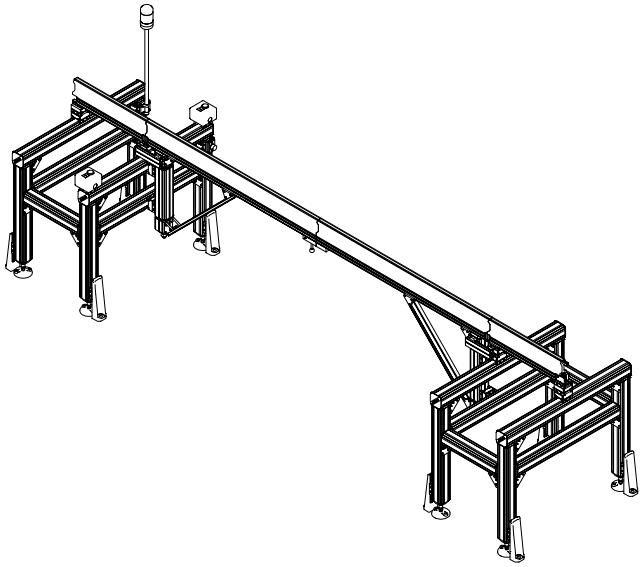
MONTECH



USER MANUAL

MONTRAC COMPONENTS

TracDoor

BA-100049

Starting from serial number 432699

english, edition 09/2007

Contents

1. Important information

1.1. Introduction

This operating instruction describes the mechanical design, the load limits, installation, maintenance and spare parts of the TracDoor.

1.2. EU - conformance (to EU Directive on Machines, Appendix II A)

Regulations and standards taken into account:
A Montrac transport system is a machine that consists of, depending on the application, a variety of precisely defined components. The regulations and standards taken into account for the components are mentioned in the respective sub-chapter of the operating instructions.

Montrac transport systems may only be put into operation,

a) when they are operated with a power supply that complies with the standards described in the operating instructions.
b) when the space beneath transfer gates and crossings is inaccessible in an area with a diameter of 1.6 m (Danger of crash for shuttles if transfer gate or crossing is incorrectly switched.)

Manufacturer
Montech AG, Gewerbestrasse 12 CH–4552 Derendingen
Tel. +41 32 681 55 00, Fax +41 32 682 19 77

1.3. EMV-Guideline

Emission:
– EMC directives: Noise field intensity according to EN 55011 or EN 55022, Class A.
Immunity:
– To electromagnetic fields according to 801-3: 10 V/m, 1 kHz, 80% AM.
– To burst according to IEC 801-4: 2 kV.
– To line-carried, narrow-band noise according to IEC 801-6: 10 VEMF.
– To 50 Hz magnetic fields according to EN 61000-4-8: 30 A/m.
– To discharge of static electricity.
– To conducted noise.

1.4. Product description and application

Montrac is a monorail transport system with self-propelling shuttles, constructed to carry loads of up to 12 kg or 24 kg (2-axle shuttle) and pallet sizes up to 300 x 550 mm. Montrac is a modular system. Standardized basic components enable customer-specific system configurations to be set up for connection to machining stations, machines, order-picking stations, etc.

Montrac can be used wherever material has to be moved, distributed, processed stepwise (e.g. assembled) or collected together at one point from various senders.

1.5. System logistics

The TracDoor is intended to permit passage through a Montrac line or access to manual workplaces within the line.
It is an automatic device and thus has its own supporting structures. Through passage is permitted for one person as a minimum and for a small fork-lift truck as a maximum (2 versions). The principle of TracDoor is very single. The gate is fixed at a pivot point and can be manually opened and rotated in the opening direction up to a rubber peg with a magnet. On closing, the gate is rotated up to an end stop and can then be manually locked again.

If a person wishes to pass through the TracDoor, he or she must first log on beforehand on the logon/logoff button. The release lamp flashes. The shuttles are stopped and, as soon as the gate is free, it is then released for passage (lamp lights up continuously). It can then be opened manually. After passing through, the person must close the gate again manually, lock it by means of the lock and log off on the logon/logoff button so that the shuttles are started again.

1.6. Safety instructions

The safety instructions, especially those concerning the electrical connection, must be heeded during commissioning, operation, repair work and decommissioning. Non-compliance with these instructions is an improper use of the transport system and its components.

The operation of a Montrac transport system in an explosive atmosphere (combustible gases, vapors or dust) may lead to their ignition and must therefore not be carried out.

1.7. Dangers

In order to exclude dangers under operating conditions, the requirements specified in the EU Declaration of Conformity with regard to a) the electrical supply and b) the safety equipment must be fulfilled.

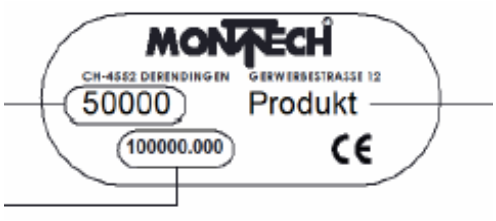
For setup or test purposes, particular attention must be paid to the shear and crushing points.
During operation, the TracDoor must be screwed to the floor or appropriately secured.
When mounting the TracDoor on the supporting structure, it must be ensured that the supporting structure is secured beforehand.

1.8. Additional information

The aim of the present operating instructions is to enable users to employ TracDoor correctly and safely. Should further information be required relating to the particular application, do not hesitate to contact the manufacturer.
When ordering user manual it is essential to quote the type and serial number.
Additional operating instructions can be obtained from our homepage www.montech.com.

Nameplate

Order number



Product name

Serial number

MONTECH AG
Management

U. D. Wagner

C. Wullschleger

1.9. Validity of the User Manual

Our products are continually updated to reflect the latest state of the art and practical experience. In line with product developments, our User Manuals are continually updated.

Every User Manual has an article number e.g. BA-100049.
The article number and the date of edition are evident on the title page.

2. Technical Data

2.1. Technical Data

Length tolerance of the TracDoor		[mm]	±2
Material			Aluminium, Copper nickel plates, Plastic
Connected voltage		[V DC]	24
Ambient conditions:	Temperature	[°C]	10 – 40
	Rel. humidity		5 - 85% (without condensation education)
	Air purity		Air purity Atmosphere for the assembly of precision mechanical products

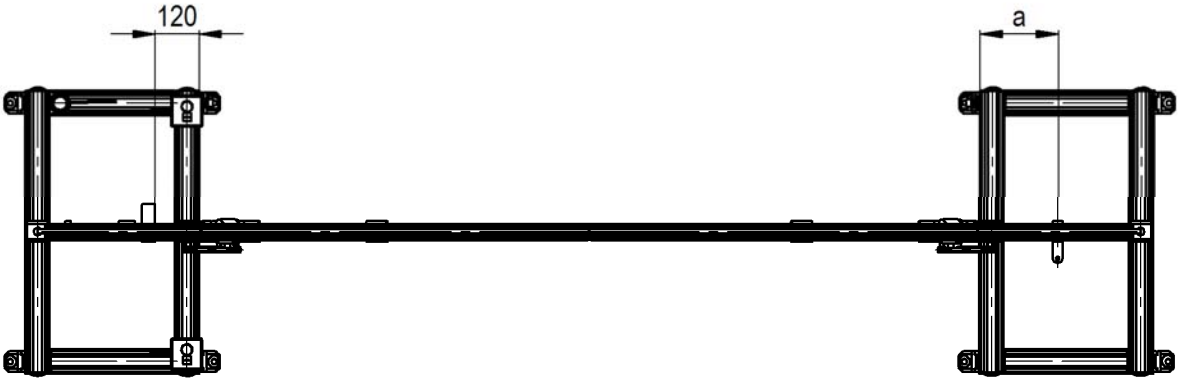
2.2. Loading limits

Electrical loadability		
between the Trac connections	[A]	64
on the movable Trac section	[A]	5
Mechanical loadability	[N]	340*
* corresponds to the force of a fully loaded two-axis shuttle.		

2.3. Throughput times

Applicable conditions:
The times shown below are applicable only for the configurations shown in the drawings.
The dimensions contained in the drawings are minimum dimensions for which the manufacturer can guarantee satisfactory operation. The throughput times are obtained at a throughput speed of v = 30 m/min.

Throughput times

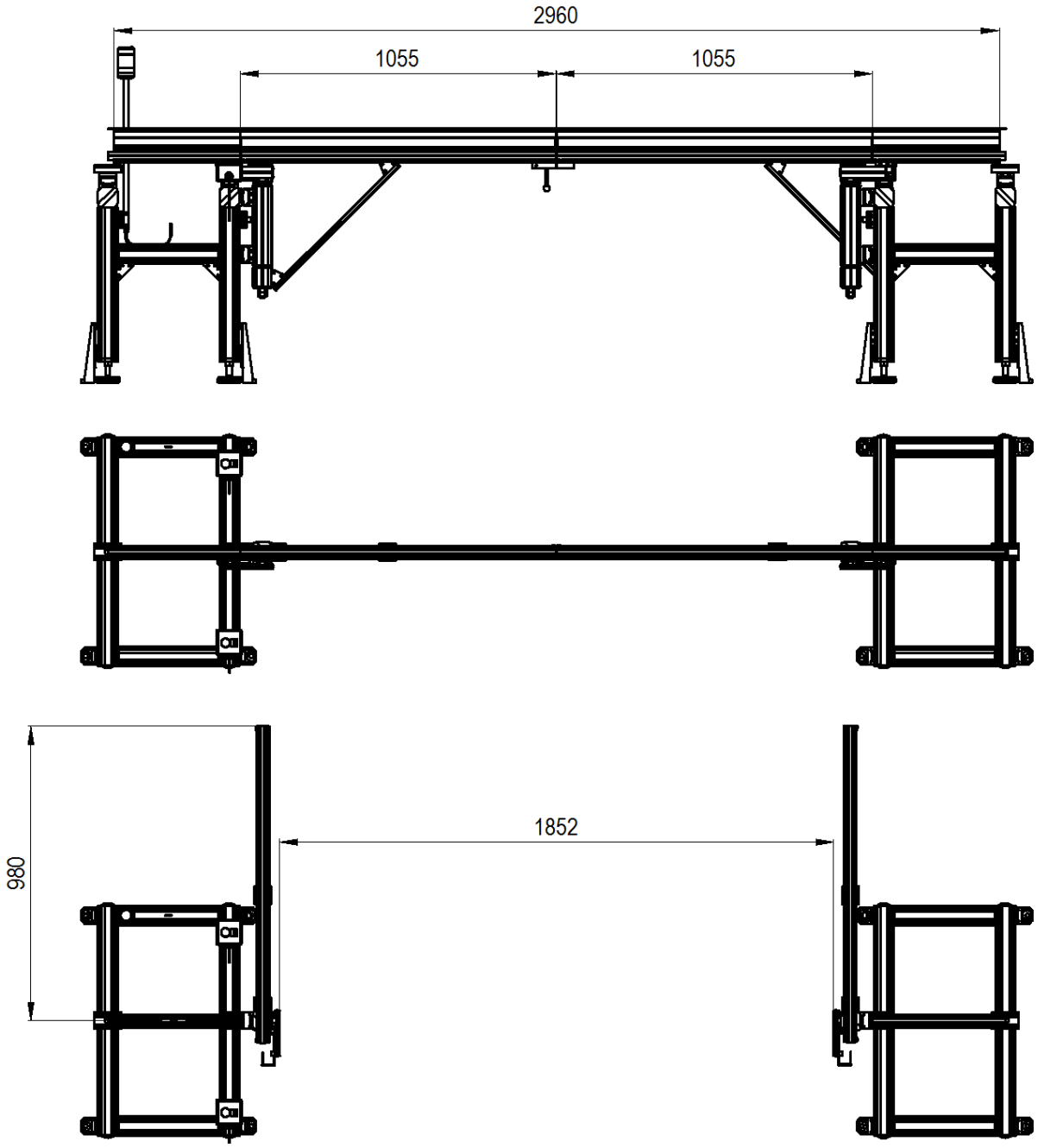


	Shuttle 200x300 a[1)] = 250mm		Shuttle 300x400 a[1)] = 350mm		Shuttle 200x550 a[1)] = 600mm	
	With alu platform without load	With alu platform and max. load	With alu platform without load	With alu platform and max. load	With alu platform without load	With alu platform and max. load
TracDoor double	5.9 s	6.1 s	6.1 s	6.3 s	6.4 s	6.6 s
TracDoor single	3.8 s	4.0 s	4.0 s	4.2 s	4.3 s	4.5 s

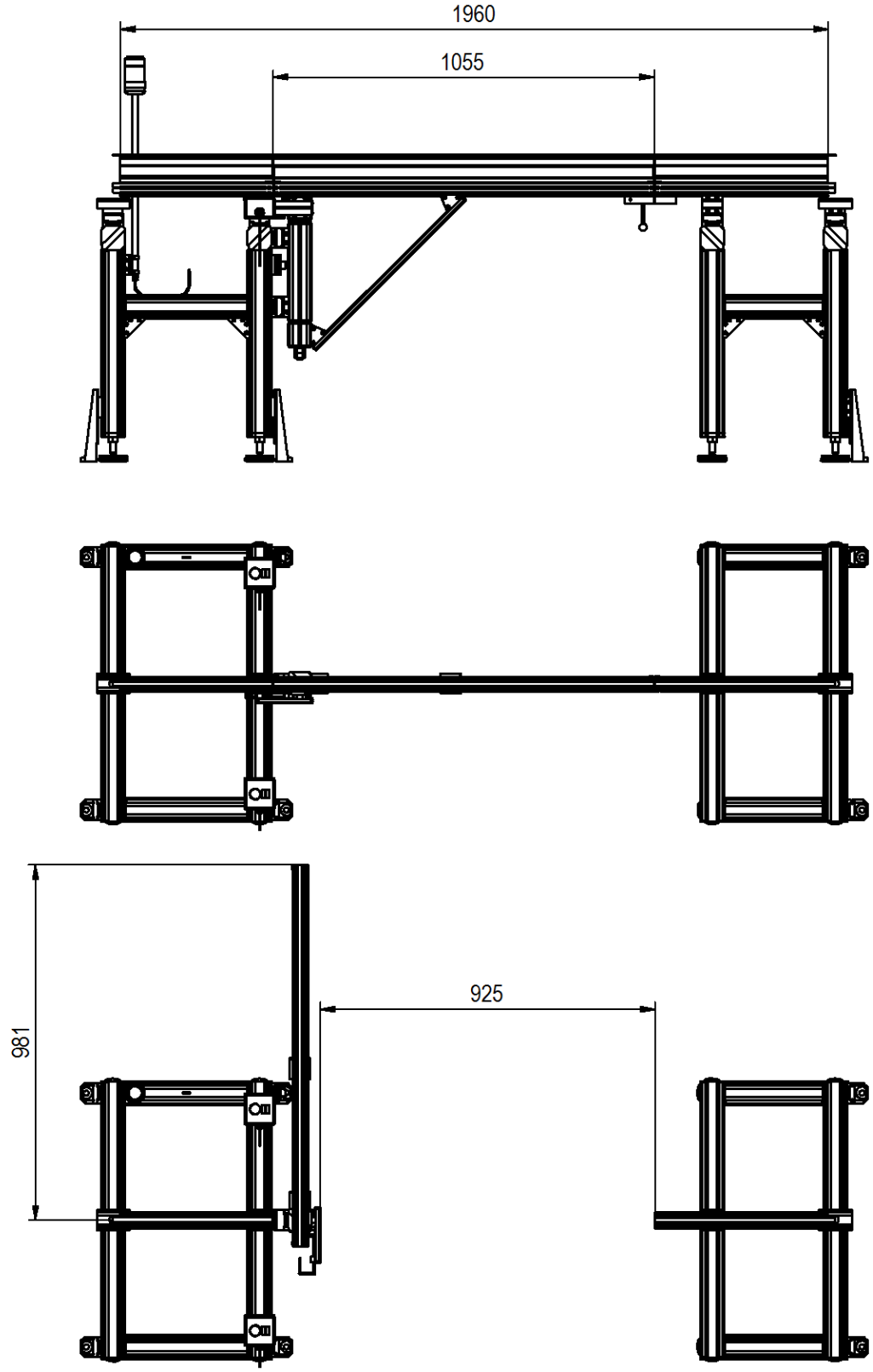
[1)] The dimensions of a are for shuttle logoff with dropping logoff sensor signals. For shuttle logoff with rising logoff sensor signal, the values for a should be increased by 70 mm in each case.

2.4. Dimension sheet

2.4.1. Dimension sheet TracDoor double L=3000mm 56954



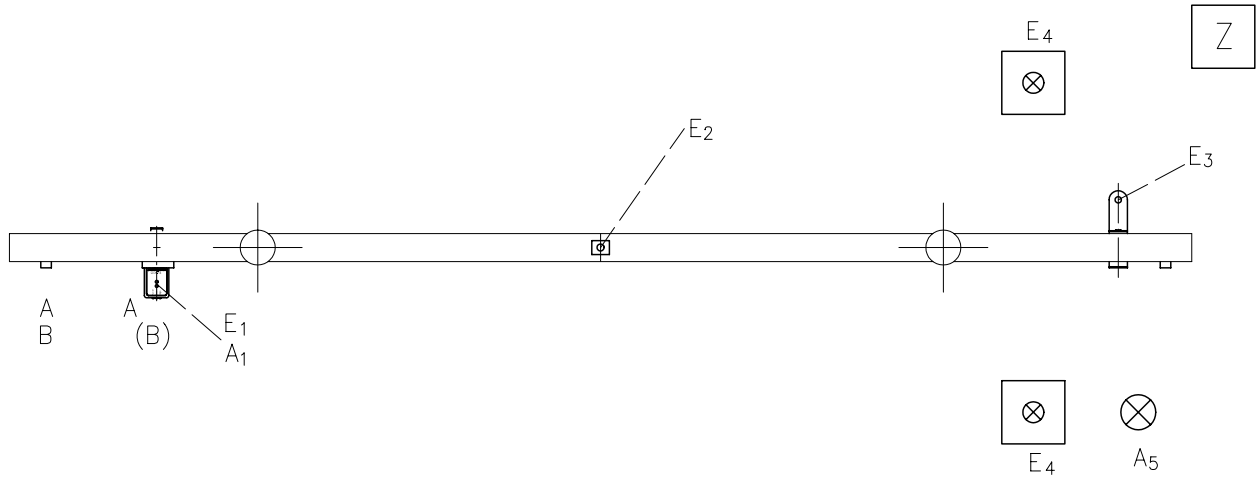
2.4.2. Dimension sheet TracDoor single L=2000mm 56953



3. Electrical and pneumatic connections

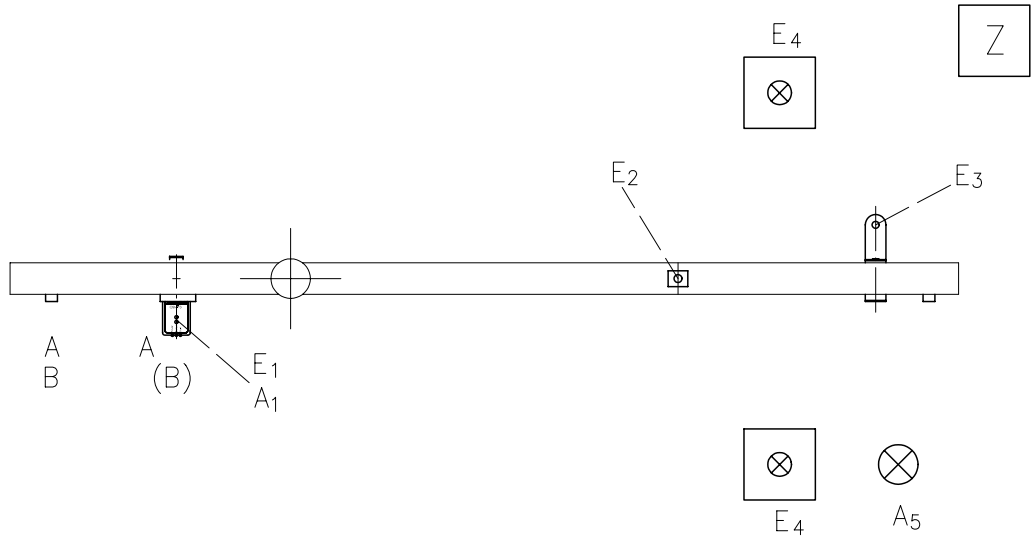
3.1. TracDoor double

Electrical and pneumatic connections TracDoor double



3.2. TracDoor single

Electrical and pneumatic connections TracDoor single

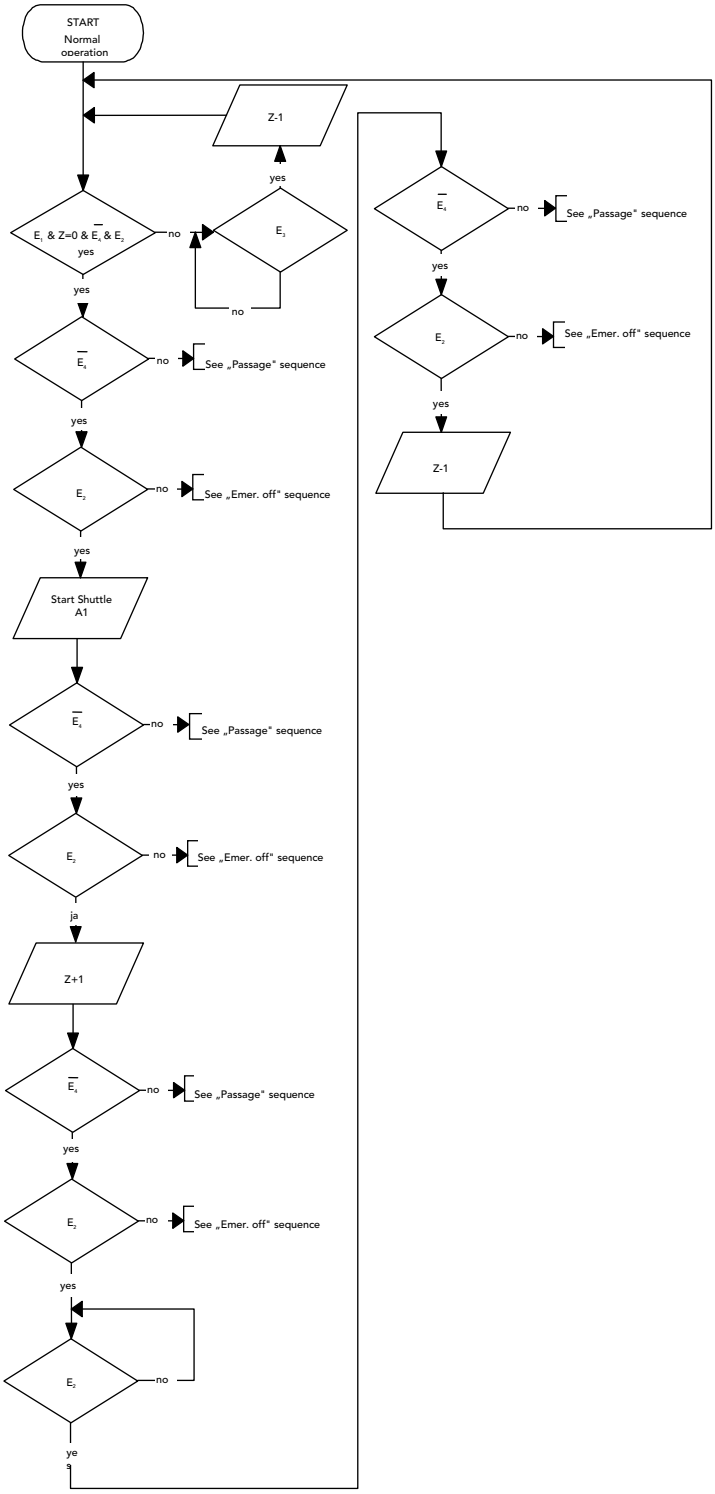


E_1 Infrared interface		Shuttle logged on before TracDoor
E_2 Proximity switch	M8x1	Monitoring of the lock
E_3 Proximity switch		Shuttle logged off after TracDoor
E_4 Logon/logoff button	Pulse frequency	Logon/logoff
A_1 Infrared interface		Start shuttle
A_5 Continuous light module		Optical indication for release of the TracDoor
Z Counter		Always allows only one shuttle over the TracDoor

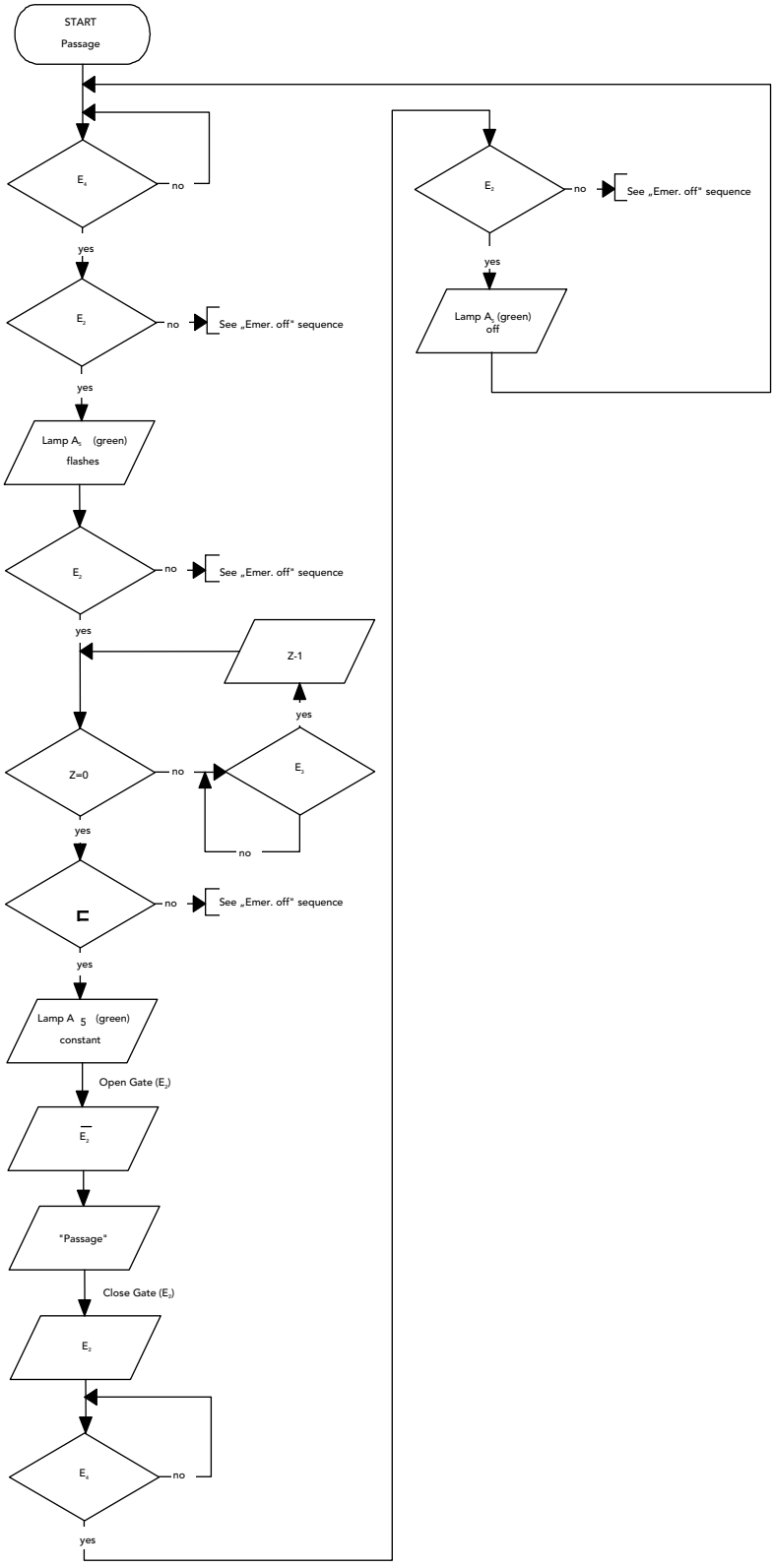
Proximity switch: M8x1, switching distance Sn = 4 mm (Art. No. 508845)

3.3. Control sequence

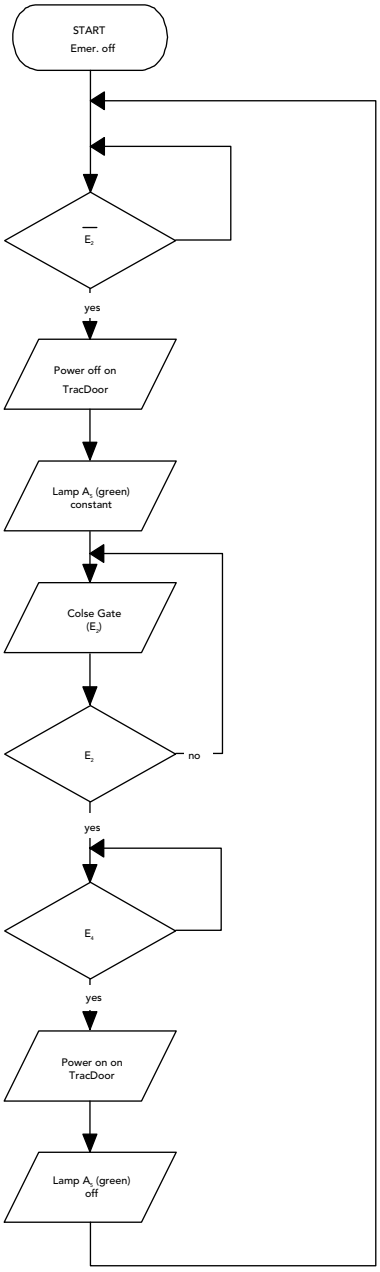
3.3.1. Normal operation



3.3.2. Through passage



3.3.3. Emergency stop



4. Scope of delivery

4.1. TracDoor double

The complete delivery of a TracDoor includes the following components:
An inlet and outlet trac, (without TracLink) two gates, one lock, two guides, a logon and logoff button, a release lamp, and two end stops, and supporting profiles

Not included are:
- stop/start control element
- the holder
- the sensors for the shuttle logoff
- the Quick-Set supporting structures.

4.2. TracDoor single

The complete delivery of a TracDoor includes the following components:
An inlet and outlet trac, (without TracLink) one gate, one lock, one guides, a logon and logoff button, a release lamp, and two end stops, and supporting profiles.

Not included are:
- stop/start control element
- the holder
- the sensors for the shuttle logoff
- the Quick-Set supporting structures.

5. Installation

5.1. Installation

The TracDoor must be connected in three ways to the system components to be connected to it:
– Mechanical connection
– Electrical connection
– Discharge of the electrostatic charge

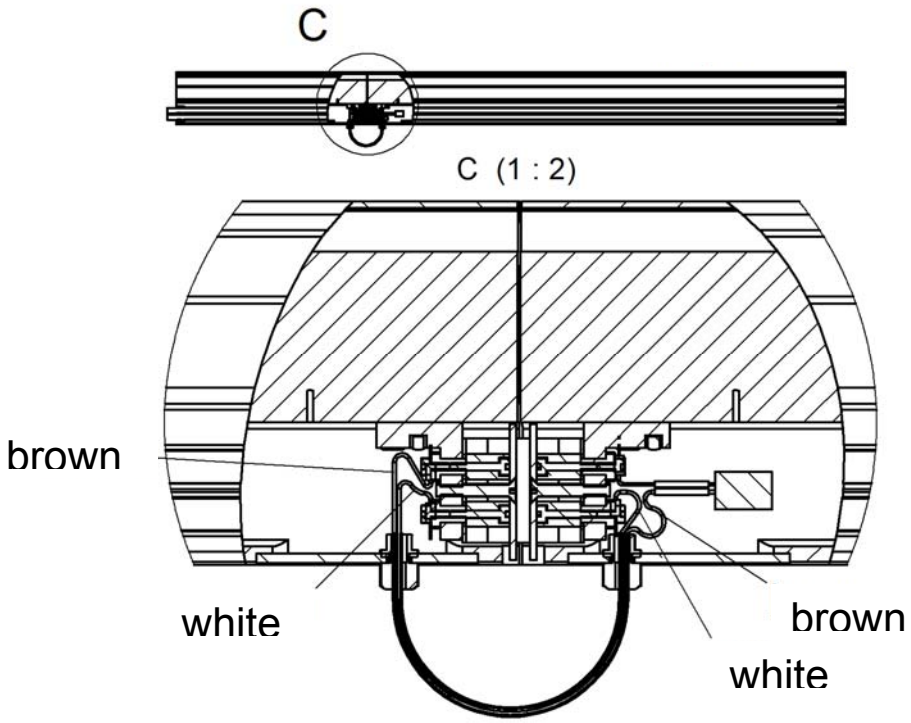
5.1.1. Mechanical connection

This connetion is performed at the two rail sections by means of TracLink (Art.No. 56056, see user manual „Trac Link“).
It should be ensured that the rail sections are exactly flush with the system components (e.g. Tracs) to be connected. Lateral alignment errors of more than 0.5 mm lead to inexact transitions between the rail sections within the TracDoor.

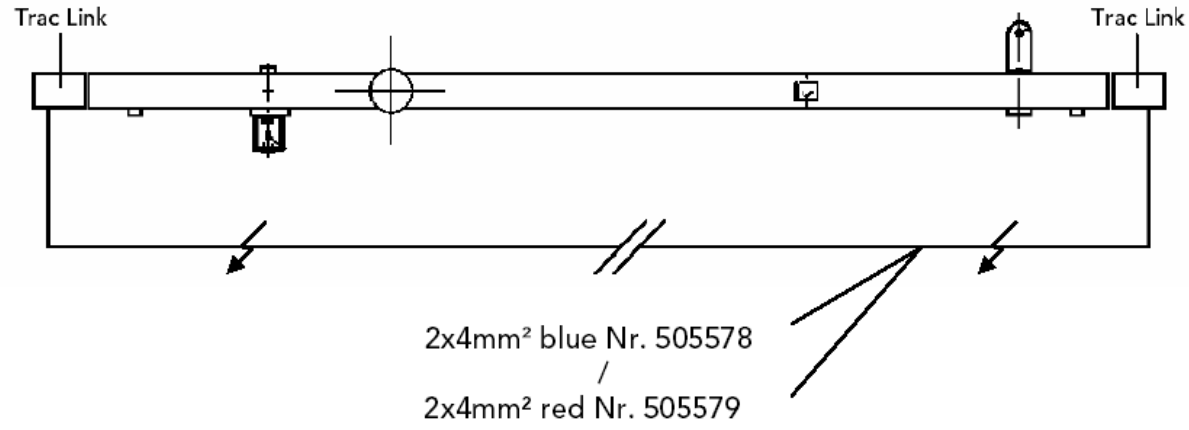
It should also be ensured that the rail sections are exactly flush with the system components (e.g. Tracs) to be connected, also in the vertical direction. This should be corrected by means of the feet of the supporting structure. Vertical alignment errors of more than 0.5 mm lead to inexact transitions between the rail sections within the TracDoor.

5.1.2. Electrical connection

The electrical connection of the connection tracs to the system components to be connected to them is implemented as described in the section entitled "TracLink", subsection "Installation".



Since the TracDoor represents an opening in the system (also in the electrical circuit), an electrical bridge must be produced between the ends of the connection tracs. The connections of this bridge are connected to the two TracLink (Art.No. 56056, see user manual „Trac Link“) at the ends of the connection Tracs.



5.1.3. Discharge of the electrostatic charge

When connecting the TracDoor to the incoming or departing system components (e.g. Tracs) by means of a Trac connection (Art.No. 56056, see user manual „Trac Link“) it is essential to ensure that each rail section is connected with an earthing cable "Trac earth" and with a screw.

5.2. Setting the Trac transitions

The transitions between the movable gate and the connecting tracs may have an offset of max. 0.5mm in the region of the running surfaces.

The following procedure must be followed when setting the transitions:

- The gate is fastened to the supporting structure by means of the SLL mounted on the guide and can thus be subsequently adjusted in the vertical and horizontal directions relative to the connection trac.
- Once the gate is flush with the connection trac, the screws of the SLL are each tightened with 6Nm.
- In order to adjust the gap between gate and connection trac, the SLL of the spacer tube and the corner connector EV3/45° must be loosened.
- The gate can then be moved in the longitudinal direction so that the gap is min. 0.5mm and max. 0.8mm.
- Once the gate has been adjusted, both connections must be tightened again, each with 6Nm.
- In order to adjust the Trac transition on the side of the locking system, all that is necessary is to loosen the SLL of the bracket.
- The gate is pretensioned by means of the strut so that the transition is no more than 0.5mm. The screws of the SLL can then be tightened again, each with 6Nm.
- The gap on the side of the locking system, i.e. between the two supporting structures can be adjusted to min. 0.5 mm and max. 1.0 mm by moving the supporting structure.

5.3. Setting the locking system

- Any alignment errors between gate / gate or gate / connection trac can be compensated by means of the locking system.
- Slightly slacken all screws of the locking system.
- Compensate alignment errors in the horizontal direction (vertical alignment errors cannot be compensated with the locking system and tighten screws again).

5.4. Setting the end stops

- The open end stop must be moved up or down, until the rubber cushions are in the middle of the gate support.
- If the installation angle of the end stop is not correct, the end stop must be clamped into the spacer using a screw clamp. After that, slightly loosen the screws of the corner connector of the guide and align the gate with the inward or outward transfer Trac. Then retighten screws with a torque of 6Nm.

6. Maintenance

Every 6 months

Checking the electrical Trac connection:
By slight pressure on the current-carrying rails at the transitions, it is possible to determine whether the electrical connection is satisfactory. If the current-carrying rails are springy, the contact pieces on the inside should be tightened according.

Checking the distance:
The distance between two Trac sections should be checked and should be tightened according to Section Istallation.

Check conductor rails:
The conductor rails should be checked for signs of burning, grease spots or excessive soiling. These areas should be cleaned with abrasive paper (grain size finer than 300) or with aluminum-rubber. The produced rubber abrasion must be removed from the Trac.

– The black layer (graphite abrasion) should not be removed. It is electrically conductive and prevents rapid oxidation of the copper!

Clean TracCurve:
The TracCurve must be freed from excessive dirt as well as from oil and grease. Remove excessive dirt and dust with a dry cloth. Dirt on the Trac is best removed with aluminum rubber. The produced rubber abrasion must be removed from the Trac.

Checking the play of the pivot point:
If a noticeable play of > 1 mm is present when the gate is moved vertically, this can be adjusted again by tightening the two nuts on the bracket of the guide so that the gate is still easily rotatable without marked play.

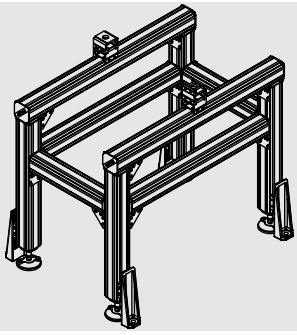
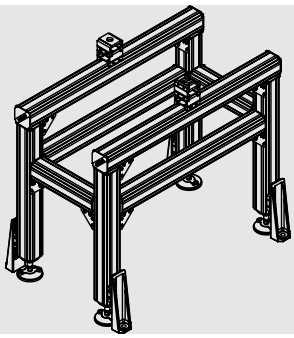
Checking the locking system:
In the locking system, the pin must be checked. If it can be moved easily, the springy thrust piece must be adjusted so that locking in the end positions is readily detectable on moving the pin.
Prior to each readjustment, apply threadlocker to the pressure pad.
If the pin has scratches, it must be changed using the hand lever.

Checking the sensor:
Check the sensor in the locking system for damage (for example, mechanical wear of the sensor cap). Replace damaged sensors.
Also check the position of the sensor. In addition, secure the sensor with a locknut.

General check:
The Trac should be checked for damage. In the event of damage, please contact MONTECH.

7. Quickset – Framework

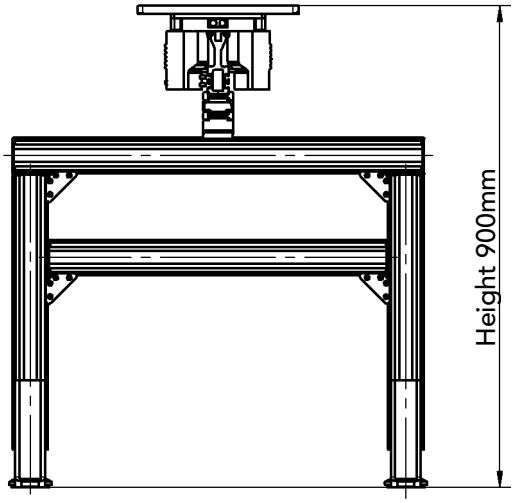
The Quickset – Framwork structures are not included for the TracDoors.

Overview	Art.No. 92064	Art.No. 92066 1)
		
TracDoor double	2x	
TracDoor single	1x	1x

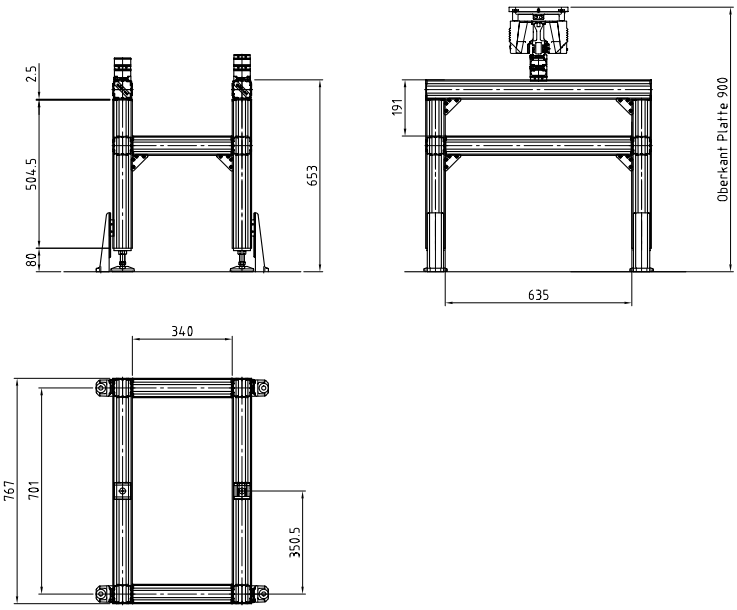
1) This Quick-Set framwork structures is to install on the side of the lock.

The standard height is 900 mm. However, this can be adapted to customer requirements.

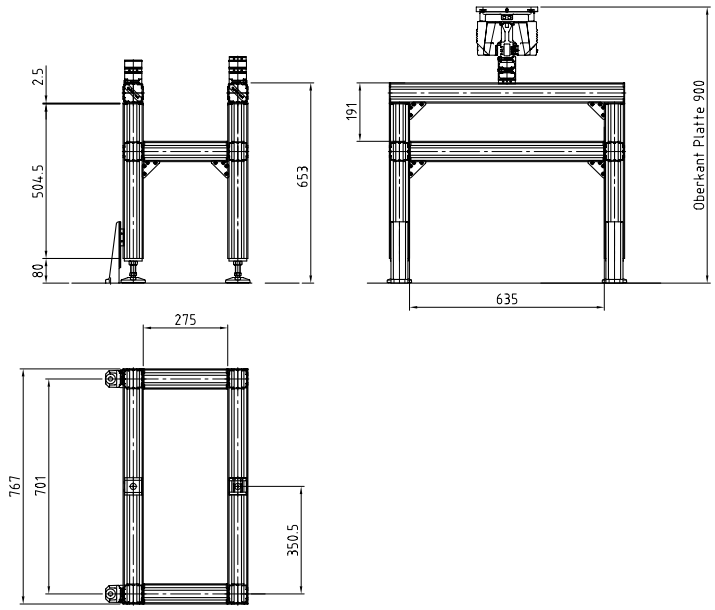
Quick-Set height



7.1. Dimension sheet Quickset-Framework 92064

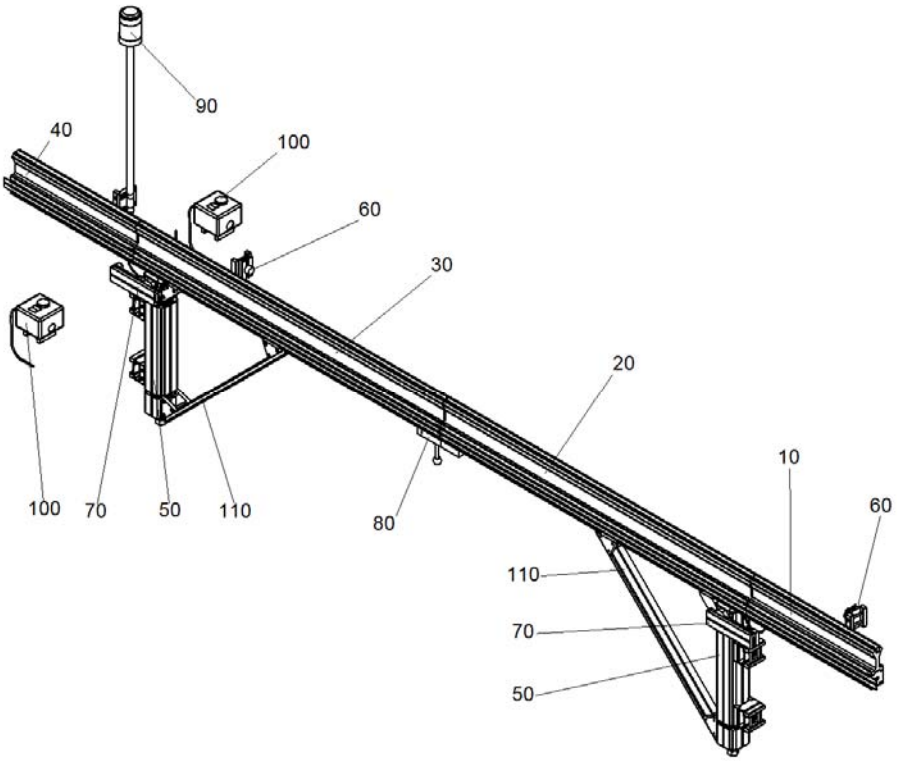


7.2. Dimension sheet Quickset-Framework 92066



8. Parts list

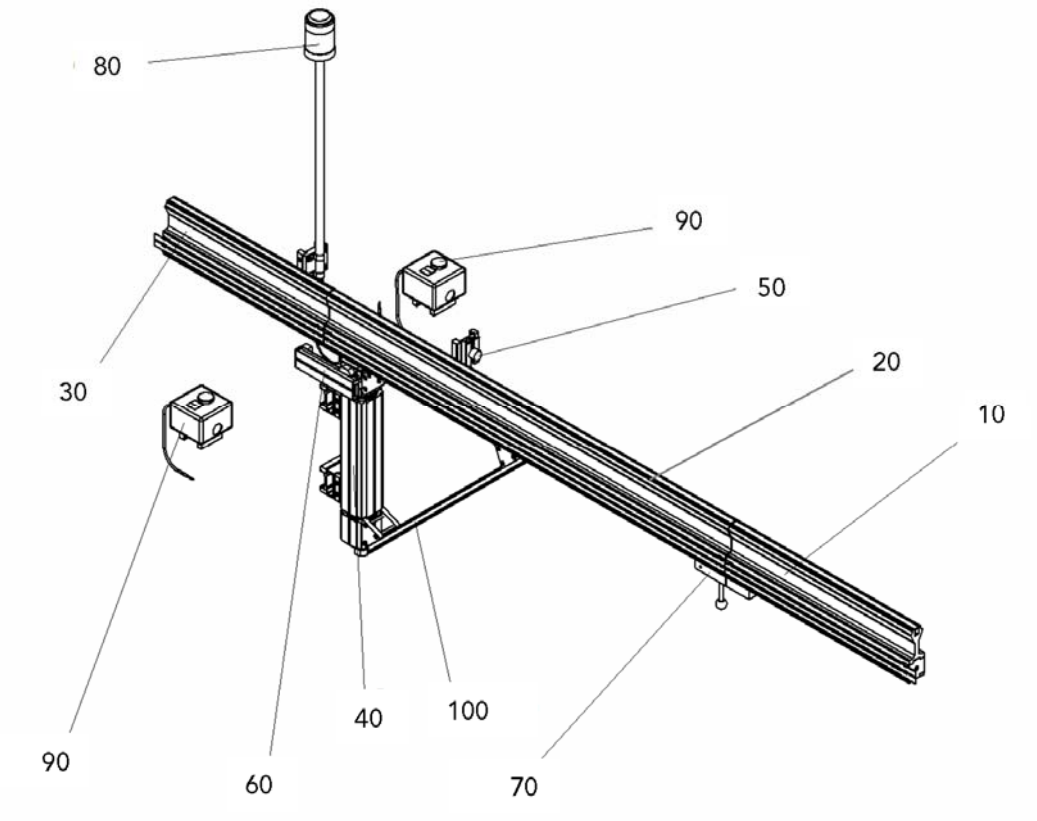
8.1. TracDoor double L=3000mm



Pos.	Sym.	Designation	Art.-Nr.	Material
	◘	TracDoor double L=3000mm complet	56954	Various
10	◊	Inward transfer Trac long	57151	Various
20	◊	Door complete	57141	Various
30	◊	Door complete	57150	Various
40	◊	Outward transfer Trac long	57158	Various
50	◊	Guide	92068	Various
60	◊	End stop open	92069	Various
70	◊	End stop close	92070	Various
80	◊	Locking system complete	92071	Various
90	◊	Release lamp	92072	Various
100	◊	Logon / logoff button complete	92073	Various
110	◊	Door support	92079	Various

● These are wearing parts and available ex stock.
◊ Not available ex stock individually (upon request).
◘ Price-listed items available ex stock.

8.2. TracDoor single L=2000mm



Pos.	Sym.	Designation	Art.-Nr.	Material
	◘	TracDoor single L=2000mm complet	56953	Various
10	◊	Inward transfer Trac long	57162	Various
20	◊	Door complete	57150	Various
30	◊	Outward transfer Trac long	57158	Various
40	◊	Guide	92068	Various
50	◊	End stop open	92069	Various
60	◊	End stop close	92070	Various
70	◊	Locking system complete	92071	Various
80	◊	Release lamp	92072	Various
90	◊	Logon / logoff button complete	92073	Various
100	◊	Door support	92079	Various

● These are wearing parts and available ex stock.
◊ Not available ex stock individually (upon request).
◘ Price-listed items available ex stock.

9. General information

9.1. Environmental compatibility and disposal

Materials used:
- Aluminium
- Copper nickel plates
- Brass
- Steel
- Bronze
- Polyethylene (PE)
- Polyamide (PA)
- Polyurethane (PUR)
- Polyvinyl chloride (PVC)
- Polycarbonate (PC)
- Thermoplastic, prevulcanized rubber (TPR)

Surface treatment:
- Anodization of aluminium
- Nickel-plating of brass and steel
- Galvanizing of steel

Shaping processes:
- Extrusion of aluminium
- Machining of aluminium, steel, bronze, PE, PA
- Casting of aluminium

Emissions during operation
- See EMC emissions

Disposal:
TracDoors which cannot be used any more should be recycled not as complete units but after dismantling into individual parts, according to type of material. The type of material for each part is shown in the spare parts lists. Material which cannot be recycled should be appropriately disposed of.