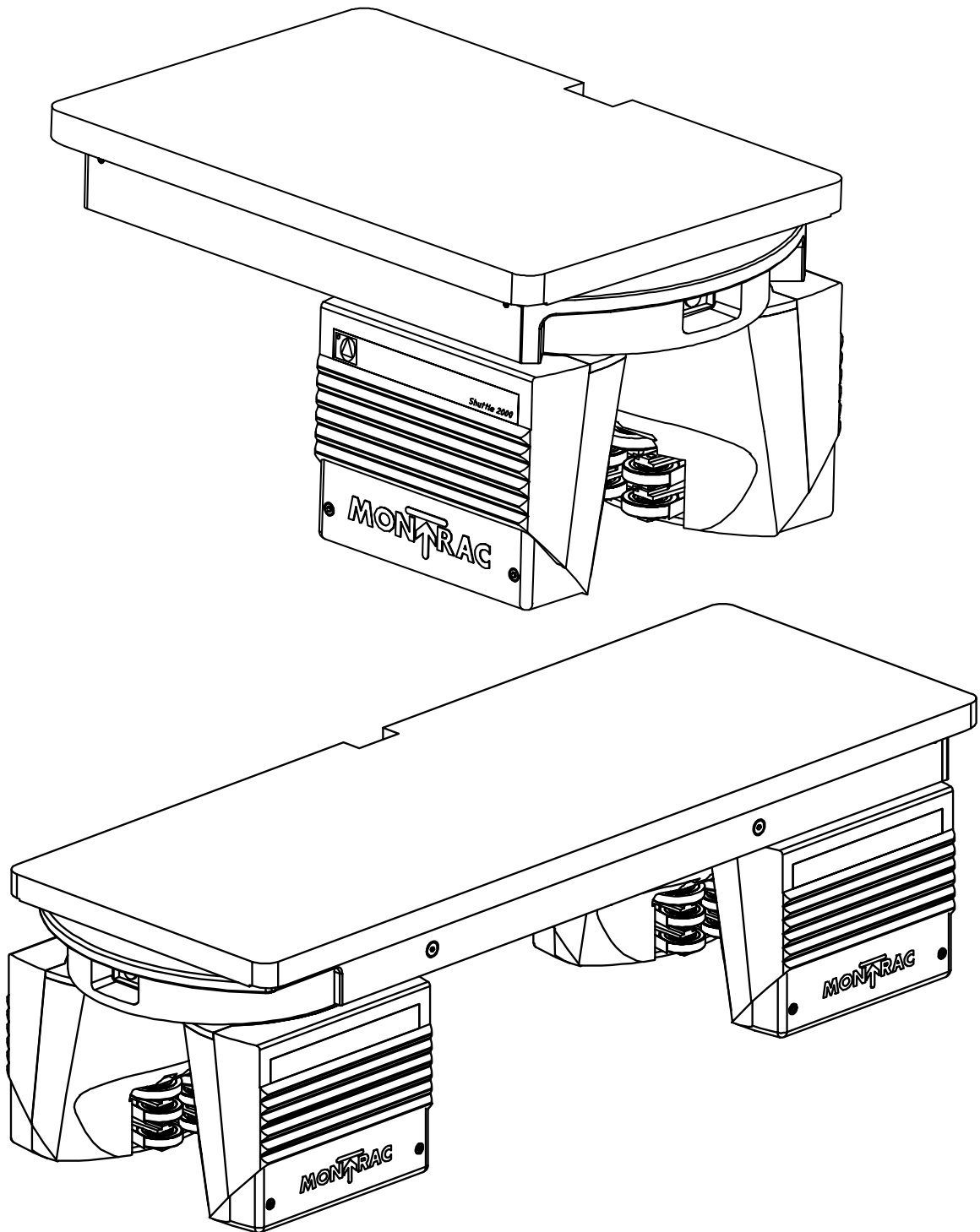


MONTRAC®



2 Shuttle

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2.1 Standard-Shuttle

2.1.01 System logistic

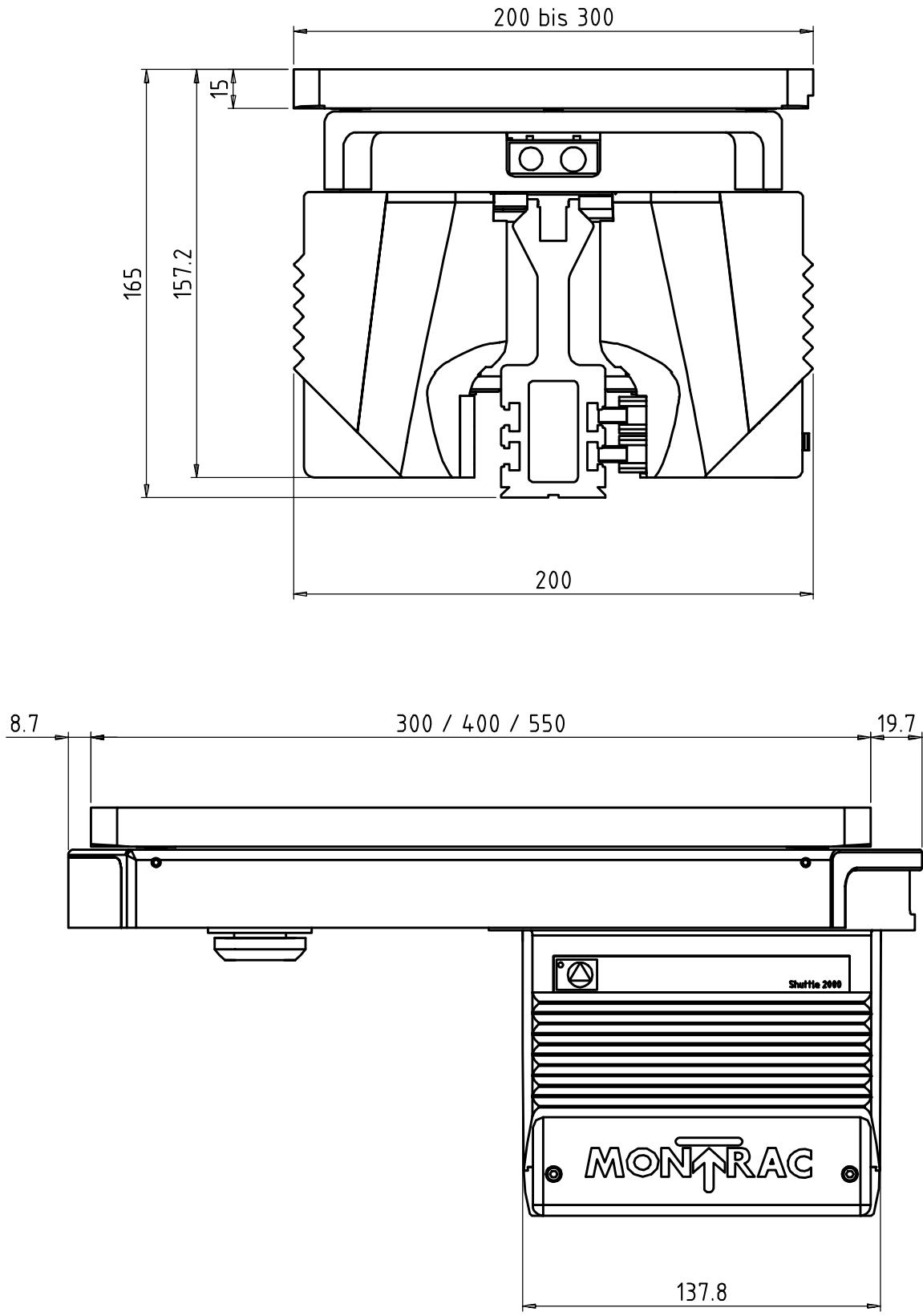
Owing to their special shape, the shuttles are self-centered on the monorail. Driven by a low-voltage electric motor requiring no maintenance, they can travel at a speed of up to 30 m/min.

Each shuttle has its own control system, which receives its commands from the control cams on the track. Possible collisions with other shuttles or obstacles are detected by a built-in sensor and prevented by appropriate control commands.

The shuttles are noteworthy for their smooth running and minimum energy consumption. The platforms on which the workpieces are accommodated can be lifted off the shuttles. The standard sizes of these platforms are: 200 x 300 mm, 300 x 400 mm and 200 x 550 mm. Other sizes on request.

2.1.02 Dimensions

Fig. 2.1-1



2.1.03 Technical data

Standard shuttle length		300 mm 400 mm 550 mm
Stopping accuracy (by means of the A-cam)		± 1.0 mm
Max. speed of travel V_{max}		30 m/min
Reduced speed of travel V_{red}		12 m/min
Total weight max.		17 kg
Shuttle weight without platform	length 300 mm	3.8 kg
	length 400 mm	4.1 kg
	length 550 mm	4.6 kg
Supply voltage		24 V DC
Power consumption	when stationary	0.08 A
	at V_{max}	0.80 A
	when accelerating	2.24 A
Acceleration time	when empty *	0.85 s
	with max. load *	1.40 s
Sound level		< 59 dB (A)
Environment:	permitted temperature range	10–40 °C
	relative humidity	≤ 90% without condensation
	air purity	Atmosphere for assembly of precision mechanical products

* Until $0.95 \times V_{max}$ ist reached



The function of the infra-optics of a shuttle can be influenced by direct or indirect (reflected) sunlight. This can cause an unmeant slowing down or stopping of the shuttle.

In the case of two shuttles travelling towards each other it is possible that both optics could be mutually influenced.

2.1.03.1 Scope of delivery

Shuttle complete, consisting of a carriage mounted on two steering axles, including transport mechanism and control. The platform is not included in delivery.

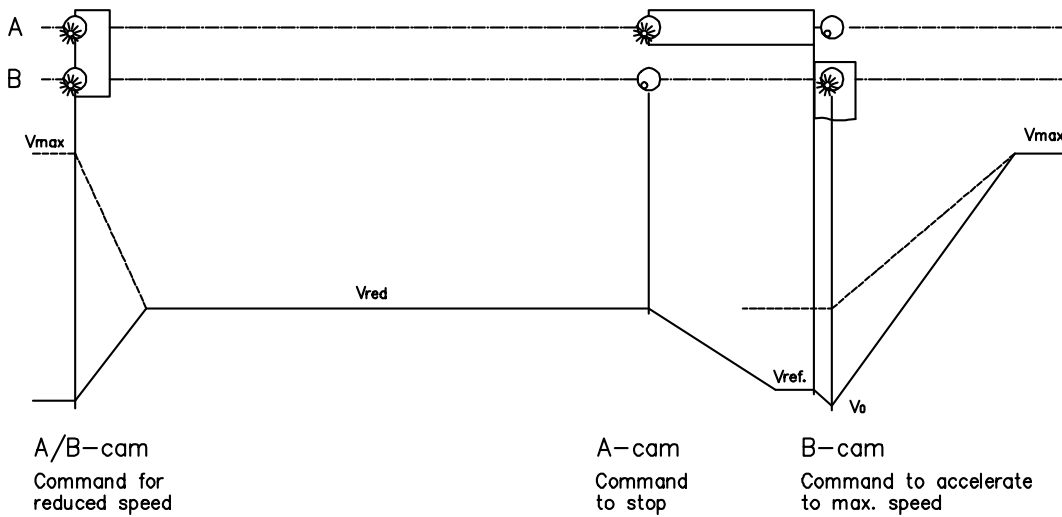
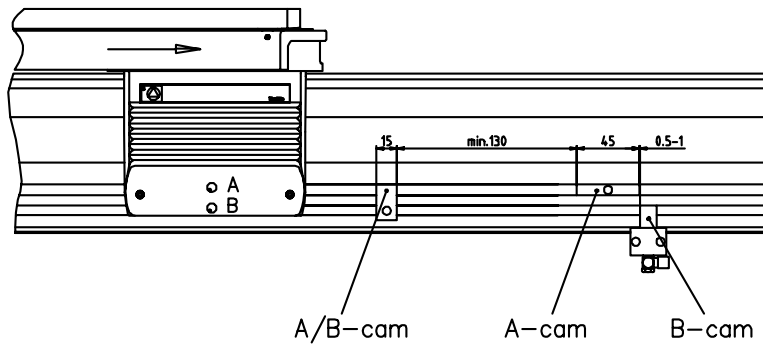
2.1.03.2 Article Nr.

Shuttle for platform 300 mm U	w/o OSM	90990	with OSM	54793
Shuttle for platform 300 mm GU	w/o OSM	90991	with OSM	54794
Shuttle for platform 400 mm U	w/o OSM	90992	with OSM	54795
Shuttle for platform 400 mm GU	w/o OSM	90993	with OSM	54796
Shuttle for platform 550 mm U	w/o OSM	91418	with OSM	54797
Shuttle for platform 550 mm GU	w/o OSM	91419	with OSM	54793

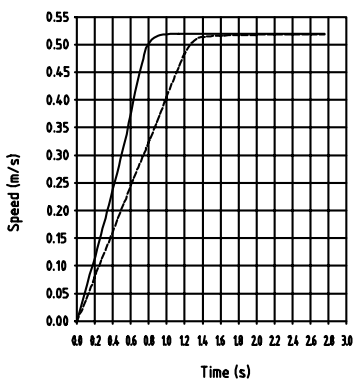
U Shuttles travel clockwise
GU Shuttles travel anti-clockwise

2.1.04 Travel commands

Fig. 2.1-2

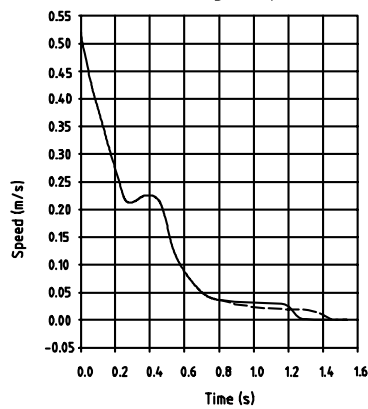


Acceleration ramp



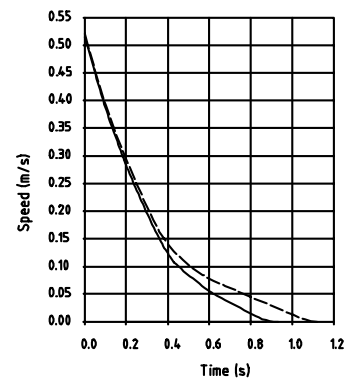
— Start without load
 - - - Start with load

Braking ramp



— Start without load
 - - - Start with load

Braking ramp emergency OFF

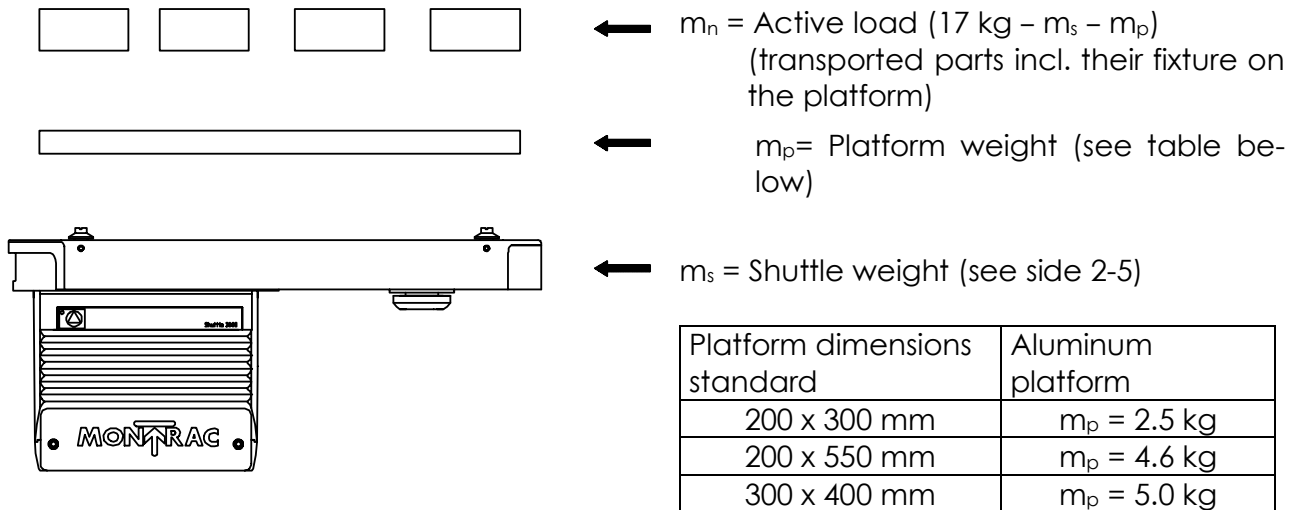


— Emergency stop without load
 - - - Emergency stop with load

2.1.05 Load limits

2.1.05.1 Active load

Fig. 2.1-3



2.1.05.2 Position of the center of gravity (Fig. 2.1-4)

The center of gravity (S) of the active load (m_n) must be within the shaded space.

2.1.05.3 Static moment around the longitudinal axis (Fig. 2.1-4)

(This static moment must not be exceeded outside the positioning unit)

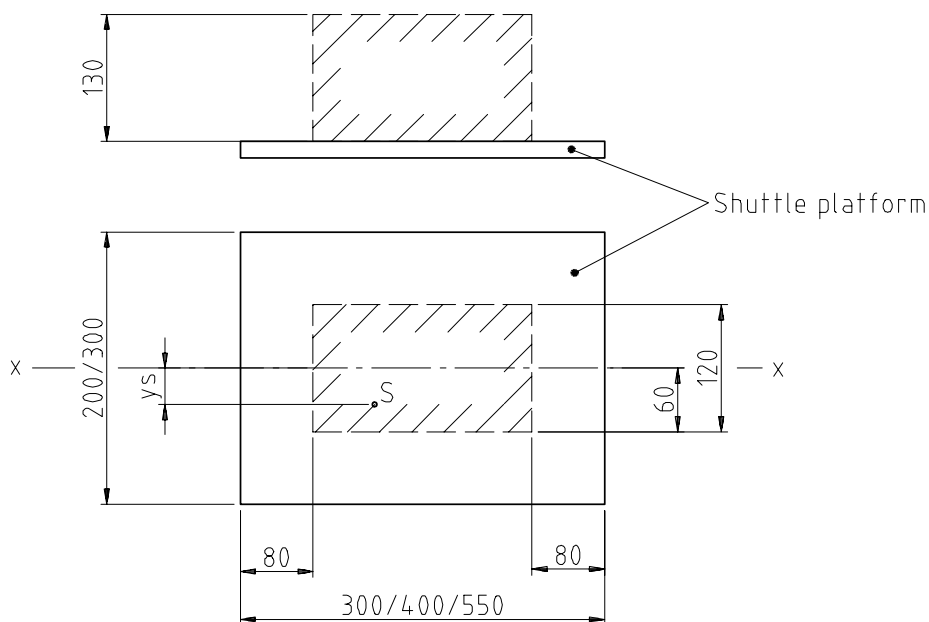
$$M_s = m_n \cdot 9.81 \text{ msec}^{-2} \cdot y_s \cdot 10^{-3} \leq 2 \text{ Nm}$$

M_s = static moment around the longitudinal axis (x) [Nm]

m_n = active load [kg]

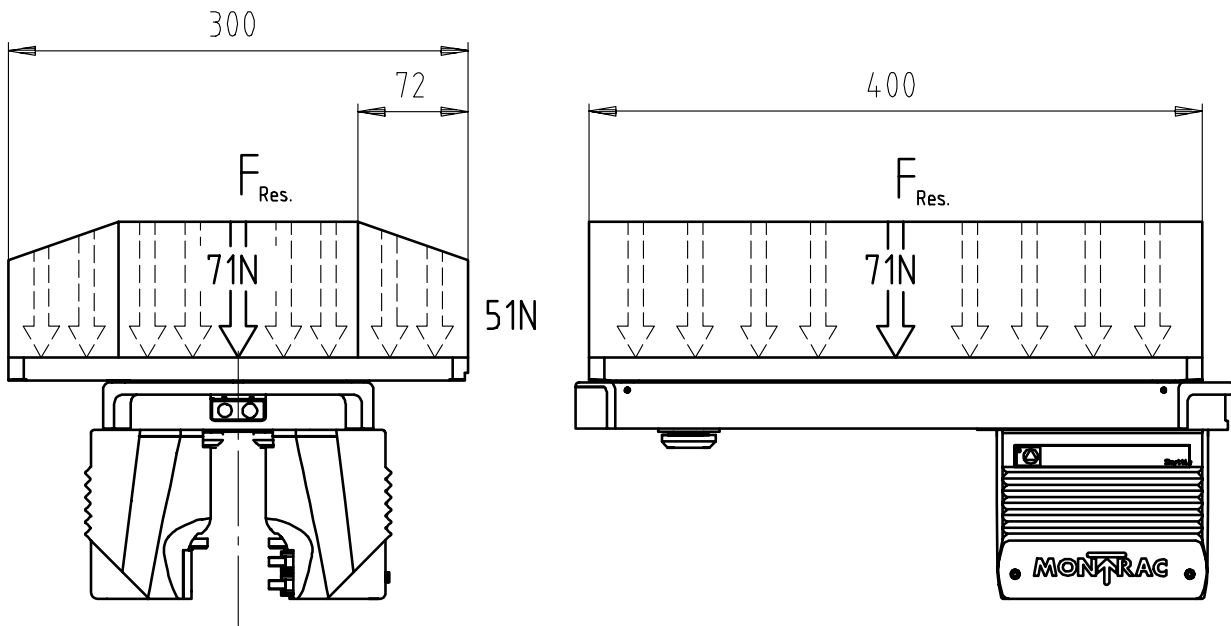
y_s = distance of center of gravity from m_n to the longitudinal axis (x) [mm]

Fig. 2.1-4



Standard-Shuttle

Fig. 2.1-5



$F_{Res.}$ = resultant weight

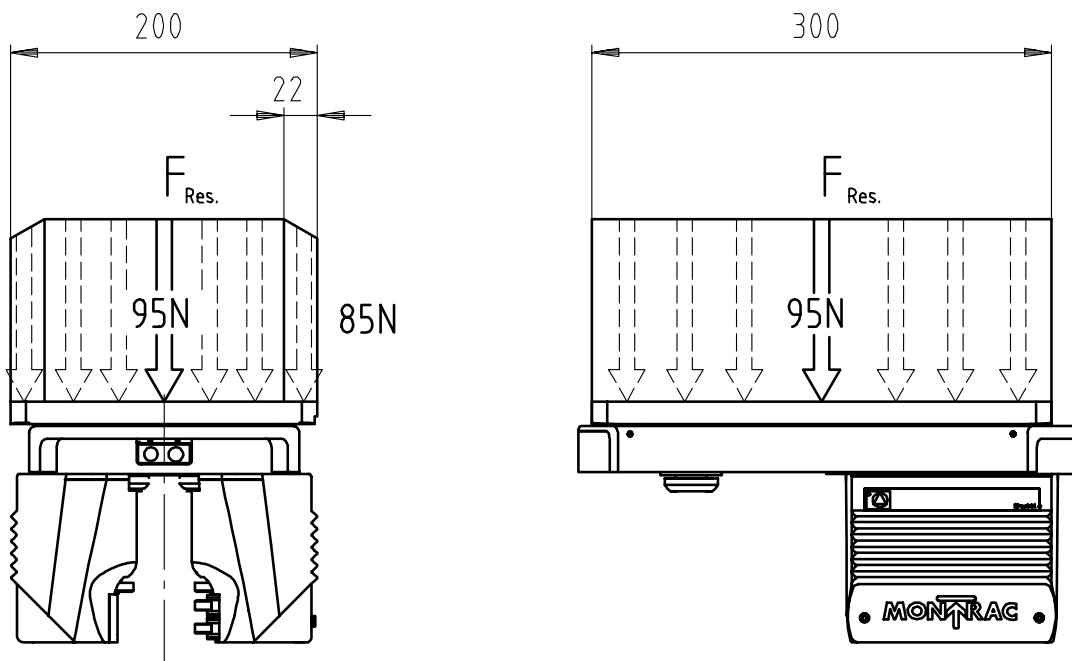
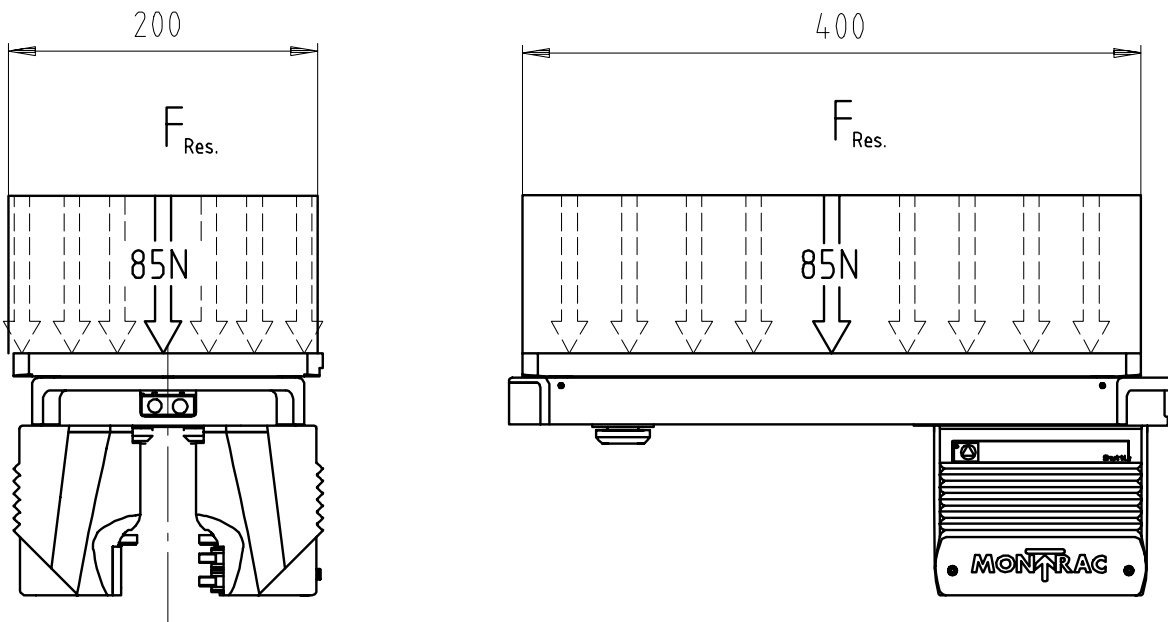
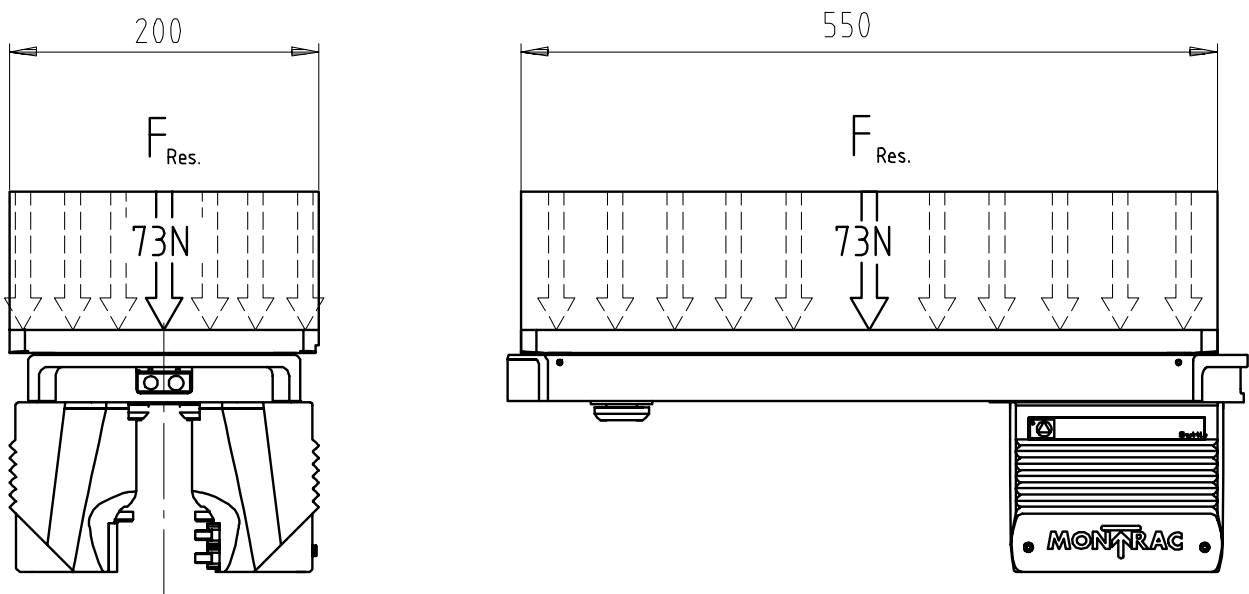


Fig. 2.1-6



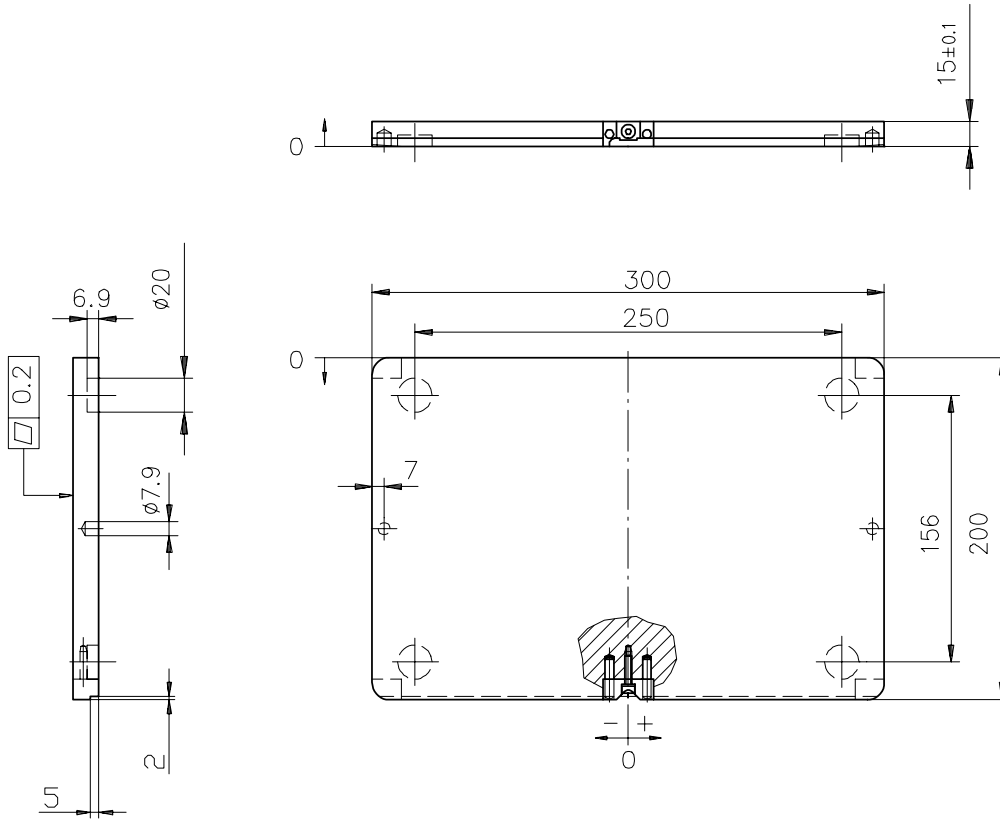
$F_{Res.}$ = resultant weight



2.1.06 Indications for the designer

Fig. 2.1-7

Platform Alu 200 x 300 mm with single positioning (mass = 2.5 kg)



Platform Alu 200 x 300 mm with multiple positioning (mass = 2.5 kg)

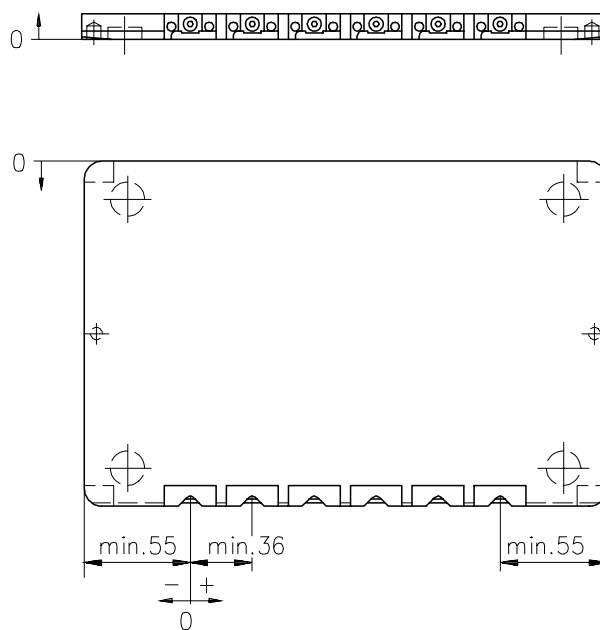
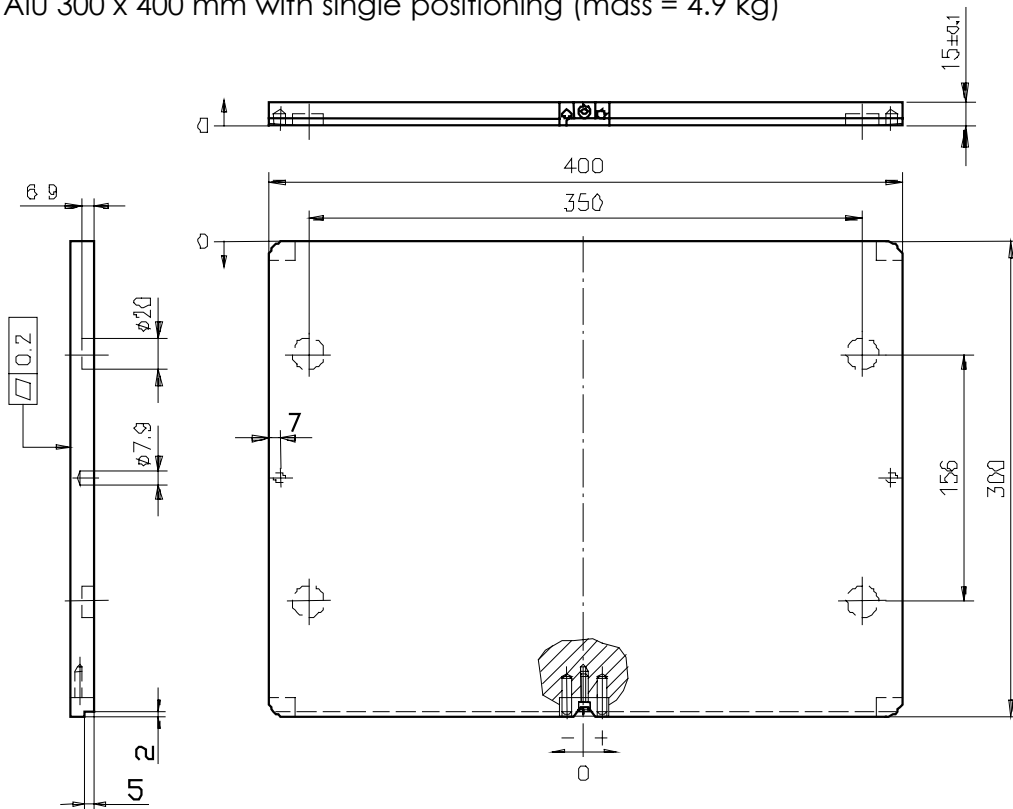
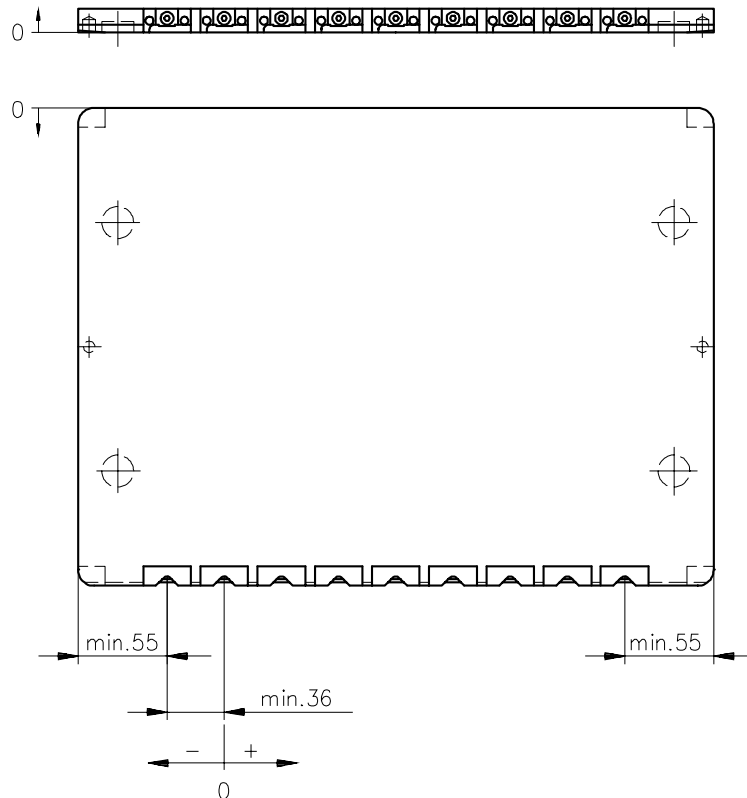


Fig. 2.1-8

Platform Alu 300 x 400 mm with single positioning (mass = 4.9 kg)



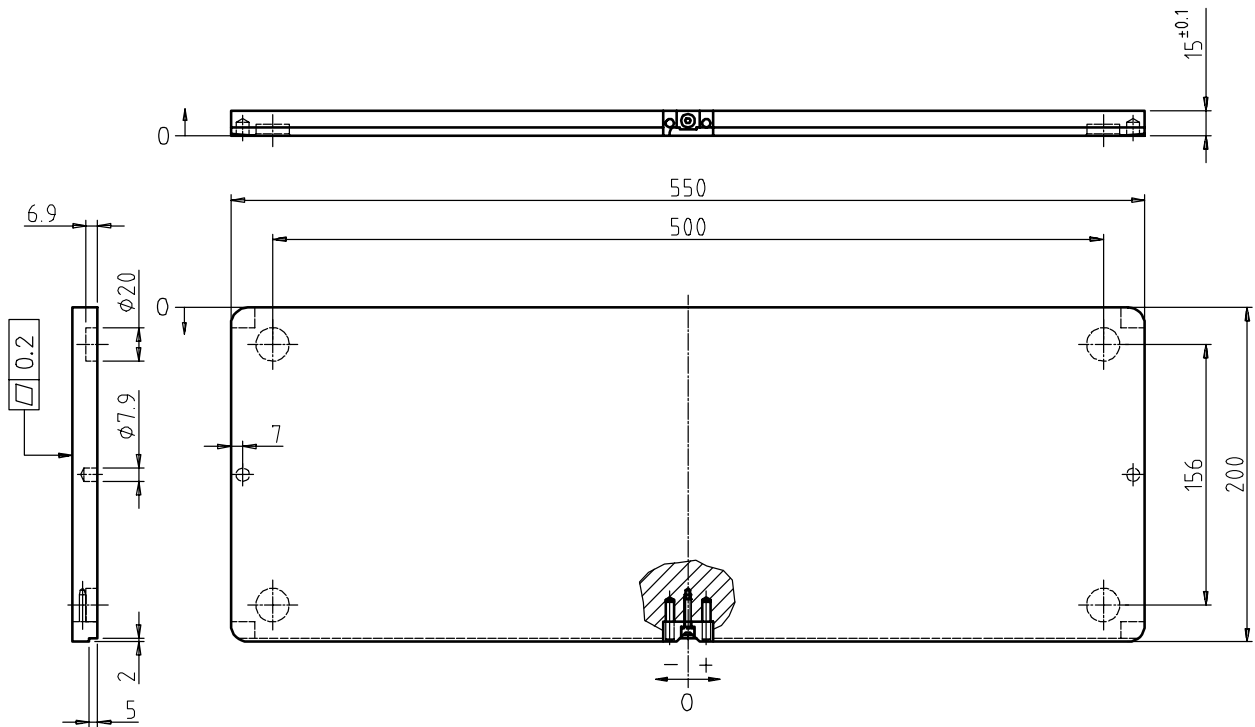
Platform Alu 300 x 400 mm with multiple positioning (mass = 4.9 kg)



Standard-Shuttle

Fig. 2.1-9

Platform Alu 200 x 550 mm with single positioning (mass = 4.5 kg)



MT-00395

2.2 Two-Axle-Shuttle

2.2.01 System logistic

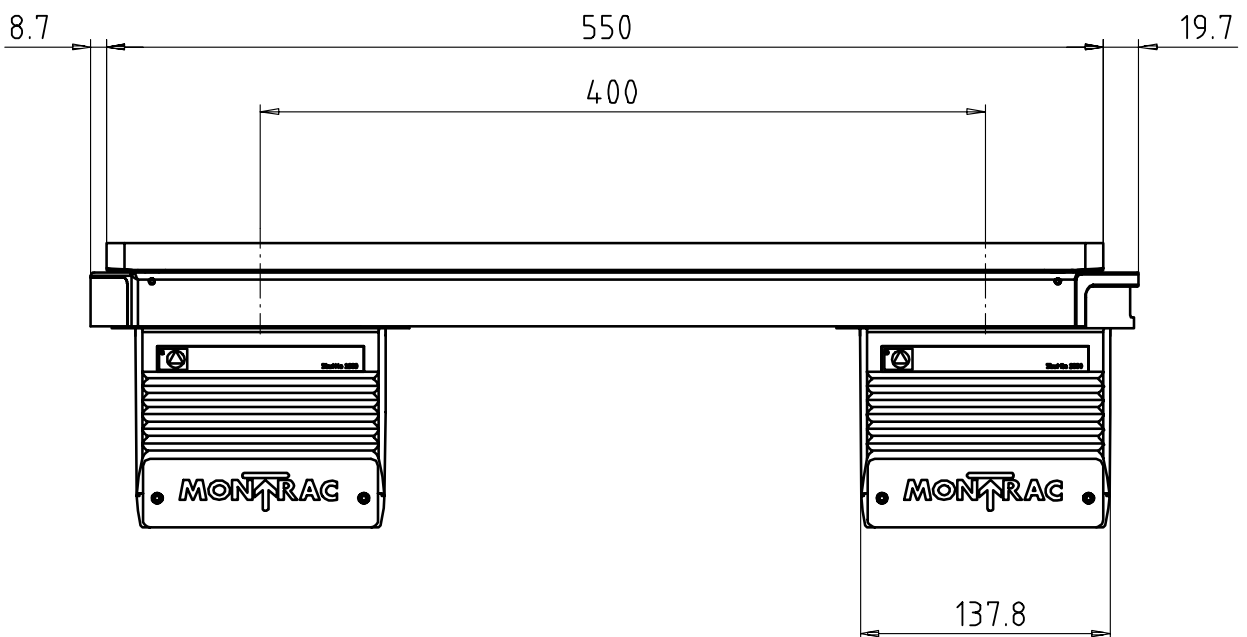
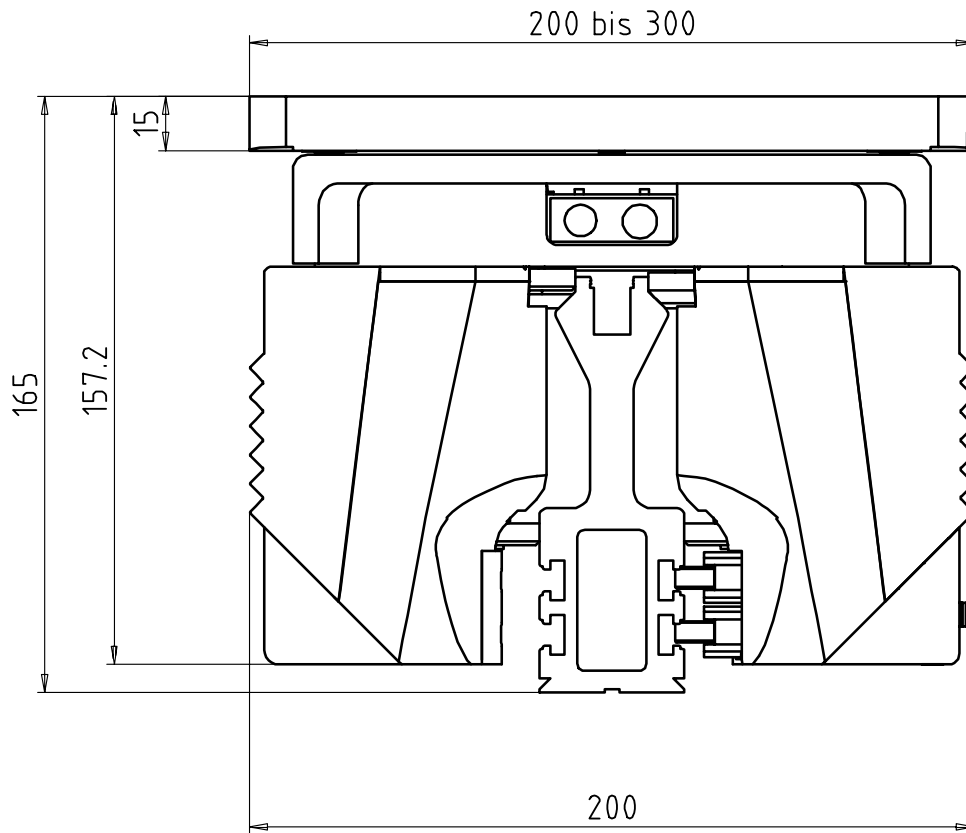
Owing to their special shape, the shuttles are self-centered on the monorail. Driven by two low-voltage electric motors requiring no maintenance, they can travel at a speed of up to 30 m/min.

Each shuttle has its own control system, which receives its commands from the control cams on the track. Possible collisions with other shuttles or obstacles are detected by a built-in sensor and prevented by appropriate control commands.

The shuttles are noteworthy for their smooth running and minimum energy consumption. The platforms on which the workpieces are accommodated can be lifted off the shuttles. The standard size of these platform is: 200 x 550 mm. Other sizes on request.

2.2.02 Dimensions

Fig. 2.2-1



2.2.03 Technical data

2 axle shuttle	length	550 mm
Stopping accuracy (by means of the A-cam)		± 1.0 mm
Max. speed of travel V_{\max}		30 m/min
Reduce speed of travel V_{red}		12 m/min
Total weight max.		34 kg
Shuttle weight without platform		9 kg
Supply voltage		24 V DC
Power consumption	when stationary	0.16 A
	at V_{\max}	1.90 A
	when accelerating	4.48 A
Acceleration time	when empty *	0.80 s
	with max. load *	1.1 s
Sound level		< 59 dB (A)
Environment:	permitted temperature range	10–40 °C
	relative humidity	$\leq 90\%$ without condensation
	air purity	Atmosphere for assembly of precision mechanical products

* Until $0.95 \times V_{\max}$ ist reached



The function of the infra-optics of a shuttle can be influenced by direct or indirect (reflected) sunlight. This can cause an unmeant slowing down or stopping of the shuttle.

In the case of two shuttles travelling towards each other it is possible that both optics could be mutually influenced.

2.2.03.1 Scope of delivery

Shuttle complete, consisting of a carriage mounted on two steering axles, including transport mechanism and control. The platform is not included in delivery.

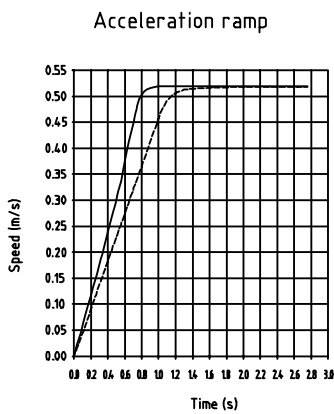
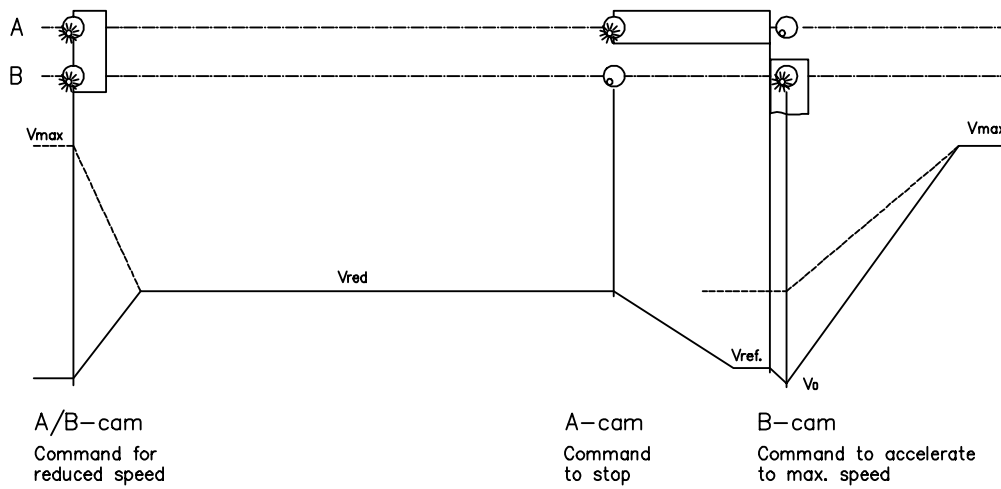
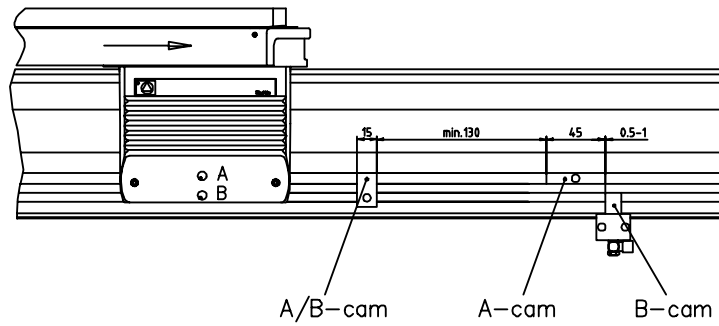
2.2.03.2 References numbers

2 axle shuttles for platform 200 x 550 U	w/o OSM	91420	with OSM	54799
2 axle shuttles for platform 200 x 550 GU	w/o OSM	91421	with OSM	54800

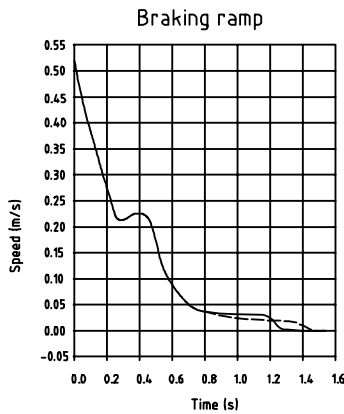
U Shuttles travel clockwise
 GU Shuttles travel anti-clockwise

2.2.04 Travel commands

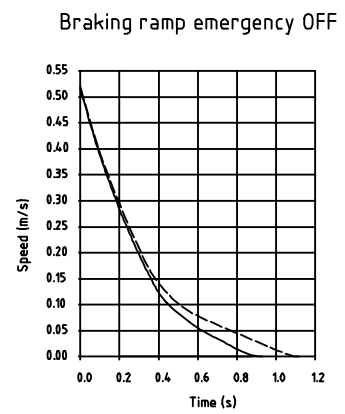
Fig. 2.2-2



— Start without load
 - - - Start with load



— Start without load
 - - - Start with load

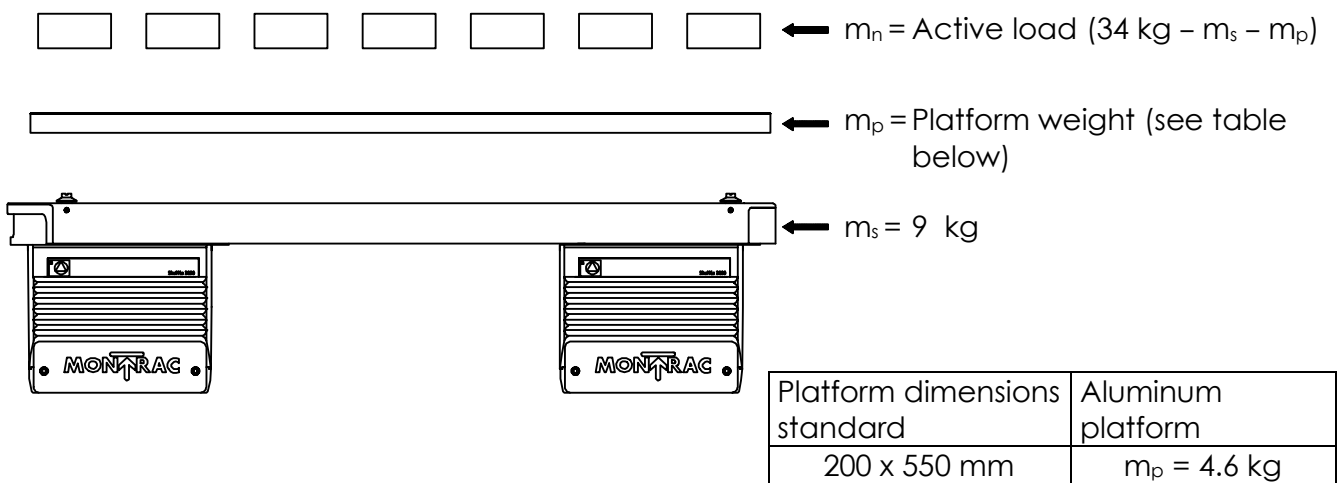


— Emergency stop without load
 - - - Emergency stop with load

2.2.05 Load limits

2.2.05.1 Active load

Fig. 2.2-3



2.2.05.2 Position of the center of gravity (Fig. 2.2-4)

The center of gravity (S) of the active load (m_n) must be within the shaded space.

2.2.05.3 Static moment around the longitudinal axis (Fig. 2.2-4)

(This moment must not be exceeded outside the positioning unit)

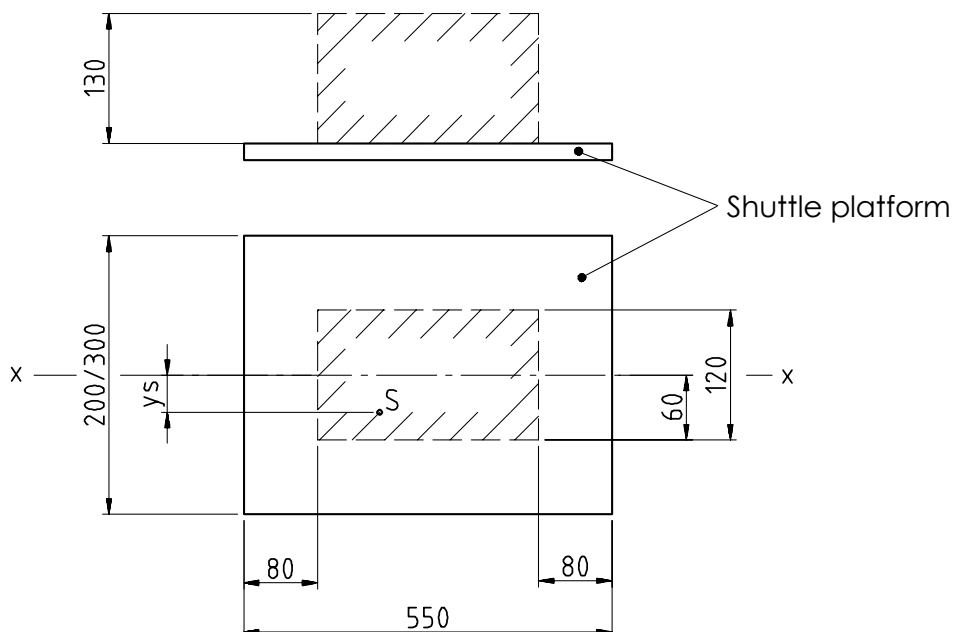
$$M_s = m_n \cdot 9.81 \text{ msec}^{-2} \cdot y_s \cdot 10^{-3} \leq 4 \text{ Nm}$$

M_s = static moment around the longitudinal (x) [Nm]

m_n = active load [kg]

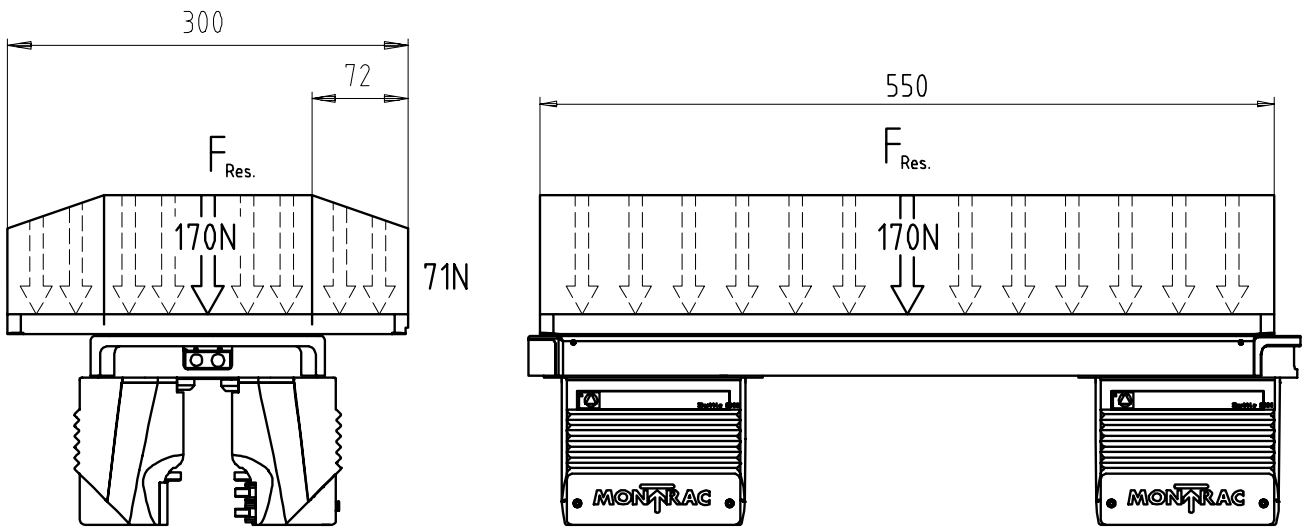
y_s = Distance of center of gravity from m_n to the longitudinal axis (x) [mm]

Fig. 2.2-4

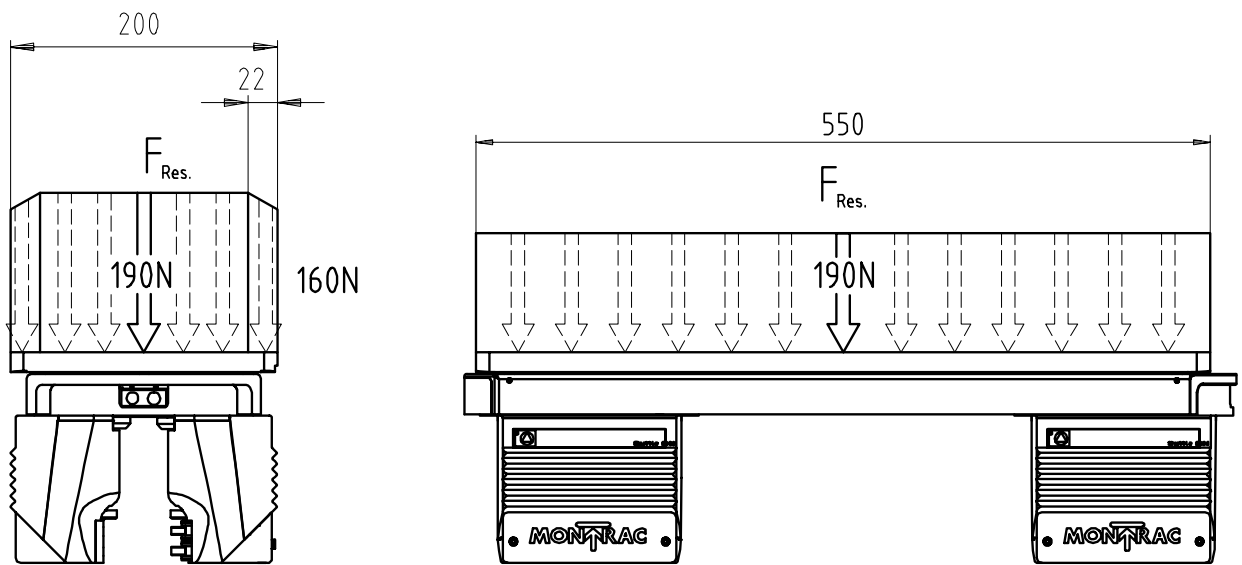


Two-Axle-Shuttle

Fig. 2.2-5



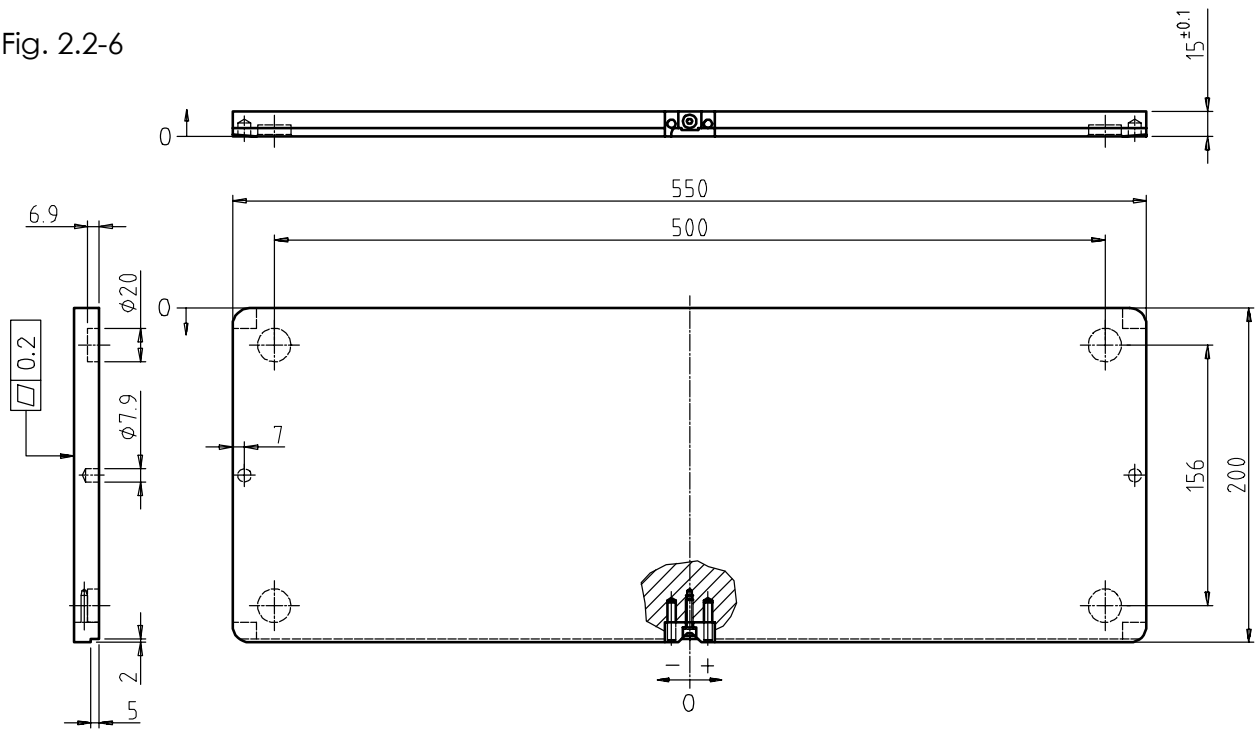
$F_{Res.}$ = resultant weight



2.2.06 Indications for the designer

Platform Alu 200 x 550 mm with single positioning (mass = 4.6 kg)

Fig. 2.2-6



2.3 Two-Axle-Shuttle (rear axle empty)

2.3.01 System logistic

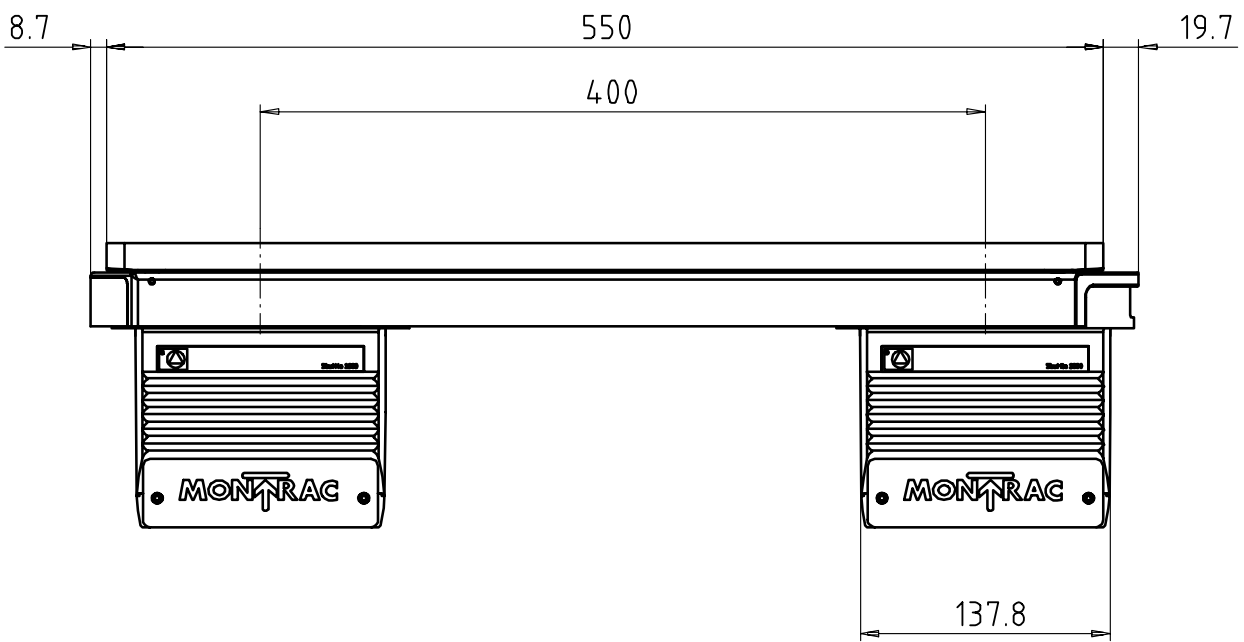
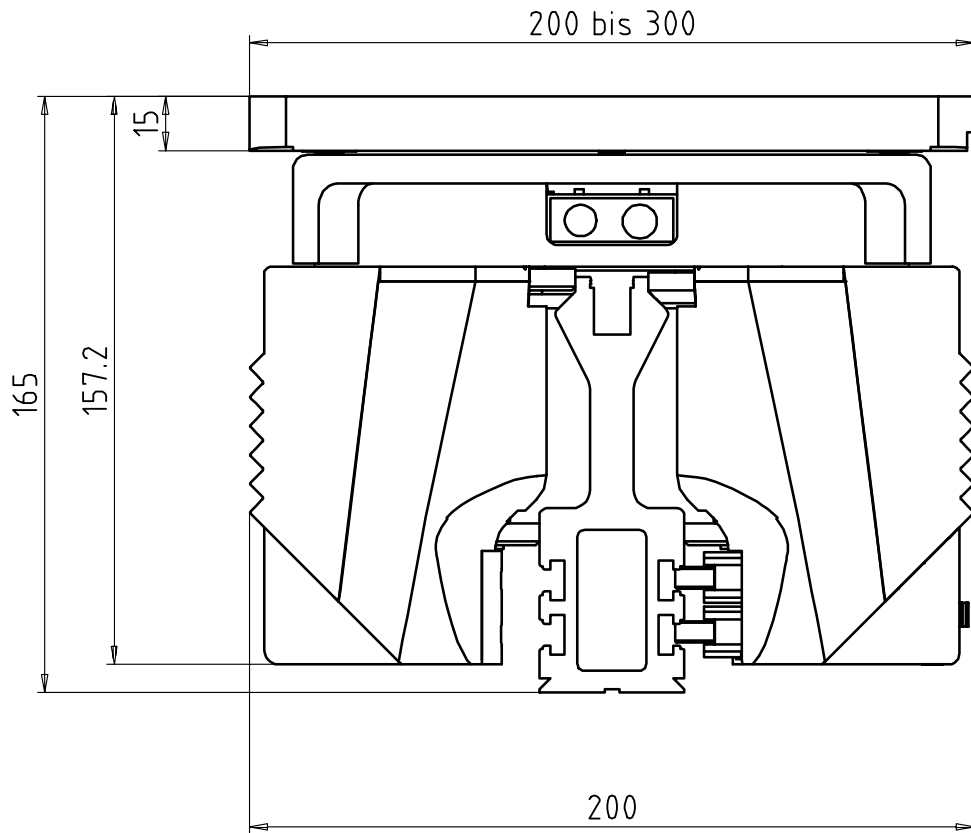
Owing to their special shape, the shuttles are self-centered on the monorail. Driven by two low-voltage electric motors requiring no maintenance, they can travel at a speed of up to 30 m/min.

Each shuttle has its own control system, which receives its commands from the control cams on the track. Possible collisions with other shuttles or obstacles are detected by a built-in sensor and prevented by appropriate control commands.

The shuttles are noteworthy for their smooth running and minimum energy consumption. The platforms on which the workpieces are accommodated can be lifted off the shuttles. The standard size of these platform is: 200 x 550 mm. Other sizes on request.

2.3.02 Dimensions

Fig. 2.3-1



2.3.03 Technical data

Shuttle standard	length	550 mm
Stopping accuracy (by means of the A-cam)		± 1.0 mm
Max. speed of travel V_{\max}		30 m/min
Reduce speed of travel V_{red}		12 m/min
Total weight max.		17 kg
Shuttle weight without platform		6.2 kg
Supply voltage		24 V DC
Power consumption	when stationary	0.08 A
	at V_{\max}	0.80 A
	when accelerating	2.24 A
Acceleration time	when empty *	0.85 s
	with max. load *	1.40 s
Sound level		< 59 dB (A)
Environment:	permitted temperature range	10–40 °C
	relative humidity	≤ 90% without condensation
	air purity	Atmosphere for assembly of precision mechanical products

* Until 0.95 x V_{\max} ist reached



The function of the infra-optics of a shuttle can be influenced by direct or indirect (reflected) sunlight. This can cause an unmeant slowing down or stopping of the shuttle.

In the case of two shuttles travelling towards each other it is possible that both optics could be mutually influenced.

2.3.03.1 Scope of delivery

Shuttle complete, consisting of a carriage mounted on two steering axles, including transport mechanism and control. The platform is not included in delivery.

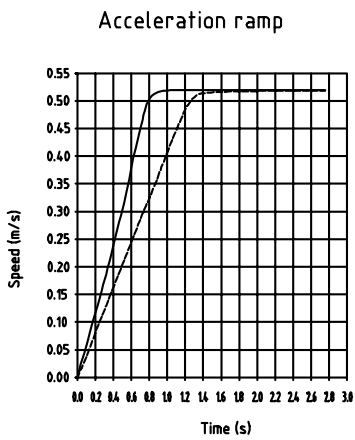
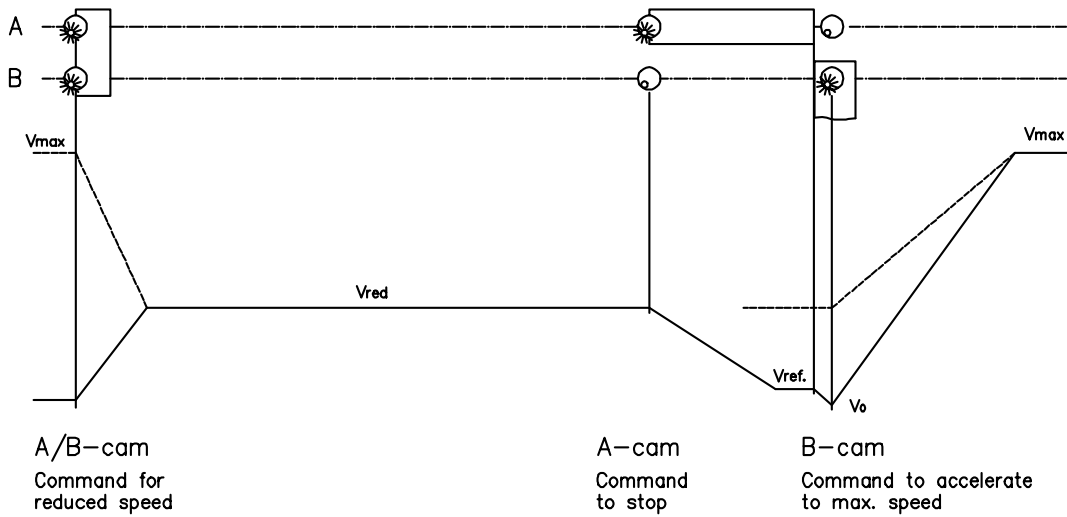
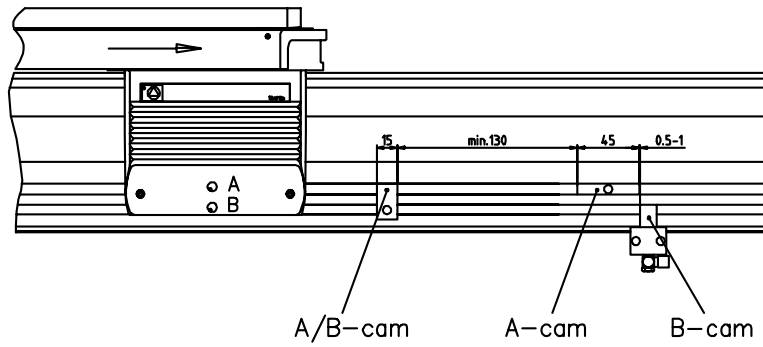
2.3.03.2 References numbers

2 axle shuttles for platform 200 x 550 U	w/o OSM 91422	with OSM 54801
2 axle shuttles for platform 200 x 550 GU	w/o OSM 91423	with OSM 54802

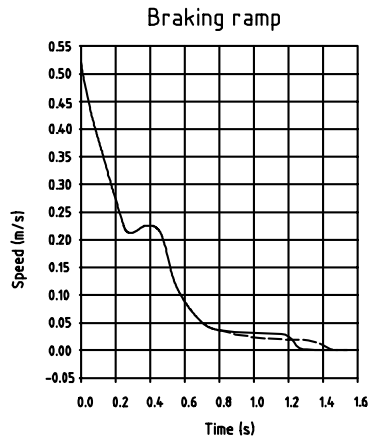
- U Shuttles travel clockwise
- GU Shuttles travel anti-clockwise

2.3.04 Travel commands

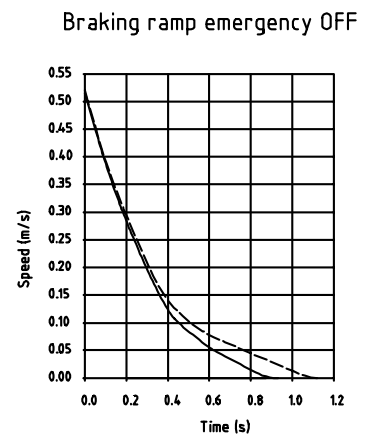
Fig. 2.3-2



— Start without load
 - - Start with load



— Start without load
 - - Start with load

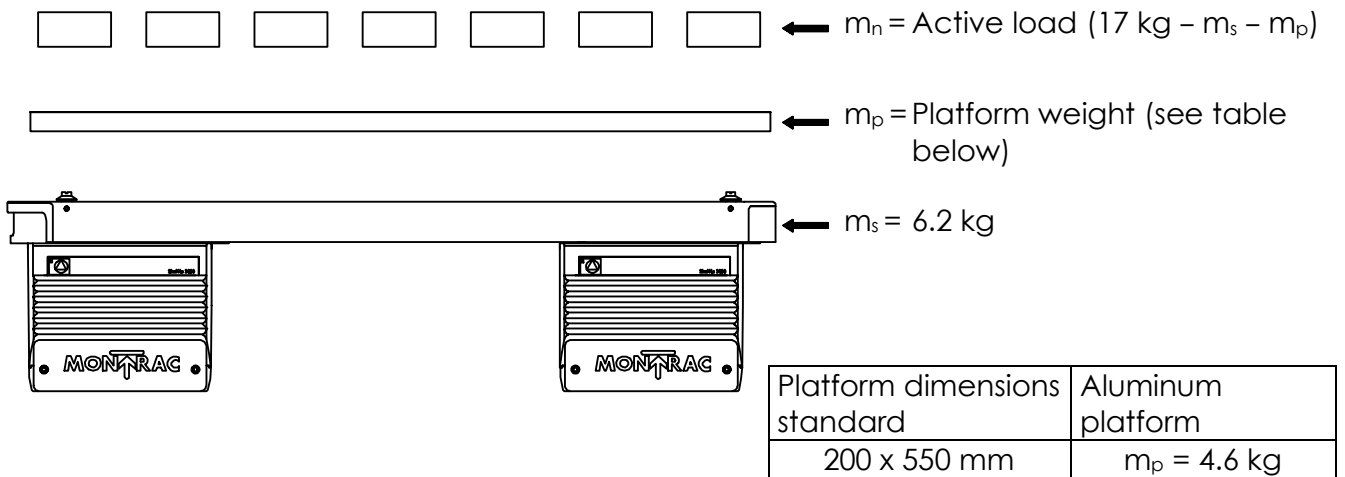


— Emergency stop without load
 - - Emergency stop with load

2.3.05 Load limits

2.3.05.1 Active load

Fig. 2.3-3



2.3.05.2 Position of the center of gravity (Fig. 2.3-4)

The center of gravity (S) of the active load (m_n) must be within the shaded space.

2.3.05.3 Static moment around the longitudinal axis (Fig. 2.3-4)

(This moment must not be exceeded outside the positioning unit)

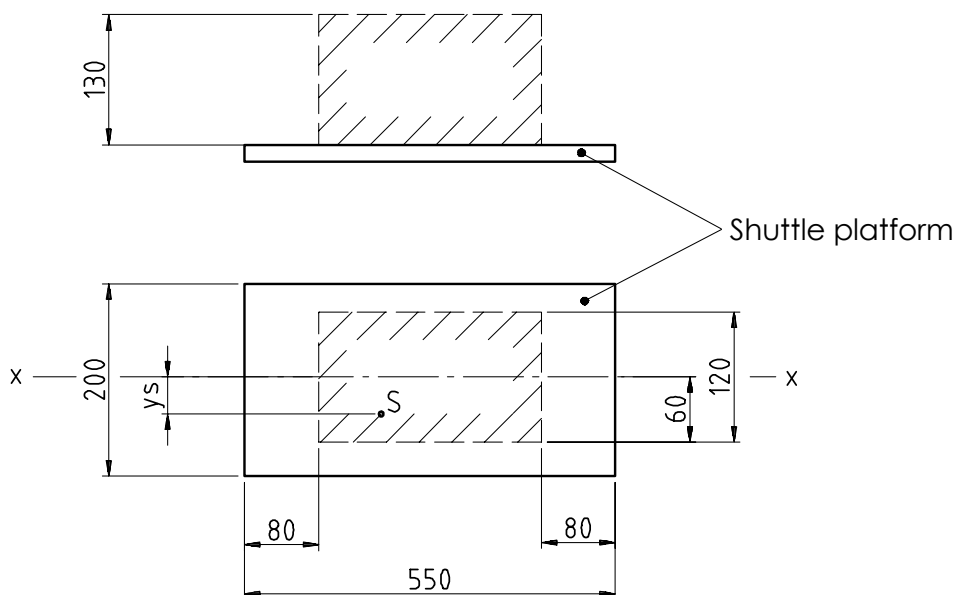
$$M_s = m_n \cdot 9.81 \text{ msec}^{-2} \cdot y_s \cdot 10^{-3} \leq 4 \text{ Nm}$$

M_s = static moment around the longitudinal (x) [Nm]

m_n = active load [kg]

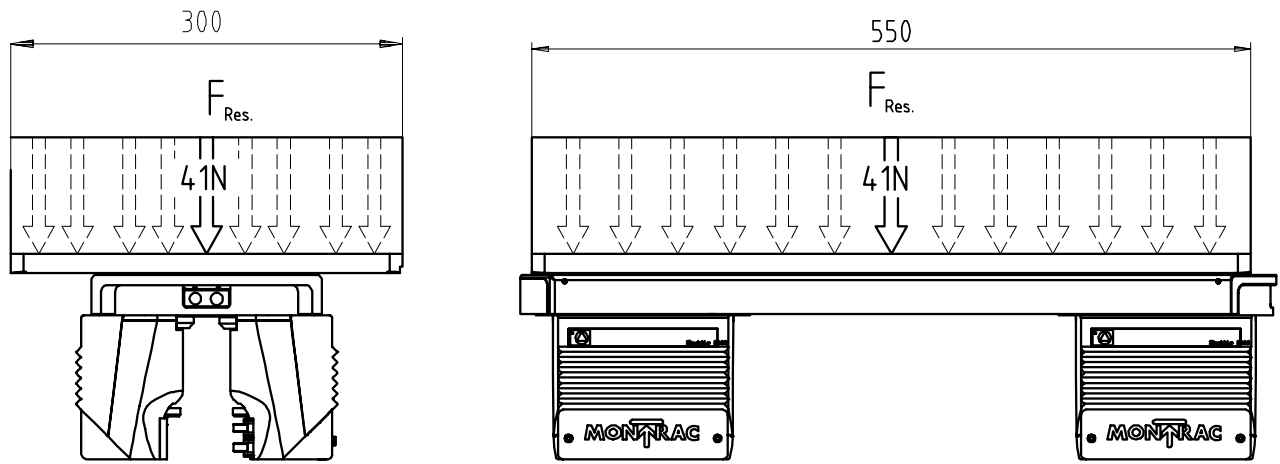
y_s = Distance of center of gravity from m_n to the longitudinal axis (x) [mm]

Fig. 2.3-4

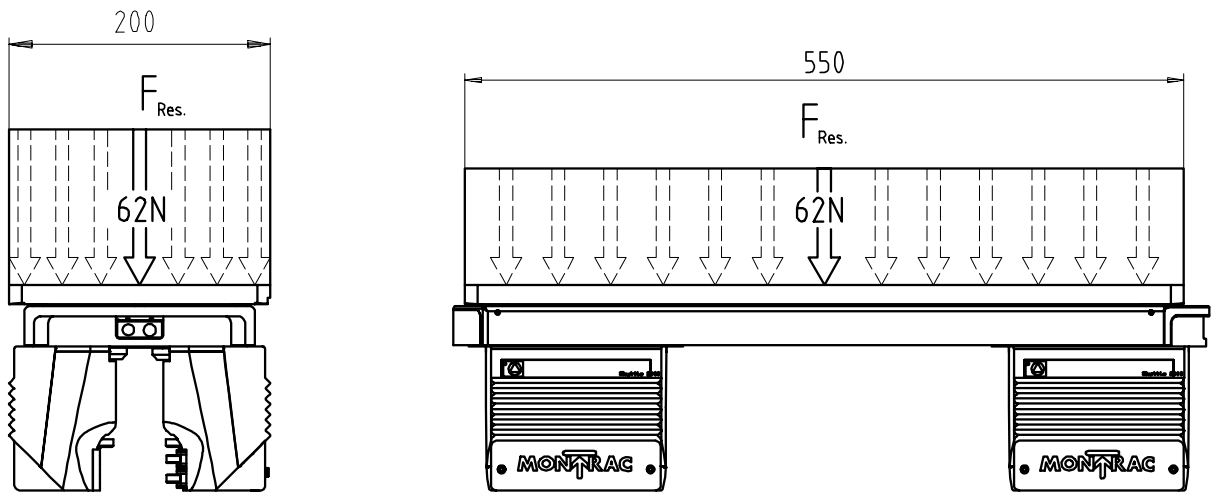


Two-Axle-Shuttle (rear axle empty)

Fig. 2.3-5



$F_{Res.}$ = resultant weight



2.3.06 Indications for the designer

Platform Alu 200 x 550 mm with single positioning (mass = 4.6 kg)

Fig. 2.3-6

