LINEAR TRANSFER SYSTEMS

SECTION 10

meto-fer® automation

Your complete source for industrial automation and electronics

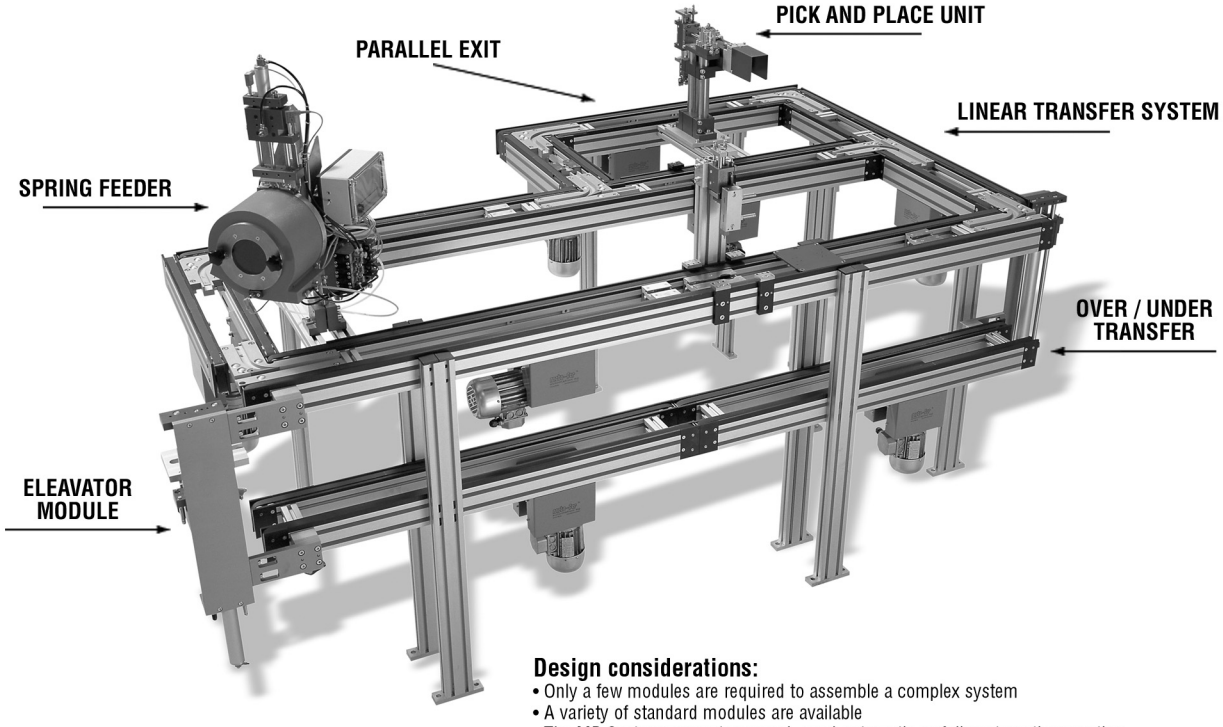
mf automation, inc.

www.meto-fer.com

1-888-638-6337

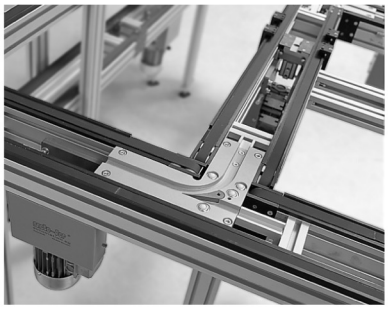
Linear Transfer System MP

Linear Pallet Transfer System
Two-Belt System



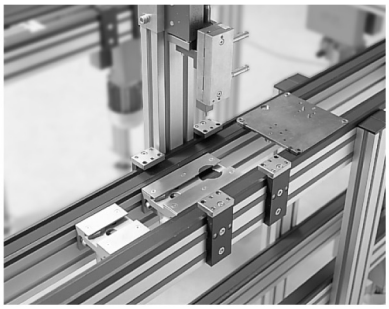
Design considerations:

- Only a few modules are required to assemble a complex system
- A variety of standard modules are available
- The MP System supports manual, semi-automatic or fully automatic operation
- The MP System can be easily expanded and all modules can be entirely re-used
- The MP System facilitates fast and reliable transport of aluminum pallets
- Any number of manual work modules can be directly integrated into the main system



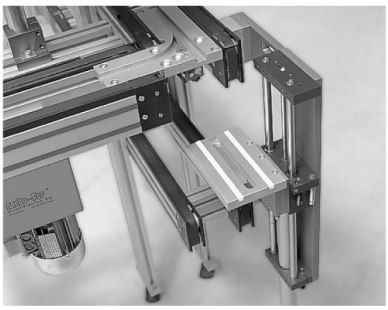
Switch Point

Partial Track Connection

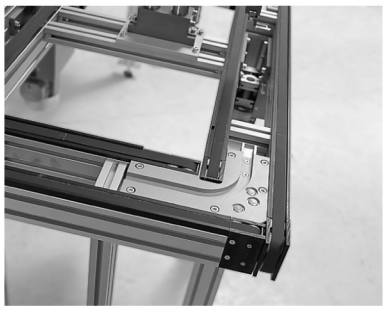


Position Station

Partial Track with Drive Unit



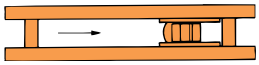
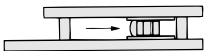
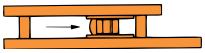
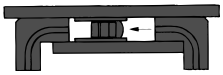
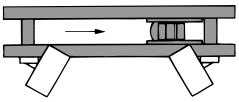
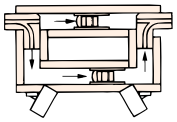
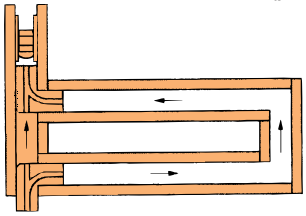
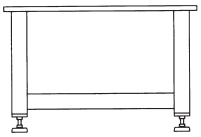
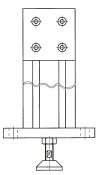
Vertical End Module with Lift



End Module

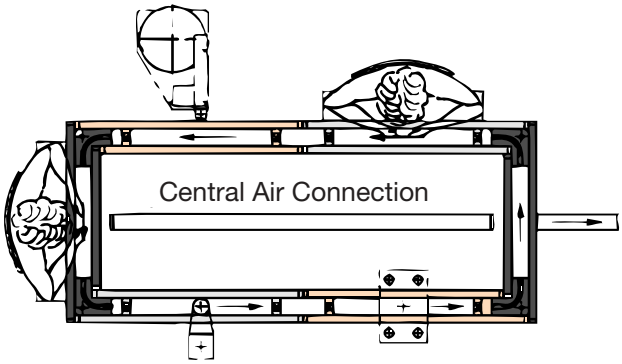
See web page: www.meto-fer.com/2LTSsub.html

Following is the list of components used in the Modular Assembly System:

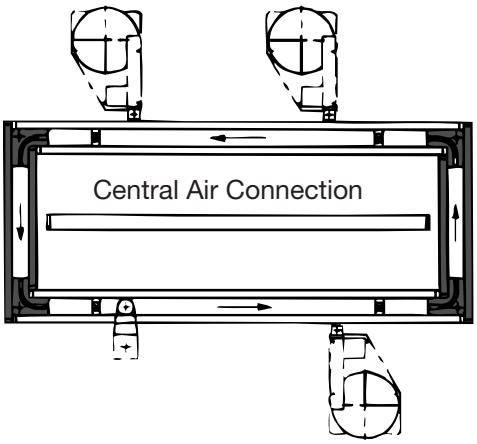
	Component No.	Page No.
Pallet (Coding "MC") 	① ② MPA-010-xxx-xxx ① = Pallet Length in mm ② = Pallet Width in mm	10.003
Positioning for automation workstation/manual workstation 	MPA-020-xxx-xxx MPA-025-xxx-xxx	10.004
Partial transport tracks 	MPA-030-xxx-xxx	10.005
Connecting transport tracks  	MPA-040-xxx-xxx MPA-045-xxx-xxx	10.005
End modules 	MPA-050-xxx-xxx MPA-051-xxx-xxx	10.006
Manual workstation A (in line) 	MPA-060-xxx-xxx	10.006
Manual workstation B (parallel exit) 	MPA-070-xxx-xxx	10.007
Manual workstation C (perpendicular exit) 	MPA-080-xxx-xxx	10.007
Base table 	MPA-090-xxx-xxx MPA-091-xxx-xxx MPA-092-xxx-xxx MPA-093-xxx	10.008
Support stands 	MPA-110-xxx	10.008

Combination Examples of MP Systems

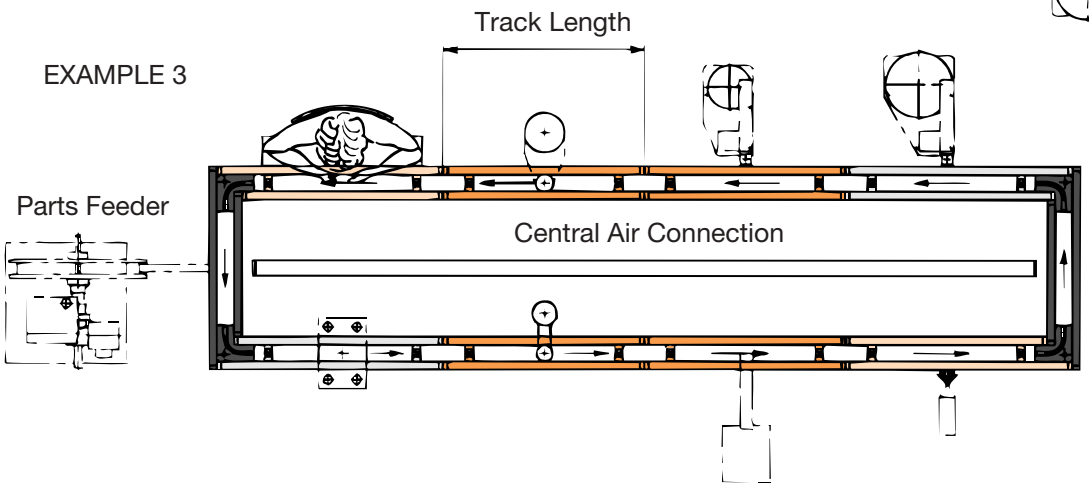
EXAMPLE 1



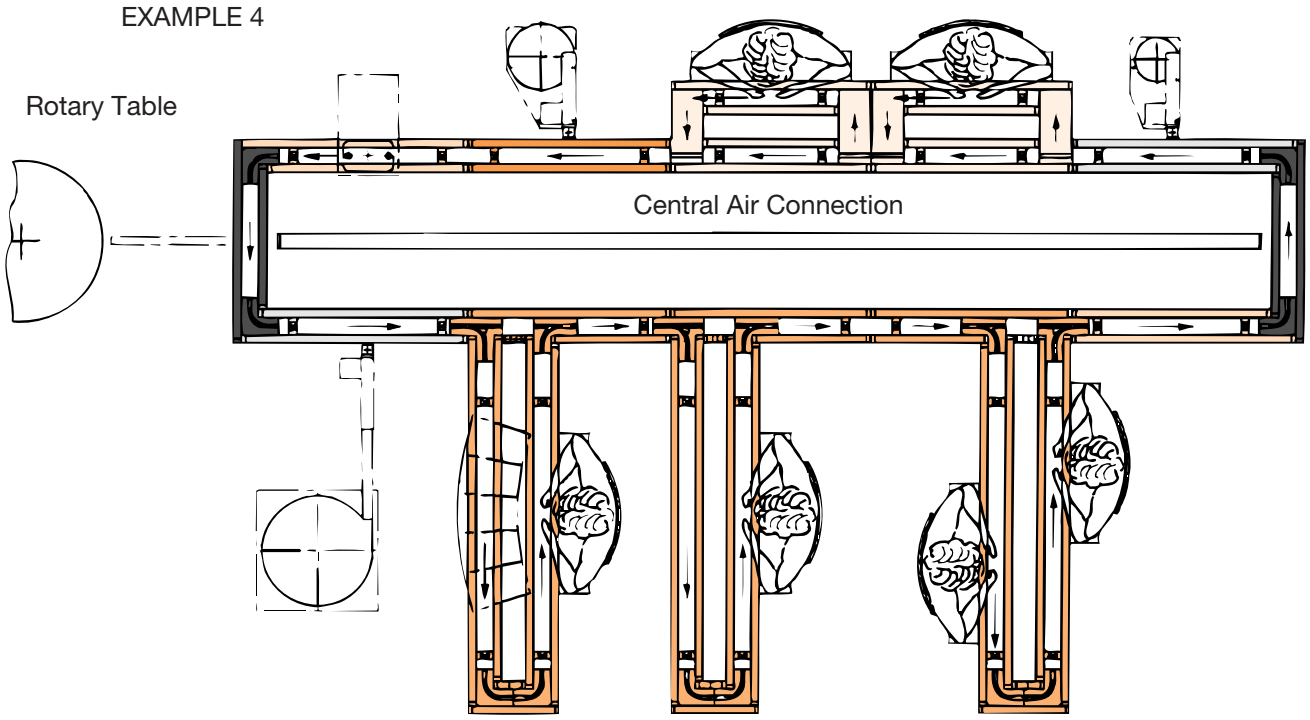
EXAMPLE 2



EXAMPLE 3



EXAMPLE 4



INQUIRY SHEET: Pallet / Chain Transporter or MP-System (2 belt)

COMPANY: _____ PHONE: _____

CONTACT NAME: _____ FAX: _____

ADDRESS: _____ EMAIL: _____

CITY / STATE / ZIP: _____

SYSTEM DATA INFO:

Approximate Length of system: _____ Approximate Width of system: _____

Dimensions of product to be handled:
Length: _____ Width: _____ Height: _____

Weight of product: _____

Weight of work piece holder per pallet: _____

Pallet size: Length: _____ Width: _____

Number of Pallets: _____

Chain/Belt Speed: _____

Direction of travel: ❑ Clockwise ❑ Counter clockwise

Including proximity switch: ❑ YES ❑ NO ❑ NPN or ❑ PNP

Automatic Workstation: (1pc. Pre-stop, 1pc. Stop, 1pc. lift) _____pc. (+ / - 0.02 mm accuracy)

Manual Workstation: (1pc. Pre-stop and 1pc. Stop) _____pc. (+ / - 0.5 mm accuracy)

Height of system: _____ (Top of Chain/Belt)

Coding systems: ❑ YES ❑ NO

Additional comments:

_____

_____

_____

PLEASE SEND OR FAX INQUIRY REQUEST TO:

mf automation, Inc.
355 Wyoming Street • Pittsburgh, PA 15211
Phone: 412-488-3488
Fax: 412-488-3498

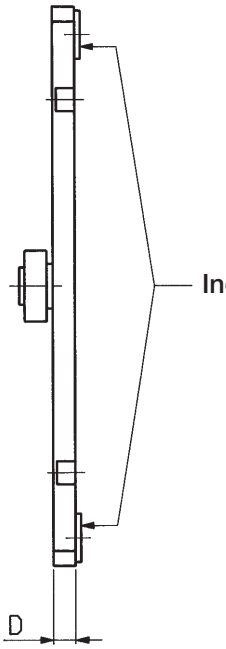
Pallets

- The pallets provide a platform for fixtures and coding system.
- Meto-Fer® offers a mechanical coding system ("MC").
- The positioning accuracy of the pallets is 0.02mm (standard).
  Option: Positioning accuracy for pallet size up to 200 x 200 mm, 0.01mm.
- The wide range of pallets allows for optimal adaptation to your product.

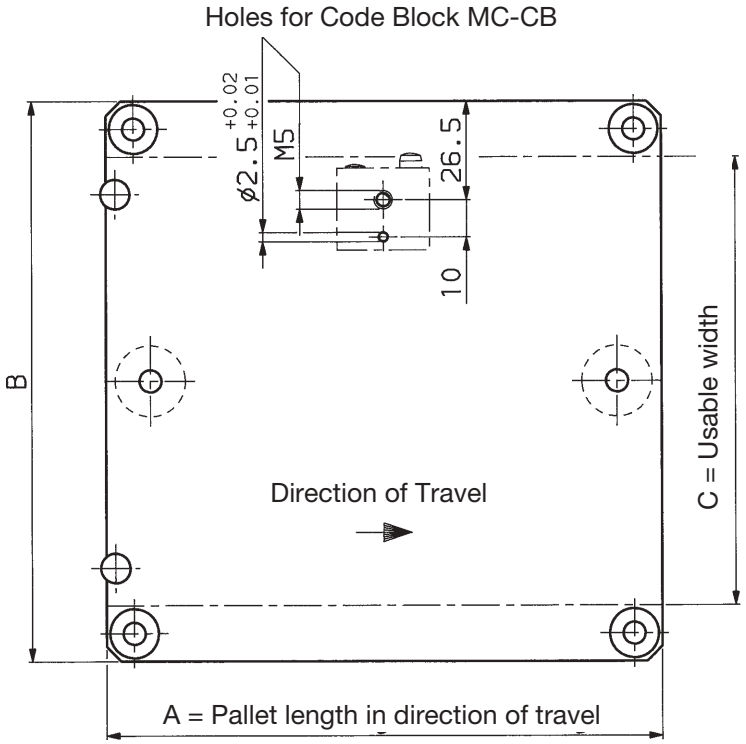
Standard Sizes

Pallet Size AxB	C	D	Pallet Interchange Time (sec.)	Material
				Aluminum (AlMg4.5Mn No. 5083)
150x100	82	10	1.2	
150x150	120	10	1.2	
200x150	120	10	1.4	
200x200	170	10	1.4	
250x200	170	10	1.6	
250x250	220	10	1.6	
300x200	170	10	1.8	
300x300	270	10	1.8	
400x300	270	10	2.2	
400x400	370	10	2.2	
500x400	370	10	2.6	
500x500	470	10	2.6	
Option up to 1,500 x 1,000mm possible				

Recommendation for number of pallets per systems:
3 pcs. per station + an additional 6 pcs.



NOTE:
If using only manual work-stations, index bushings are not required. Please specify when ordering.



Order No. for Pallets

MPA-010-xxx-xxx (1) (2)

(1) = Pallet Length in mm
(2) = Pallet Width in mm

Mechanical Coding System MC

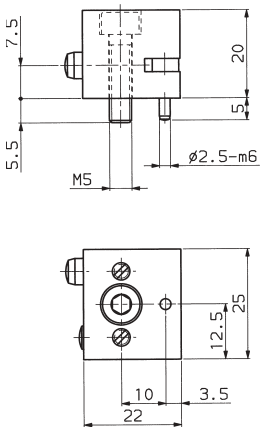
The Coding System transfers information regarding the status of assembly, such as:

- acceptable / failure
- part present/not present
- status of process
- transportation destination (exit, straight forward)

Coding Block: Type MC-CB

This is the information carrier about the status of the work piece which circulates on the MP-System from station to station. In each coding block are 2 coding pins. One pin is for the "Set", the other for the "Read" and reserve. The mechanical coding system requires that each pallet is equipped with a minimum of one coding block. Several coding blocks can be mounted next to each other.

Order No. **MC-CB-01-06**



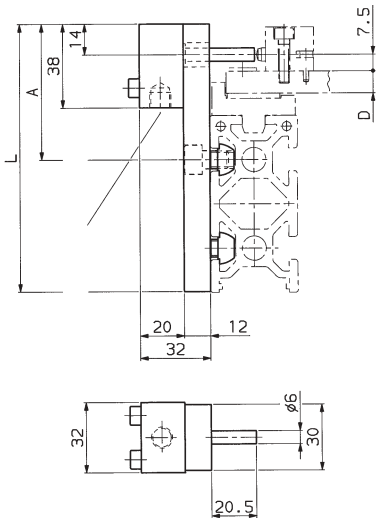
Coding Setter: Type MC-CS

The Coding Setter serves to "Set" and "Reset" of the coding pin. It consists of a single acting cylinder which is mounted to the MP-profile by an adapter. To "Set" the coding pin, the pallets have to be stopped.

Pallet Thickness—D	L	A
10	121	61.5

Air consumption per stroke 0.1 ml
Amount: 1 pc. per station

Order No. **MC-CS-01-10** (for pallet thickness 10mm)



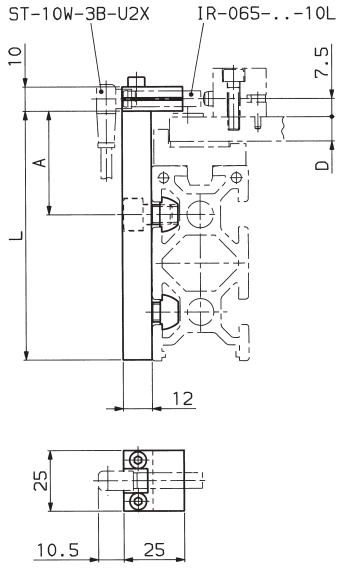
Code Reader: Type MC-CL

The code reader is used to read the coding pins. The reading is done by inductive proximity switch with LED display.

Pallet Thickness—D	L	A
10	102	42.5

Amount: 1 pc. per station

Order No. **MC-CL-01-10** (for pallet thickness 10mm)



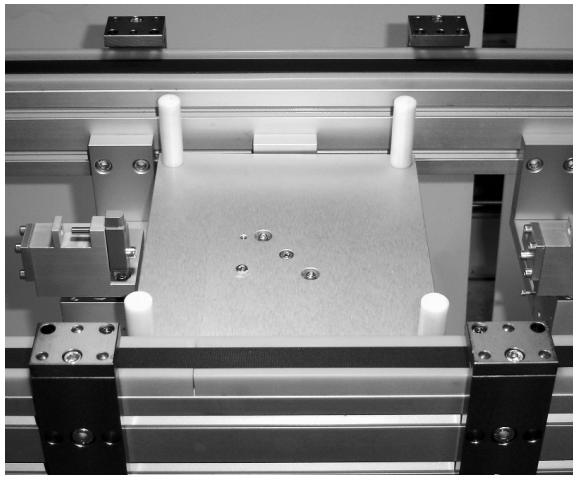
NOTE: Sensors and cables are not included with the pallet system and need to be ordered separately.

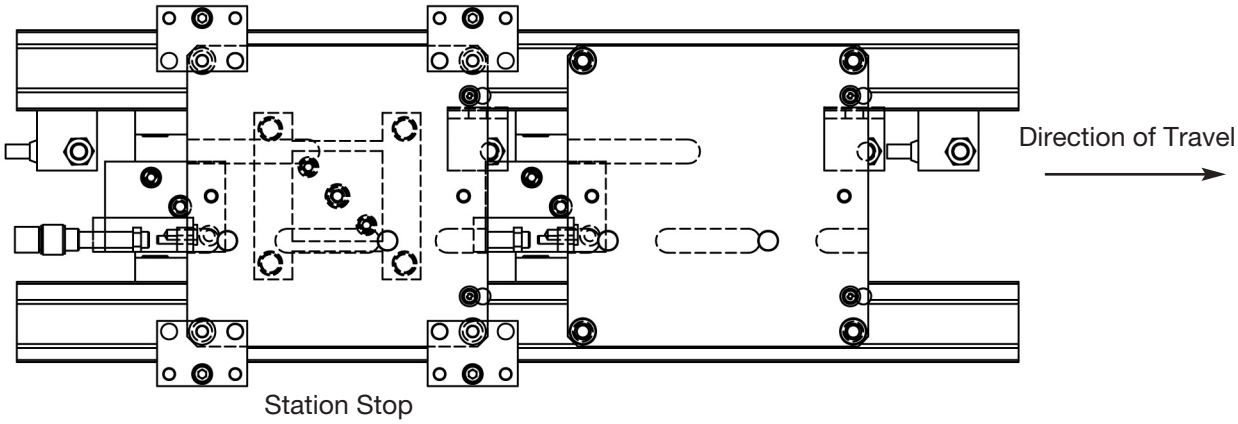
Sensor: **Order No.** IR-065-NS-10L (NPN) or IR-065-PS-10L (PNP)

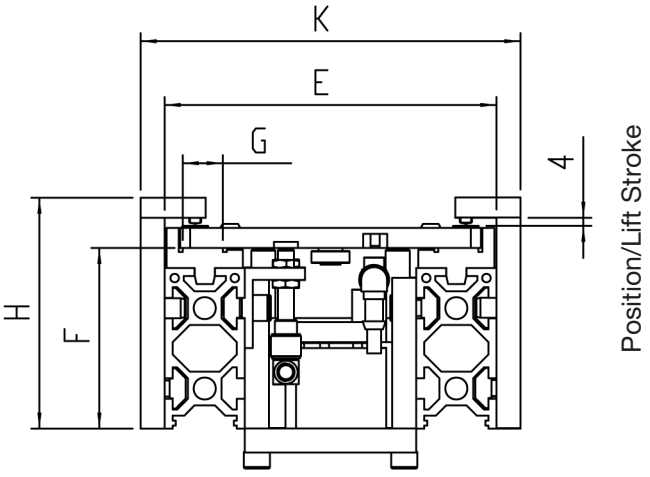
Cable: **Order No.** ST-10W-3B-U2X (2m) ST-10W-3B-U5X (5m)

Positioning (Automatic Workstation)

- For accurate positioning, the pallets are lifted from the transport belts and positioned with pins/cones.
- The positioning accuracy is +/- 0.02mm in the standard version. We offer options up to 200 x 200 pallet size with a positioning accuracy of +/- 0.01mm.
- The positionings can be fixed at any place over the entire length of the lateral transport without any mechanical modifications.
- 2 or more workstations can be set up per partial lateral transport.
- The pallets are cushioned in the end position.
- If required, positioning stations are available for:
- access from underneath (working from below possible)
- the pallet supported from underneath (press from above possible)
- the pallet to be changed by quick exchange (short pallet changing times)







NOTE: Sensors (4 pieces) and cables are not included with the pallet system and need to be ordered separately.

Sensor: **Order No.** IR-008-NS-11L (NPN) or IR-008-PS-11L (PNP)

Cable: **Order No.** ST-11W-3B-U2X

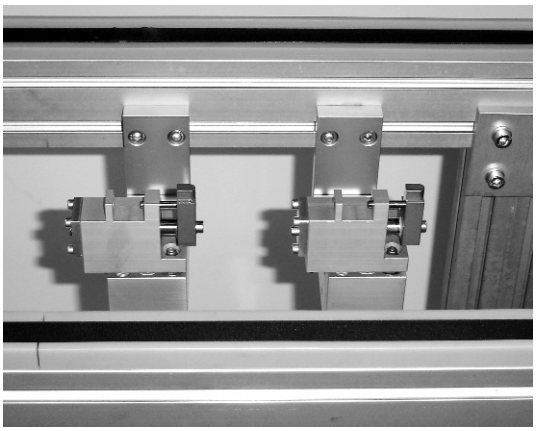
Air Consumption per Stroke 0.4 NL
3 Cyl. diameter 32 with 5mm stroke

Pallet Size AxB	E	F	G	H	K
150x100	111	60	14	80	135
150x150	165	90	20	115	189
200x150	165	90	20	115	189
200x200	215	90	20	115	239
250x200	215	90	20	115	239
250x250	265	90	20	115	289
300x200	215	90	20	115	239
300x300	315	90	20	115	339
400x300	315	90	20	115	339
400x400	415	90	20	115	439
500x400	415	90	20	115	439
500x500	515	90	20	115	539

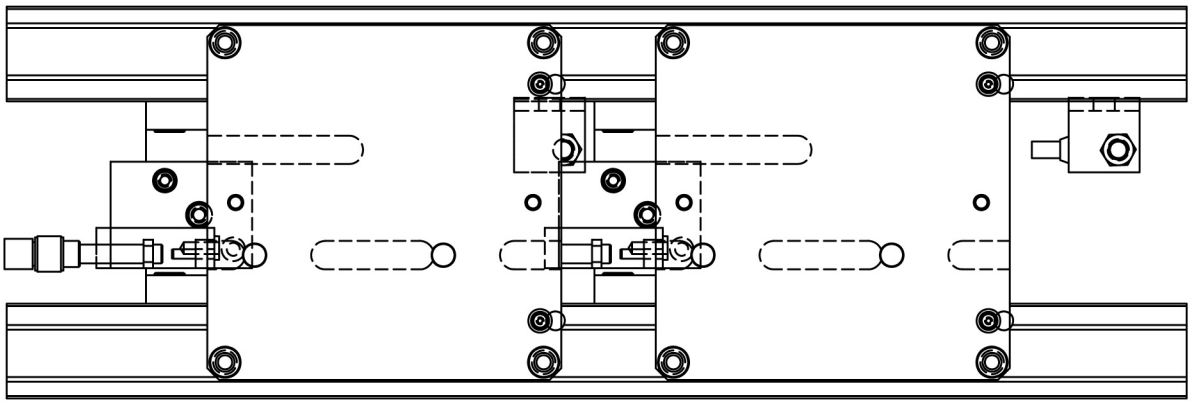
Order No. for Positioning Automatic Station: **MPA-020-xxx-xxx** (① ②)

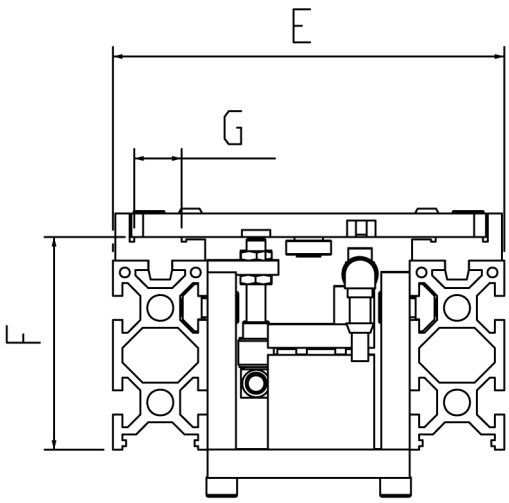
① = Pallet Length in mm
② = Pallet Width in mm

Positioning (Manual Workstation)



The pallets at the manual workstations are not accurately positioned as on the automatic workstations. They are individually centered with guides such that the position within approximately +/- 0.5mm can be maintained. The pallets are not lifted from the transport belt.
Upon request automatic positioning can be added at any time.





Pallet Size AxB	E	F	G
150x100	111	60	14
150x150	165	90	20
200x150	165	90	20
200x200	215	90	20
250x200	215	90	20
250x250	265	90	20
300x200	215	90	20
300x300	315	90	20
400x300	315	90	20
400x400	415	90	20
500x400	415	90	20
500x500	515	90	20

NOTE: Sensors (2 pcs.) and cables are not included with the MP System and must be ordered separately

Sensor: **Order No.** IR-008-NS-11L (NPN) or IR-008-PS-11L

Cable: **Order No.** ST-11W-3B-U2X (2m)

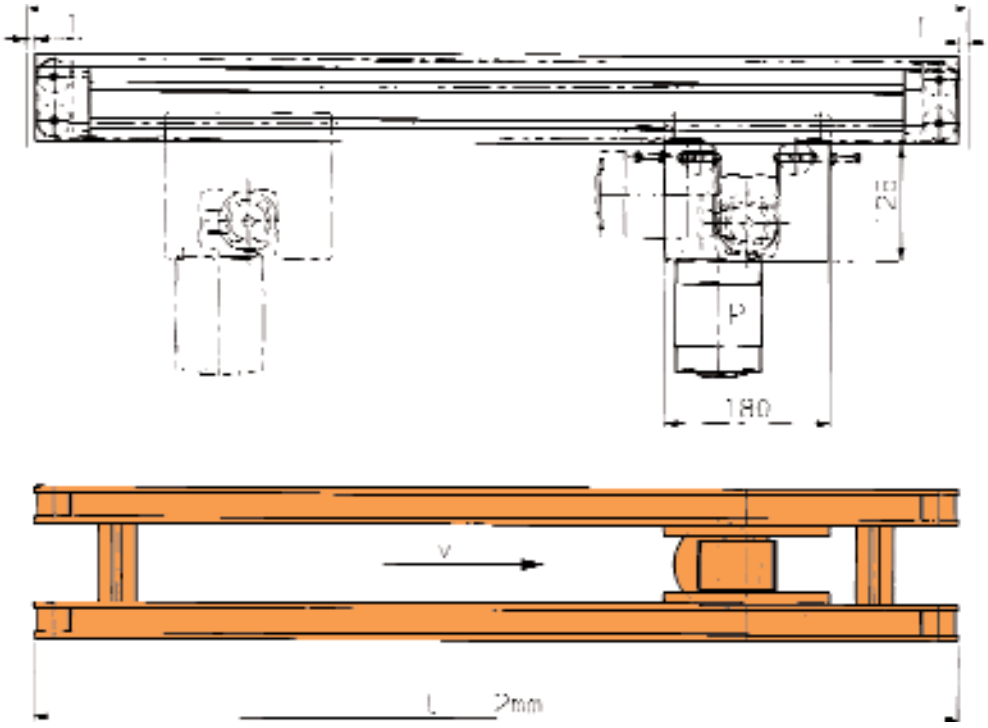
Order No. for Positioning Manual Workstation: **MPA-025-xxx-xxx** (① ②)

① = Pallet Length in mm
② = Pallet Width in mm

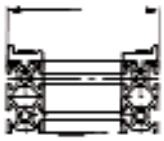
Partial Transport Track

- A partial transport track consists of 2 equal length transport belts and a common drive with rubber coated drive pulley. The belts of the transport tracks can be separately tightened and exchanged.
- The drive can be fixed at any place of the partial track.
- In addition to standard lengths of partial tracks, special lengths between 300mm and 5000mm are available.
- Several stations can be mounted on a partial track.

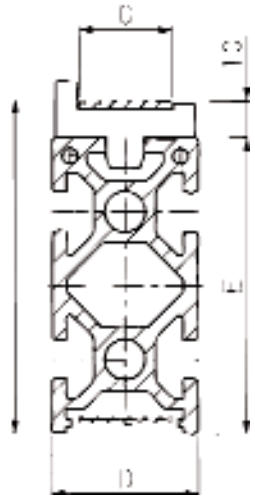
Track Length L ≈ (4x Pallets Length) + 200



Pallet Width + 15*



*11mm for
Pallet Width 100



Standard - Track Length

Pallet Length	Track Length	D	E	F	G	v* [mm/s]
100	1000	25	50	60	14	300
150	1000	40	80	90	20	300
200	1000	40	80	90	20	300
250	1200	40	80	90	20	300
300	1400	40	80	90	20	200
400	1800	40	80	90	20	200
500	2200	40	80	90	20	200

* faster or slower transport speeds available (max.500mm/s, depending on transport weight

3 Phase AC Motor
208

Order No. for Partial Transport Track: MPA-030-①xxx-②xxx

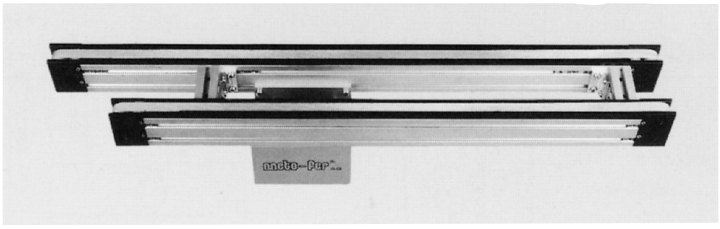
① = Pallet Length in mm
② = Pallet Width in mm

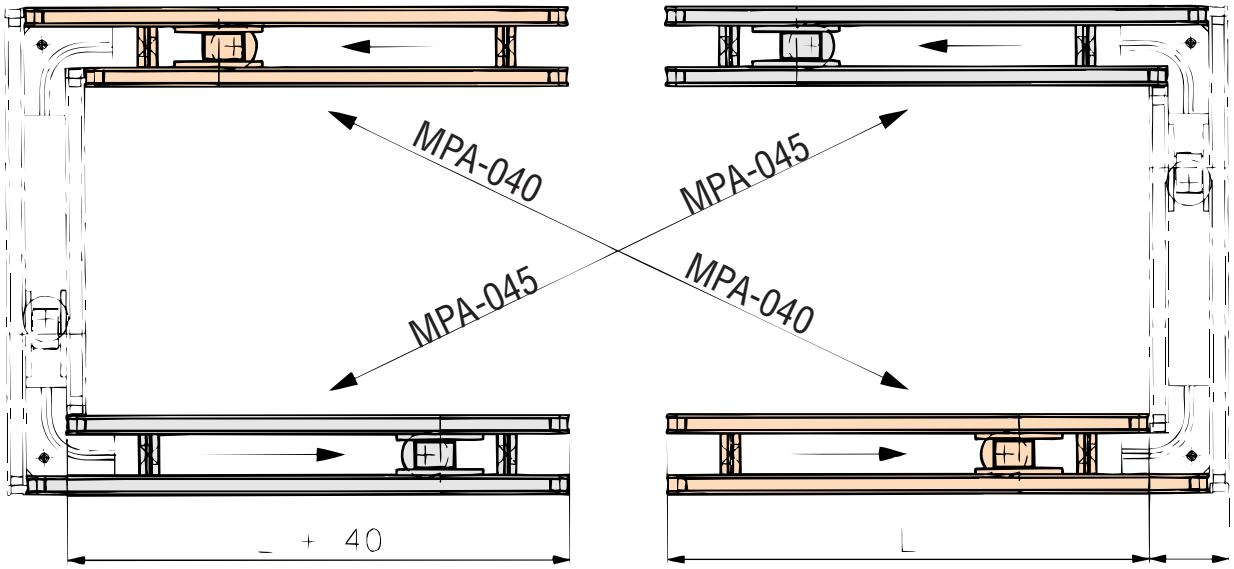
Connecting Transport Tracks

- Each connecting transport track consists of two transport belts of different lengths and one common drive as similar to the partial transport track.
- Two each connecting tracks are identical.
- Special lengths up to 5000 mm are available.
- Small single purpose systems can be constructed using only one drive. See example 2 on page 10.002.
- Automatic stations and manual stations can be integrated into the connecting transport tracks

Standard Dimension:

Pallet Length	L
100	1000
150	1000
200	1000
250	1200
300	1400
400	1800
500	2200





Pallet Width + 15mm*

*11mm for a
Pallet Width of 100

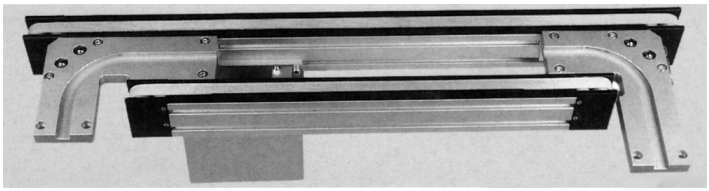
Order No. for One Connecting Transport Track:

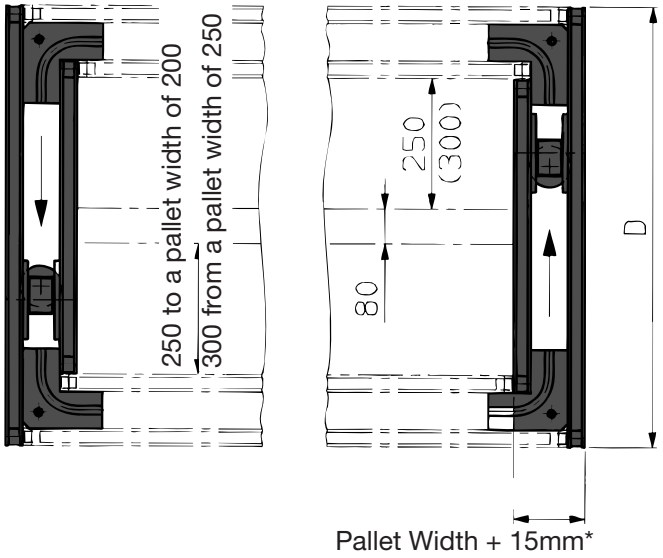
① ②
MPA-040-xxx-xxx
MPA-045-xxx-xxx

① = Pallet Length in mm
② = Pallet Width in mm

End Module

- Each turn-around consists of two transport belts of different lengths and a common drive as on the partial transport track.
- The turn-around to the left and right are identical.
- Each turn-around contains tow angles with guiding track and support transfers for the transport pallets.
- The End Modules are directly assembled to the connecting transport tracks.
- Automatic Stations and manual stations can be integrated into the end modules. (Dimension D; Change)





*11mm for a pallet width of 100

Standard Dimensions:

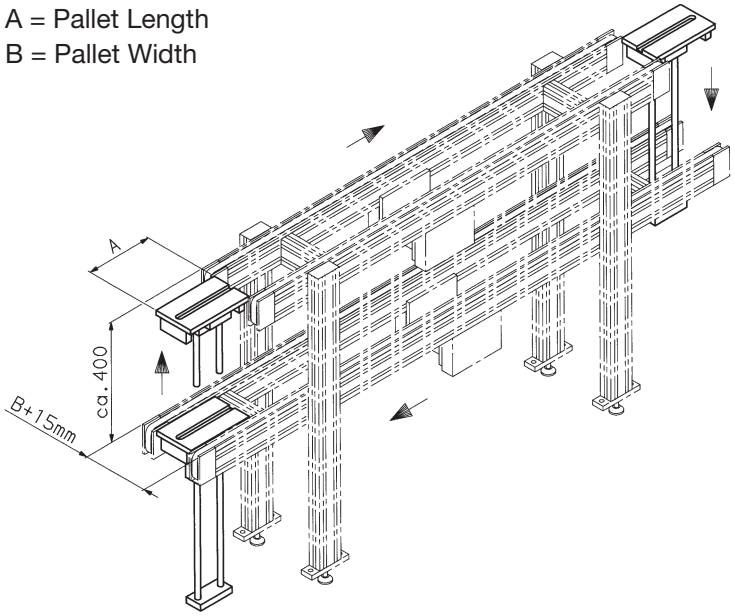
Pallet Width B	D
100	810
150	910
200	1010
250	1210
300	1310
400	1510
500	1710

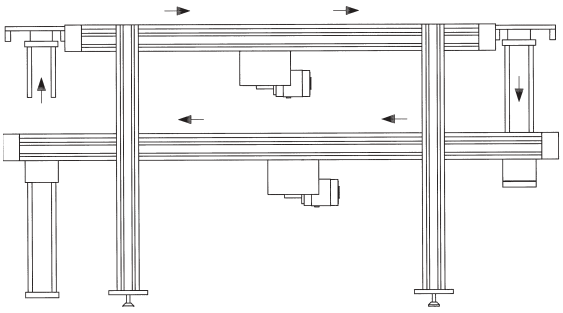
Order No. for End Module: **MPA-050-xxx-xxx** (① ②)

① = Pallet Length in mm
② = Pallet Width in mm

End Module Vertical

A = Pallet Length
B = Pallet Width





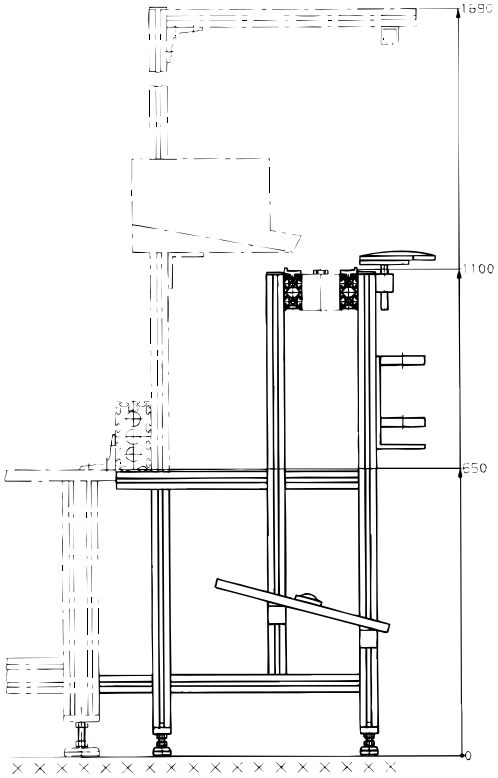
Order No. for End Module Vertical: **MPA-051-xxx-xxx** (① ②)

① = Pallet Length in mm
② = Pallet Width in mm

Manual Workstation “A”

“In Line”

- This workstation is “in line” assembled and fulfills all ergonomic and economical requirements.
- The transport track is mounted on a stand which is directly integrated into the assembly line.
- The arm- and feet rests are adjustable. The feet rest is coated with a slip resistant, black rubber.
- The pallets can be positioned with either manual or automatic workstations (Sheet 10.004).
- The throughput of the system can be influenced with this workstation. The working content should not exceed the throughput of the slowest automatic station.



Order No. for Manual Workstation A:
(without positioning)

MPA-060-①xxx-②xxx

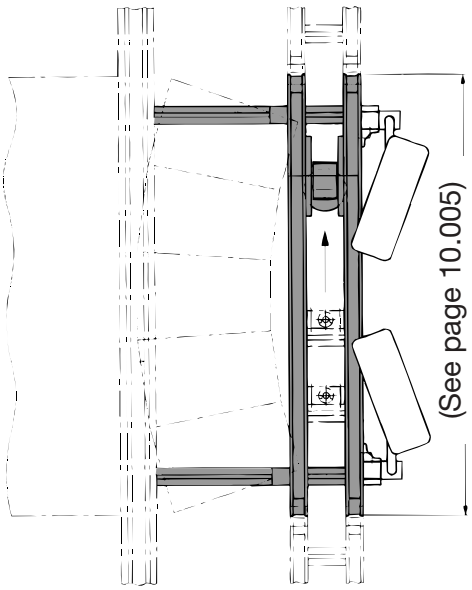
Order No. Automatic Workstation Positioning
(Sheet 10.004)

MPA-020-①xxx-②xxx

Order No. Manual Workstation Positioning
(Sheet 10.004)

MPA-025-①xxx-②xxx

① = Pallet Length in mm
② = Pallet Width in mm

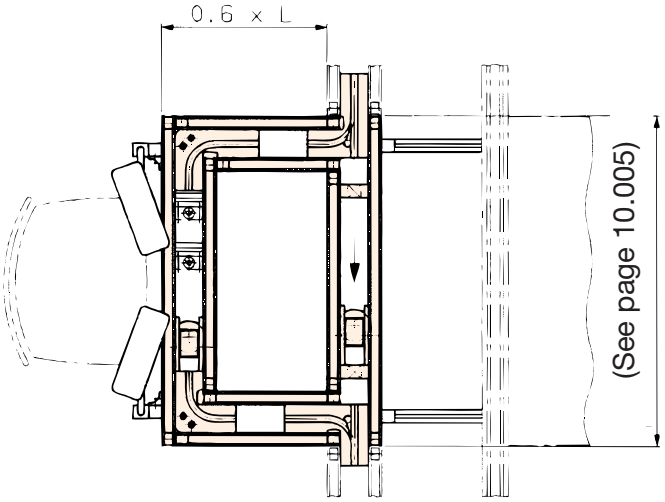


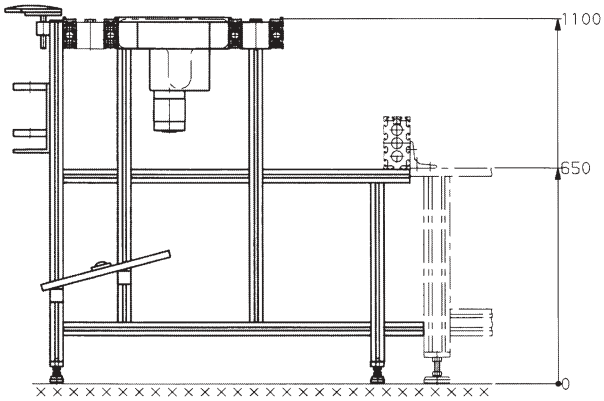
(See page 10.005)

Manual Workstation “B”

"PARALLEL EXIT"

- Ideal for repair or random check working place, or if several working places in sequence are needed.
- This requirement does not influence the throughput directly.
- Random checks/tests also can be executed with Automatic Stations. Air consumption per positioning 0.26 ml, 2 cylinders diameter 12mm with 15mm stroke





Order No. for Manual Workstation “B”: (without positioning)

① ②
MPA-070-xxx-xxx

Order No. Automatic Workstation Positioning (Sheet 10.004)

① ②
MPA-020-xxx-xxx

Order No. Manual Workstation Positioning (Sheet 10.004)

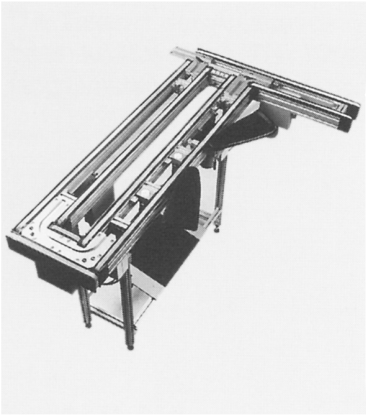
① ②
MPA-025-xxx-xxx

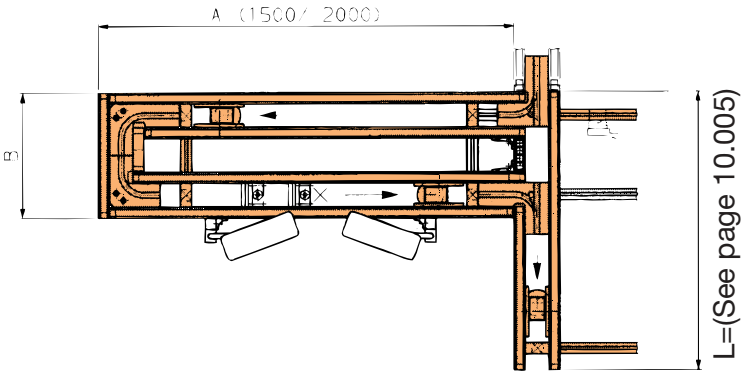
① = Pallet Length in mm
② = Pallet Width in mm

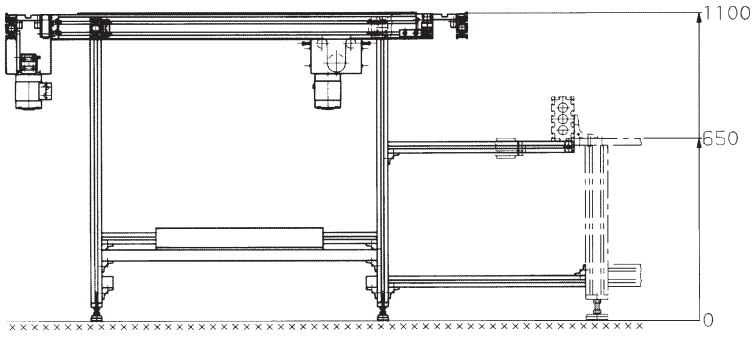
Manual Workstation “C”

“PERPENDICULAR EXIT”

- This kind of exit can be used by manual a well as by automatic workstations.
- Length A and width B basically can be configured of any size, whereby the minimum dimension for B = 2 x (Pallet width + 15) + 120mm.
- Standard dimensions for A = 1500 or 2000 mm.







Order No. for Manual Workstation “C”: (without Positioning)

MPA-080-xxx-xxx (① ②)

Order No. Automatic Workstation Positioning (Sheet 10.004)

MPA-020-xxx-xxx (① ②)

Air consumption per positioning 0.26 ml, 2 Cyl. diameter 12mm with 15mm stroke

Pallet Length	A	B
100 - 300	1500	See Text
300 - 500	2000	See Text

Order No. Manual Workstation Positioning (Sheet 10.004)

MPA-025-xxx-xxx (① ②)

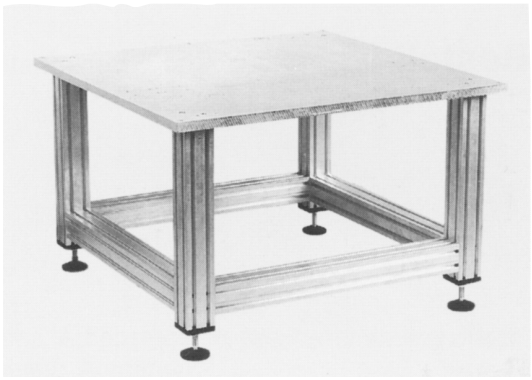
① = Pallet Length in mm
② = Pallet Width in mm

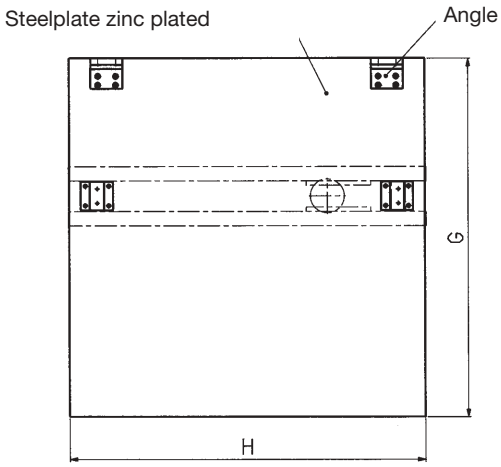
Base Table

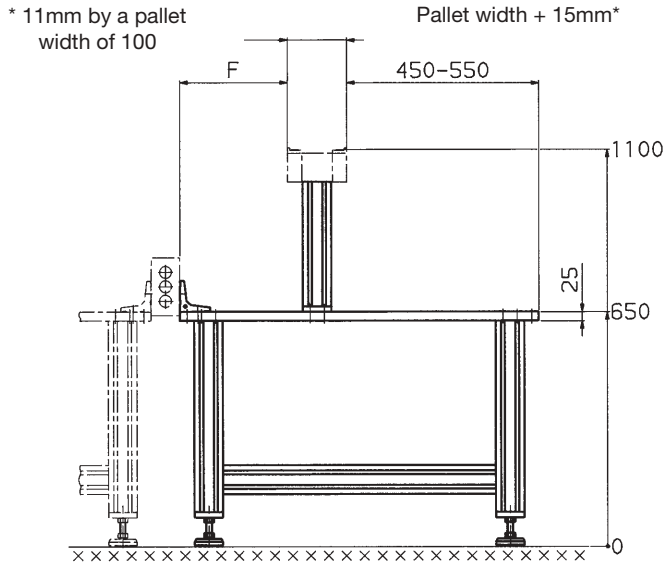
- The table top of the Base Table consists of a 25mm thick ground and zinc plated steel plate.
- The lower frame consists of MFP-080-080 profiles and is screw assembled.
- Two angled brackets on the rear of the plate are for the mounting and positioning of a pneumatic channel profile.

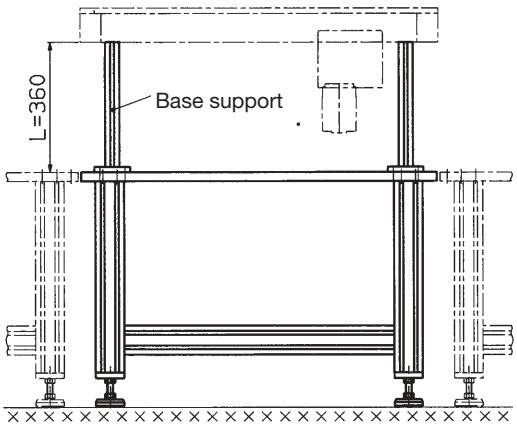
Standard Dimension:

Pallet width	F	G	H
150 - 200	250	900	992
250 - 300	300	1050	1000
350 - 400	300	1150	1000
450 - 500	300	1300	1100









Order No.

For Base Table with Stand: **MPA-090-xxx-xxx**

For Base Table without Stand: **MPA-091-xxx-xxx**

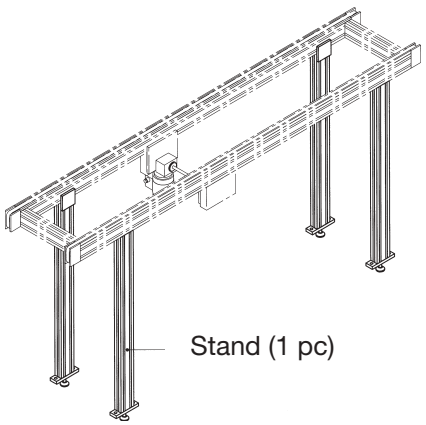
① = Pallet Length in mm
② = Pallet Width in mm

For Base Table without Steel plate, with Stand: **MPA-092-xxx-xxx**

For a Stand: **MPA-093-_____** — Length in mm (standard 360 mm)

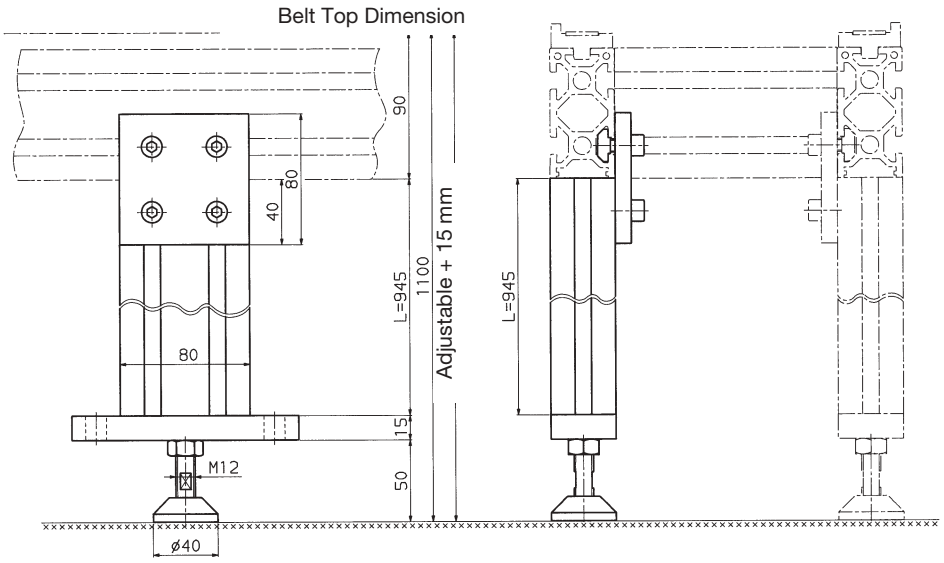
Stand

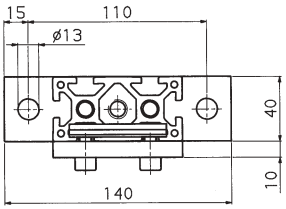
- The stands are used as support of the tracks.
- After assembly the stands can be anchored to the floor.
- The stands can be adjusted in height +/- 15mm
  Standard 945mm, top of belt



Stand (1 pc)

Example of Track with 4 Stands





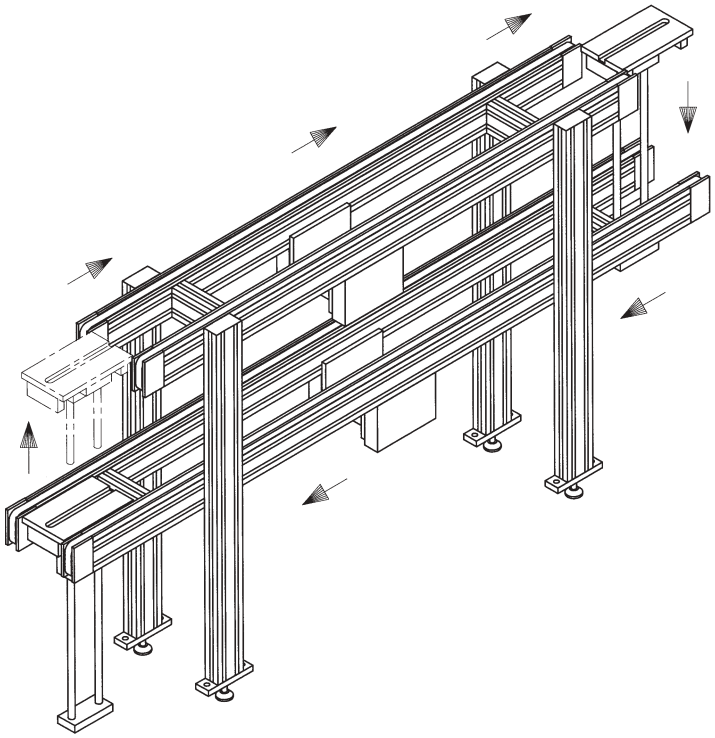
Order No. For Stand: **MPA-110-** _____

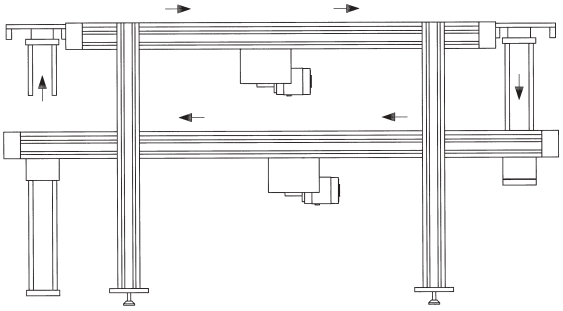
Length in mm (Standard 945 mm)

Example of Pallet Transfer System OVER / UNDER (with Elevators)

Meto-Fer Automation's modular, non-synchronous Pallet Transfer Systems incorporate a dual belt conveyor with manual or fully automatic assembly stations.

Pallets, which contain the work piece, travel from assembly station to station, pallets can accumulate in front of every work place for maximum efficiency and system flexibility. Our elevators specifically designed for over / under systems, reduce your lines overall floor space requirements, and any elevator stroke is possible.



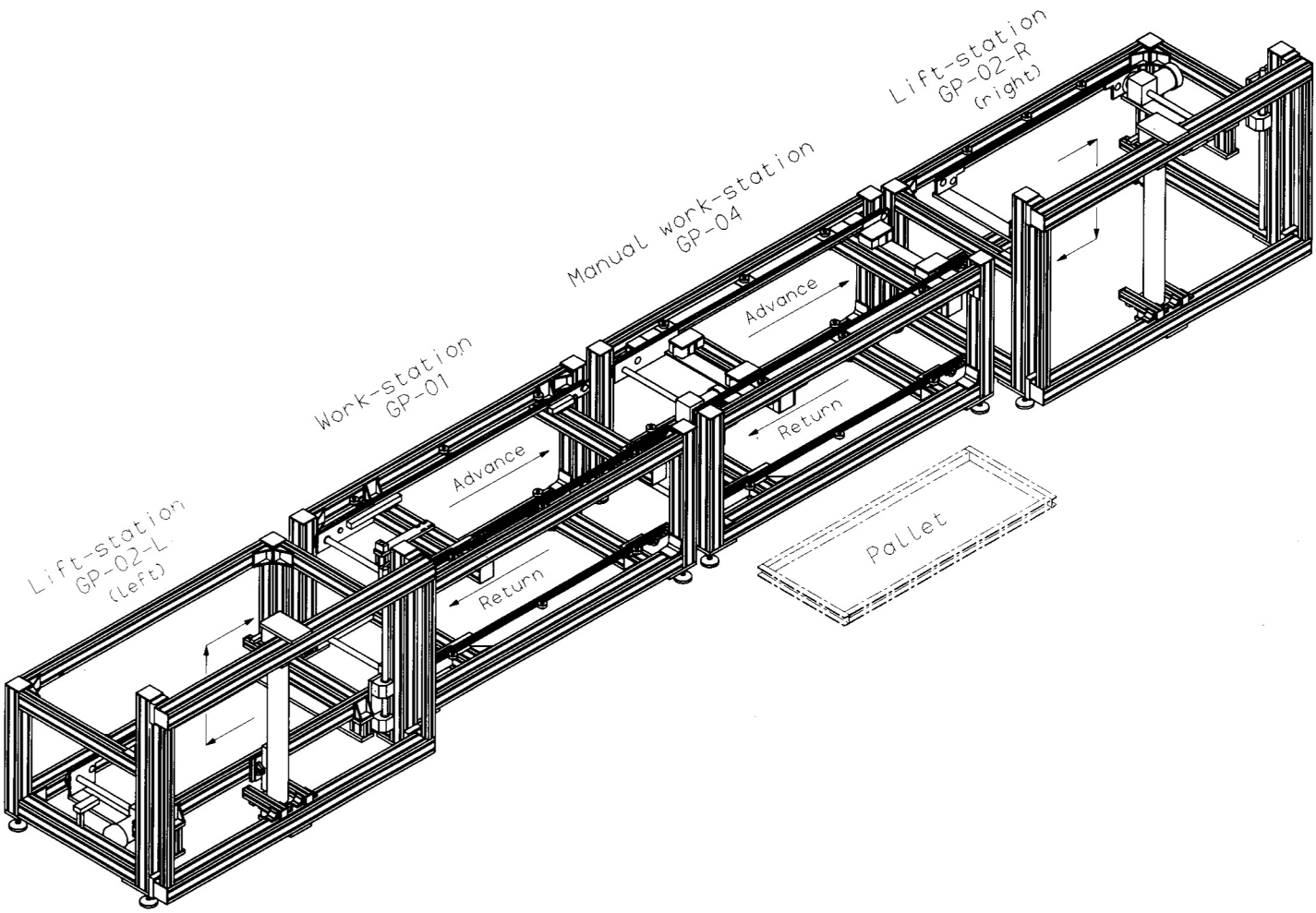


Order No. Elevator **MPA-051-①xxx-②xxx**

(Additional information for price: stroke length, cycle time and pallet load)

① = Pallet Length in mm
② = Pallet Width in mm

Large Pallet System GP (Over-Under System)



Design and Function:

- The GP-System consists of 3 exchangeable elements:
  - GP-01 Work Station
  - GP-02 Lift Station
  - GP-04 Manual Work Station
- Length of the linear transport system: as required
- Linear travel by a two-belt-system

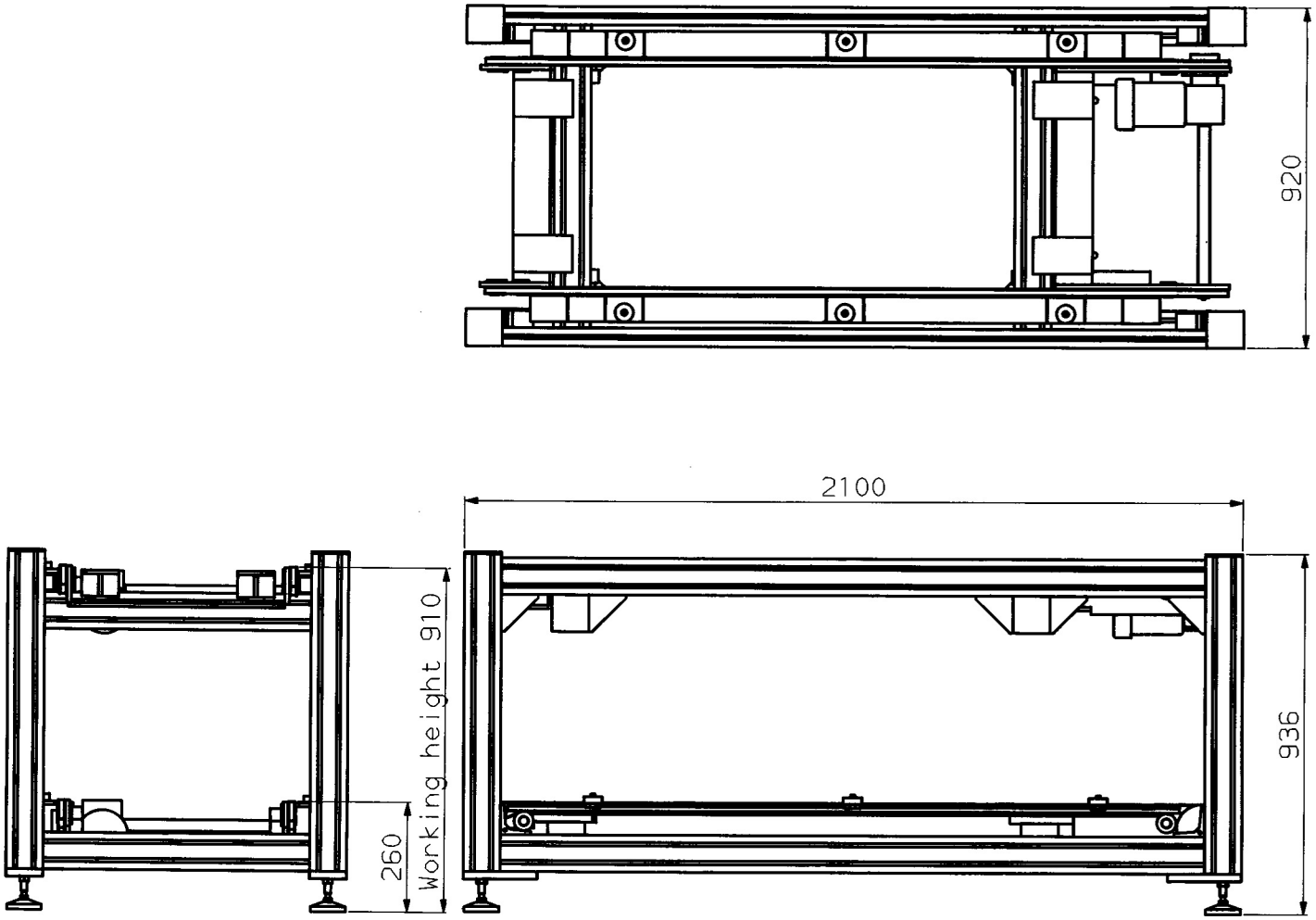
Technical data:

- Size of pallets (area)	min.	400 x 1000	mm	
	max.	1000 x 2000	mm	
- velocity, standard conveyor belt		36	m/min	
- Max. pallet load		80	kg	(176 lb)
- Positioning accuracy (on work station GP-02)		+/- 0.2	mm	
- Height of transport belt from floor (standard) (This height can be adapted to the customers requirements)		900	mm	

Large Pallet System GP

Work Station GP-01

At this station, the pallets are singled out (with initiators and pneumatic cylinders) and indexed into the work station.
The maximum force of pressure of one station is 1000 N.



Order No. GP-01

Technical data:

- Operating medium	Compressed air
- Operating pressure	43.5 - 116 psi (3-8 bar)
- Air connections	R1/4"
- Positioning accuracy	+/- 0.2 mm
- Electrical connection	Please specify on order: Voltage, Number of phases, and Frequency (Standard: 3 phase / 208 / 50 Hz)