WIAP® MEMV®

Metal stress relief with vibration

Technical information

Fully automatic metal relaxation facility WIAP MEMV E

An alternative to Low stress annealing

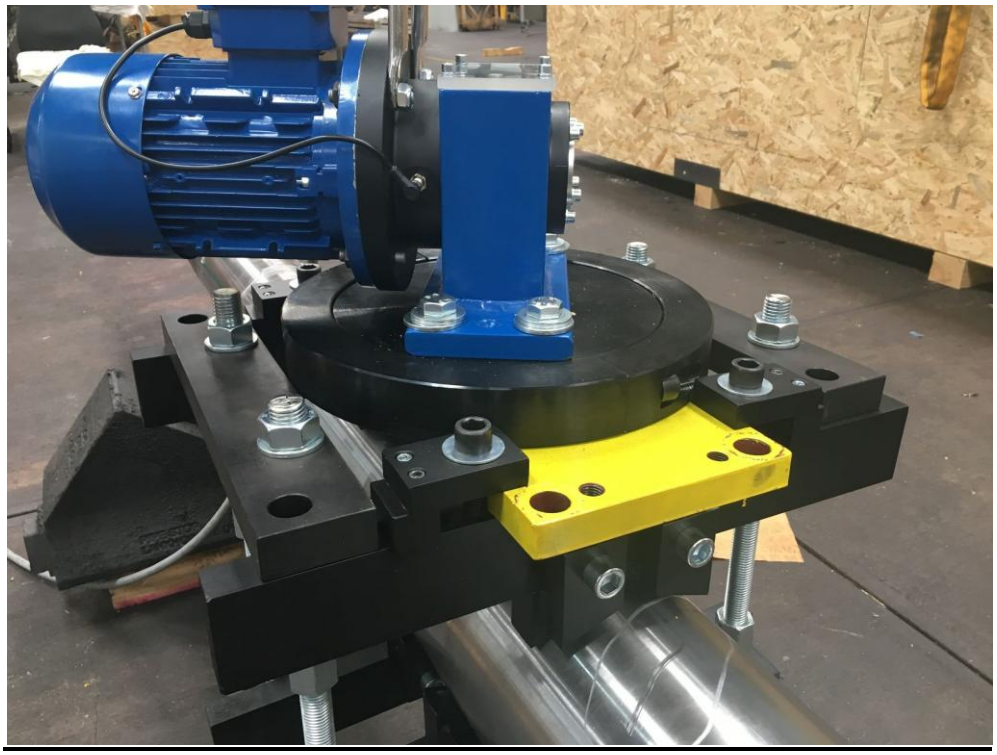


Table of Contents

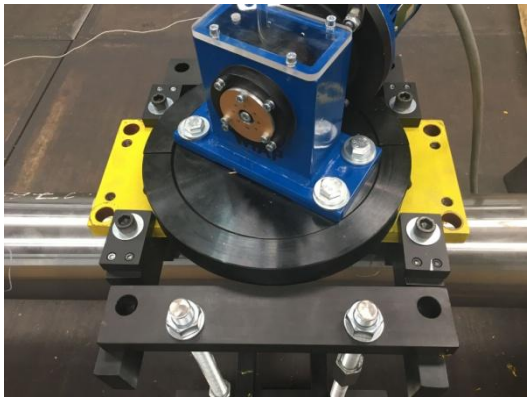
1. Introduction

The WIAP relax metal with vibration since 1983. Many own tools and patents represent the state of where we ereichten today greatly affected. The metal relax newly called MEMV with vibration, Metal relax with vibration is today because it greatly shortens the lead time is an excellent alternative to glow. There in the present state of process reliability a reliable method.

2. Description

description of **WIAP®** MEMV® e process
The metal relax unit WIAP MEMV_E 5.20.50 brings about the V - Vibrator the workpiece to the edge zone of the self-oscillation. In the lower speed range, depending on the set Exzenterstufe a weak may well be over. The relaxation process can, thanks to additional measuring devices, are in addition to a motor speed controller, observed and influenced. The motor current is measured which varies but the location precision says only a global statement at the mounting of the motor. In contrast, the G shift between before and after a value of the selectively makes a Global state determining a very precise statement. Thus, a workpiece during the first 5 to 10 minutes, a G value at a rotational speed and the G value migrates within 15 minutes.

These are reliable indications that a stress relief is done. With the help of the metal relaxation by controlled vibration, with the**WIAP®** MEMV® Investment, You can achieve good results without high additional costs in most cases. There are proven good results.



4. User description of WIAP® - MEMV® E process - Vibration relaxation

4.1 The workpiece with the crane on 3-10 rubber pads provide generally better min 120 mm inferior to 200 mm. Especially with long workpieces using multiple rubber pads. (Small workpieces secured with the crane, possibly with a shock cord - fix in place of a rope.)

The WIAP V engine with robust special clamps or even better well-slick mounting clamp set mount and tighten with extension. Please note that the Schraubzwingenbügel not affect the vibrator or the workpiece, adversely affecting the measurement with the probe. (Please select the motor mounted in the horizontal axis, provided it allows the fixture situation. It is better for the life of the eccentric ball bearings). For location is outside the center to arrange usually 1/3 to 2/3. Please also note that the V engine is not fixed in the dead zone of the workpiece, or he has to be postponed by a few hundred mm to a different location. The dead zone is a section of the Zone V waves which is obtained a compensation and therefore does not transmit the vibrations, special balanced. If the V engine was placed in the dead zone can be achieved subsequently is also not a good relaxation with Maximae speed no stimulation.

4.2 The probe supplied with the clamp fix eccentrically on the workpiece. At most, with the magnetic base. The probe attachment is to be off-center. The probe cable is very thin and is often overlooked. installing the controller about 1 to 2 meters from the workpiece removed. Without passage between the workpiece and operating unit WIAP MEMV_E that there is no continuity between the probe and the measuring device is possible 20th

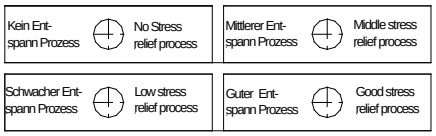
The measuring probe as it is mounted on the workpiece. Always use caution; the cable is very sensitive and should also not be "kinked".

Photo: The measuring probe as attached to the workpiece
With solenoid Please Achrsichtung of excitement
.When note 2 D vibration is always an axis untouched
ie the probe is to check the axial direction,
which is touched.

Excenter Einstelltabelle Wiap LC System und MEMV E											
	Einzel Scheibe	Doppel Scheibe	3D System	Einzel Scheibe	Doppel Scheibe	3D System	Einzel Scheibe	Doppel Scheibe	3D System	Einzel Scheibe	Doppel Scheibe
	LC05 und MEMV bis 5 To			LC20 und MEMV bis 20 To			LC50 und MEMV bis 50 To			LC100 bis 100 Tonnen	
RPM	N			N			N			N	
1000	55	110	220	209	418	836	418	836	1672	1045	2090
1500	124	248	496	470	940	1880	940	1880	3760	2352	4704
2000	220	440	880	836	1672	3344	1672	3344	6688	4181	8362
2500	345	690	1380	1306	2612	5224	2612	5224	10448	6533	13066
3000	497	994	1988	1881	3762	7524	3762	7524	15048	9407	18814
3500	676	1352	2704	2561	5122	10244	5122	10244	20488	12805	25610
4000	883	1766	3532	3344	6688	13376	6688	13376	26752	16725	33450
4500	1118	2236	4472	4233	8466	16932	8466	16932	33864	21167	42334
5000	1380	2760	5520	5226	10452	20904	10452	20904	41808	26132	52264
5500	1670	3340	6680	6324	12648	25296	12648	25296	50592	31620	63240
6000	1988	3976	7952	7526	15052	30104	15052	30104	60208	37630	75260
6500	2333	4666	9332	8832	17664	35328	17664	35328	70656	44164	88328
7000	2706	5412	10824	10244	20488	40976	20488	40976	81952	51219	102438

WIAP ®
MEMV ®

Metall entspannen mit Vibration



Display shows the status is also expressed

6. Scope of WIAP® MEMV_E expansion plant:

Metal expansion plant WIAP MEMV®_E 20 designed for a maximum part weight of 20 tonnes with 30% ST. Proportion Vol.

Pos.6.1 1 Workshop Accessible, handy and transportable well control device; consisting out:

- Connector; HMI touch screen display
- 3 mode system: manual / semi-automatic / automatic
- USB port for printer or laptop
- static frequency device;
- 0.5 - 100 Hz; 380 V; 50 Hz
- Device Connection: 230 volts
- dimensions b = 400 mm t = 450 mm h = 200 mm
- carrying handle
- Transport Box no. 1 18 Kg
-. Transport Box No. 2 Printer Brother MFC J 680 DW 13,8Kg
  substitute Color

Pos. 6.2 1 vibrator stepless 2 axis vibration exciter, adjustable from 0 to 100%

- consisting of housing, 1.1 KW AC motor; Eccentric; pulse;
- designed for workpiece weights, stability depends up to 20 tons
- 5 meter cable with plug
- Exciter mass Max. 800 Kg / Max revolution 100% Exzenterstufe
- Transport Box no. 3 38 Kg

Item 6.3 The delivery belonging accessories.:

- 2 robust WIAP clamps span 175 mm trapezoidal spindle TR 30 made in the transport box no. 7 of Patent Application 2016 19 kg
- 8 rubber pads (.; 4 pcs 120 x 100 x 200 mm. X 100 4 80 x 200 mm pieces) in the transport box no. 4 25 kg
- 1 measuring probe with probe holder and a 5 meter cable, with necessary

Tool in the transport box no. 12 7 kg

- 1 Operating Instructions
- 1 Protocol pattern (template)

Pos. 6.4 ACCESSORIES / SPARE PARTS

item 6.4.1	4 rubber pad 80 x 100 x 200 mm	8.4 kg
item 6.4.2	4 rubber pad 120 x 100 x 200 mm	kg 10.6
item 6.4.6	1 set of replacement stock for excitation	box 4
item 6.4.7	1 Spare probe cable 5 meters	additional delivery
item 6.4.8	1 spare probe G-measuring probe	additional delivery
Pos 04/06/10	About Brin narrowing and instructing the system Box 4 with certificate	

Item 6.4.20 chuck prisms set for round parts
A diameter of 60 up to 420 mm
In Transport Box 120x400x600mm
box 40 kg

Pos 04/06/21 Rotating plate with clamping ring for V05 / 20
In Transport Box 120x400x600mm
box 9 27 kg
Box 10 lower plate with ring 33 kg

Pos 04/06/22 chuck prisms Set for round parts
Diameter 400 to 800 mm

Pos. 04/06/70 Turnbuckles M24 Box 2 pcs.
; M24 4 x 400 pcs. ; 2 M24 x 200 pcs.
Long nuts M24 8 pcs.
.; 10 nuts M24 Stk Washers 20 pcs.
In Transport Box 80x400x500 mm
Pallet 600x1200 x 300 171 kg

Pos 6 4.71 Clamping flanges Set 01
. L clamping flanges 500 for M24 2 pcs
M24 x 50 4 pcs.
. Nuts M24 10 pieces
. Washers 10 pc
In Transport Box 5 80x400x500 mm Kg 28.5 KG

Pos. 6.5 w / vWIAP MEMV®

- Weight: Total 438 Kg
- Volume: 400 dm / 3
- Customs Item number: 8479.8942
- Country of origin: Switzerland

7. WIAP MEMV WM Rapport System G displacement

7.a The measure of tension the WIAP has fixed by various methods
Follow a small treatise by explaining

7.b MEMV WM 850-10 measurement method G single measurement multipoint HM
measurement mode
7.c MEMV WM 850-30 measurement method G single measurement with Amp, and RPM
HEM mode measurement
7.d. MEMV WM 850-40 measurement method G single measurement
Data logger MAN 6 x 3 D multipoint measurement
VEM mode measurement
7.e MEMV WM 850-50 Method of measurement data logger 3 D Machine
Data logger MAN 6 x 3 D multipoint measurement
AEM mode measurement
7.f MEMV WM 850-55 measurement method Singel 1 channel multi-point measurement
24 individual probes each measurement axis 8 measurement points
SAM mode measurement

7.g MEMV WM 850-60 compilation Various measurements evaluation
ZM mode measurement
7.h MEMV WM 850-70 measurement expression of HMI device
GM mode measurement
7.i MEMV WM 850-80 measurement printout of computer of WM 850-70
GM mode measurement
7.K MEMV WM 850-90 Full analysis evaluation of all measurements
VAM mode measurement

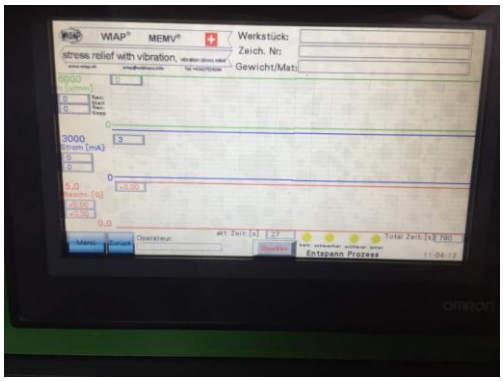
9. Various pictures:

V05_Simplex, V20 and V50 Simplex Simplex

Device with clamps.

WIAP MEMV E control unit in transport box

Protection Transport box for equipment storage and transportation



Log from the automatic mode

Control unit with status display from MEMV_E

Back MEMV E unit

Box for the Printer direct from the device,

prints without a PC

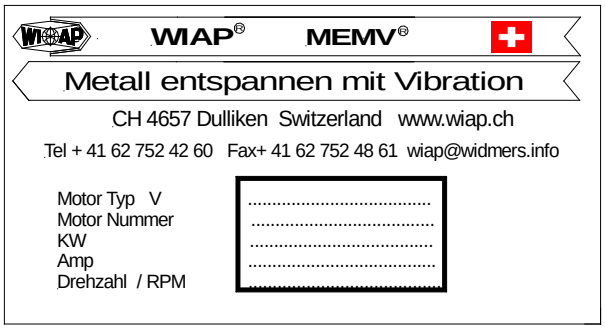
Box for the rubber documents

Rubber for the workpiece rests. 80x100x200

and 120x100x200

V excitation mono system 20 tons version

Transport box for the V agents



V5 0.75 KW, 1.1 KW V20, V50 2.2 KW

Tool box for MEMV conditioning

10. Vibrationsentspannen workpieces during welding system MEMV EV 3D

10-a Since moving tensions, especially in the transition zones between the stare and the cash in the cooling zones in all directions we have 3 DV engine designed to. It shifts the default behavior in all three axes and is therefore to neutralize tensions during the welding the most ideal device

10-C ExplanationSummary MEMV 3 D Schweiss V Motor

One or more to relaxing the workpieces (1) are simultaneously or successively vibrates in three mutually angled axes X, Y and Z. The Y-axis is in the horizontal perpendicular to the X-axis, while the Z-axis in the vertical is perpendicular to the X-axis. Deviations from the right angle, including acute or obtuse angles are possible. The at least one workpiece (1), however, will vibrate both in the horizontal and in the vertical. Characterized at least voltages in the vicinity of a cyclical 0.1 yield strength are achieved,
to both the macroscopic and microscopic residual stresses in the workpiece (1) break down. The vibration relaxation is a safe and reliable method. The device comprises at least one drive (5, 6) in the form of a rotary motor, wherein the vibration by at least two angularly related eccentric (7, 8) is applied to the at least one workpiece (1).

11.MEMV E method Achsrichtungswechsel

11-a Since in the 2D V engine with cubic workpieces generally, the voltages are respectively always extracted only in 2 axes. is moved, it requires a change in the axial direction during the relaxing process.

11 - C Explanation / Summary MEMV_E

The design relates to apparatus for vibration relaxation of workpieces. A vibration device (9) has at least one eccentric (10, 16) with a vibration drive (11, 15), for example an electric motor. The vibration caused by unbalance. This vibration means (9) is arranged on a rotation device (1). Characterized the rotational position (4) and thus the axis of vibration with respect to the workpiece is adjustable. If two or more eccentric (10, 16) is present, whose rotational position may be changeable to each other and thus the vibrating action. Thanks to the construction of the device according to even complex workpieces, such as welded
Stegen, relax reliable.

12.Messung the residual stress G displacement measuring method

12-A Stresses compete with many measuring points on the whole component distributed excact in each zone to recognize is the value determine the G shift. In particular, the values must be detected in all 3 axes for a system to the total component flow to be acquired in each zone

12 C Summary G displacement measuring method

The test method refers to a method of measuring the residual stress of workpieces (1) which can be used in vibration relaxation. It is practicable for the metal processing companies. Acceleration values are measured - at a plurality of measurement points (13 6). These measuring points (6 - 13) lie in at least two mutually angled measuring axes (X - Z), where in each case at least two measurement points (6 -13) per measurement axis (X - Z) are provided. In each dimension, thus in the width, height and / or length of the workpiece (1), a plurality of parallel measurement axes may be present. Characterized reliable measurement results are obtained and identified

areas in the vibration relaxation, in which the material of the workpiece (1) other than specified is responsive to the induced vibration. This method is for testing purposes and for workpieces (1) can be used, which were not relaxed by vibration, but, for example by heating. (Diagram 2)

13.Schraubzwingen in metal relax with vibration

13-A. For the metal relax with vibration is a very good connection between the component and the V t of the engine key to success. Only a minimalstes by springs or resonance of the clamps will distort measurement results. In general, we recommend that you use today clamping flanges and 4 points to mount a vibrator not only by 2.

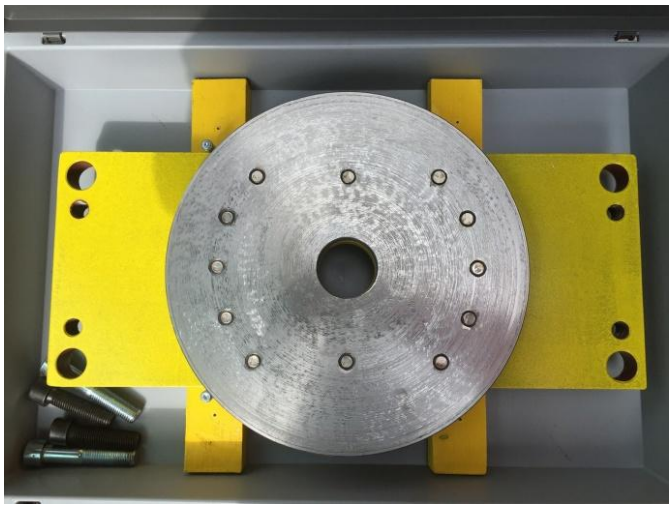
13-C declaration summary clamp

In the construction according to at least one clamp, the screw(6)retaining spindle guide (7) and a clamping arm(2) reciprocallyformed cross. For this purpose, at least one groove hinterschnit tene(10)andat leastan engaging into this web(12)available,This made groove(10)andWeb (12)compound formedist in the preferred example, at a 90° -cornerto the longitudinal axis(14)the screw spindle (6) aligned. In addition, a screw or weld connection canin betweenthe spindle guide(7)be provided and the tensioning arm in question (2). This rugged and vibration-resistant Schraubzwingeis particularly suitable for temporarily holding workpieces to devices for vibration relaxation.since it is the local, exceptional loads suited to tackle.

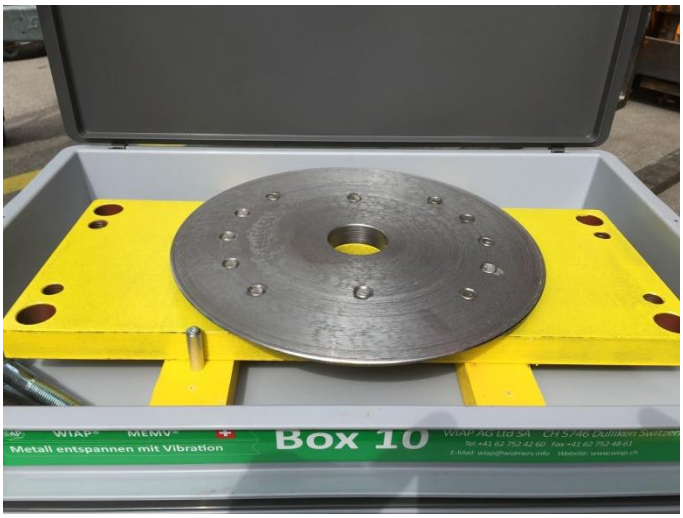
14. Accessories

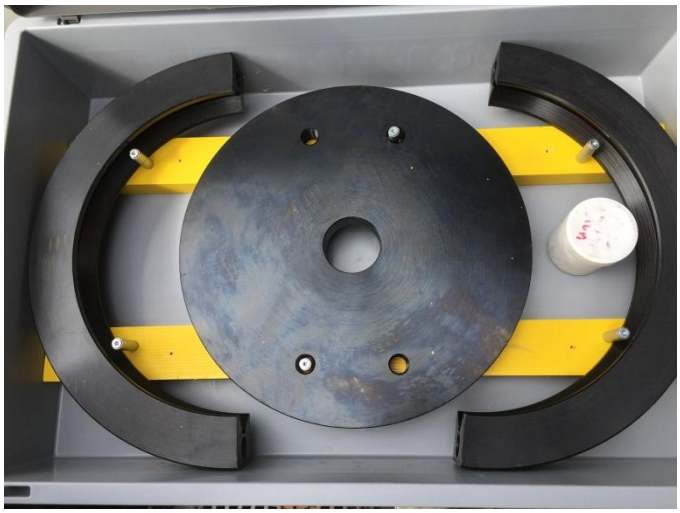
14 4.21 **Rotating plate with clamping ring**
For V05 / V20
In transport 80x400x600 mm

Pos 14.2 rotating ring lower part Version H

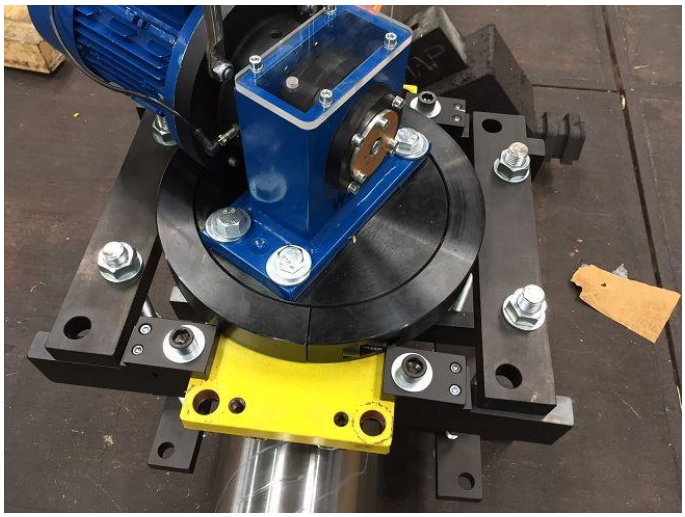


Rotating ring lower part Version H





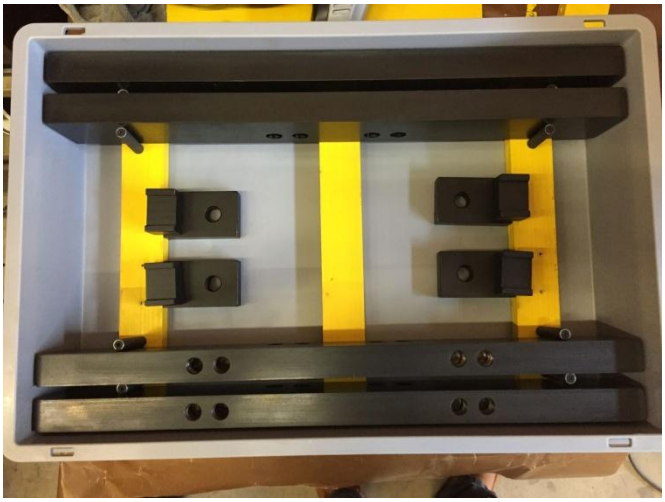
Rotating ring lower part Version H



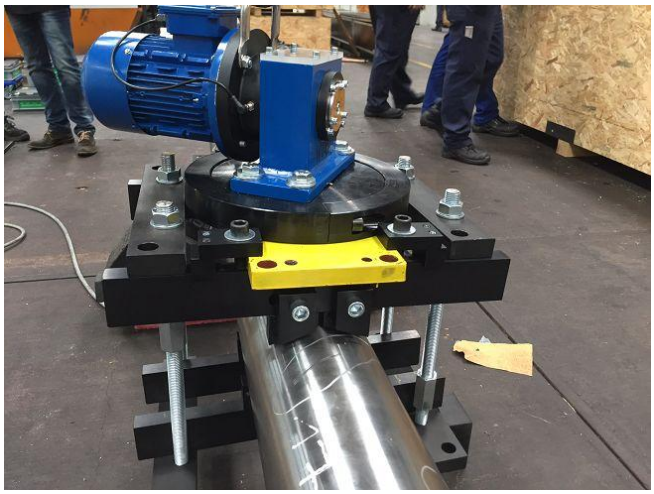
14. 4 21A turntables automatic
Clamping the rotary plates and
Twisting in div. Of degrees
14. 4,21B software and PLC extension for turntables
Automatic control with Electric

14 4.20 **Prisms set for round parts up to 420mm**

A diameter of 60 up to 420 mm
In transport 120x400x600 mm
19.3 kg



Chuck shafts diameter 60-420



14. 4.22 prisms set for round parts up to 800mm
Diameter 400 to 800 mm
In transport 200x400x600 mm; 176 kg

Mounting clamp set waves 400 to 800 mm

14 4.23	**Motors footplate** Dimension of the plate 25 x 250 x 500 mm In transport 80x400x600 mm; 27.4 kg	Stk.	EUR	535.00
14 30.04	**Second vibrator, infinitely variable 2-axis vibration exciter** **for 5 tons Type V05** - consisting of housing, 0.55 KW AC motor; eccentric - pulse generator for workpiece weights up to 5 tons - 5 meter cable with plug - Transport box no. 6 - V05 21 kg Box 5.1 KG Total 26.1 Kg	Stk.	EUR	3'750.00

14. 30.4 A price reduction instead V05 V20

If ordered 05 just is not MEMV
MEMV 20,

14 4.30B**Replacement vibrator continuous 2-axis**
vibration exciter
for 20 tons Type V20
- consisting of housing, 1,1 KW AC motor; eccentric
- pulse generator for workpiece weights up to 20 tons
- 5 meter cable with plug
- Transport box no. 6
- Box dimensions 400x400x600
- V20 30kg, Box 5.5 kg Total = 35.5 Kg

14 4.31**Second vibrator, infinitely two-axis**
vibration exciter
for 50 tons Type V50
- Consisting of housing, AC motor 2.2 KW; Eccentric;
- pulse generator for workpiece weights up to 50 tonnes
- 6 meter cable with plug
- Change inverter up to 2.2 KW
- Transport box no. 6
- Box dimensions 400x400x600
- Weight V50 42 kg Box 5.5 Kg Total = 47.5 Kg.

14 4:32 **Second vibrator, infinitely two-axis**
vibration exciter
for 100 tonnes of Type V100
- consisting of housing, 5,5 KW AC motor; Eccentric;
- pulse generator for workpiece weights up to 100 tons
- 10 meter cable with plug
- Change inverter up to 5.5 KW
- Caddies from Pos, 1
- Box dimensions
- New large base plate 40x400x750 mm

14 4:33 **Second vibrator, infinitely two-axis**
vibration exciter
for 200 tonnes V200
- Consisting of housing, AC motor 11 KW; Eccentric;
- pulse generator for workpiece weights up to 200 tons
- 15 meter cable with plug
- Change inverter up to 11 KW
- Caddies from Pos, 1
- New large base plate 75x800x1250 mm
-. Special transportation Box No. 9

04/14/36 vibrator type V5 Twin Simpex, V20 Twin Simplex, V50 Twin simplex

04/14/37 Twin Douplex vibrator type V5 Twin Dulex, V20 Twin duplex, V50 Twin Duplex

14 4:38 Welding vibrator type V5_3D, T20 3D, 3D V50

3 axis welding vibrator excites all three axes simultaneously distributed

the stresses in all directions

14 4:50 **0-150 clamp 2 pieces**
consisting of 2 clamps in Box
14 4.50a 2x attachment 150 mm with twin spindle TR
14. 4.50c 1 WIAP Schraubzwingenset 150 mm TR
consisting of 2 clamps in Box
box 80x400x600 mm; 19 kg

14 4.4a 1 attachment 150 mm TR Twin spindle

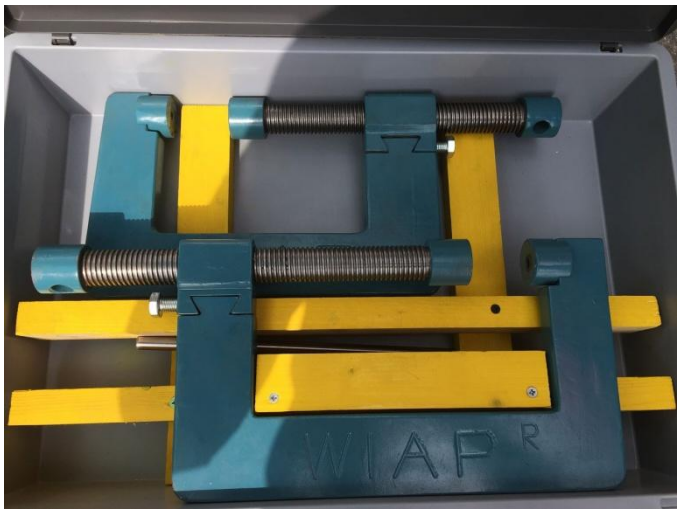
14 4:51 **0-175 clamp 2 pieces**
Box 80x400x600 mm; 20.5 kg

14 4:52 **0-200 clamp 2 pieces**
Box 80x400x600 mm; 22 kg

14 4:53 **0-250 clamp 2 pieces**
Box 80x400x600 mm

14 4:54 **0-300 clamp 2 pieces**
Box 80x400x600 mm

14 4.55 clamp 0-400 2 pieces
Box 80x400x600 mm



Screw Set Type 175mm

Available versions, wingspan

100,150,175,200, mm Security / Safety Version

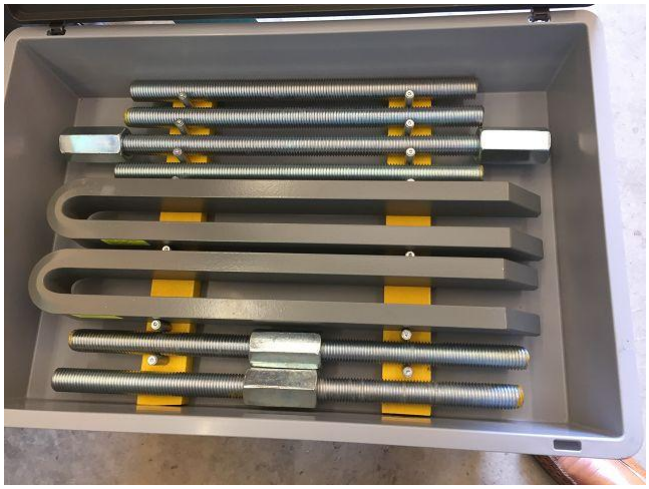
150, 175,200,250,300,400 Welded / Welding version

14 4.70 **Turnbuckles M24 Box Set Box**

4 x M24 x 400;2 x M24 x 200; 8 Long nuts M24
10 nuts M24; 20 washers
Box 80x400x500 mm

14 4.71 **Clamping flanges Set 01**

2 x Mounting clamp L 500 for M24
4 x M24 x 500
10 nuts M24
10 washers
Box 80x400x500 mm; 25 kg



Mounting clamp set 500mm

14 4.72 **Clamping flanges Set 02**
2 x Mounting clamp L 300
4 x M24 x 300, 4 x M24 x 200
12 nuts long M24
12 nuts M20 short
10 Piece washers
Box 80x400x500; 20 kg

14 4.80 **magnetic holder** for measuring probe

14 4.81 **Probes holder** for large waves to 420

14 4.81 **Probes holder** for large waves to 800

14 4.90 **vibration table** 800 x 1200 mm 800 ground level
240mm rubber Buffering Maximum load approx
1500 kg

14 4.91 **Mounting clamp set for vibration table**

Pos 11.14 factory wagons

- Holder for the controller, in a lockable cabinet 600 x 600 x 600 mm
  Standard equipment to be stripped for Foreign Works

- Storage space for: prisms Clamping set for round parts with diameters up to 430 mm
- Storage space for: prisms set for 800 mm round parts
- Storage space for: clamps, spans: 150,175,200,250,300 and 400 mm
- Storage space for: rubber pads, 80x100x200 mm and 120x100x200 mm
- Storage space for: Device V20, V05, V50 or 3D_V20 or 3D_V50
  Shelf swung out easily accessible to the crane loading and unloading

- Storage space for: special platen
- Storage space for: More D fixture

15.Totpunkt discovery process

Very complex difficult components require special attention needs to be in various axial directions Inspired while also various axial directions are measured also important here is what view the G shifts Due to many measurements all components are forms also different in characteristics.

The tables below show measurement methods and excitation scheme for the MEMV system. These tables. The fully automatic WIAP MEMV plant was also supported the component shapes and automatic stimulate the directions of vibration which stimulates the nützlichten axes depending on the part family.

16.Anforderung to the surgeon and diploma template

The metal 16a relax with vibration MEMV called requires a very conscientious surgeon. The WIAP has a training program created that this man can perform his work conscientiously. And the most important is: The surgeon must know what he is doing. That today the more the quality, the longer important show many examples. The WIAP relaxed for defense contractors, including Flugzeugbauer- Many turn to the MEMV system. Was also the man of this work carries a great deal of attention placed, because tensions in the regulator is not as easy to measure the surgeon can shrug their shoulders and think, yes, nobody notices. But at least when a component is on a machine and it warps is recognized there were stresses in the component. The MEMV surgeon must be very conscientious and should be proud when he can. The MEMV, metal relax with vibration.

The following version is the 2013 version. The latest version is not listed here.

17.Schlusswort, vibrate instead Low stress annealing:

With the relaxation of welded metal parts, companies can save several million kilowatt precious energy, save time, save money and protect the environment. Welded seams are under pressure. The relaxation process is done now on site. This brings the number of dangerous heavy transport can cut down on the highways. So far heating workpieces scorching at temperatures around 750 degrees Celsius. Immensely may be for companies the cost of the expansion of their plants. Huge, elaborately dismantled parts of large systems in factories are regularly moved over long distances at considerable logistical effort to efficient annealing furnaces. The impact on the environment. Another problem is the extinction of the annealing plant is because the number of foundries takes other hand.: There, the parts are manufactured and welded. let the necessary relaxation by vibrating alone for structural reasons, a forward-looking alternative.

Flash-related parts, 10 meters long, without annealing, only MEMV relaxed: no distortion after machining
(When the parts are annealed, it distorts them back, edited without MEMV, delay of several mm)

Heavy rolls 12 tons; annealed and vibrates = identical results. Annealing requires 935 KW / h and relax MEMV requires 2 KW / h. Annealed and MEMV relaxed, same result. No distortion after machining.
(Relax with 12 tons of rolling with 2KW / h MEMV system replaces the annealing which requires 935 KW / h)
Burned-out plates; annealed and MEMV relaxed identical result. No distortion after machining.
(That was only with the new MEMV® system. The old VSR system that we anwandten to 2014, works with boards not)

Mechanics makes non-elastic body can vibrate. Excited they are employed mostly medium to higher frequency, niederamplitudigen vibrations. Escapes pressure from the fringes of the seams.

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Instructions created: Hpw / IW / sw 12: 04: 2017