Manual Production Systems
EcoShape: Easy³ – Versatile, simple, efficient

With just a few components and a minimum investment in time and costs, your existing production equipment can be optimized (kaizen) or extended. EcoShape easily adapts to your specific requirements. You can create the precise solutions you need – and increase productivity.

It's the ideal combination of efficiency and lean production. Sometimes less is simply more!

For more information visit www.boschrexroth.com/mps and see the chapter on the EcoShape tubular framing system in this catalog!
Symbols

MTpro

You can easily configure customized products using the MTpro software

Part number

No.
3 842 514 653

Available in packing units

Available as set = typical consumption unit

Technical data

Delivered as individual components (not pre-assembled)

Delivered as components (pre-assembled)

Delivered assembled

Profile used in the frame

Width of profile groove; accessories suitable for attaching in profile groove

Conductive material version according to DIN EN 61 340-5-1, suitable for ESD-sensitive areas
Ergonomics and lean production – the pillars of your success!

Any company’s economic success is built on top-quality products and services that result in the highest level of customer satisfaction. Given this fact, it is only logical that companies strive for continuous improvement across all levels of their operations.

Comprehensive success relies not only on lean, waste-free processes, but also on ergonomically designed work systems that allow employees to do their jobs with no waste. Good ergonomics serves to support the value chain and reduce waste.

With MPS you have a production system that places equal importance on both lean production and ergonomics.
For motivated employees, higher productivity and better quality

Ergonomic workplace systems make work easier and keep workers healthier.
The eight ground rules for workplace systems help you to layout and design ergonomic workstations and flow rack systems

The results: Increased motivation and satisfaction, higher performance, efficiency and work quality, as well as fewer absences due to illness. The bottom line: Ergonomics provide you with valuable benefits in the form of higher productivity, increased efficiency, and a decisive edge over the competition – thus ensuring lasting success for your company.

Body height and working height
The optimum working height is based on the worker’s body height and the type of activity to be performed. The average optimum working height for average requirements is 1125 mm for sit-down/stand-up workstations.

Work area
The work area height should always be between 800 mm and 1500 mm. Working positions over heart height should be avoided, as should any work below 800 mm, as bending places undue strain on the worker’s body. Ideally, workers should perform dynamic activities with frequent shifts of exertion, such as switching between standing and sitting.

Grab area
All containers, equipment, and operating elements must be easily accessible and located in the anatomic/physiological range of movement for the employee. Torso rotations and shoulder movements, particularly when under exertion should be avoided whenever possible.

Parts supply
All reach distances should be as short as possible. Grab containers and parts containers placed in direct reach of the employee are therefore ideal.

Vision areas
Unnecessary head and eye movements should be avoided. Maintaining objects at a uniform distance to the worker’s eyes eliminates the need for refocusing. Avoid joining points that are not visible to the worker.

Lighting
Optimum lighting prevents fatigue, improves concentration, and reduces the risk of errors. High contrasts, glare and reflections should be avoided.

Adjustment of work equipment
Correct adjustment of the equipment serves to minimize required movements, thus reducing physical exertion and employee absences.

Planning aids
Available planning aids include the Ergonomics Checklist (3 842 523 943) and the Planning Template (3 842 542 286/287). You can then use MTpro (3 842 539 057) to do your technical designing.
Lean production for greater productivity and shorter passage times

Constantly growing cost pressure makes it necessary to permanently increase productivity in manufacturing. Central aspects involved are detecting and avoiding waste (muda).

Waste refers to all process steps that do not directly contribute to adding value. Waste must be avoided permanently. In order to achieve this, the causes of waste must be identified and eliminated.

When analyzing processes, we need to distinguish between waste and added value. Next, we separate waste into two categories: avoidable waste and unavoidable waste. Waste reduction, once initiated, is a continuous improvement process (kaizen) that impacts on all levels of the company.

Overproduction
Overproduction occurs whenever more is produced than the customer ordered – or more than was planned. Overproduction requires additional warehousing and thus ties up capital.
We differentiate between seven types of waste

**Superfluous movements**
Superfluous movements occur whenever the worker needs to move materials or tools across large distances. Unnecessary paths cost valuable production time.

**Waiting times**
Waiting times occur whenever the worker needs to wait for materials or for a process to end. During this time, the worker is tied up and does not contribute to adding value.

**Transports**
Transports occur whenever a forklift or lifting truck/crane is used to transport materials through production. Transports change the position of the product, but not its value.

**Overprocessing**
Overprocessing occurs whenever production exceeds the standard that the customer requires. More is invested in the process than is required to fulfill the function.

**Stocks**
High stocks in production, as well as in the raw material and finished goods warehouses, result in costs of capital. The stocks provide a feeling of security, but they also make the product more expensive.

**Faults**
If parts are defective, they are classified as faulty. Faults require reworking and sorting, which results in increased costs.
MPS – a complete ESD-protected system

ESD is caused by electric charges that are generated by friction on various materials or by the influence of electric fields. Voltages of up to 10,000 V can develop from electrostatic discharge.
Protection for ESD-sensitive components

Damage to ESDSs and their printed circuit boards result in high costs. Damage leads to an irreversible change in the device and a reduction in the ESDS service life. Dangerous component voltages have an effect on ESDS sensitivity.

The most effective way to reduce ESD is to simply avoid electric charges or to conduct carried charges safely. Rexroth's ESD program, with ergonomically designed components, will assist you in designing a production system that avoids electrostatic discharge. With suitable materials and connection technology, the components in the ESD program are either electrostatically conductive or deflective and create a fully protected system.

To ensure and maintain the ESD-conductive properties, we recommend checking conduction resistance at regular intervals after assembly.

Rexroth components fulfill the requirements for the protection of ESDSs (DIN EN 61340-5-1). The individual national personal safety regulations must be observed during assembly and connection.

Defined grounding to an ESD-safe structure serves to make the entire system both safe and economical.
Plan assembly lines that are ergonomic, lean, fast and safe with MTpro

Careful and comprehensive planning is the only way to cost-effectively integrate ergonomics into the production system.

Ergonomic workplace systems help to keep workers both healthy and productive. What’s more, they create the foundation for implementing lean production concepts and for improving the economic efficiency of companies. The manual production systems combine these two aspects perfectly. Post-installation attempts to improve the ergonomics of workplace systems are costly and subtract from any economic advantage. So it is important to include ergonomic aspects early on in the concept phase right alongside of lean production requirements. This is the only way to attain the desired cost savings.

On the other hand, as product life cycles and unit production numbers continue to shrink, so does the time left for planning. This is where MTpro can provide valuable support. This planning software is designed with ergonomics in mind and offers good visualization and a CAD interface.

Parameter selection or customized assembly are the two options for creating an ergonomic workstation.

Multiple workstations are linked to form a production line that follows lean production principles.
Users without CAD experience can use this software to design workstations, flow rack systems, manual roller sections and material shuttles. The user-friendly system allows users to create their designs by either using a guided parameter selection system for configurable products or by assembling various discrete components. A comprehensive set of rules covers the design logic, all product dimensions and the necessary information on accessories.

Users can rapidly retrieve complete parts and order lists, price calculations and CAD data, all at the click of mouse.

Once in place, the manual production systems form the basis for high productivity and efficiency.