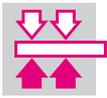




ROEMHELD
HILMA ▪ STARK

Machine Vice with clamping force indication in kN





Pressure gauge for enhanced precision

CLAMPING TECHNOLOGY – Atlas Copco was having problems due to tool breaking and machine downtime. Solution: A HILMA machine vice with a pressure gauge that allows parts to be safely clamped ready for machining.

Problems first arose in 2011 after a change of metal cutting machines. Michael Beer, equipment engineer for fixture construction at Atlas Copco Construction Tools Essen: "With the old equipment, parts were machined on two sides at a time, but the new system only machined them on one side. As pressure came only from one side, the workpiece moved."

This issue occurred when machining steel forgings weighing up to 1.2 tons, which are used to produce the main components of hydraulic hammers. The largest parts are up to 900 mm long with side lengths of 490 mm. The hydraulic hammer range, which has tools varying in length from 1,000 to 1,900 mm,

consists of a total of 13 variants of the ›MB‹ and ›HB‹ series. Some 250 employees are involved in producing hydraulic add-ons to be used in mining, demolition, clearance and other tasks in the construction industry.

Precision clamping

As the forgings have an uneven surface, this is milled by about 15 mm. During machining, HILMA Varioline VL 160 machine vices, which have a clamping force of five tons, ensure the components are safely held in place.

Michael Beer first assumed that a defect in the clamping systems might be the reason for the tools breaking. Another issue was that some operators felt that the more you pull the crank of the machine vice, the more clamping force you generate. This however is not true and led to several cranks becoming defective and having to be replaced. Andreas Menn of ROEMHELD's fitter team at Hilchenbach helped Mr. Beer to identify the root cause. The expert was quick to find out that the workpiece supports with grip inserts used by Atlas Copco were the true cause for the breakage. All workpieces shifted during clamping, which meant they were not held with the full clamping force.

Safe processes

Mr. Menn suggested retrofitting the HILMA machine vices with pressure gauges, which is an option thanks

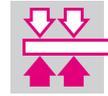
to the mechanical-hydraulic power transmission of the clamps. The clamping force indication allows the required force, which can be read throughout the machining process, to be precisely applied. This helps avoid clamping forces which are too low or excessive, thus enhancing process safety.

For roughing, the workpiece is clamped with full force, but the clamping force can be sensitively and precisely adjusted for finishing. For repeat orders, the required clamping force can be precisely reproduced so that the unique conditions ensure production of the same high quality. If the workpiece is a housing or a similar part or if soft materials have to be clamped, the pressure gauge helps avoid deformation resulting from excessive clamping pressure.

Michael Beer was immediately struck by the benefits demonstrated by the fitter. What is more, he suggested the use of clamping jaws with specific coating. Their rough surface would clearly enhance their holding power so that the workpiece can be held safely and precisely even at a reduced clamping force. With this approach, higher machining forces may be applied during production.

Atlas Copco had been using clamps made by the Hilchenbach-based experts for over two decades, recalls Mr. Beer: "I do know that HILMA's products are a bit more expensive, but they are better and they offer great, fast and cheap service."





Benefits at a glance

- **Constant process control**
- **No workpiece deformation, thanks to sensitive clamping**
- **Immediate identification of incorrect clamping**
- **Higher clamping quality because of reduced clamping force**
- **No option for manual clamping force**
- **Ideal for roughing and finishing applications**

The success of HILMA machine vices with a pressure gauge was quickly apparent: Since these solutions have been in place, no tools have broken. Michael Beer is enthusiastic: "If I had known before that VL 160 with a pressure gauge costs just 200 Euros or so more but offers such a great value for money, I would have ordered all the vices with this add-on upfront." The remaining four vices were retrofitted during production.

And the extra cost has already paid for itself in the fact that there has been no tool breakage. According to Mr. Beer, the service was "as quick as usual". Regular maintenance is a clear benefit.

To make sure customers are not bound by costly and long-term maintenance contracts, HILMA has changed their system to a simple, value for money scheme. For a fixed price of 99 Euros, a fitter comes to the company to check all the HILMA machine vices. If no work is required, this is the only charge. If a clamp needs a repair, the customer will just pay another 99 Euros per vice plus any material costs.

On request, a member of staff of the customer can watch the fitter carrying out maintenance work in order to learn how to tackle smaller jobs him/herself.

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EXTRA LARGE PARTS MACHINING



NC vices with a clamping force indication for high precision, reproducible clamping



Clamping of sensitive workpieces without deformation (housing parts)



Permanent process control for heavy machining, identification/avoidance of incorrect clamping, Andreas Menn (ROEMHELD), Michael Beer (Atlas Copco) and Christoph Neuhaus (ROEMHELD)

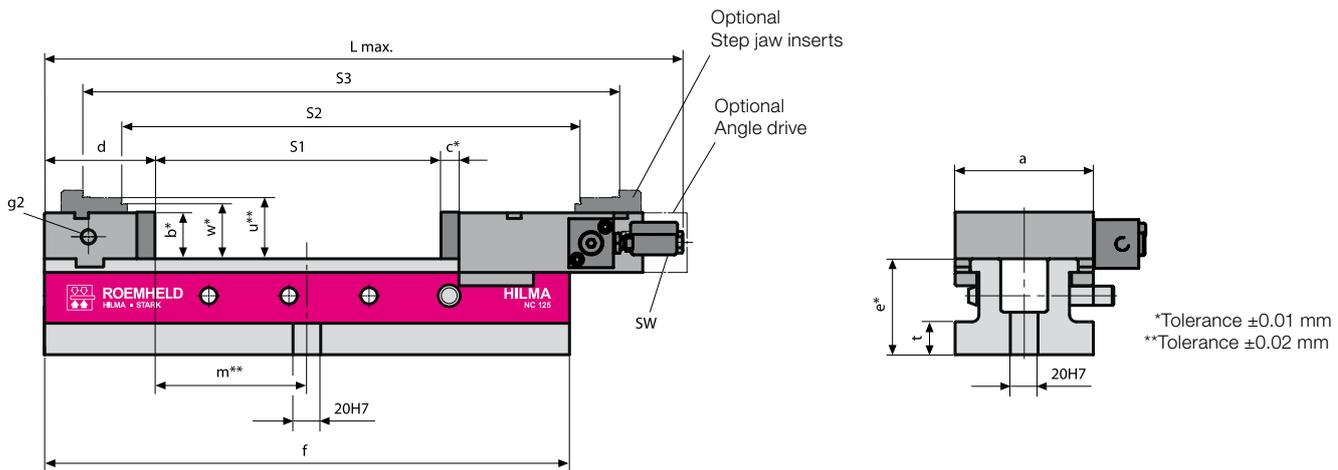


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The completely revised power transmission requires minimal force to be applied to the crank. An angle drive (optional extra) facilitates operation, for instance for lengthwise clamping on the machine bed. Optional clamping power preselection (available for retrofit) allows the clamping power to be limited in 6 steps.

It offers special benefits thanks to precise positioning on all grooved tables and optimal utilization of machine travel, as well as an increase in the clamping range using step jaw inserts.



Scope of supply: Standard reversible jaws smooth/serrated, manual crank, operating manual

Type	Part no.	Jaw width a (mm)	Clamping force (kN)	Clamping width (mm)			Total length L max. (mm)	Weight (kg)	Dimensions mm										
				S1	S2	S3			b	c	d	e	f	g2	m	SW	t	u	w
NC100M	9.3072.0213	100	25	205	330	386	464	18.5	34	13	80	70	380	M12 x 18	110	14	24	45	40
NC125M	9.3073.0213	125	40	225	363	431	526	31.5	45	15	100	82	430	M12 x 18	115	17	27	58	53
NC160M	9.3074.0213	160	50	309	503	573	684	58.5	54	18	120	95	550	M20 x 27	155	19	27	70	65

More data available in PDF or CAD format upon request. Please contact us: info@hilma.de

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