely for use at a fixed leaf at 2-leaf systems
- may **not** be used externally
- is not tested in accordance with DIN 18650

Any other use than the proper use, such as permanent manual operation, as well as all changes to the product are impermissible.

- ▶ Observe the "GEZE Product information for door closers".

3.2 Safety instructions



CAUTION!

Danger of crushing through automatic closing force.

Hands or fingers can be crushed particularly in the area of the side closing edge (hinge side).

- ▶ Use jarring-free doors.
- ▶ If necessary monitor the opposite hinge side and hinge side with presence sensors (see wiring diagram).

- The prescribed mounting, 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.
- GEZE shall not be liable for injuries or damage resulting from unauthorised modification of the system.
- GEZE shall not be liable if products from other manufacturers are used with GEZE equipment. Only original GEZE parts may be used for repair and maintenance work as well.
- Protect the display programme switch against unauthorised access.
- In accordance with Machinery Directive 2006/42/EC, a risk analysis must be performed and the door system identified in accordance with CE Identification Directive 93/68/EEC before commissioning the door system.
- Observe the latest versions of guidelines, standards and country-specific regulations, in particular:
 - BGR 232 "Guidelines for power-operated windows, doors, gates"
 - DIN 18650 "Building hardware - Powered pedestrian doors"
 - VDE 0100; Part 610 "Erection of low-voltage installations"
 - DIN EN 60335-2-103, DIN 18263-4
 - Accident-prevention regulations, especially BGV A1 "General regulations" and BGV A2 "Electrical systems and equipment"

3.3 Safety-conscious working



- ▶ Observe the safety instructions for electrical systems and in the wiring diagram.

- ▶ Protect the workplace against unauthorised entry.
- ▶ Attach safety labels to glass leaf doors (Mat. No. 081476). Risk of injury through breakage of glass.
 - Risk of injury by sharp edges and moving parts at the drive.

3.4 Inspection of the mounted system

Safety analysis (danger analysis)

In accordance with Machinery Directive 2006/42/EC and DIN 18650, a risk analysis must be performed and the door system identified in accordance with CE Identification Directive 98/68/EEC before commissioning the door system.

This includes:

- ▶ Checking measures for security and prevention of crushing, impact, shearing or drawing-in spots.
- ▶ Checking the function of the safety and actuation sensors.
- ▶ Checking the protective conductor connection to all metal parts which can be touched.

3.5 Additionally applicable documents

- Wiring diagram TSA 160 NT EN 3-7
- Cable plan TSA 160 NT EN 3-7
- User manual TSA 160 NT EN 3-7



- The diagrams are subject to change.
- ▶ Use only the most recent versions.

4 Transportation and storage

CAUTION!

Damage to the TSA 160 NT swing door drive through hard knocks and falls!

- ▶ Do not throw or let drop the TSA 160 NT.
- ▶ Store dry. Protect from moisture during transportation and storage.
 - Storage temperatures under -30 °C and above $+60\text{ °C}$ can result in damage to the device.

5 Tools and aids

Tool	Size
Tape measure	
Marking pen	
Drill bits	Ø 4.2
Threading tap	M5
Allen key	4 mm
Crosstip and screwdriver	Blade widths: 2.5 mm and 5 mm
Centre punch	
Hammer	
Self-adhesive tape for fastening the drilling template	
Wire stripper	
Crimping pliers for wire-end ferrules	

6 Product description

6.1 System description and technical data

The TSA 160 NT automatic system is an electronically controlled hydro-mechanical swing door system for system doors made of wood, metal, all-glass, steel or plastic.

The system is mounted above the door leaf and is suitable for right- and left-hinged 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.

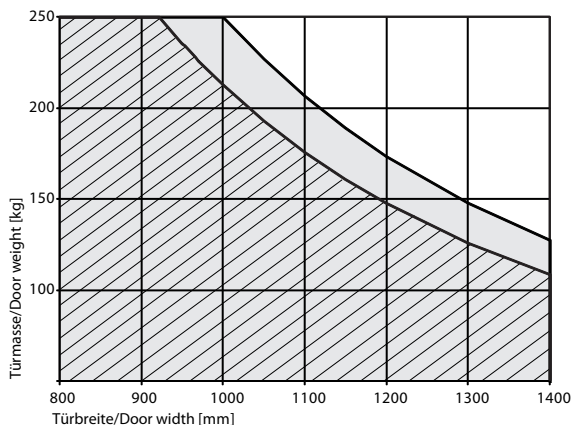
The swing door drive of the TSA 160 NT Invers operates electro-hydraulically when closing the door. During the closing process a spring stores the energy required for opening. The opening process is controlled hydraulically.

TSA 160 NT field of application

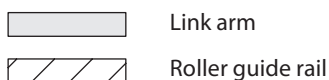
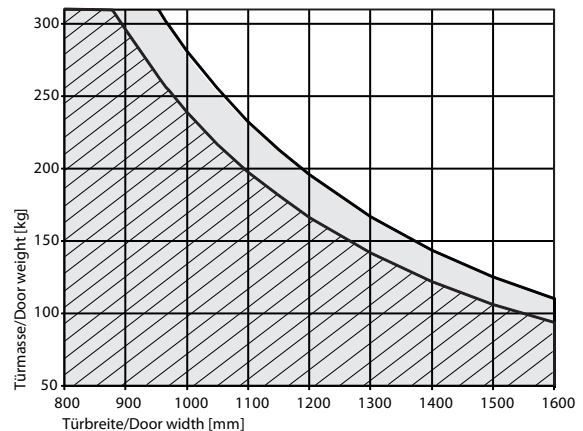
	TSA 160 NT / TSA 160 NT Invers				TSA 160 NT F	
Opening torque	D	D	Z	Z	D	D
On the door on dimension EN	3-6	7	3-6	7	3-6	7
Automatic [Nm]	approx. 150 ... 90	approx. 180	approx. 70 ... 40	approx. 80	approx. 150 ... 90	180
Manual [Nm]	approx. 35 ... 110	approx. 160	approx. 13 ... 45	approx. 50	approx. 35 ... 110	approx. 160
Closing torque at closed door [Nm]	approx. 20 ... 60	approx. 110	approx. 8 ... 30	approx. 50	approx. 20 ... 60	approx. 110

D = Pushing, Z = Pulling

Maximum range of use TSA 160 NT EN3-6



Maximum range of use TSA 160 NT EN7



Mechanical data

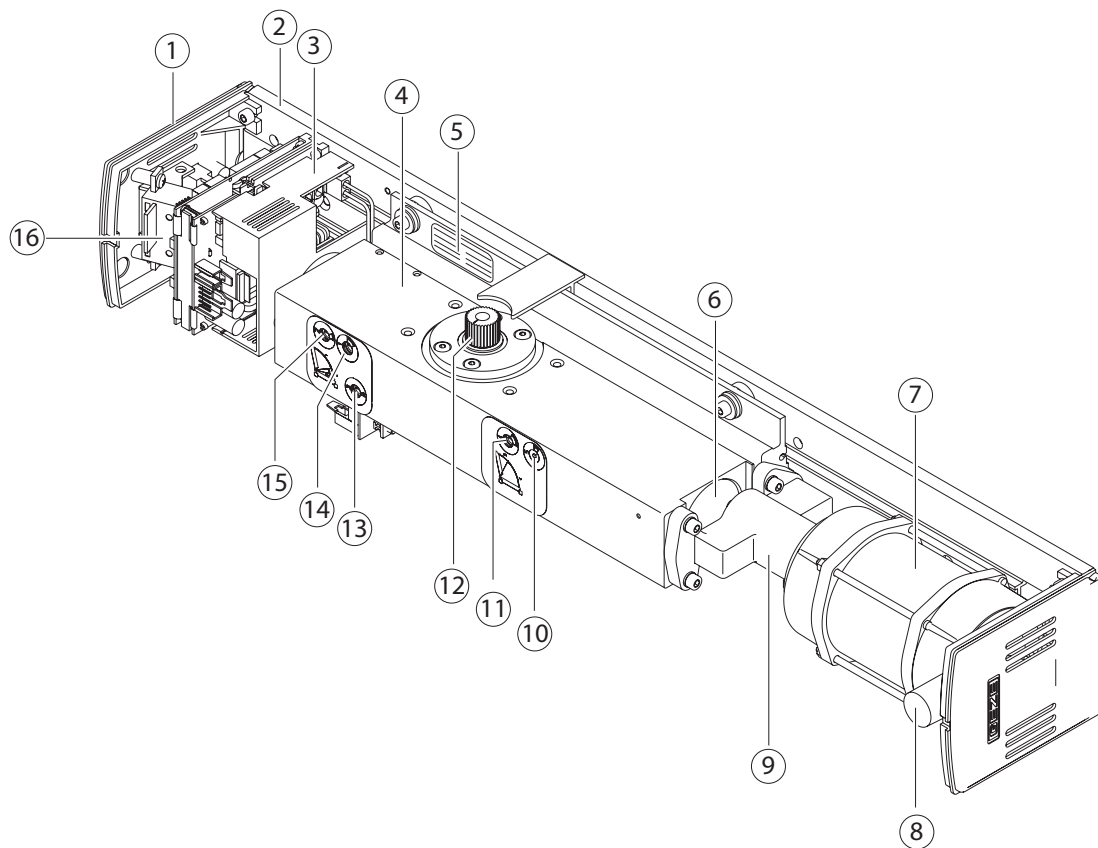
- Dimensions (H x D x L): 100 mm x 120 mm x 690 mm
- Ambient temperature range: -15 °C to +50 °C
- Drive mass: approx. 13 kg

Electrical data

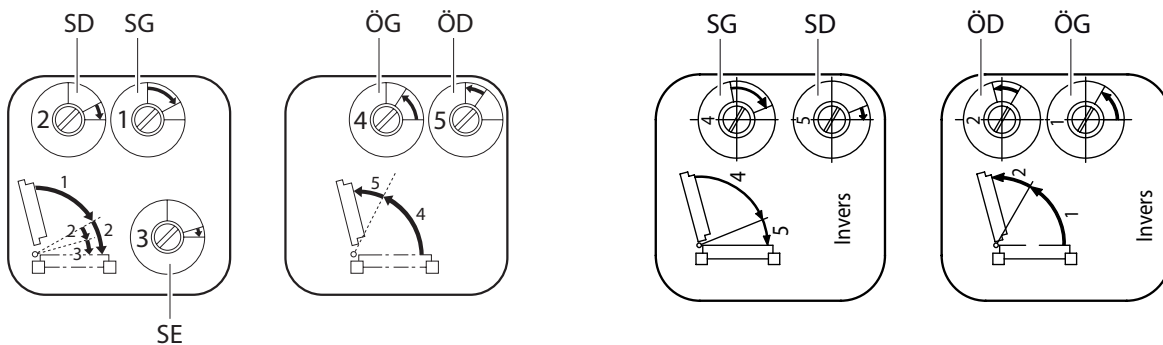
- Mains connection: 230 V, 50 Hz
- Power consumption: max. 300 W (TSA 160 NT EN 3-6)
max. 450 W (TSA 160 NT EN 7)

6.2 Basic structure

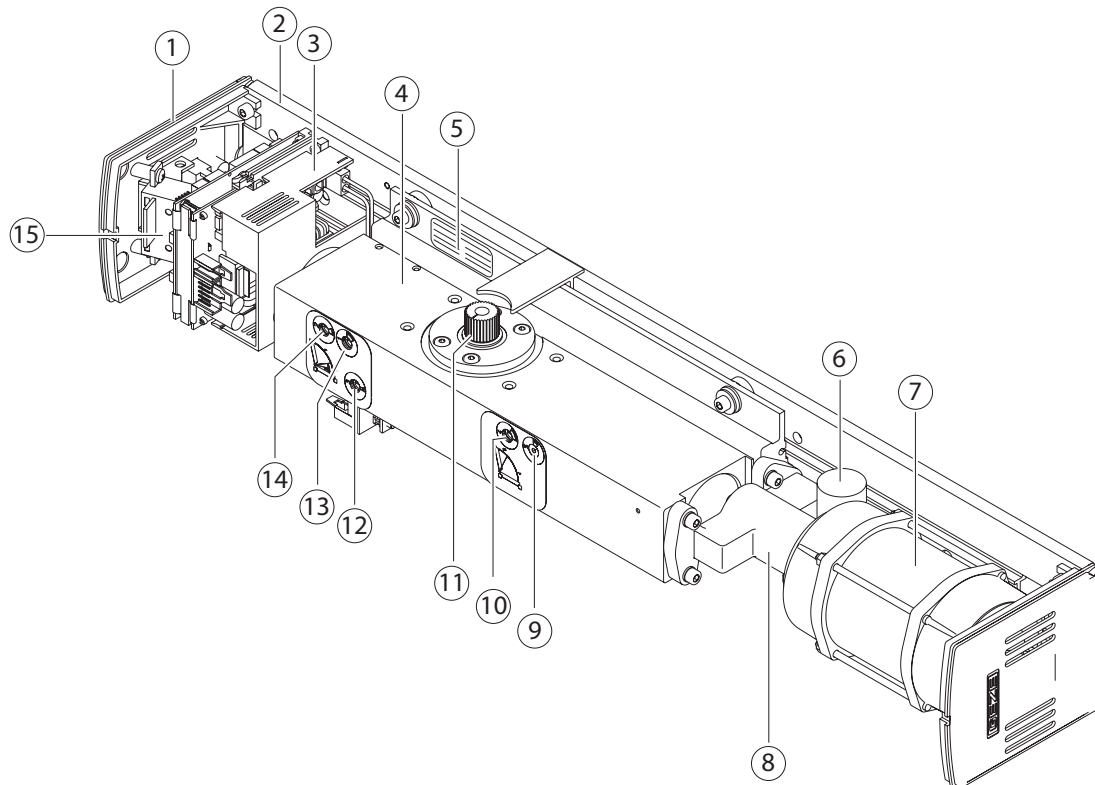
Drive TSA 160 NT EN 3–6



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



Drive TSA 160 NT EN 7



- | | | | |
|---|--|----|--|
| 1 | Side panel | 10 | Opening speed (ÖG)
(at Invers drives: closing speed (SG)) |
| 2 | Base plate | 11 | Drive shaft |
| 3 | Controller | 12 | Latching setting (SE)
(not at Invers drives) |
| 4 | Hydraulic cylinder | 13 | Closing speed (SG)
(at Invers drives: opening speed (ÖG)) |
| 5 | Information plate | 14 | Latching speed (SD)
(at Invers drives: back check (ÖD)) |
| 6 | Capacitor | 15 | Mains fuse TSA 160 EN 7: T2.0A |
| 7 | Motor | | |
| 8 | Pump | | |
| 9 | Back check (ÖD)
(at Invers drives: latching speed (SD)) | | |

Delivery

Latching setting SE closed. If required SE is activated.

CAUTION

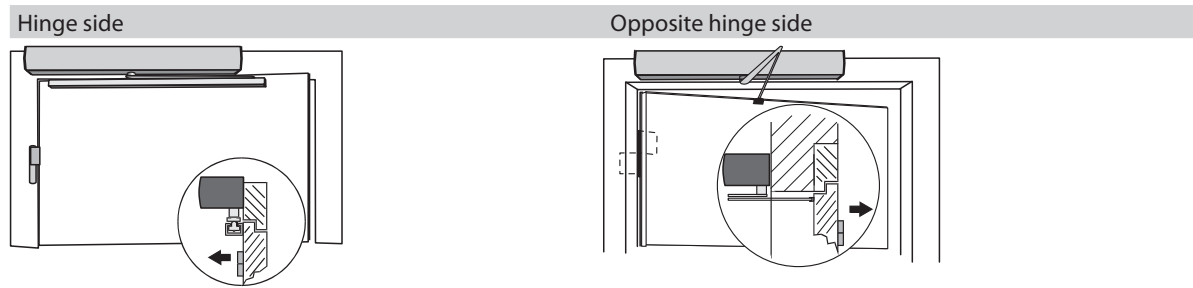
The SE setting may not cause a delayed opening of the door leaf.

- ▶ Open the valve only partially.

7 Types of mounting, stops

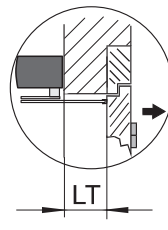
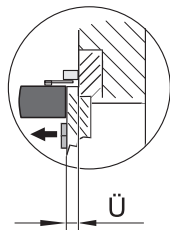
7.1 Single-leaf

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



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. soffit depth SD	75 mm*	Max. soffit depth SD	0–100 mm
Max. door overlap O	30 mm*		100–200 mm
			200–350 mm (EN 3–6)
			Max. 300 mm (EN 7)

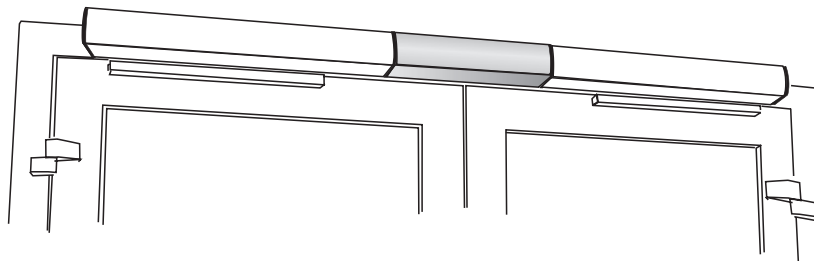
* depending on door opening angle



O Door overlap
SD Soffit depth

7.2 Double-leaf

The two-leaf version corresponding to that of the single-leaf mounting type.
With integrated closing sequence control IS, see Section 8.7.
The combination TSA 160 NT is mechanically identical to 2 x TSA 160 NT.
An intermediate cover is optionally possible (see sketch).
Opposite hinge side mounting is also possible.



8 Mounting

8.1 General information for mounting



WARNING

Danger of serious injury through incorrect mounting.

- ▶ Observe all the instructions.
- ▶ Observe the specified ambient temperature range at the installation location of the drive.
- ▶ After completing mounting check the settings and functionality of the drive.



WARNING

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

- ▶ Set the opening angle in the open position using the link arm (deenergised motor).
- ▶ Set the correct closing position using cams.

8.1.1 Scope of delivery and completeness



- ▶ Open all the packaging units, check whether they are complete and familiarise yourself with the parts.

Door drive TSA 160 NT with roller guide rail or link arm, essentially consisting of:

- Drive unit
 - 1 (2) drive(s)
 - 1 drilling template
- Cover
 - 1 hood per drive and, if necessary, 1 intermediate cover or continuous cover in accordance with scope of order

Scope of delivery, depending on order:

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

or:

- Link arm
 - 1 link arm (size depending on soffit depth)
- Mounting plate for drives (optional)
 - Depending on the installation situation a mounting plate is required. A mounting plate is generally recommended to facilitate mounting (for 2-leaf version available also continuous or with intermediate mounting plate).

Accessories (optional)

- Mounting plate
- Door stop buffer
- Actuation elements (in accordance with the specifications in the wiring diagram)
- Safety sensors
- Switch
- Programme switch and smoke switch control unit in accordance with the guideline for hold-open system

8.1.2 Preparations to be made by the customer

Checking of the location conditions and the required physical conditions



WARNING!

Danger of injury through falling components!

Unsecured components may fall down when under load.

- ▶ When mounting the TSA 160 NT swing door drive ensure that the substructure ensures secure fastening of the drive.
- ▶ Use suitable means of fastening such as anchors, rivet nuts, etc.
- ▶ Before mounting the drive check whether the door leaf is in a good mechanical state and can be opened and closed easily.

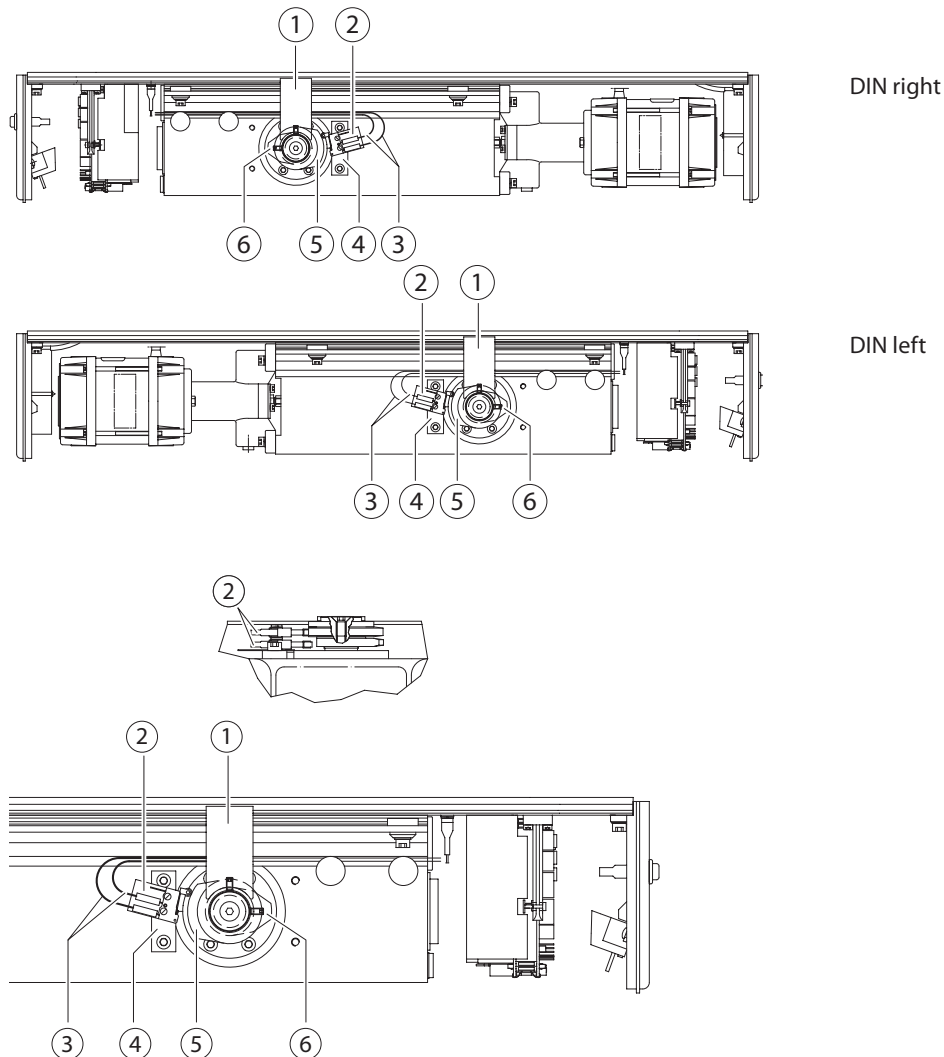
- ▶ Mount the bottom edge of the element mounted at the lowest point (roller guide rail or link arm) at least 2 m above the floor.
- ▶ Lay cables in accordance with the cable plan.
- ▶ Check the type of stop on the leaf or frame profile (see Chapter 7).
- ▶ Version DIN right/DIN left (conversion see Section 8.2).
- ▶ Mounting the stop buffer on the floor.

8.2 Conversion to DIN left



State of delivery is DIN right. If required the drive can be converted on site to DIN left.

8.2.1 TSA 160 NT / TSA 160 NT Z Invers



Procedure

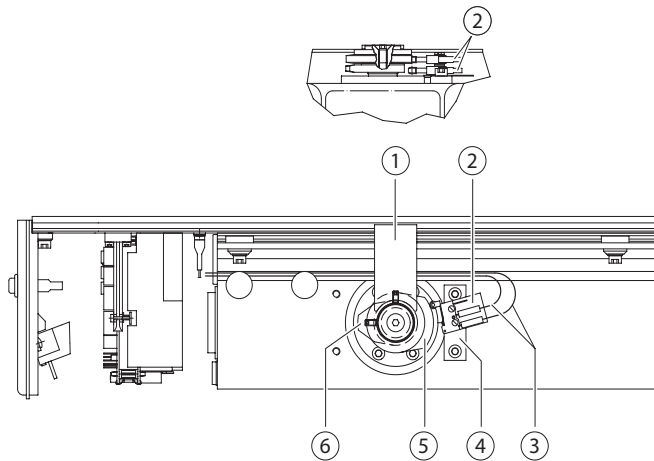
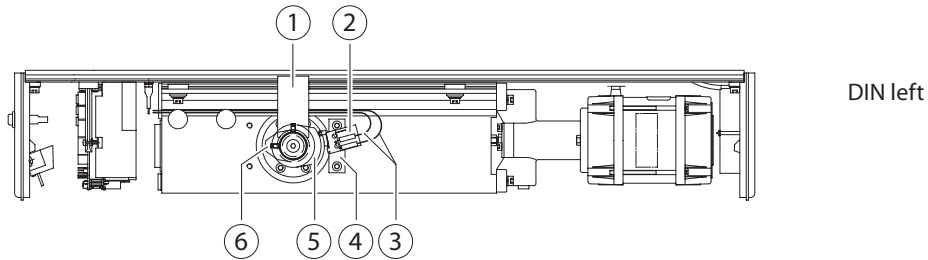
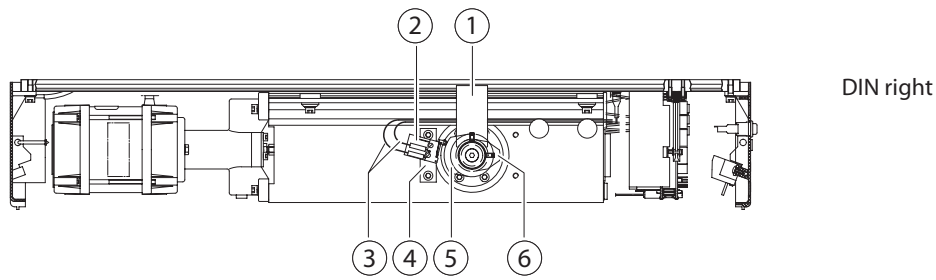
- ▶ Screw off the limit switch (2), screw off the limit switch bar (4).
- ▶ Dismantle the blue (5) and yellow (6) cam plates. Lift the black cover plate (1) slightly to do so.
- ▶ Mount the blue (3) and yellow (4) cam plates on the other axis side. Lift the black cover plate (1) slightly to do so.
- ▶ Lay the cables (3) of the limit switch (2) in the cable duct (see drawing).
- ▶ Mount the limit switch group (2), (4) in accordance with the sketch (see above).
- ▶ Carry out the fine adjustment of the cam plates for the limit switch and safety sensor.

Cable colours (3):

- above: white upper limit switch. Yellow operating cam
- below: green lower switch. Blue operating cam

8.2.2 TSA 160 NT Z / TSA 160 NT Invers

State of delivery is DIN right. If required the drive can be converted on site to DIN left.



Procedure

- ▶ Screw off the limit switch (2), screw off the limit switch bar (4).
- ▶ Dismantle the blue (5) and yellow (6) cam plates. Lift the black cover plate (1) slightly to do so.
- ▶ Mount the blue (3) and yellow (4) cam plates on the other axis side. Lift the black cover plate (1) slightly to do so.
- ▶ Lay the cables (3) of the limit switch (2) in the cable duct (see drawing).
- ▶ Mount the limit switch group (2), (4) in accordance with the sketch (see above).
- ▶ Carry out the fine adjustment of the cam plates for the limit switch and safety sensor.

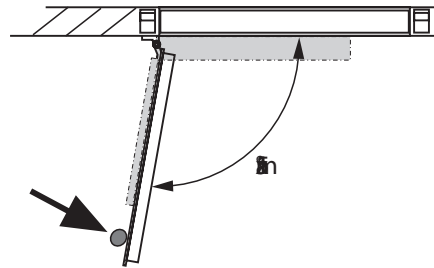
Cable colours (3):

- above: white upper limit switch. Yellow operating cam
- below: green lower switch. Blue operating cam

8.3 Preparation of installation

8.3.1 Opening angle limitation

- ▶ Check the physical conditions.
- ▶ Open and close the door manually.
- ▶ When mounting the door panel take care of the pinch and shearing points of the door edges when laying the cables.
- ▶ Place the stop buffer.

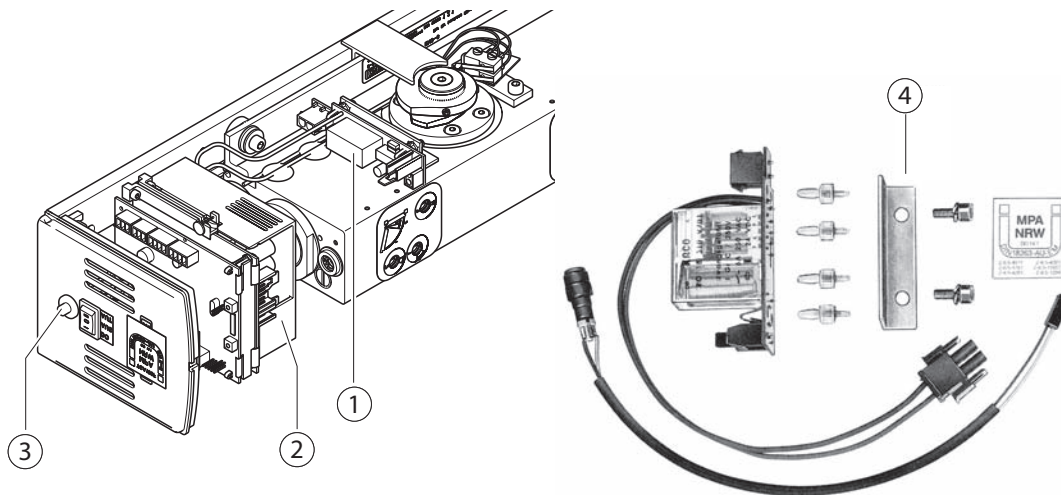


Opening angle depending on the type of mounting



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.

8.3.2 TSA 160 NT F conversion kit / Accessories



- 1 Disconnection circuit board
- 2 Door control unit DCU5
- 3 Reset switch
- 4 Accessories for TSA 160 NT F

- ▶ Break out the side part for the reset switch and insert the reset switch.
- ▶ Screw the disconnection circuit board (1) on the provided location.
- ▶ Connect the electrical connections in accordance with the wiring diagram.

8.4 Mounting dimensions for the mounting types

! The top of the door must be aligned exactly horizontally, both in the closed and in the open position.

- ▶ Use the correct fitting template in accordance with the mounting type.
- ▶ Take the type of fastening into account: Direct fastening or with mounting plate.
- ▶ Align the fitting template parallel to the top of the door.
- ▶ Affix the template with adhesive tape in accordance with the specified mounting type.
 - Help: see the door and type of stop sketches on the template.

! In the case of doors not closing smoothly separate or fold the template along the perforation.

- ▶ Pre-drill doors of wood with a diameter of 2.5 mm.

! **Is there enough space to open the door sufficiently?**

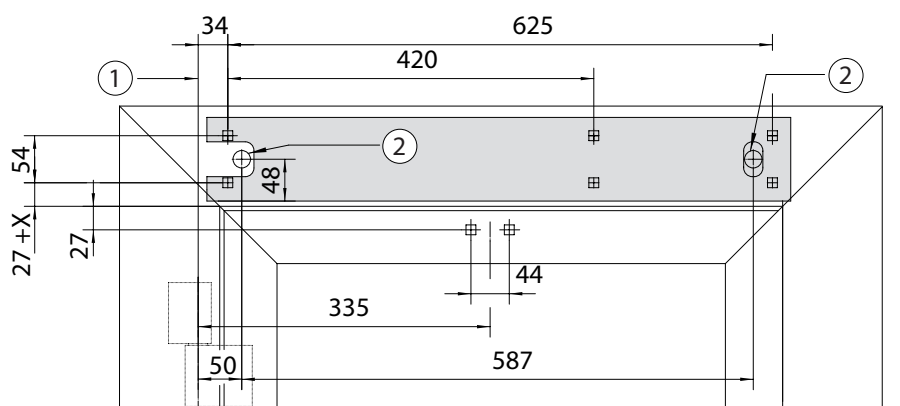
- ▶ Check the preparations that are not included.
 - Example: All the cables must be connected with door transmission to the junction boxes (concealed/surface mounting).

8.4.1 Transom mounting opposite hinge side with link arm (single-leaf, pushing)

! ▶ Observe drilling template: DIN left and DIN right mirrored.

- ▶ Drill both holes for the concealed cable path.
- ▶ Use rivet nuts, anchors bolts or equivalent fastening material.

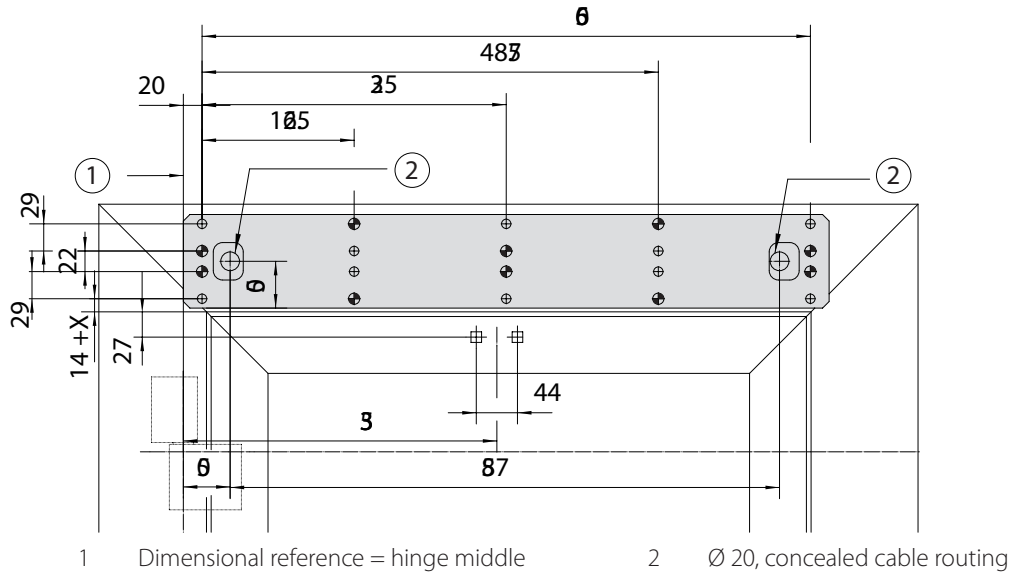
Direct fixing






1 Dimensional reference = hinge middle

2 Ø 20, concealed cable routing

Fixing with mounting plate

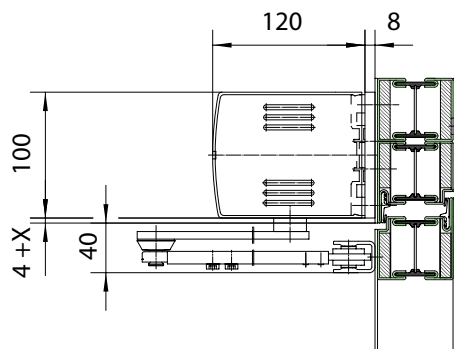
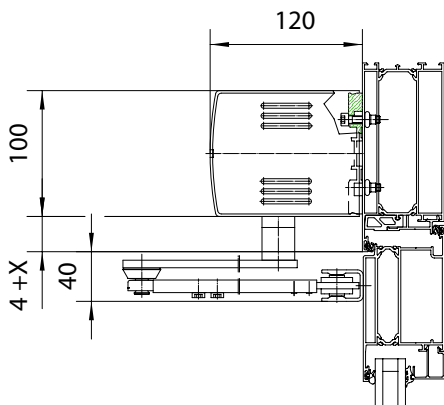


-  Fitting hole Ø 8
-  Fitting hole Ø 6
-  Fitting hole Ø 5

Axial extension X= 0 (without axial extension)
 24 mm
 30 mm
 45 mm

With 24 mm axial extension

Without axial extension

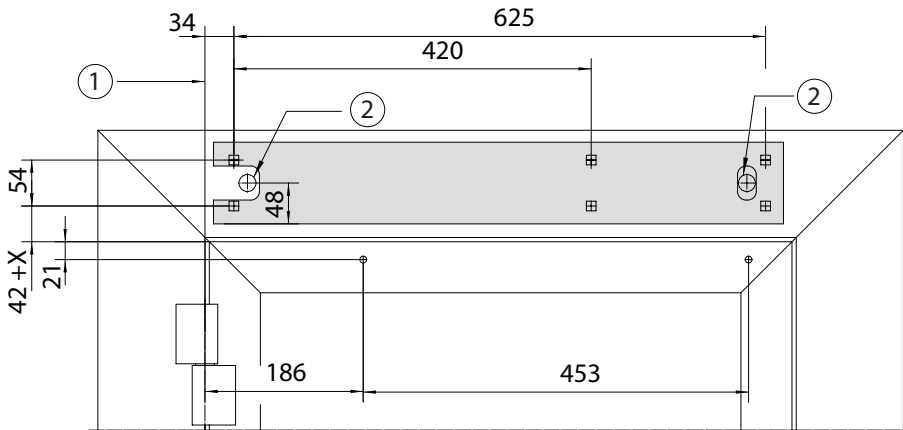


8.4.2 Transom mounting hinge side with roller guide rail (single-leaf, pulling)

! ▶ Observe drilling template: DIN left and DIN right mirrored.

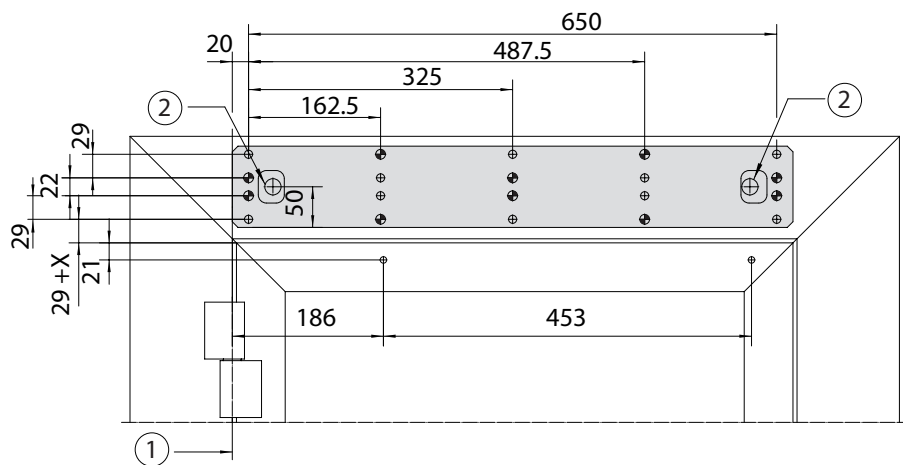
- ▶ Drill both holes for the concealed cable path.
- ▶ Use rivet nuts, anchors bolts or equivalent fastening material.

Direct fixing






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

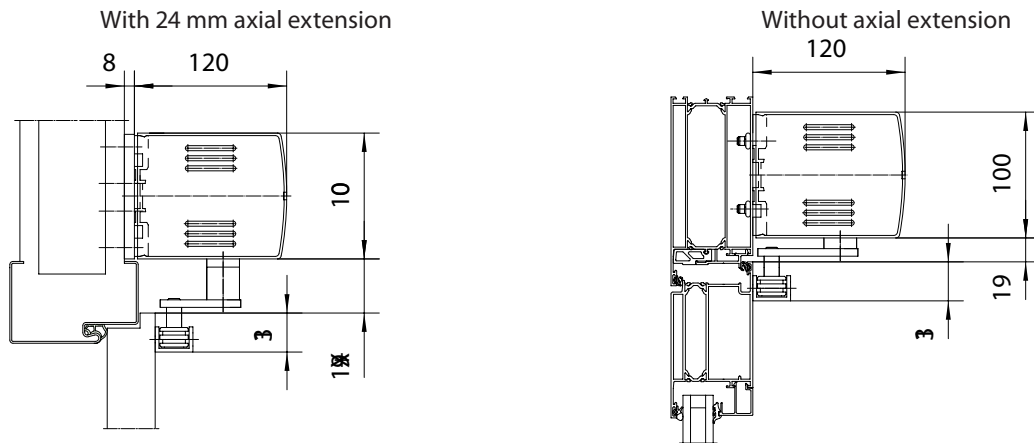
Fixing with mounting plate



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

-  Fitting hole Ø 8
-  Fitting hole Ø 6
-  Fitting hole Ø 5

Axial extension X= 0 (without axial extension)
 24 mm
 30 mm
 45 mm

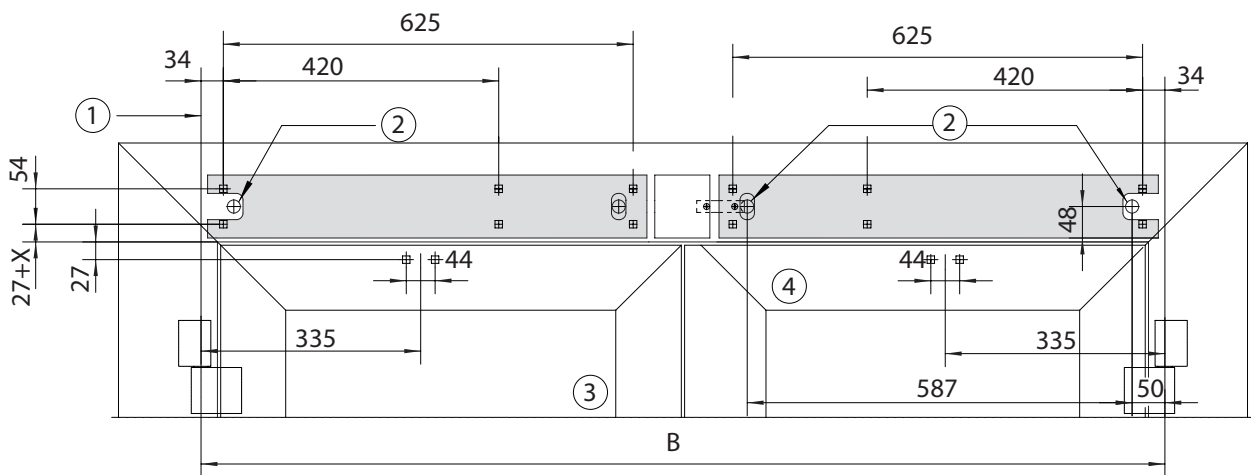


8.4.3 Transom mounting opposite hinge side with link arm (dual-leaf, pushing)

! ▶ Observe drilling template: DIN left and DIN right mirrored.

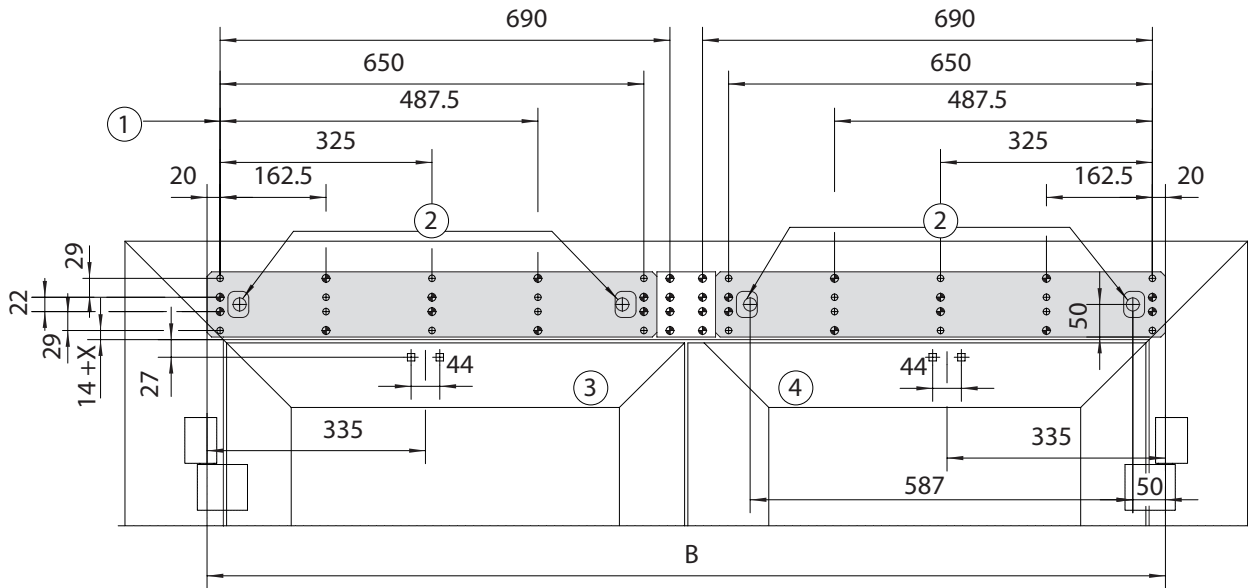
- ▶ Drill both holes for the concealed cable path.
- ▶ Use rivet nuts, anchors bolts or equivalent fastening material.

Direct fixing



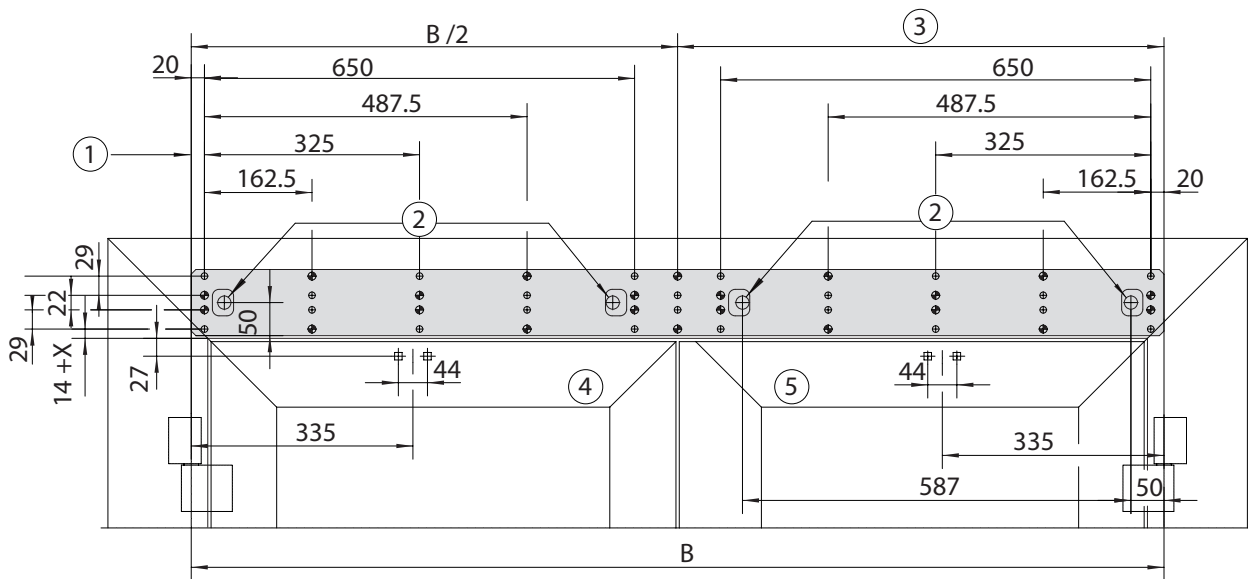
- | | | | |
|---|--------------------------------------|---|-------------|
| 1 | Dimensional reference = hinge middle | 3 | Fixed leaf |
| 2 | Ø 20, concealed cable routing | 4 | Moving leaf |

Fixing with mounting plates






- | | | | |
|---|--------------------------------------|---|-------------|
| 1 | Dimensional reference = hinge middle | 3 | Fixed leaf |
| 2 | Ø 20, concealed cable routing | 4 | Moving leaf |

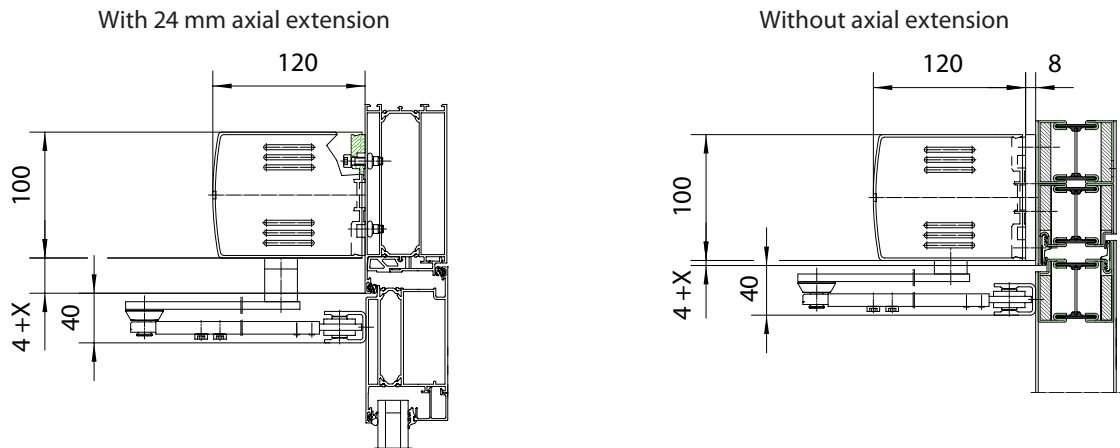
Fixing with continuous mounting plate



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

-  Fitting hole Ø 8
-  Fitting hole Ø 6
-  Fitting hole Ø 5

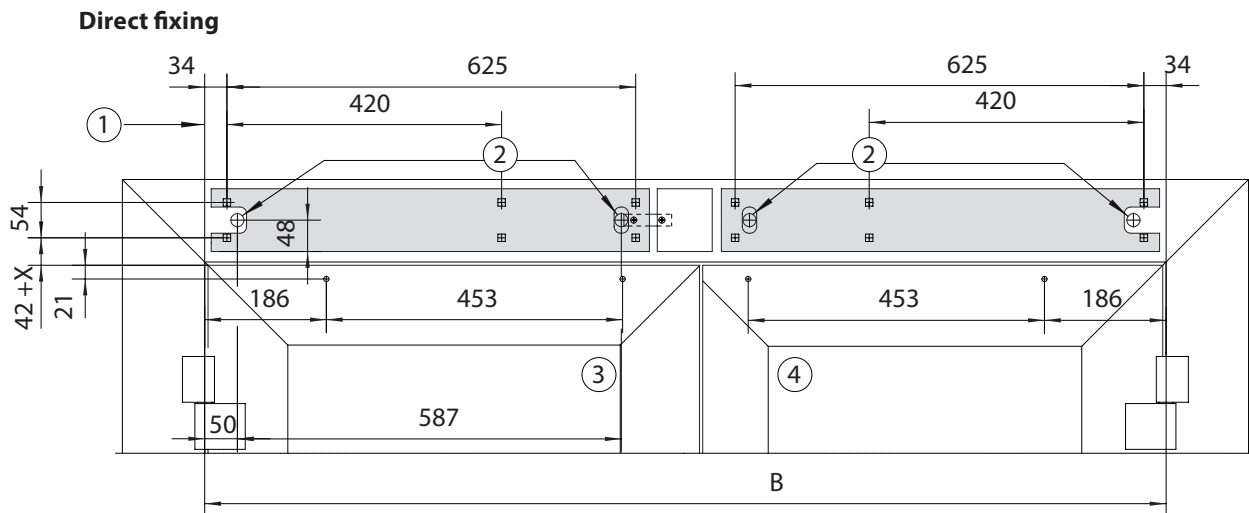
Axial extension X= 0 (without axial extension)
 24 mm
 30 mm
 45 mm



8.4.4 Transom mounting hinge side with roller guide rail (dual-leaf, pulling)

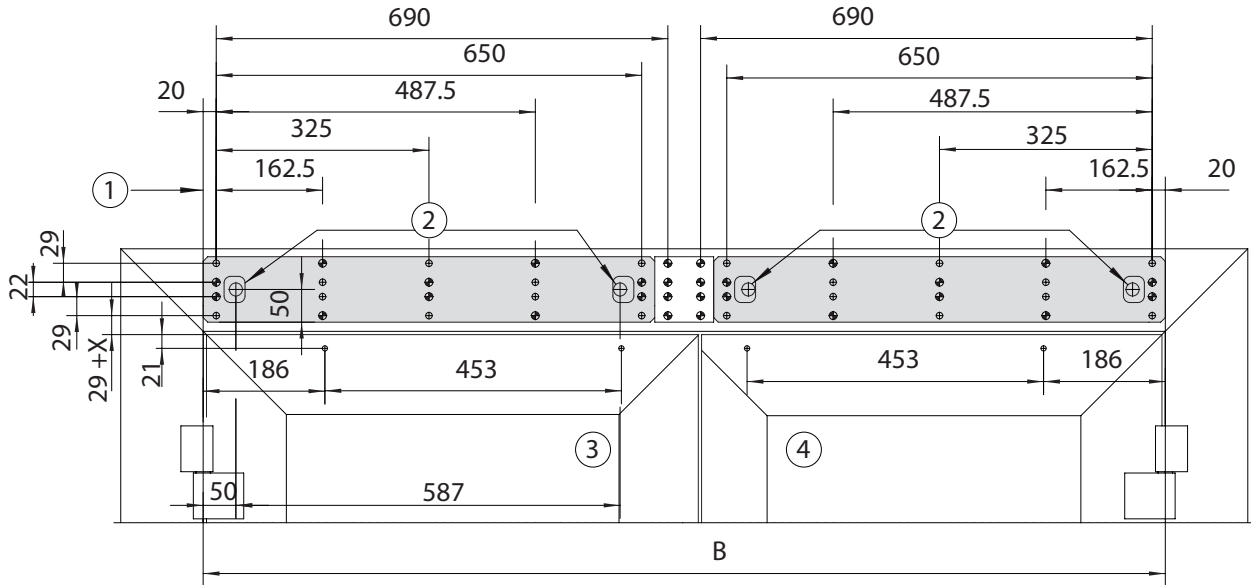
! ▶ Observe drilling template: DIN left and DIN right mirrored.

- ▶ Drill both holes for the concealed cable path.
- ▶ Use rivet nuts, anchors bolts or equivalent fastening material.



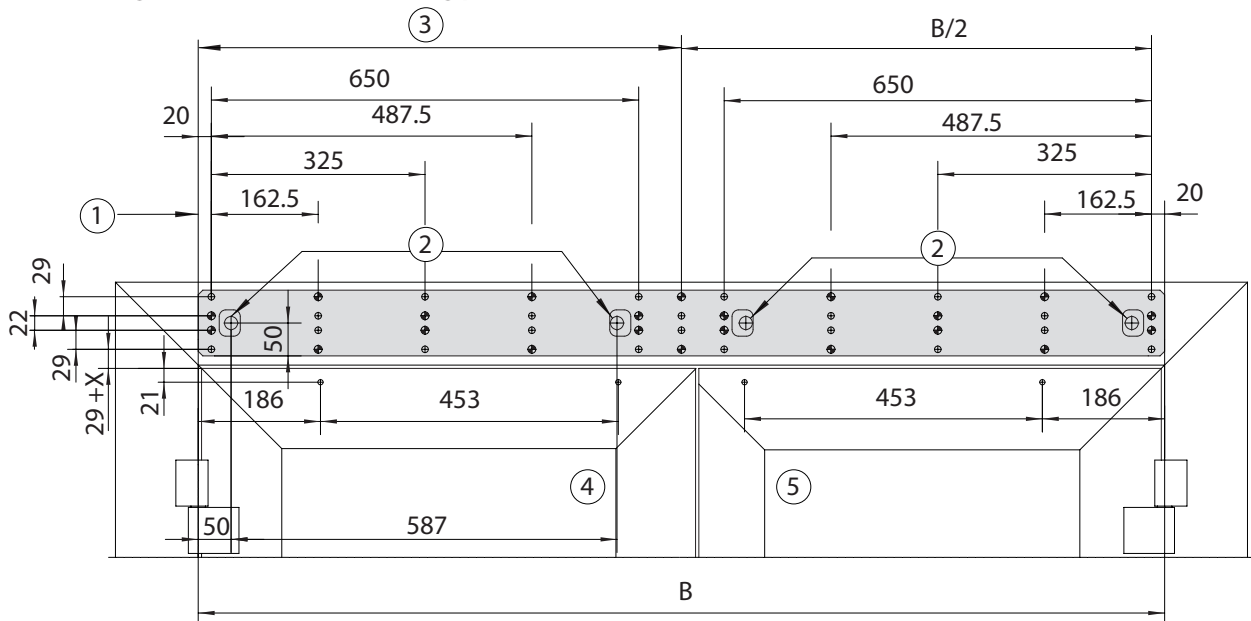
- | | | | |
|---|--------------------------------------|---|-------------|
| 1 | Dimensional reference = hinge middle | 3 | Fixed leaf |
| 2 | Ø 20, concealed cable routing | 4 | Moving leaf |

Fixing with mounting plates






- | | | | |
|---|--------------------------------------|---|-------------|
| 1 | Dimensional reference = hinge middle | 3 | Fixed leaf |
| 2 | Ø 20, concealed cable routing | 4 | Moving leaf |

Fixing with continuous mounting plate

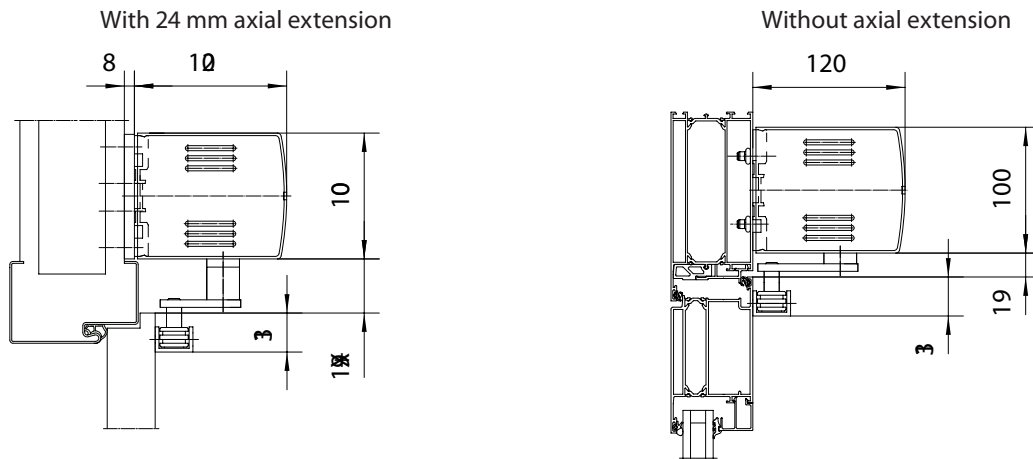


- | | | | |
|---|--------------------------------------|---|-------------|
| 1 | Dimensional reference = hinge middle | 4 | Fixed leaf |
| 2 | Ø 20, concealed cable routing | 5 | Moving leaf |
| 3 | Only required for B > 2000 | | |

-  Fitting hole Ø 8
-  Fitting hole Ø 6
-  Fitting hole Ø 5

Axial extension X= 0 (without axial extension)

- 24 mm
- 30 mm
- 45 mm



8.5 Mounting the drive



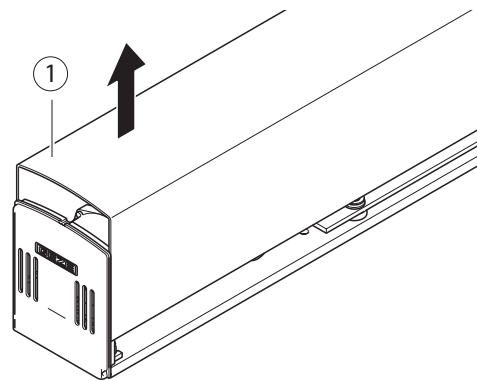
Delivery only as DIN right.

- ▶ If necessary convert to DIN left.



- ▶ During mounting ensure that the connection cables are not pinched.
- ▶ Use only the supplied screws.

- ▶ Lift off the housing cover (1) with a screwdriver.

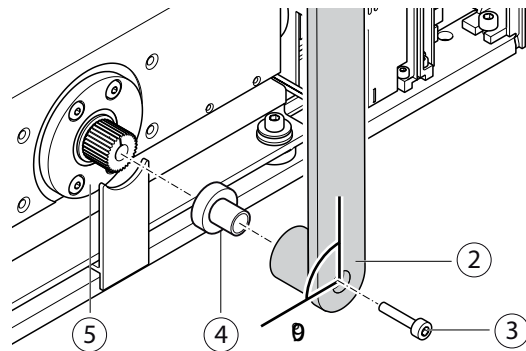


- ▶ If necessary, fasten the mounting plate.
- ▶ Fasten the drive to the prepared threaded holes at the door frame or with the supplied screws to the mounting plate.

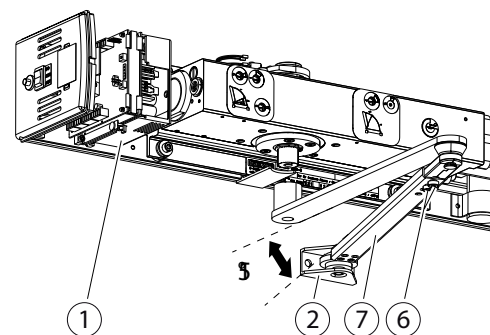
8.5.1 Mounting the link arm (drive on opposite hinge side, pushing) TSA 160 NT / TSA 160 NT Z Invers

! The door drive is mounted true-sided when the controller (6) points to the door pivot point.

- ▶ Press the distance 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.



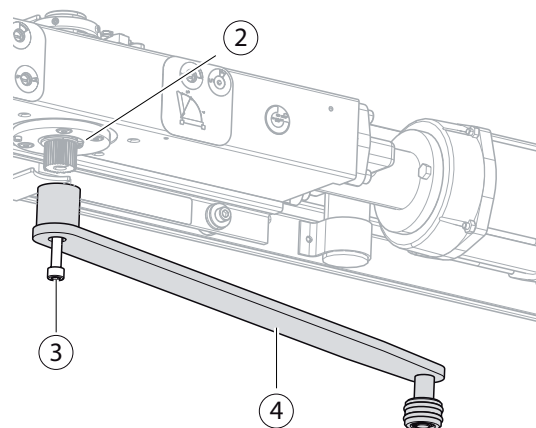
- ▶ Fasten the bearing block (2) at the door leaf with 2 screws M6.
- ▶ Adjust the connecting link arm (7) to length, pretension the lever arm manually. The connecting link arm (7) must be positioned perpendicularly (90°) to the door level and the lever arm be pretensioned by approx. 15°.
- ▶ Tighten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



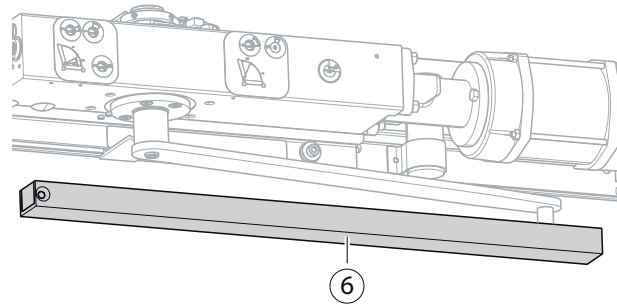
8.5.2 Mounting the roller guide rail (drive on hinge side, pulling) TSA 160 NT Z / TSA 160 NT Invers

! The door drive is mounted true-sided when the controller points to the door pivot point.

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



- ▶ Mount the roller guide (6) on the door leaf with 2 screws M5.
- The roller of the roller lever (4) has to run in the roller guide (6).
- ▶ Close door.
- ▶ Press the roller lever (4) upwards by hand and position the roller over the roller guide (6).
- ▶ Let the roller latch into the roller guide (6).



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

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

- The course of the mechanical mounting corresponds to the course at the drive TSA 160 NT.
- Electrical connection: see wiring diagram.

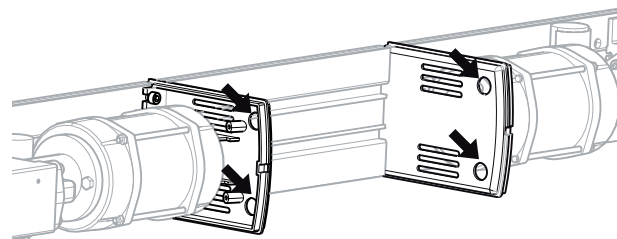
8.7 Extension of integrated closing sequence control unit TSA 160 NT -IS, TSA 160 NT F -IS, TSA 160 NT Z -IS

When mounting plates are used:

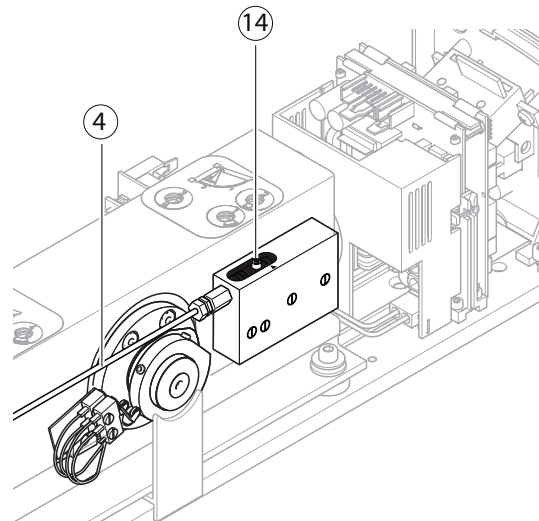
- ▶ Mount the mounting plates and intermediate mounting plate at the frame or sash.
- ▶ Mount the fixed swing door drive on the fixed leaf.
- ▶ Mount the swing door drive (-IS) on the moving leaf.
- ▶ Mount the intermediate cover kit optionally (without the cover itself).

Mounting variations	TSA 160 NT F-IS
DIN left	
DIN right	

- ▶ Lay the wire rope (4) in accordance with the sketch (see above).
- ▶ Break out the side parts at the marking.

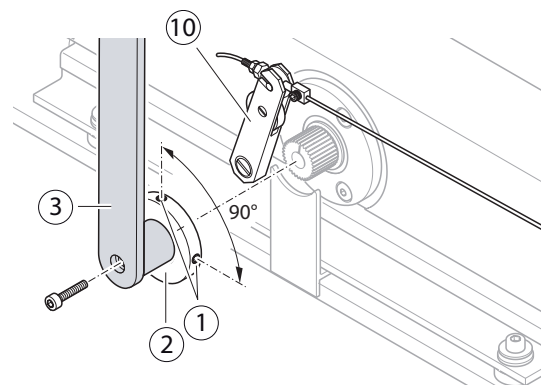


- ▶ Insert the wire rope (4) in the IS block (moving leaf) and fasten it with the clamping screw (14).

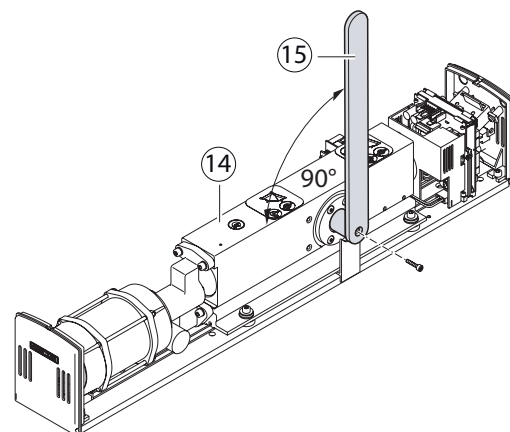


Mounting on the fixed leaf drive

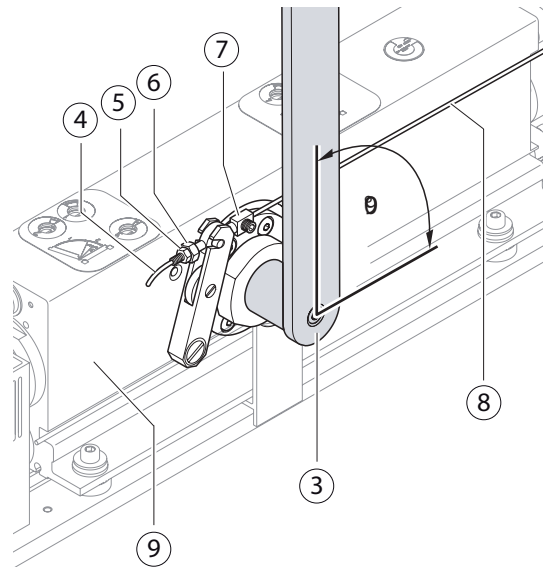
- ▶ Slide the cam plate (2) onto the lever of the fixed leaf drive (3) and premount with the clamping screws (1) as shown.
 - Two clamping screws lie in parallel, one clamping screw lies 90° to the longitudinal axis of the lever.
- ▶ Mount the release rocker (10) in accordance with the sketch.



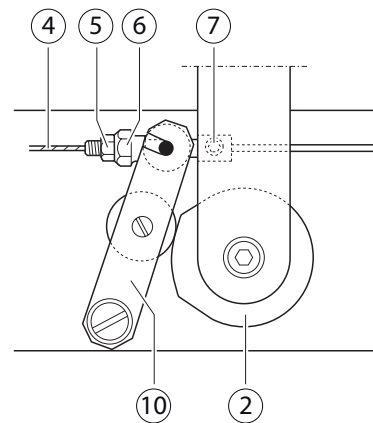
- ▶ Carry out mounting of the link arm or roller guide rail at the fixed leaf, see Section 8.5.1 or 8.5.2.



- ▶ Guide the wire rope (4) through the spindle (7).

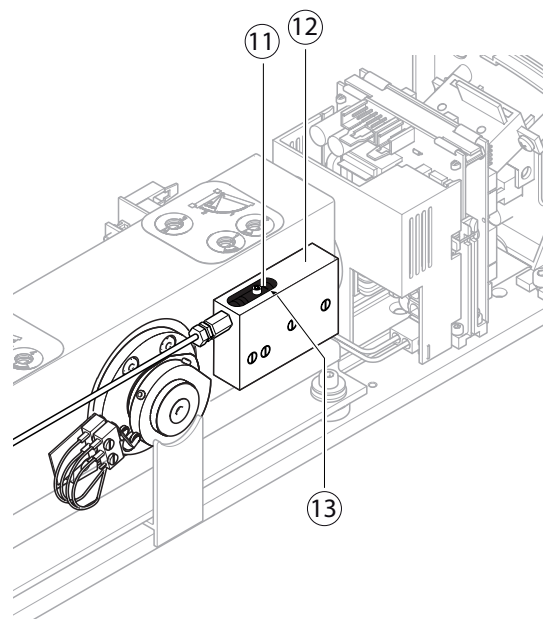


- ▶ Lay the release rocker (10) against the cam plate (2).
 - The release rocker has its maximum deflection in this position.
- ▶ Pull the wire rope (4) tight and clamp tight with the clamping screw (7).

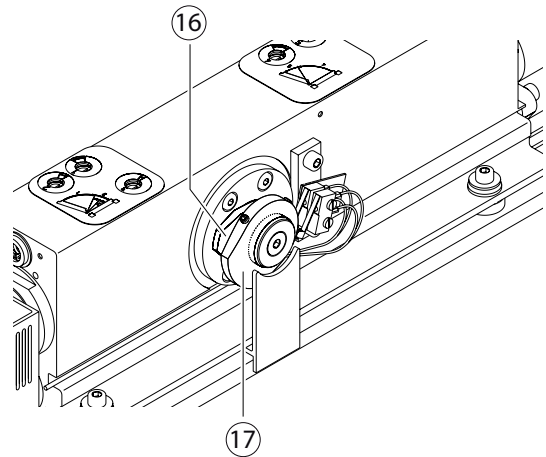


Mounting on the moving leaf drive

- ▶ Adjust the adjusting nut (6) so that the marking arrow (11) exactly covers the marking notch (13) at the IS valve (12).
- ▶ Then lock with the lock nut (5).



- ▶ Carry out mounting of the link arm or roller guide rail at the moving leaf, see Section 8.5.1 or 8.5.2.
- ▶ Check the IS function: Open both leaves manually and then release.
 - The fixed leaf has to close and the moving leaf does not begin to close until shortly before the fixed leaf closing position (max. 30° open position).
 - The begin of closing can be modified by adjusting the cam plate (2) at the fixed leaf drive.



9 Electrical mounting and device settings



For electrical mounting and device setting:
see wiring diagram

9.1 Mains connection



DANGER!

Danger of fatal injury via electric shock!

- ▶ The electrical system (230 V) may only be connected by a professional electrician.
- ▶ Observe the VDE regulations.
- ▶ Before working on the electrical system, always disconnect the system from the mains network.
- ▶ Switch off the master switch provided at customer and secure against unintentional switching on.

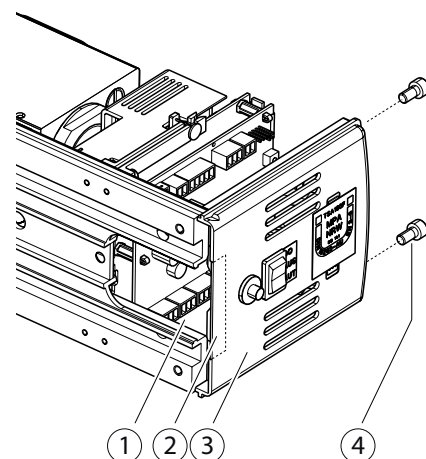


CAUTION!

Damage through incorrect supply voltage!

- ▶ Before connecting the power cable ensure that the specifications on the information plate agree with the supply voltage and that the fuse has been removed.

- ▶ Pull off the side panel (3) by loosening the cylinder head screws (4).
- ▶ Lay the power cable and supply cable of the control devices in accordance with the cable plan and connect in accordance with 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.

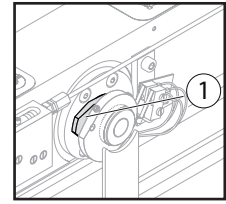
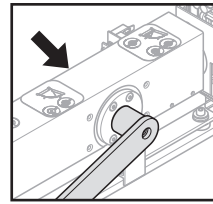


9.2 Settings

9.2.1 Setting the limit switch

Factory setting: 90° door opening angle.

- ▶ Open the door manually up to the desired opening angle or buffer and jam (wedge).
- ▶ Set the blue cam plate (1) so that the limit switch is operated in the open position of the door.
- ▶ Tighten the setscrews of the blue cam plate

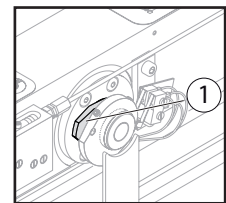
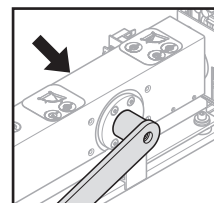


In the case of 2-leaf systems the blue cam plate (1) at the moving leaf drive and at the fixed leaf drive have to be set.

9.2.2 Setting the limit switch at TSA 160 NT Invers

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.
- ▶ Tighten the setscrews of the blue cam plate



9.2.3 Safety sensor (SIS, SIO)

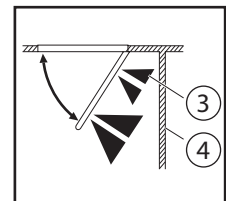
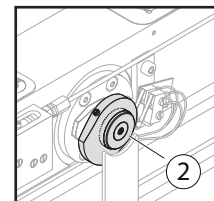
At all 1- to 2-leaf door systems the safety sensors (SIS, SIO) have to be connected to the controller of the drive belonging to the door leaf.

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

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

In order to mask structural areas (e.g. a wall) in the opening direction of the respective door leaf the yellow cam plate has to be adjusted.

- ▶ Open the door manually until the sensor (3) signals the wall (4) by means of an indicator LED.
- ▶ Move the door back until the LED extinguishes.
- ▶ Jam the door with a wedge.
- ▶ Tighten the setscrews of the blue cam plate
- ▶ Turn the yellow cam plate (2) 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



9.2.4 Closing torque for TSA160NT F and guide values for other drives

The door closer power size (closing force of the closer) depends on the door width.

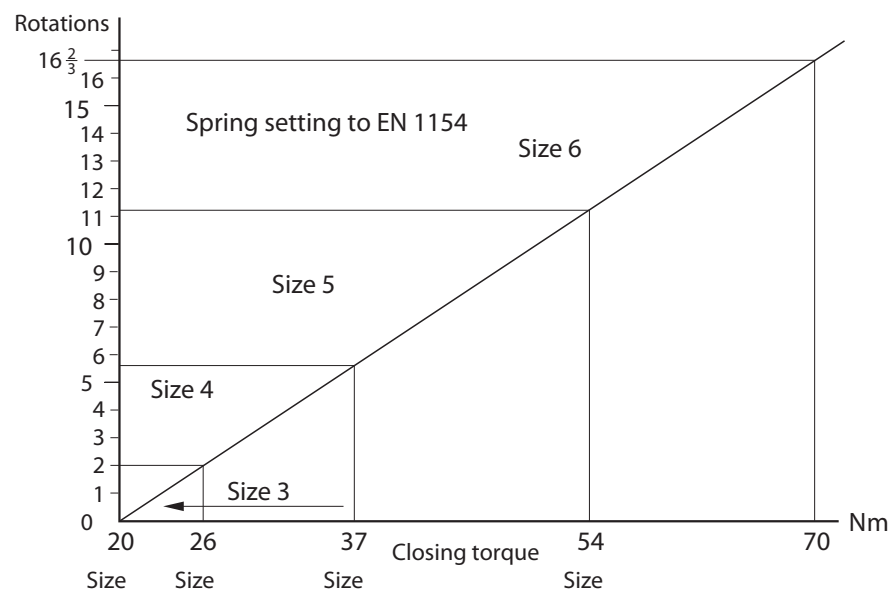
The door leaf widths and door closer power sizes specified in the EN 1154 are binding for the TSA 160NT F. EN 1154 is a guide value for all other drives. If the constructional (door height, door weight) or local (wind influence) conditions make it necessary, the next higher size has to be set. The closing force can be changed steplessly for the variants EN 3 – EN 6 (see diagram and Section 6.1).

The closing force of Variant EN 7 is fixed.

- Counterclockwise = lower
- Clockwise = higher

TSA160NT F in acc. with DIN EN 1154

Door closer power size EN	Door leaf width to EN [mm]
3	>850 ... 950
4	>950 ... 1100
5	>1100 ... 1250
6	>1250 ... 1400
7	>1400 ... 1600

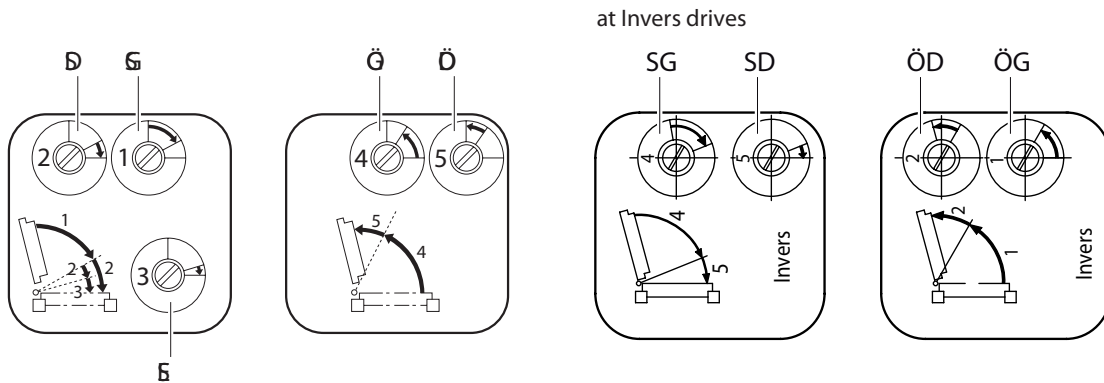


9.2.5 Speed adjustment

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

- ▶ Optimising the closing process with "SG" and "SD".
 - Closing speed Adjusting screw SG
 - Latching speed Adjusting screw SD
 - Latching setting Adjusting screws SE (not at Invers drives)

- ▶ Optimising the opening process with "ÖG" and "ÖD".
 - Opening speed Adjusting screw OG
 - Back check Adjusting screw OD



CAUTION

The SE setting may not cause a delayed opening of the door leaf.

Clockwise = Speed reduction

Counterclockwise = Speed increase

CAUTION

Damage to the brass threaded sleeves!

- ▶ Be sure not to skew the threaded sleeves during the adjusting process.

10 Final check

The safety of power-operated windows, doors and gates must be checked before initial commissioning and at least once a year by a trained professional.



A trained specialist is a person who, due to his/her specialist training and experience, has sufficient knowledge in the field of power-operated windows, doors and gates and is familiar with the relevant statutory work safety regulations, accident prevention regulations, directives and guidelines and generally recognised engineering rules (e.g. DIN standards, VDE regulations) to the extent that he/she can assess whether power-operated windows, doors and gates are safe to operate.

Written proof of the test is required.

Safety analysis (danger analysis)

In accordance with Machinery Directive 2006/42/EC and DIN 18650, a risk analysis must be performed and the door system identified in accordance with CE Identification Directive 98/68/EEC before commissioning the door system.

This includes:

- ▶ Checking measures for security and prevention of crushing, impact, shearing or drawing-in spots.
- ▶ Checking the function of the safety and actuation sensors.
- ▶ Checking the protective conductor connection to all metal parts which can be touched.

Test run

- ▶ Disconnect the door drive from the power supply.
- ▶ Check manually that the door moves properly, ensure that it does so.
- ▶ Check the correct mounting and closing sequence control (for 2-leaf doors) in manual operation.
- ▶ For TSA 160 NT F: Open the door(s), check the closing speed and latching action and if necessary adjust. Checking of the valve settings is recommended for all the other drive types
- ▶ Switch the power supply back on or plug the connector back in.
- ▶ Check measures for protecting and avoiding of crushing, impact, shearing and drawing-in spots.
- ▶ Check the functioning of presence sensors and movement detectors.
- ▶ Check the protective conductor connection to all metal parts which can be touched.

11 Periodic monitoring, maintenance

The door drive is maintenance-free to a great extent and extensive work is not required, with the exception of:

- ▶ Check fastening screws for firm seating.
- ▶ Check the link arm or the roller lever for damage, replace if necessary.
- ▶ Tighten the fastening screw for the link arm or roller lever.
- ▶ 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.

11.1 Dangers during servicing



DANGER

Danger of fatal injury via electric shock!

- ▶ Disconnect the power supply from the drive by a master switch supplied by the customer and secure it against reactivating. If necessary, disconnect the connector in the drive.
- ▶ Before working on the electrical system, always disconnect the system from the mains network.
- ▶ Switch off the master switch provided at customer and secure against unintentional switching on.



DANGER

Danger of fatal injury through an earth fault and lack of earthing!

- ▶ When carrying out remounting plug the earth cable back in at the same point before mounting the hood.



WARNING

Danger of injury through crushing resulting from swing movements of the lever or link arm!

- ▶ Always switch off the power during adjusting work.

**WARNING**

Danger of getting burnt through hot motor!

The motor in the drive can have relatively high temperatures after continuous operation or poor ease of movement or other defects.

- ▶ Switch the motor off, disconnect it from the power supply and let it cool down before carrying out further work.

**CAUTION**

Danger of injury from falling hood!

- ▶ For dismantling unplug the earthing cable (yellow-green) from the tab connector at the hood.
- ▶ When carrying out remounting plug the earth cable back in at the same point before mounting the hood. Otherwise there is the danger of an electric shock when an earth fault occurs.

11.2 Service

The owner must ensure that the system functions properly. A safety test with maintenance has to be carried out by a trained specialist (in accordance with DIN 18650) as required, but at least once a year. When used and operated in Germany the guidelines BGR 232 for power-operated windows, doors and gates issued by the "Hauptverband der gewerblichen Berufsgenossenschaften" (German Federation of trade associations) in 53757 Sankt Augustin, Germany. When operated outside Germany the owner must observe the country-specific regulations. Written proof of the implementation is required.

We recommend the conclusion of a corresponding maintenance contract under which our customer service carries out the safety-relevant testing and maintenance with the following services:

- Checking and, if necessary, optimisation of the hydraulic and electrical functions
- Checking of the fastening, setting and function of the control elements
- Preventative maintenance of the external devices, if necessary adjustment, functional check and cleaning
- Checking of safety of the entire system

11.3 Repairs

Any repairs are to be carried out by GEZE or qualified personnel authorised by GEZE.

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