HEMA

HEMA
MASCHINEN- UND
APPARATESCHUTZ GMBH

Operating instructions

MClamp
Manual clamping system

Operating Instructions

Data last revised: 1/03/2015, Version 2.1
Language of original version: German

Specifications subject to modification without prior notice. Errors excepted.

MClamp is a patented development of HEMA Maschinen- und Apparateschutz GmbH.

Contact

For further details, please turn to:

HEMA Maschinen- und Apparateschutz GmbH
Seligenstädter Strasse 82
63500 Seligenstadt
Telefon: +49 (0)6182-773-0
Telefax: +49 (0)6182-773-35
E-mail: info@hema-group.com
Internet: www.hema-group.com

Art.-No. 80-80-1050/EN 03032015

HEMA
MASCHINEN- UND APPARATESCHUTZ GMBH

Contents

1. IMPORTANT INFORMATION

These operating instructions describe how to use the MClamp properly. Warranty claims are valid only when these instructions have been observed. It is therefore imperative that you please read all of these instructions before using the safety clamp.

- It is imperative that you observe the tolerance ranges and thresholds (e.g. for pressures, forces, torques, and temperatures) specified in these instructions.
- If necessary, consider the prevailing ambient conditions.
- Observe the rules and regulations issued by the professional associations and the technical safety inspectorate TÜV, and the pertinent national, international, and European terms and conditions.
- Before installing for the first time, please remove all transport locks and guards like paper, foil, etc. Each of these materials must be introduced to the legally prescribed disposal cycle (recycling containers).
- The product may be installed and commissioned only by qualified, specialised personnel in accordance with these operating instructions.

Symbols used

Warning
Note

2. GENERAL DESCRIPTION

- MClamp clamping systems close and open mechanically and generate their force via a metric thread clamping screw that is turned by hand. The nominal retaining force is reached when the clamping screw is tightened with the specified torque.
- The retaining force is exerted by the friction applied by the clamp or brake linings, which are pressed vertically against the contact surfaces on the linear guide rail.
- When pressed against the contact surfaces on the linear guide rail, the linings have no effect on the surfaces, measurements, precision, or service life of the linear guide.

Active MClamp variant (closing/clamping by hand)

- To open – The clamping screw is turned anticlockwise until there is no perceptible resistance (disengaged). In this process, the H shaped clamping body is deformed elastically to its initial state (the top part of the clamping screw is shortened while the bottom is expanded at the linings). The linings lift off the linear guide element. The MClamp is now disengaged and can move freely.

- To close – The clamping screw is turned clockwise until the rated torque is reached for engaging the clamping screw. The top part of the clamping body expands under the tightening action of the clamping screw. This expansion, however, causes at the same time a constriction in the area of the clamp linings. This constriction presses the linings against the linear guide element.

3. Model variants

- MClamp as active clamp (closing/clamping by hand)
- Retaining force as a function of tightening torque on clamping screw and size
- Clamping element: design with steel linings

4. Controls and connections

- Depending on design, fastening options on the top side:
  - Depending on the size of the clamping element, two fastening holes with M2 and M12 thread
- Available for actuating the clamping screw:
  - hex socket cheese head screw (1.5–10 mm)
  - safety clamping lever

5. Use

- MClamp clamping systems are designed to hold moving masses on the axis of linear guide rails and linear guide elements whose designs, surface qualities, geometries, and tolerances are equivalent to those available on the market.

6. Improper use/warnings

- MClamp clamping systems are not designed to secure suspended loads when machines or machine parts are being manufactured, transported, assembled, installed, commissioned, used, cleaned, subjected to troubleshooting, repaired, shut down, disassembled or disposed of in personal danger areas without redundant safety systems.
- MClamp clamping systems cannot be used as guides on linear guide rails or other linear guide elements.

7. Residual risks

MClamp clamping systems are not fitted with a second safety circuit. When the system is actuated intentionally or by accident, the MClamp opens. The retaining force is therefore no longer transferred to the linear guide element, and the mass to be secured will no longer be held. As a consequence, during all operating modes and lifecycle phases without a redundant system there are mechanical dangers from:

- crushing, cutting, shearing, abrasion, scraping, or puncturing caused by:
  - unsecured connecting structures
  - human error (e.g. inadequate experience or qualifications, stress, fatigue, negligence)
  - failure to observe the information and warning signs
  - wrong use of the MClamp (see Section 6.)

8. Warranty

Valid for the following conditions of use:

- Ambient temperature min 10 °C and max 45 °C
- The tightening torques in the table depend on the size and do not include tolerances. Higher tightening torques cause damage to the threads and pipe sleeves, and lower tightening torques cannot generate an adequate retaining force (active MClamp).
- MClamp type clamping elements are warranted for twelve months following delivery, or for max 10,000 (ten thousand) actuated clamping cycles. When submitting a warranty claim, the customer must present suitable verification of the actual number of actuations.
- Installation, conversion, maintenance, and repairs: Observe the installation instructions and use the necessary equipment along with the original accessories. The pertinent safety and installation instructions must be observed during all work on the clamping elements.
- The clamping elements are used properly only when they are used in full compliance with the technical specifications. Any other use will exempt HEMA Maschinen- und Apparateschutz GmbH from providing any other services.
- The warranty covers MClamps in their fully assembled state.
- Removing, dismantling, or machining the MClamp by the customer without prior consent issued in writing by HEMA reduces the operating safety and renders the warranty void.
- Corrosion may occur as a result of the materials used. Any warranty claims made on this basis will not be recognised.

9. Transport/storage/intermediate storage

- Only transport the clamping elements in their disengaged state.
- The clamping elements should be placed in storage or interim storage in the preserved state and in the packaging selected by HEMA.

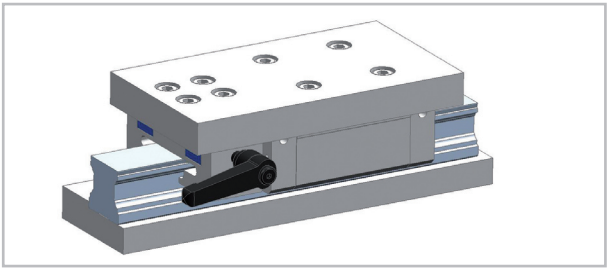
10. Type designation

The engraved type designation and serial number (SN) serve to clearly identify and track the clamping element. This is unique to every clamping element and absolutely essential for followup and tracing processes. For this reason, never obliterate the engraved type designation by chemical and/or mechanical means. The type designation must remain legible at all times. Removing or obliterating the type designation renders all warranty claims void. The type designation describes the type and size. The type designation is engraved on the long right side of the MClamp, on the clamping body.

11. Installation notes

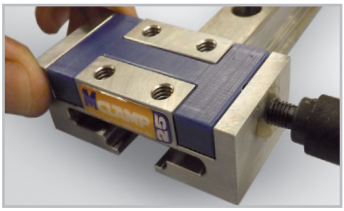
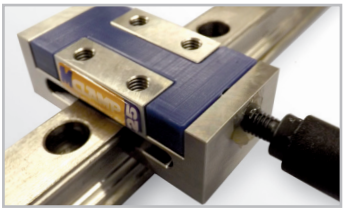
- Check that the type designation engraved on the MClamp agrees with the MClamp you want to install.
- Handle the MClamp so that it cannot sustain damage. This will reduce the operating safety and render the warranty void.
- Make sure that the installation is free of torsion and that the permissible loads according to the catalogue are observed.
- Important! Before the specified retaining forces can be transferred to the optimal effect, the (steel) clamp linings must be cleaned thoroughly prior to installation. This eliminates any detrimental effects.

12. Installed state (example)



13. Installing the MClamp (active)

- Turn the clamping screw anticlockwise until the MClamp can be pushed freely over the linear guide rail. **Never loosen the clamping screw over its whole length!**

- Push the MClamp over the linear guide rail to the provided assembly holes in the connecting structure. Now introduce and hand tighten the affected fastening screws.

- Hand tighten the clamping screw. The MClamp will then centre itself to the linear guide rail. At this position, tighten the fastening screws over several stages until the defined tightening torque has been reached. Every time a screw is tightened, loosen the clamping screw (MClamp opens) and then tighten it again (MClamp clamps).

- As the last step, loosen the clamping screw, and check that the MClamp can move freely over the linear guide rail. The device can now operate properly.

- The full nominal retaining force is available when the clamping screw has been tightened with the prescribed torque.

14. Tightening torques for screws

This applies to screw head supports of steel. On connecting structures of softer materials (e.g. aluminium), the tightening torque on the screws must be determined separately as a function of the max transferred forces and the max surface pressure under the screw head support.

Recommended tightening torque for ISO 4762 screws, property class 12.9	Nm
M2	0,6
M3	2,1
M4	5,4
M5	10,7
M6	18,3
M8	44,1
M10	86,9
M12	151,0

Table 1 (based on VDI 2230, no responsibility for correctness)

Note: Only screws of property class 12.9 may be used. Other property classes may prove detrimental to the clamping force and clamping properties.

15. Commissioning

- Once it has been installed properly, check the MClamp for operational readiness
- Check ease of movement by manually moving the linear unit.
- The clamping process must be checked; it may no longer be possible to manually move the linear unit.
- Check that all fastening screws have been tightened with the specified torque.
- Owing to the paired fits configured at the factory for the clamp linings and the linear guide rail, readjustments are not required after the MClamp has been installed properly
- Start a trial run with consideration to the applicable regulations.

16. Maintenance and care

Most linear guides are generally fitted with greased or oiled runner blocks, i.e. the running or contact surfaces of the linear guide rail always present a thin film of lubricant.

- Before installation, clean the linear guide rail's and, if necessary, the clamp linings' contact surfaces with a soft cloth. Permitted cleaning agents are all substances compatible with the installed materials (we recommend "S" spray cleaner from Weicon).

17. CE MARKING CE

In the delivered state, MClamp clamping elements fulfil the requirements under the Machinery Directive 2006/42/EC and are marked with the CE symbol.

18. EC DECLARATION OF CONFORMITY

In accordance with the EC Machinery Directive 2006/42/EC of 17 May 2006, Annex II, Nr 1 A

We hereby declare that the design and type of the structurally identical safety components named in the following comply in their conception and build and the version we market with the fundamental safety and health requirements in the EC Machinery Directive 2006/42/EC. This declaration becomes void when any change is made without our consent to the safety components.

Manufacturer HEMA Maschinen- und Apparateschutz GmbH
Seligenstädter Strasse 82
63500 Seligenstadt
Telephone: +49(0)6182/773-0, Telefax: +49(0)6182/773-35
www.hema-schutz.de

Description of safety componant
Function: clamping on linear guide rails
Type/model: MClamp linear guide clamp in the sizes 5, 7, 9, 12, 15, 20, 25, 30, 35, 45, 55, 65

HEMA Maschinen- und Apparateschutz GmbH

Steffen Walter
Managing Director

Philipp Sendelbach
CE authorized person

Seligenstädter Str. 82
63500 Seligenstadt

Seligenstadt, 31 Januar 2014

19. CAUSES OF FAULTS – SOLUTIONS

Malfunction	Possible cause	Remedy
MClamp cannot be mounted on guide rail	■ Linear guide does not conform to order details	Compare request, order, order confirmation, and MClamp drawing
	■ Carriage does not conform to order details (high-low)	Compare request, order, order confirmation, and MClamp drawing
	■ Gap too small between clamp linings	Clamping screw already generates clamping force: unscrew this a little
Clamping screw difficult to turn	■ Thread damaged	Call HEMA services
	■ Inadequate lubrication on clamping screw thread	Relubricate clamping screw, recommendation: antifriction bearing grease
	■ Clamping screw damaged at thread	Call HEMA services
Clamping screw cannot be turned	■ Thread damaged	Call HEMA services
	■ Inadequate lubrication on clamping screw thread	Relubricate clamping screw, recommendation: antifriction bearing grease
	■ Clamping screw damaged at thread	Call HEMA services
	■ Clamping screw turned in too far	Call HEMA services
Retaining force not reached	■ Clamp linings soiled	Remove coarse dirt and dwarf, clean soiled surfaces
	■ Contact surfaces on linear guide rail	Remove coarse dirt and dwarf, clean soiled surfaces
	■ Clamped mass too large	Check the connecting structure
	■ MClamp installation not aligned correctly	Check installation against the operating instructions
	■ Linear guide rail damaged	
Linear guide rail damaged by MClamp use	■ MClamp moves relatively to guide rail in the clamped state	Check the connecting structure, the sequence, of movements, and the conditions of use
When installed and open, MClamp cannot be moved, or moved only with difficulty over the rail	■ MClamp installation not aligned correctly	Check installation against the operating instructions
	■ Gap too small between clamp linings	Call HEMA services

20. MCLAMP

Specifications and drawing

Rail-size	B	L	H*	H1*	A	L1	J	M	Tightening torque max.	Holding force min.
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[Nm]	[N]
15	47	23	24	15	3,2	17	17	M4	3.5	900
20	59	24	30	19	4	15	15	M6	5.5	1000
25	69	30	36	22	5	20	20	M6	7.5	1100
30	84	35	42	26	5.3	22	22	M6	10.0	1100
35	96	35	48	31	6.5	24	24	M8	11.0	2000

*H corresponds to the dimension of the low carriage of the linear guide rail manufacturer, if higher carriages are used, distance plates must be considered.
Subject to modification without prior notice. The respective order confirmation issued in writing applies.