

Installation and operating instructions

Swing gate operator SWING-X (HD), SWING X TP



tousek[®]
G A T E A U T O M A T I O N





Important warning and safety notes for installation and operation

- These installation- and operating instructions form an integral part of the product "gate operator". They have been specifically written for professional installers trained and skilled in the trade and should be carefully read in their full length before carrying out the installation. They describe the proper installation and operation of the sliding gate operator only, not of the overall device "automatic gate". After the installation this manual has to be handed over to the user.
- **Installation, connection, adjustments, putting into operation, and servicing may only be carried out by trained professionals in full accordance with these installation- and operating instructions.**
- The EU Machine Directive, laws and rules concerning the prevention of accidents, and laws and standards which are in force in the EU and in the individual countries have to be strictly followed.
- The TOUSEK Ges.m.b.H. cannot be held liable for any claims resulting from disregards of the laws and standards in force during the installation and operation.
- The product may only be used in accordance with its original purpose, for which it has been exclusively designed, and which is described in these installation and operating instructions. The TOUSEK Ges.m.b.H. rejects any liability if the product is used in any way not fully conforming to its original purpose as stated herein.
- **The product is not suitable for installation in explosion-hazardous areas. The existence of inflammable gas and steam is of great danger !**
- The packaging materials (cardboard, plastic, EPS foam parts and filling material etc.) have to be properly disposed of in accordance with the applying recycling- and environmental protection laws. They may be hazardous to children and therefore have to be stored out of children's reach.
- Before beginning with the installation the installer has to make sure that all mechanical components of the gate facility, like carrier profile/rail, gate frame and panels, guiding elements etc. are sufficiently supportive and resistant for the purpose of gate automation. Check also whether the product has transport damages.
- All electrical installations have to be made in full conformity with the applying rules and laws (e.g. using a fault current circuit breaker, proper grounding etc.).
- An all-pole disconnecting main switch with a contact opening-gap of minimum 3 mm has to be foreseen.
- When installing the safety device (photocells, safety edges, emergency-stops etc.) please comply with the valid directives/standards, the criteria of practical rules of conduct, the installation environment, the operating logic of the system and the effected force of the motorised gate. .
- The safety devices must secure possible bruise, shear and general danger areas of the motorised gate.
- After installation the proper function of the gate facility and the safety devices has to be checked!
- Place warning signs and notes of the valid regulations to indicate danger areas .
- With each installation the identification data of the motorised gate has to be placed in a visible place.
- The label for the Handauslöser has to be placed next to its operating element.
- The electric motor heats up during operation. Therefore the device should only be touched after it has cooled off.
- Please make sure that no other persons are on site of the motorised gate area, especially in when operating the facility in hold to run mode (switch with OFF-pre adjustment) . The pre-adjusted OFF-button/switch has to be placed in sight of the actuated gate but away from moving parts. This switch/button (except key-switch) has to be mounted in min. 1,5m height and non-accessible to the public.
- **Children have to be instructed, that the gate facility as well as the belonging parts may not be used improperly, e.g. for playing. Furthermore handheld transmitters have to be kept in safe places and other impulse emitters as buttons and switches have to be installed out of children's reach.**
- Only original spare- and replacement parts may be used for repair of the product.
- The TOUSEK Ges.m.b.H. rejects any liability for claims resulting from usage of the product in combination with components or devices which do not fully conform to the applying safety laws and rules.
- The installer has to inform the user about all aspects of the automatic operation of the complete gate facility, as well as about emergency operation. The installer further has to supply to the user all instructions relating to the safe operation of the gate facility. The installation and operating instructions also have to be handed over to the user.
- The user has to be informed that he has to turn off the main power switch in case of malfunction of the product and that he can use the facility again after repair and adjustment works have been completed.
- **Please notice that the warranty will not be applicable if the label with the engine number has been removed or damaged.**



Maintenance

- **Disconnect the power supply during mounting, maintenance and repair works.**
- **Maintenance works may only be carried out by qualified personnel.**
- **Check the proper force adjustment once a month.**
- **Check the proper function of the emergency release mechanism periodically.**
- **Check if all mounting screws are securely fastened periodically.**
- **Remove dirt from the operator periodically.**
- **Maintenance and servicing of the complete gate facility has to be carried out according to the gate builder's/ installer's instructions.**

The swing gate operator TOUSEK SWING X, can be easily installed at new and also already existing swing gate facilities. For the development of the SWING X electromechanic operator the main objective was set upon reliability and long durability. For this reason all parts are made of premium materials such as aluminium, stainless or galvanised steel.

Also the whole gearing which is placed in a diecast aluminium housing as well as the drive unit are entirely made of metal. This ensures long lasting trouble-free operation.

The drive/operator is gimballed-mounted on both gate and column side. This enables an absolutely free of play installation of the operator as well as smooth and even movement of the gate.

An extremely massive spindle together with a spindle socket made of brass ensures a long lasting and reliable operation.

Of course the spindle is supported on both sides. This prevents unwanted vibrations.

A torque sensor enables the use of the automatic reverse system (ARS). When touching an obstacle the operator stops and reverses automatically. This guarantees a high degree of safety.

The operator closes the gate reliably. The emergency release which is important in case of power failure is lockable with a standard profile half cylinder. It can therefore be replaced and integrated into an already existing house key system. The cylinder and 3 keys are included as standard equipment.

The operators ensure the blocking of the gate and therefore usually do not need the use of electric locks.

To obtain a fixed detention of the gate in the end positions it can also

be useful for blocking gate operators - according to the installation- to install an additional locking device such as e.g. a electronic lock. In order to avoid a limit stop on the floor - which can be dangerous and annoying - the operator has a built-in mechanical limit stop.

Characteristics

- electromechanical swing gate operator for 230V a.c., SWING X TP: 3 x 230Va.c.
- gate weight max. 500kg (per wing)
- self-locking gear mechanism
- high-grade bronze worm wheel
- emergency release lockable with standard half cylinder
- torque sensor
- adjustable internal limit stops (mechanical)
- adjustable soft stop
- automatic reverse system ARS
- suitable for subsequent installation
- elegant design



Technical data

Swing gate operator SWING-	X3HD	X3LHD	X4HD	X4LHD	X5/1LH		X3HD	X3LHD	X4HD	X4LHD	X5/1LH	
Power supply	230Va.c., 50Hz					Motor condensator	6,3µF				10µF	
max. current consumption (excl. equipment)	1,9A											
Max. wing width	3m	3,5m	4m	4,5m	5m	max. stroke	320mm	450mm	320mm	450mm		
Max. wing weight	500kg					travel speed	14mm/s		11mm/s			
Operating factor (mode S3)	60%				40%	Thrust	4000N		5000N		6500N	
max. inclination / gradient of gate entry	up to 7° *)					Ambient temperature	-20° up to +40°C					
						Article no.	11260520	11260530	11260460	11260470	11260420	

Swing gate operator SWING X TP	X3 TPspeed		SWING X4 LHTP		X3 TPspeed	X4 LHTP
Power supply	3 x 230Va.c., 110Hz		3 x 230Va.c., 65Hz	max. stroke	320mm	450mm
max. current consump- tion (excl. equipment)	200W			travel speed	30mm/s	14mm/s
Max. wing width	3m	4m		Thrust	3000N	5000N
Max. wing weight	300kg	400kg				
Operating factor (mode S3)	80%			Ambient temperature	-20° bis +40°C	
max. inclination / gradient of gate entry	bis 7° *)			Article no.	11260550	11260570

connection box SWING X TP	to extend the motor wire and the sensor wire	Article no.
motor wire for SWING X TP	10m extension for SWING X TP	14120430
	20m extension for SWING X TP	14120440

Other (SWING X + X TP)	blocking in open and closed position • force adjustment through control unit • emergency release lockable through standard half cylinder • adjustable brackets • torque sensor optional: boltable motor attachment brackets for gate and column (galvanised or stainless steel)
------------------------	---



- Max. wing widths do neither apply to full-panel gates (but to stave or trellised gates) nor to non-horizontal gates!
- *) With rising gates the max. leaf width and gate weight have to be reduced up to 50%. The gate and pillar sided support bracket for the operator enables a possible gradient of up to 7°.



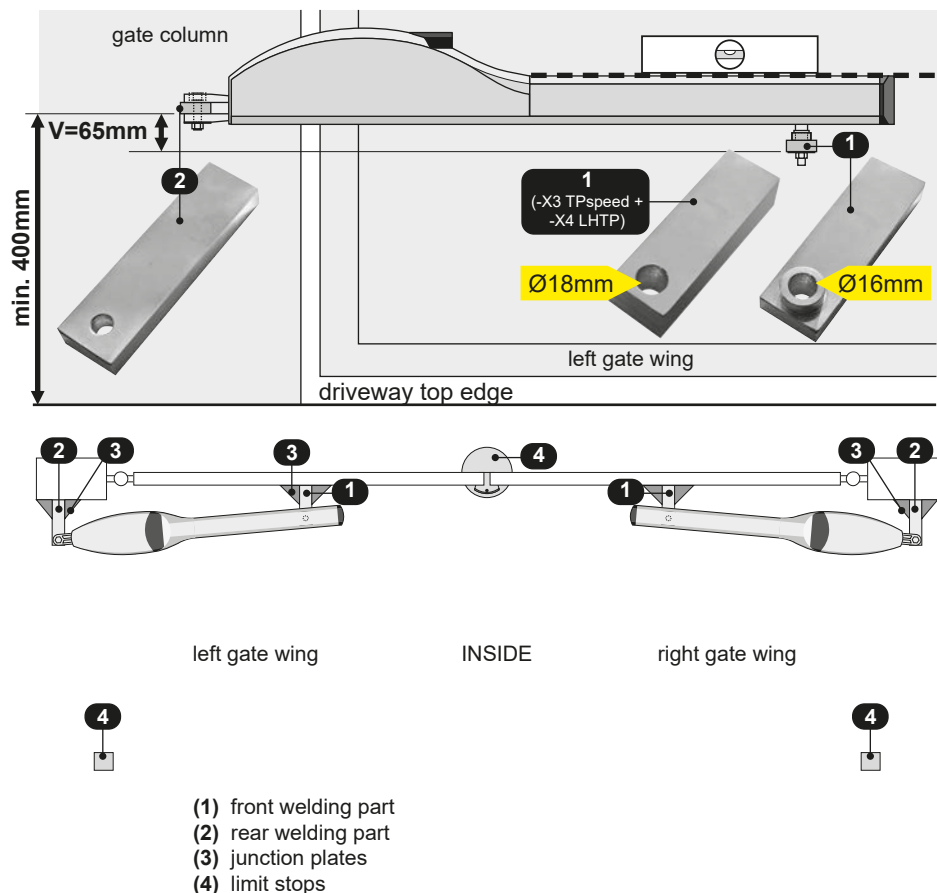
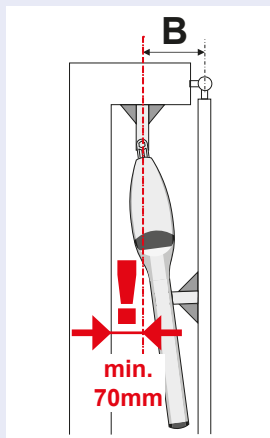
General installation notes

- The operator type SWING X is equipped with internal limit stops that can be used for gates below 200kg and with a wing width below 3m for adjustment of limit positions OPEN and CLOSED.
Gates with a weight above 200kg and more than 3m gate width can not be used with the internal limit stops, please use external limit stops (4) for gate limit positions! particularly in the closed position it is recommended to use always a floor limit stop (4) or Tousek piston rod.
- With lean or wooden gates the welding part should not be mounted directly on the gate. Please use for that a flat steel bar.
- *) Attention: to avoid contaminations and to ensure a long lasting and reliable operation please make sure to keep a minimum distance of **400mm** to the driveway top edge.
- The mounting points for the **front (1)** and for the **rear welding part (2)** should be chosen in accordance of the below mentioned mounting measures. The adjustment/alignment of the operator should be levelled out (**please note vertical misalignment (V) of welding parts !**).



Important

- When planning or installing the operator, make sure that it has enough space also in the door open position.
- In no case, in order to make space, the mounting dimension B may be shorter than specified!** (dimensions ➡ page 5,6)



2a. Definition of mounting points and attachment of welding parts

Installation

Mounting points



Note

- The mounting points for the front (1) and for the rear welding part (2) should be chosen in accordance of the mounting measures (see following tables).
- Please note that the measures A, B and D must always be measured from the pivotal point of the gate.
- Furthermore a vertical has to be placed for a levelled adjustment of operator (V=65mm) between the welding parts (Lower edge to lower edge).



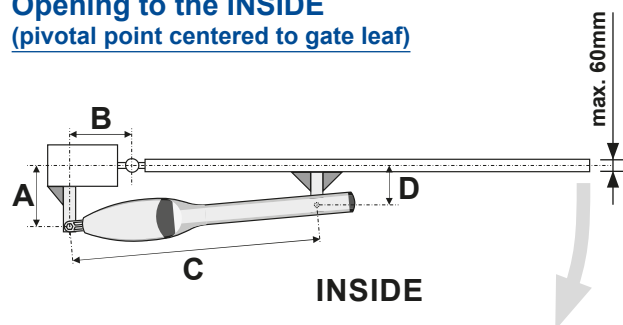
Mounting measures with different swing gate situations

Note

- The specified measures correspond only to the pictured gate types „pivotal point centered with max. leaf thickness of 60mm“ or „pivotal point not centered, to the inside“.
- For differing gate types please find out the corresponding measures !

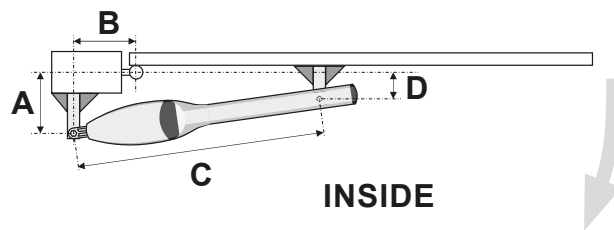
Opening to the INSIDE

(pivotal point centered to gate leaf)



Opening to the INSIDE

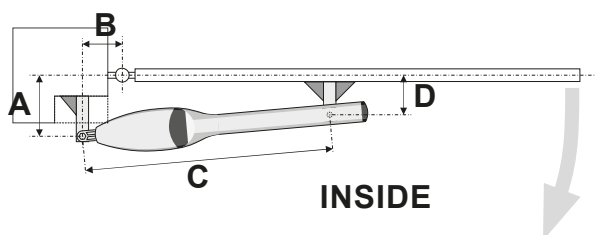
(pivotal point not centered (inside) to gate leaf)



Mounting measures SWING X3 opening to the INSIDE	SWING X3HD + SWING X3 TPspeed (standard stroke)	SWING X3LHD (long stroke)		
Application	standard	standard	for larger columns	for larger opening angle
A (mm)	145	190	180–250	160
B (mm)	145	190	160	200
C (mm)	860	990	990	990
D (mm)	110	130	130	130
max. opening angle	100°	110°	100°	120°
max. wing width	3m	3,5m	3m	3m

Mounting measures SWING X4, X5 opening to the INSIDE	SWING X4HD (standard stroke)		SWING X4LHD + SWING X5/1LH + SWING X4 LHTP (long stroke)		
Application	standard	for larger opening angle	standard	for larger columns	for larger opening angle
A (mm)	145	115	190	180–250	160
B (mm)	145	145	190	160	200
C (mm)	860	860	990	990	990
D (mm)	110	100	130	130	130
max. opening angle	100°	110°	110°	100°	120°
max. wing width	4m	3,5m	X4LHD: 4,5m X5/1LH: 5m X4 LHTP: 4m	4m	4m

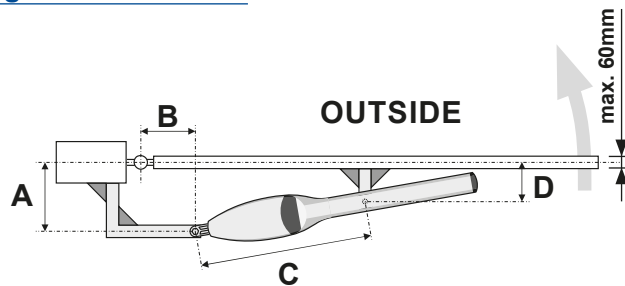
Mounting at larger columns



Important

- For keeping the measurements A and B, at larger columns an alcove according to the beside picture has to be made.
- The recess in the gate column has to be big enough to make sure that the electrical supply cable of the operator will not be buckled.

Special case: opening to the OUTSIDE



Mounting measures opening to the OUTSIDE	SWING X3HD + SWING X3 TPspeed (standard stroke)	SWING X4HD (standard stroke)	SWING X3LHD + X4LHD + X5/1LH + X4 LHTP (long stroke)
Application	standard	standard	standard
A (mm)	145	145	200
B (mm)	145	145	200
C (mm)	550	550	570
D (mm)	110	110	145
max. opening angle	100°	100°	95°
max. wing width	3m	4m	X3LHD: 3,5m X4LHD: 4,5m X5/1LH: 5m X4 LHTP: 4m

Mounting of welding parts

Mounting of rear welding part

- after having defined the pivotal point (taking into account the mounting measures) attach the rear welding part (2) in that position to the gate column (wall) and support it with a gusset plate (3) .

Mounting of front welding part

- now attach the front welding part (1) in compliance with measure C to the gate wing.
Attention: please note upper/under side (see figure page 4).
- Please make sure that the gate is fully closed and that the vertical misalignment V = 65mm between the two welding parts is kept to ensure a levelled mounting of the operator.
- With lean or wooden gates the welding part should not be mounted directly on the gate. Please use for that a flat steel bar.
- support the front welding part (1) with a gusset plate (3) .

2b. Installation of the operator

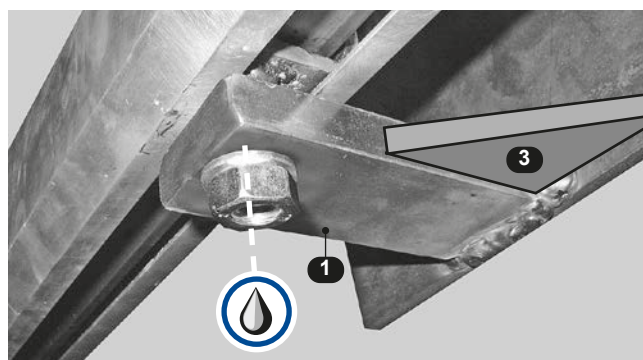
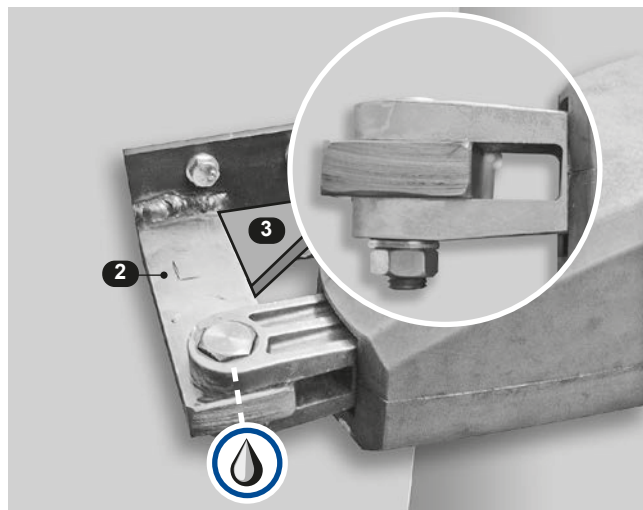
Installation

- After having mounted the welding parts and junction plates (3) please install the operator as follows.
- **Before mounting please note that the moving parts should be lubricated on their pivotal points!**
- Now slide the operator with the fork on the rear welding part (2), insert the screw from above, place a plate below and fix with by using the screw nut.
- **the screw nut that has been tightened before, should now be opened a little (approx. 1/4 turn), to ensure the movability on the pivotal point!**
- Now turn the gate wing until the bolt/pin of the part (L) (= part which is moved through the operator spindle) can be put from above into the drilling of the front welding part (1). Then place a plate below and fix by using the screw nut.
- **the screw nut that has been tightened just now, should now be opened a little (approx. 1/4 turn), to ensure the movability on the pivotal point!**



Lubrication for moving mounting parts

- The pivotal points of the operators (holes of welding parts and corresponding pins/screws, that are used for the attachment of the operator on the welding parts, have to be lubricated before installation of the operator !



2c. Adjustment of internal limit stops

Installation

- The operator type SWING X is equipped with internal limit stops that can be used for gates below 200kg and with a wing width below 3m for adjustment of limit positions OPEN and CLOSED.
- The following steps describe the adjustment for **gates opening to the inside** (when opening to the outside then the limit stops have exactly the contrary function - (6) for closed and (5) for open position):
- Unlock the gate (see „emergency release“).
- Manually move the gate with unlocked operator into end position CLOSED.
- Now move the internal limit stop „closed“ (5)- after dismantling the hexagon head screw- towards the part (L) (on contact!). After that please tighten the hexagon head screw.
- Now move the gate into OPEN limit position.
- Now move the internal limit stop „open“ (6)-after dismantling the hexagon head screw - towards the part (L) (on contact!). After that please tighten the hexagon head screw again.
- Lock the operator again.



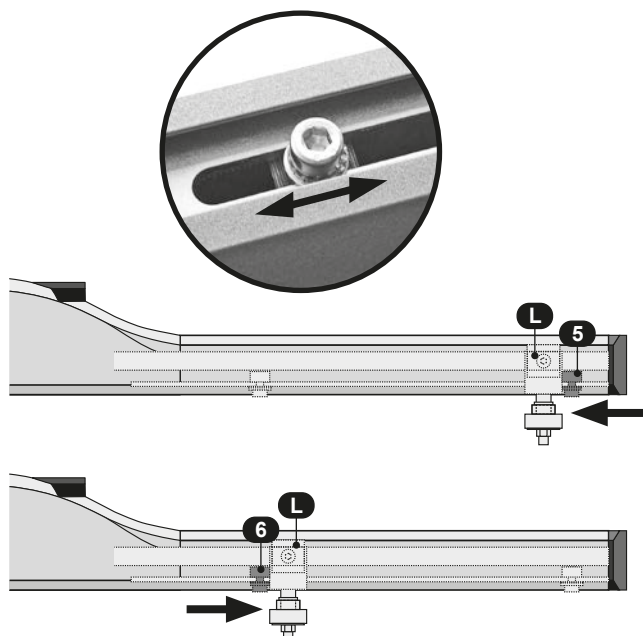
Important (for gate wing > 200kg or >3m)

- Gates with a weight over 200kg or with a width above 3m, as described here, can not be used with the internal limit stops, please use external limit stops (4) for gate limit positions!



Readjustment

- When operator is ready for operation, place/drive/move the operator with electricity (through an impulse) into limit positions and if necessary readjust the internal limit stops.
- **Before adjusting the operator please disconnect from power supply**



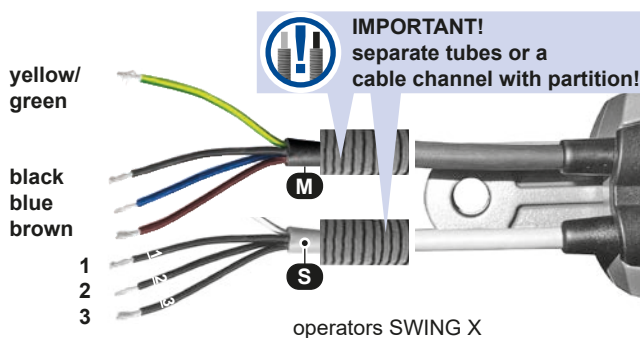


Warning

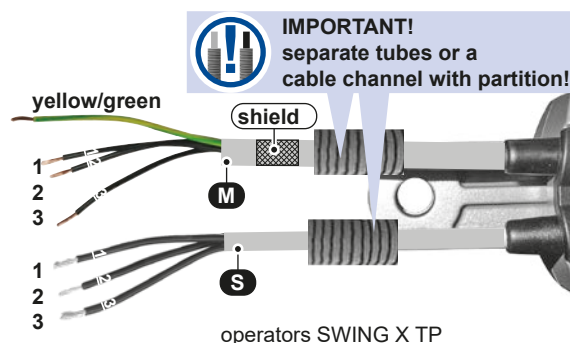
- Before carrying out the electrical connections, the power supply of the gate facility must be turned off
- The safety regulations for electric shock prevention have to be complied.
- The device should only be connected by qualified personnel
- The device should not be used in an explosive environment !
- An all-pole disconnecting mains switch with a contact opening gap of min. 3 mm has to be foreseen. The gate facility has to be secured according to the valid safety regulations!
- **IMPORTANT:** The control lines (buttons, radio, photocells, etc.) have to be laid separately from the 230V lines (supply line, motors, signal lamp).
- The safety standards and regulations regarding the force adjustment have to be in compliance with the effective rules !



- The gate facility must be turned off from power supply when making the electrical connections.
- The motor wire (M) and sensor wire (S) have to be connected to the control unit as described in the manual of the control unit.
- It is important to pay attention to the color or marking codes (1-3) of the lines!
- For the connection of diverse safety devices, transmitters and other accessories please check the corresponding manuals (please note cable/wire plan).
- The force adjustment of the operator is made through the control unit (please see manual for control unit).



Connection wire with the color / number		
	SWING X	SWING X TP
(M) motor cable	black	1
	brown	2
	blue	3
	yellow/green	yellow/green
		shield
(S) sensor cable		1
		2
		3



Important

- The motor and sensor wires must be supplied to the control unit in 2 separate tubes or a cable channel with partition.
- The sensor wire must not exceed the max. length of 50m ! - For lengths of more than 20m shielded control lines must always be used. The shield must be clamped together with the cable number 3 (terminal 68)
- For the sensor supply line between operator and electronic control make sure that only the 3 electronic control cables are being clamped - do not clamp to a ground wire (earth lead)!



2e. Dismounting



The dismounting of the motor is effected in the opposite order of installation.

Please note that before dismounting the operator the power supply has to be turned off !

SWING X-TP: cable extension with connection box

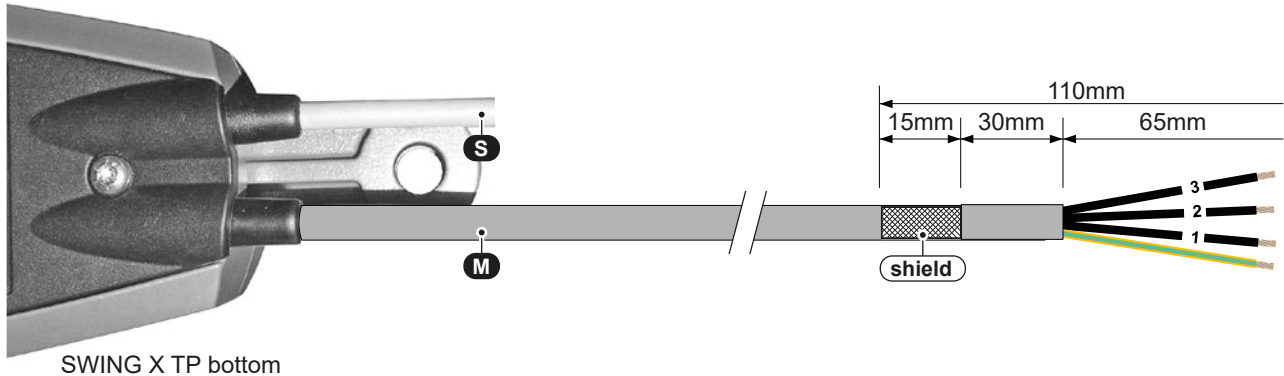


For EMC conform cable extension is necessary to use a connection box with the suitable screws.



motor wire:

- (M) motor wire
(S) sensor wire

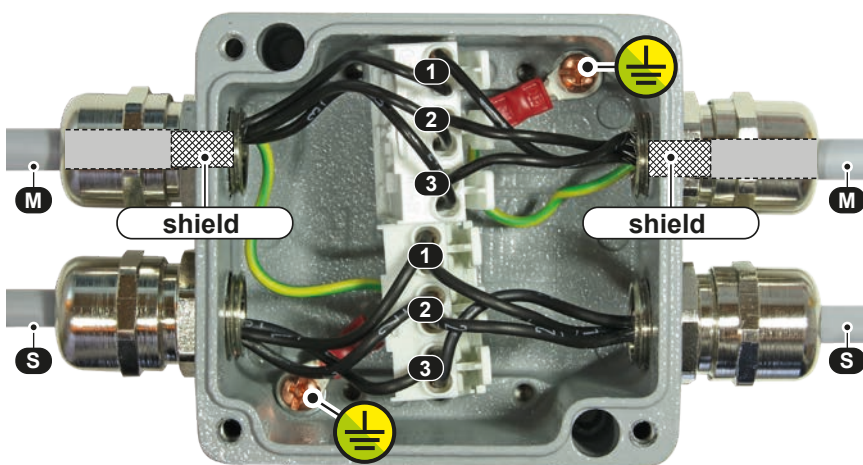
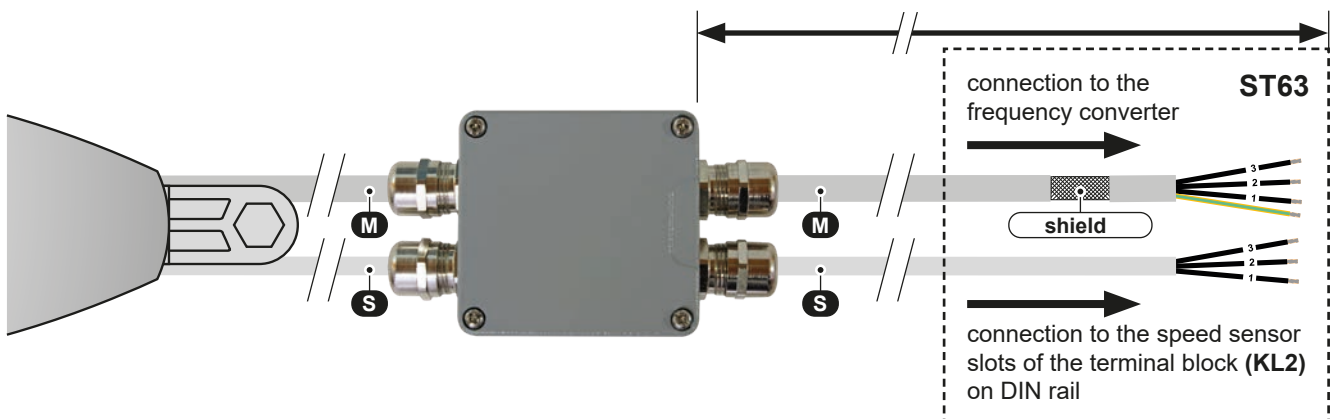


cable extension:

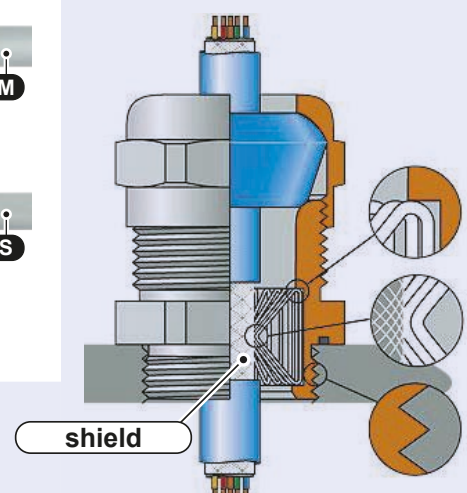
connection box SWING X TP	to extend the motor wire and the sensor wire	Article no. 14120420
------------------------------	--	-------------------------

motor wire for SWING X TP ¹⁾	10m extension	Article no. 14120430
	20m extension	Article no. 14120440

¹⁾ or equivalent cable of the type YSLC/PUR-JZ 4G0,75mm²



cable bolting M16



- Metal tongues in the holes serve as contact to the shield. Remove the cable sheath at these points!
- Take care of the right connection between the metal tongues in the holes and the shield of the motor wire (M).

3. Emergency release of the operator at power failure

SWING-X, -X TP



Important: Power off before unlocking!

Before unlocking, make absolutely sure that the power supply to the system is switched off and **remains switched off after the renewed locking** of the operator!

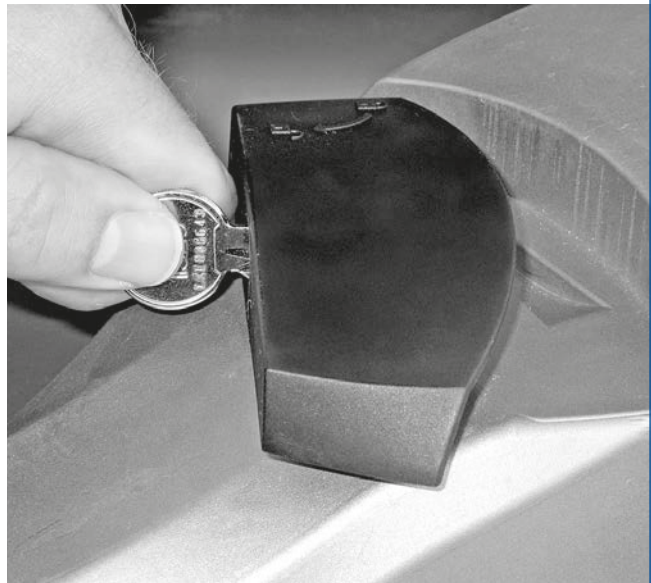


- should it be necessary to release the operator (e.g. in case of power failure, please proceed as follows: 
- **Turn off power supply of gate facility!**
- Unlock the emergency release lock and turn the emergency release lever to the limit (for 90°).
- The operator is now unlocked and the gate may be moved manually (**slowly** !- not faster than with the operator).
- For operator usage turn the emergency lever back to its initial position and close the emergency release lock.



After the handle is back in normal position, slowly move the gate manually in its travel direction until you can hear that the gearing has re-engaged!

- After that turn on the power supply.
After impulse transmission the open position is approached slowly.



7 main power switch and fuse 12A

- Note: An all-pole disconnecting main switch with a contact opening-gap of minimum 3 mm has to be foreseen.
- 8** pushbutton momentary contact switch
 - 9** key-operated momentary contact switch
 - 10** safety sensing edges
 - 11** electric lock or dropbolt
 - 12** floor stops



- *) **Motor cable:** operators SWING X: 4 x 1,5², operators SWING X TP: Cable extension (Article no.: 10m: 14120430, 20m: 14120440)

230 V cables and control lines have to be laid in separate sleeves.

In case that special regulations require another type of cable, cables according to these regulations have to be used.

All possible bruise, shear and general danger areas of the motorised gate have to be secured.

The Tousek Ges.m.b.H. cannot be held responsible for any consequences resulting from disregard of applying standards and laws during installation or operation of the gate facility.

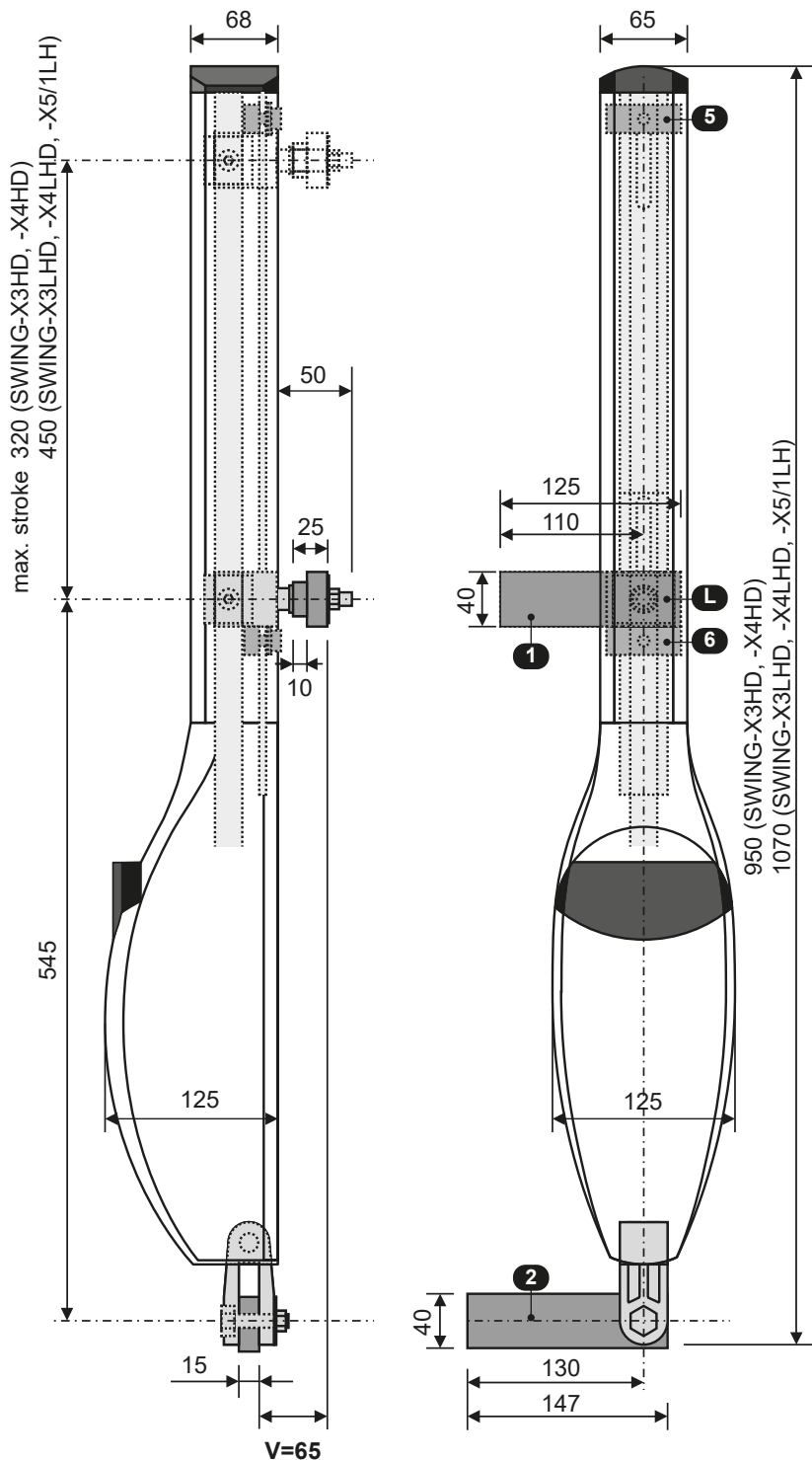
The 0,75mm2 control lines are shown without ground lead. In order to facilitate connections we recommend using flexible wires and not using thicker wires for the control lines.

5. Dimensioned sketch SWING X

Swing gate operator SWING-X

- measures in mm

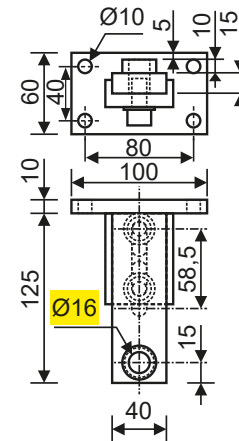
- (1) front welding part (installation on the gate - supported by gusset plate !)
- (2) rear welding part (installation on the gate column - supported by gusset plate !)
- (5) internal limit stop (for position "CLOSED" with gates opening to the inside)
- (6) internal limit stop (for position "OPEN" with gates opening to the inside)
- (L) running part



optional (for mounting on the **gate**):
boltable motor attachment bracket



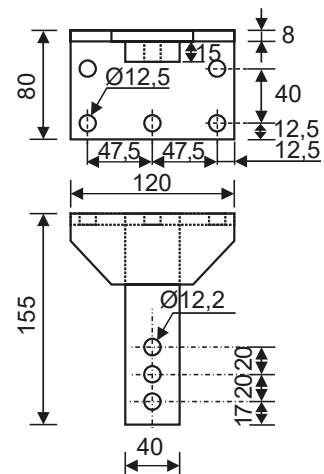
Article no.
galvanised 14120310
stainless steel 14120320



optional (for mounting on the **column**):
boltable motor attachment bracket



Article no.
galvanised 14120280
stainless steel 14120300



measures and technical modifications
subject to change !



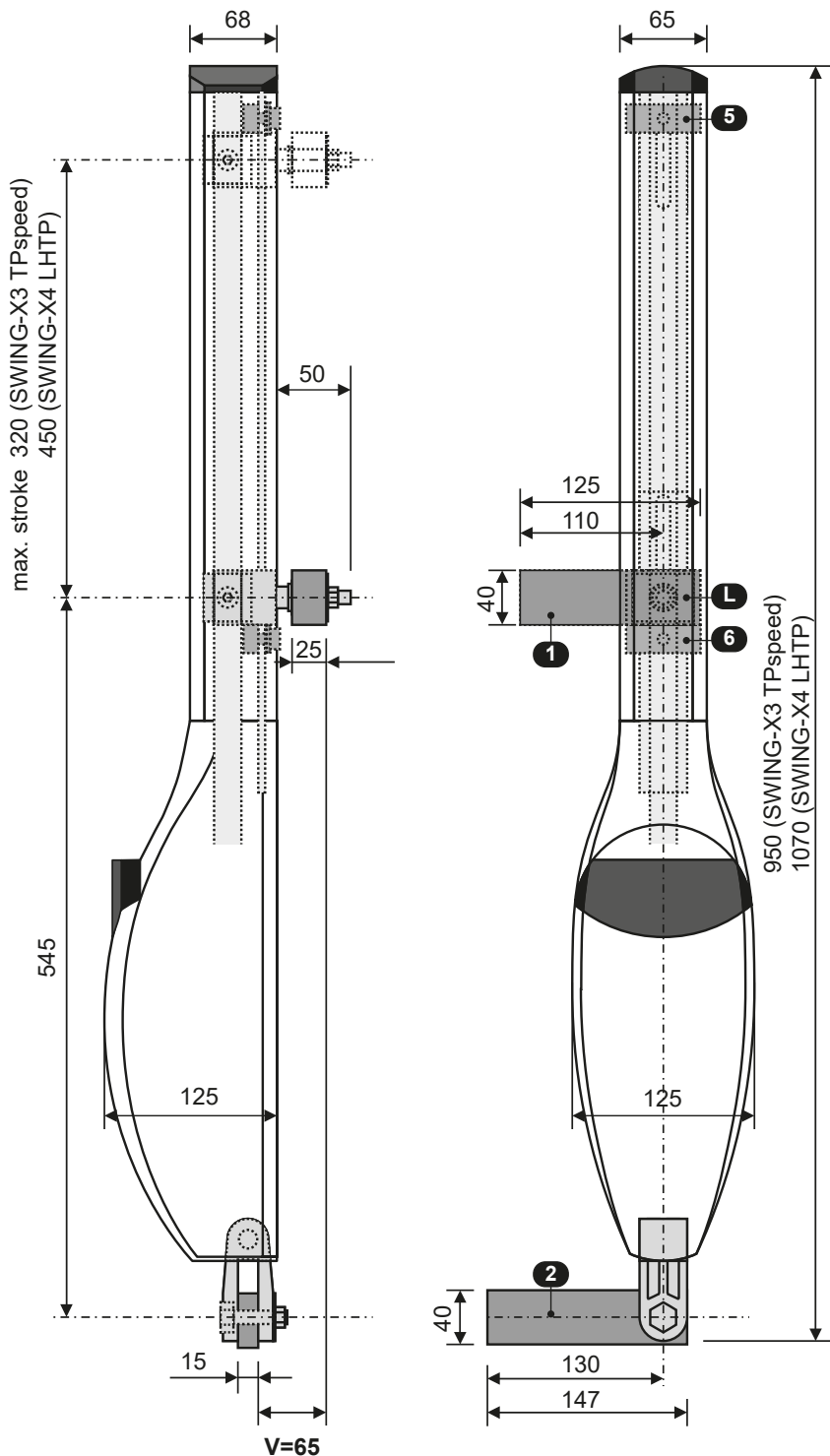
With rising gates the max. leaf width and gate weight have to be reduced up to 50%.
The gate and pillar sided support bracket for the operator enables a possible gradient of up to 7°.

6. Dimensioned sketch SWING X TP

Swing gate operator SWING-X TP

- measures in mm

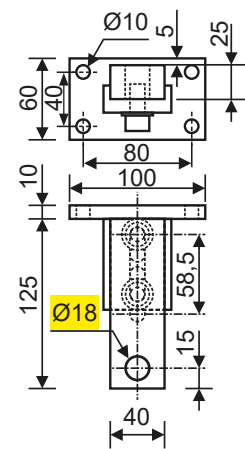
- (1) front welding part (installation on the gate - supported by gusset plate !)
- (2) rear welding part (installation on the gate column - supported by gusset plate !)
- (5) internal limit stop (for position "CLOSED" with gates opening to the inside)
- (6) internal limit stop (for position "OPEN" with gates opening to the inside)
- (L) running part



optional (for mounting on the **gate**):
boltable motor attachment bracket



Article no..
stainless steel 14120400

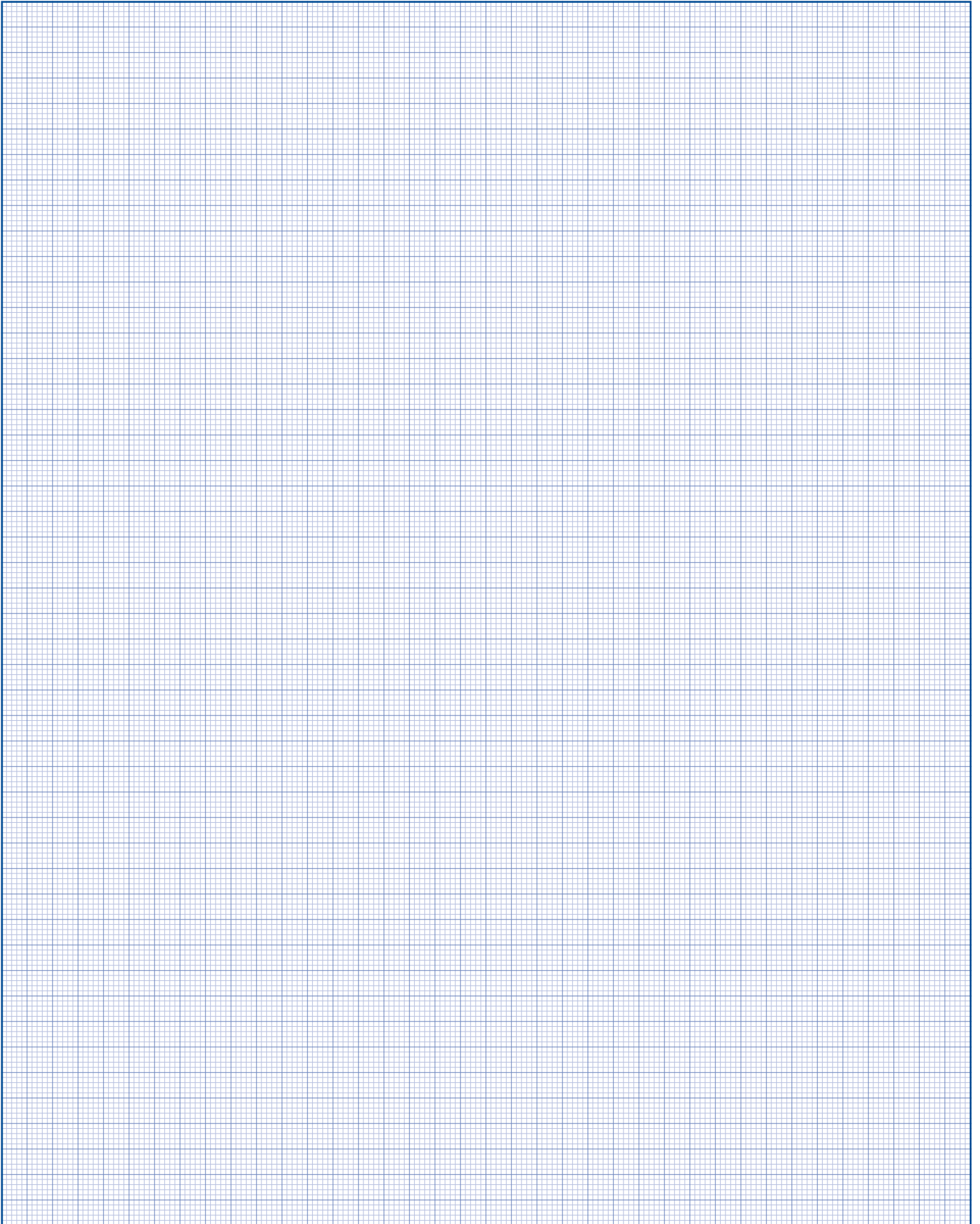


measures and technical modifications
subject to change !



With rising gates the max. leaf width and gate weight have to be reduced up to 50%.
The gate and pillar sided support bracket for the operator enables a possible gradient of up to 7°.

Notes





Declaration of incorporation

In compliance with EC Machine Directive 2006/42/EC, Annex II B for the installation of an incomplete machine.

We hereby declare that the following product, as well as its version, put by us into circulation, complies with the essential requirements of the Machinery Directive (2006/42/EC), due to its design and type of construction.

The validity of this declaration will cease in case of any unauthorized modifications to the products.

The product:

Swing gate operator

**SWING-X3HD, -X3LHD, -X4HD, -X4LHD, -X5/1LH,
SWING-X3 TPspeed, SWING-X4 LHTP**

is developed, designed and manufactured in accordance with:

Machinery Directive 2006/42/EG
Low Voltage directive 2014/35/EU
Electromagnetic compatibility 2014/30/EU

Applied and used standards and specifications:

EN 60335-1 as applicable
EN 60335-2-103
EN 61000-6-3
EN 61000-6-2

Following requirements of Annex I of the EC Directive 2006/42/EC are met:

1.1.2, 1.1.3, 1.1.5, 1.2.1, 1.2.2, 1.2.3, 1.2.6, 1.3.2, 1.3.4, 1.3.7, 1.5.1, 1.5.4, 1.5.6, 1.5.8, 1.7

The relevant technical documentation is compiled in accordance with Annex VII, Part B of the EC Machinery Directive 2006/42/EC.

We undertake to submit it in electronic form and within a reasonable time to the market surveillance authorities in response to a duly substantiated request.

TOUSEK Ges.m.b.H., A1230 Wien, Zetschegasse 1, Austria

is authorized to compile the technical documentation.

The incomplete machine cannot be put into service, until it is determined that the machine, into which the incomplete machine has to be inserted, complies with the the Machine Directive 2006/42/EC.

Eduard Tousek, CEO

Vienna, 05. 11. 2018



EC Declaration of Conformity

In compliance with EC Machine Directive 2006/42/EC, Annex II, Part 1 A.

When the described operators are connected to a gate they form a machine in the sense of the EC Machine Directive.

Relevant EU directives:

Construction Products Directive 89/106/EWG
Machinery Directive 2006/42/EG
Low Voltage directive 2014/35/EU
Electromagnetic compatibility 2014/30/EU

We hereby declare that the following product, in the version put by us into circulation, complies with the essential requirements of the Directives mentioned above. The validity of this declaration will cease in case of any unauthorized modifications to the products.

Product:

Gate description

Motor description

The incomplete machine cannot be put into service, until it is determined that the machine, into which the incomplete machine has to be inserted, complies with the the Machine Directive 2006/42/EC.

Installation company

Address, ZIP code, Place

Date/ Signature

Motor number (Type plate):

Other components:

tousek PRODUCTS

- sliding gate operators
- cantilever systems
- swing gate operators
- garage door operators
- folding door operators
- traffic barriers
- electronic controls
- radio remote controls
- key operated switches
- access control
- safety devices
- accessories

Tousek Ges.m.b.H. Austria
A-1230 Vienna
Zetschegasse 1
Tel. +43/ 1/ 667 36 01
Fax +43/ 1/ 667 89 23
info@tousek.at

Tousek GmbH Germany
D-83395 Freilassing
Traunsteiner Straße 12
Tel. +49/ 8654/ 77 66-0
Fax +49/ 8654/ 57 196
info@tousek.de

Tousek Benelux NV
BE-3930 Hamont - Achel
Buitenheide 2A/ 1
Tel. +32/ 11/ 91 61 60
Fax +32/ 11/ 96 87 05
info@tousek.nl

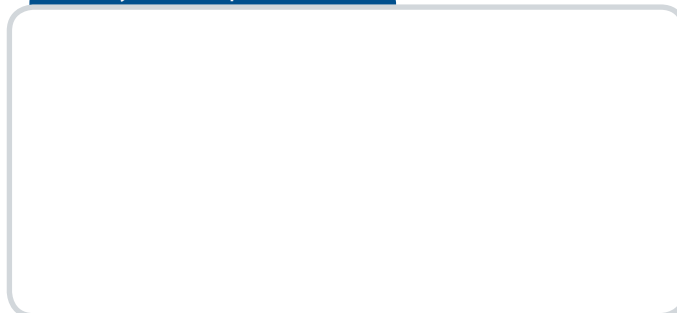
Tousek Sp. z o.o. Poland
PL 43-190 Mikołów (k/Katowic)
Gliwicka 67
Tel. +48/ 32/ 738 53 65
Fax +48/ 32/ 738 53 66
info@tousek.pl

Tousek s.r.o. Czech Republic
CZ-252 61 Jeneč u Prahy
Průmyslová 499
Tel. +420 / 777 751 730
info@tousek.cz

tousek
EN_SWING-X_42001008
05. 02. 2020



your service partner:



We reserve the right to change dimensions and/or technical specifications without prior notice. Claims resulting from misprints or errors cannot be accepted.

