WIAP MEMV ®

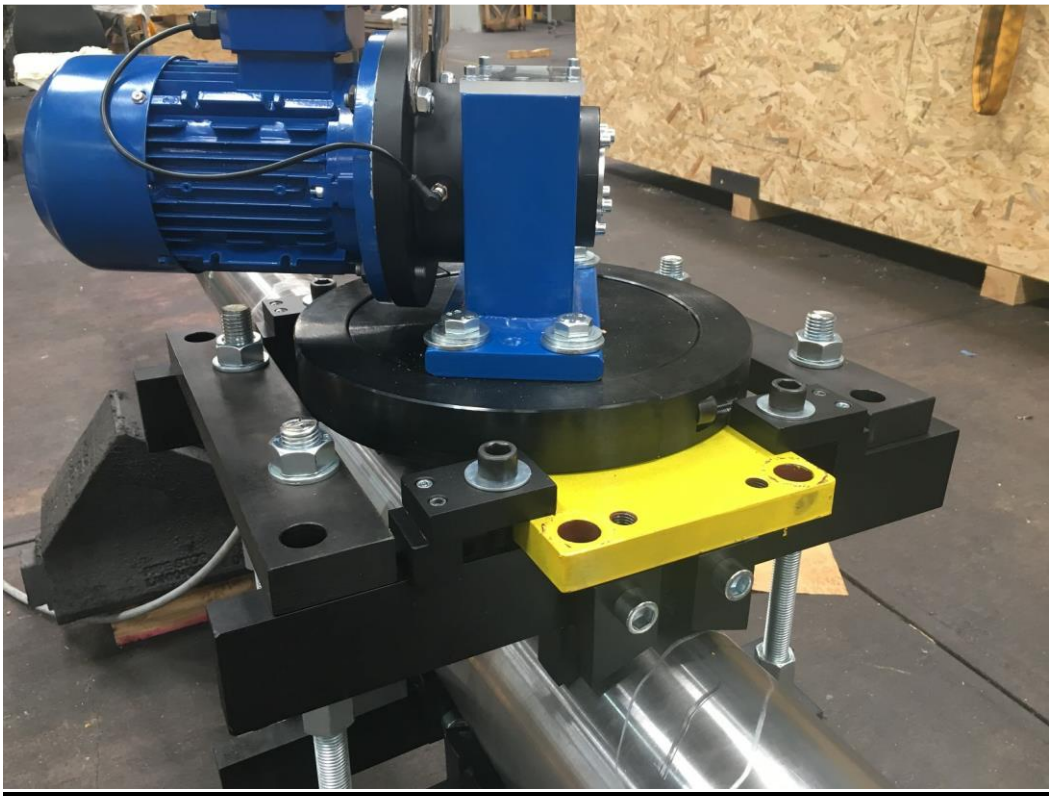
Metal relax with vibration

operating manual

Fully automatic metal relaxation facility WIAP MEMV E

An alternative to Low stress annealing

Device:	device numbers
MEMV controller	100127
MEMV V Motor	100128
Jig 60-420	100129a
Jig 400 to 800	100129b delivery 12/04/2017



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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 schacher may well be over. The relaxation process can,

thanks to additional measuring devices, together with one Motor speed controller, are monitored and influenced. The motor current is measured the precision but the location is changing just says a global statement at the mounting of the motor. In contrast, the G shift between before and afterwards is a value of a global state determination selectively makes a very accurate statement. Thus, a workpiece during the first 5 to 10 minutes has a G value at a rotational speed and the G value migrates within 15 minutes. the G Shift of the value can be used as proof of a voltage breakdown.

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

3. Safety Information

3.1 Metal relax with vibration may only be performed by trained personnel

All documents should be studied in detail 3.2 before starting work. Workpieces should not be relaxed for 45 minutes with vibration generally. Please note Position-16 request to the operator

3.3 It should not vibrate directly on the self-resonant speed range

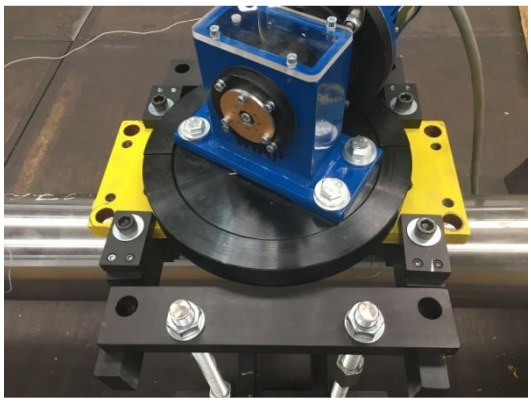
be, but beside, above or below the self-resonance rotational speed.

3.4 Who will vibrate for a long time, to a **ear protection** carry. Especially in light, thin-walled structures.

3.5 If the vibration place is at a place where many people work: choose the most distant, Schallunendpfindlichsten, if possible, not unterkellerter place. Please take into account the environment.

3.6 Never without rubber pads, at least 50 Shore 80/120 mm thick; relax, choose three or four documents. To ensure that no third party damage can be caused

3.7 If not 100% good mounting option, secure the vibrator on the crane with a rope without tension. The plant never run without supervision, always stay within sight. The eccentric protective cover must not be removed during the decompression process.



3.8 One of the main task is always to secure the V engine well. If necessary, make special designs for If a component can touches the natural resonance Punk are going at a good attachment of the run over and played around with a slight mounting the component can make uncontrolled movements.

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 sectional area of the V wave which is obtained a compensation and therefore does not transmit the vibration special balanced.
If the V engine is placed in the dead zone, with the Maximae

number of revolutions be achieved no suggestion therefore no good
Relaxation done.

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 it is mounted on the workpiece with magnetic
Please Achrsichtung of excitement note .When 2 D vibration is always an axis untouched
ie the probe is to check the axial direction, which is
touched.

4.3 A 230 volt outlet is required. (10 Amp. MEMV_E05 and MEMV_E 20, 16 Amp. MEMV_E 50)

4.4 Connect the motor cable to the control unit via plug-in connection.

4.5 The probe cable plug on the control unit. (Please never voltage plug of the probe, plug or pull out.)

note the work piece weight for the setting. After long device standstill possibly the basic data must be typed

The MEMV_E 05 Vibrator V05 generated in the 0 to 100% setting a force introduction **from 0-3976 N Maximum. Maximum energy imbalance kg**
(Caution:. Make adjustment according to weight specifications refer to the maximum speed of 6000 revolutions)

The vibrator 20 MEMV_E V20 generated in the 0 to 100% setting a force introduction **from 0 N to 15,442 maximum. Maximum unbalance power 0,930 kg (beware. Settings do depend on weight specifications refer to the maximum speed of 6000 revolutions)**

The vibrator 50 MEMV_E V50 generated in the 0 to 100% setting a force introduction **from 0 N to 30,884 maximum. Maximum unbalance energy 1.86 kg**

(Caution:. Make adjustment according to weight specifications refer to the maximum speed of 6000 revolutions)

4.6 the front of the vibrator is a screw which is provided with a notch. As a reference mark for the percent setting.

4.7 the top of the plastic cover of the housing is a hole, whereby the eccentric (Photo 5) clamping screw is loosened. That is, a labeled screw. Front insert the 6 mm Allen key in the screw and get access to the position% of the scale.

4.8 Slowly on the screw turn to the hole in the plastic cover the Allen screw can be dissolved in the eccentric disc. See now in the position where the 6 mm Allen wrench inserted from above through the plastic housing in the screw, which position indicates the notch on the% scale.

4.9 It is important to Allen front not let go, then the Eccentric screw to loosen the allen key. Front screw rotate to adjust the mark to the notch% position according to the following weight table.

4:10 Then tighten the clamping screw of the eccentric disc again.

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

Attention, important: At speeds from 5,000 to 6,000 rpm, the acceleration to - display on the display device does not go beyond the value 10G.

11.4. Off the system

4.11a pressures emergency stop
4.11.b Turn the ON / OFF switch to off
4.11 c Turn the potentiometer completely to the left. (Attention has 3600 degrees away, d, h 10 revolutions)
4.11 d Put pull out of 230 volts
Pull 4.11e probes Cable low
4.11f separate motor cables

12.4 Preparing the equipment for operation

Connect 4.12a motor Kabele
Connect 4.12b probes cable
4.12c Power cables connect 1,230 volts
Turn 4.12c V device good fix Exzenterstufe not too high
Turn 4.12d emergency stop button out
4.12e On Devices panel knob unit on clockwise to ON Wait about 20 seconds to device ready
4.12f At devices the code welding or machine comes

4.13 Description of a relaxation process in manual mode, for example, for the welding operation Power

4.13.a pressures welding mode hand
4.13 b Turn the potentiometer fully to the left. (Attention has 3600 degrees away, d, h 10 revolutions)
3.13 c pressures on the screen Start
3.13 d Turn the potentiometer to walk slowly to the right, which begins Moor

(Attention has 3600 degrees away, d, h 10 revolutions)

4.14 Description of a relaxation process in manual mode, for example, for the welding operation off

4.14.a Turn the potentiometer slowly to the left, the Moor begins to run Stops

(Attention has 3600 degrees away, d, h 10 revolutions)
4.14 b pressing emergency stop

4.15 Description of a relaxation process in automatic mode

4.15.a pressures Automatic mode on the screen

Prepare 4.15 b preferences Erstbedienung:
4.15 c basic flow of data input which may fall out after long standstill

4.15 d 10 hours, 10 speeds

Pos. G for measurement of displacement before and after
displacement measurement G

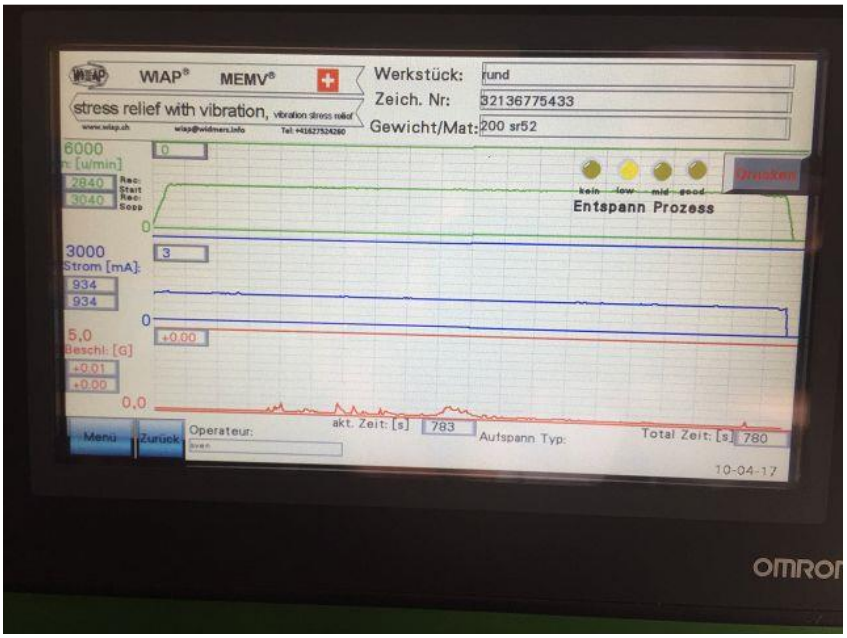
WIAP MEMV Standard Werb component group A

Pos	time value	time seconds	data	total speed	Value measurement. position
4.15 e 1	Z1	10	D1	3500	
4.15 e 2	Z2	20	D2	3500	25 sec
4.15 e 3	Z3	25	D3	3800	
4.15 e 4	Z4	25	D4	3500	
4.15 e 5	Z5	700	D5	3500	
4.15 e 6	Z6	25	D6	3800	
4.15 e 7	Z7	25	D7	3500	
4:15 e 8	Z8	20	D8	3500	840 sec
4.15 e 9	Z9	10	D9	0	

4.15 f Push the button Back
4.15 g Go for correction Standard 1

Input for what	value	comment
Percent correction in value probing	5%	
alarm value	2.5 G	
emergency value	5 G	

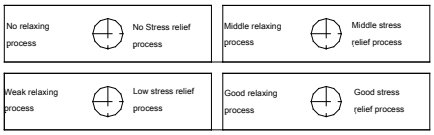
15.04 h Press Start
4:15 i pressures view diagram
4.15k transmitter component data into the display
4.15l If expiration press ready button Print not forget it
otherwise stores,



Protocol of system

WIAP ®
MEMV ®

Metal relax with vibration



Display shows the status is also expressed

5. Frequently asked questions:

5.1 *Can to save costs, clamp several workpieces together? In principle, yes.*

The single workpiece logging is then to make the manual dipstick but only two axes to measure the third axis which is clamped together can be determined only once per clamping.

5.2 Can be cold drawn material are relaxed? In welded structures when the cold rolling skin is not removed. When the MEMV method is applied can also be processed when the load cycle are introduced correctly by our standard into the workpieces.

5.3 *Can forged, rolled aluminum rings are relaxed?*

Yes 4 when the D method MEMF is applied. but it takes time min longer run. 3 x 15 minutes

5.4 *Can aluminum welded structures are relaxed with vibration? Yes.*

5.5 Can be stainless relaxed? is

Customers can Stainless constructions with vibration relax

5.6 Which certificates are available for the metal relax with vibration.

The WIAP determines the G shift. Because of the many measuring points and measurement locations, the voltage waveform can be accurately determined. As long as there are shifts as long as it has voltages Annealed components have cooled usually in only one axis shifts, which thus hangs together as a component in an oven. To control measuring method even better the G shift we prepare a larger measurement campaign prior to recognize why annealed parts still have small G shifts but only in an axial direction.

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 of:**

- 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

Pos. 6.3 **The scope of supply belonging Accessories:**

- 2 WIAP robust clamps 175 mm span trapezoidal screw TR 30 prepared in the transport box no. 7 according to Patent Application 2016 19 kg
- 8 rubber pads (. 80 x 100 x 4 pcs 200 mm;. 120 x 4 pcs 100 x 200 mm) in the transport box # 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
Pos 4 6.4.2 rubber pad 120 x 100 x 200 mm kg 10.6

Item 6.4.6 1 set of replacement bearings for pathogens box 4
Pos 6.4.7 1 spare probe cable 5 meters additional delivery
Pos 6.4.8 1 spare probe G-measuring probe additional delivery
Pos 04/06/10 About Brin narrowing and instruction of the system box 4
with certificate

Item 6.4.20 chuck prisms set for round parts
Diameter 60 up to 420 mm in the transport box 120x400x600mm box
40 kg

Item 6.4.21 rotating plate with clamping ring for V05 / 20
In Transport Box 120x400x600mm Box 9
27 kg
Box 10 lower plate with ring 33 kg

Item 6.4.22 chuck prisms set for round parts
Diameter 400 to 800 mm clamping screws Pos. 06/04/70 2 pcs. Box M24
; M24 4 x 400 pcs. ; 2 M24 x 200 pcs. Long nuts M24 8 pcs.
.; 10 nuts M24 Stk . Washers In Transport Box 80x400x500 mm pallet 600x1200 300 x 20 pcs
171 kg

Pos 6 4.71 mounting clamp Set 01
. Washers in the transport box. Clamping flanges L 2 pcs 4 pcs 500 for M24. M24 x 50 10. Nuts M24 pcs 10 pcs 5 mm 80x400x500
Kg 28.5 KG

Pos. 6.5 **Weight / volume WIAP 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 has WIAP with various methods fixed succession 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 multi-point measurement mode measurement VEM

7.e MEMV WM 850-50 Method of measurement data logger 3 D Machine

Data logger MAN 6 x 3 D multi-point measurement mode measurement AEM

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

7.b MEMV WM 850-10 measurement method G single measurement multipoint HM

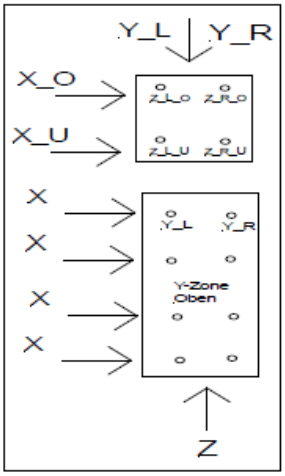
measurement mode

0 Grad / 45 Grad WM 850_20_D

WIAP MEMV® Diagramm 2016 3 D

Werkst. FA172247 mittel		Walze_Geglüht		Dimension	296,381,236x6757	
Werkstück Gewicht		5400 kg	Excenter	Entspannungsanlage Typ	Wiap LC20	
c60		RPM	Stufe %	Energie/ N	Erreger Energie % / N	
Drehzahl 0 Grad		4562	100	15052	8400,00	
Drehzahl 3. Achse		4764	100	15052	9000	

Achse	O=Oben U=Unten	V=Vorher N= Nachhe	LC20 Anlage 0 Grad	LC20 Anlage 90 Grad
			m/2 s	
X	O	V	0	22,8
X	O	N	0	27,1
X	U	V	2,5	3,2
X	U	N	14,2	3,5
X	O	V	3	4,3
X	O	N	3,2	3,2
X	U	V	4,4	
X	U	N	4,5	
X	O	V	3,6	8
X	O	N	5	7,6
X	U	V	5,7	5,7
X	U	N	3,4	4,6
X	O	V	0	14,4
X	O	N	0	13,2
X	U	V		
X	U	N		
Z	LO	V	5,2	8,1
Z	LO	N	6,3	5,8
Z				
Z				
Z	LU	V		
Z	LU	N		
Z				
Z				



Achse	L= Links R= Rechts	V=Vorher N= Nachhe	Anlage 0 Grad	Anlage 90 Grad
			m s/2	
Y	L	V	0	27,7
Y	L	N	0	26,8
Y	R	V	4	2,4
Y	R	N	23	3,1
Y	L	V	3,5	4,4
Y	L	N	11,1	3,3
Y	R	V	4,2	0
Y	R	N	10	0
Y	L	V	5,3	11,8
Y	L	N	12	12,3
Y	R	V		
Y	R	N		
Y	L	V	3,2	6,7
Y	L	N	8,7	7,1
Y	R	V		
Y	R	N		
Z	RO	V	5,7	7,1
Z	RO	N	10,3	6,6
Z				
Z				
Z	RU	V		
Z	RU	N		
Z				
Z				

Page 2 = acquisition Datasheet

0 Grad / 45 Grad WM 850_20_D

WIAP MEMV® Diagramm 2016 3 D

X Achse

X Achse oben 0 Grad vorher	0	3	3,6	0		
X Achse oben 0 Grad nachher	0	3,2	5	0		
Differenz oben	0	0,2	1,4	0		1,6
X Achse unten 0 Grad vorher	2,5	4,4	5,7	0		
X Achse unten 0 Grad nachher	14,2	4,5	3,4	0		
Differenz unten	11,7	0,1	-2,3	0		14,1
X Achse oben 3. Achse vorher	22,8	4,3	8	14,4		
X Achse oben 3. Achse nachher	27,1	3,2	7,6	13,2		
Differenz oben	4,3	-1,1	-0,4	-1,2		7
X Achse unten 3 Achse vorher	3,2	0	5,7	0		
X Achse unten 3. Achse nachher	3,5	0	4,6	0		
Differenz unten	0,3	0	-1,1	0		1,4

Y Achse

Y Achse links 0 Grad vorher	0	3,5	5,3	3,2		
Y Achse links 0 Grad nachher	0	11,1	12	8,7		
Differenz oben	0	7,6	6,7	5,5		19,8
Y Achse links 3. Achse vorher	27,7	4,4	11,8	6,7		
Y Achse links 3. Achse nachher	26,8	3,3	12,3	7,1		
Differenz unten	-0,9	-1,1	0,5	0,4		2,9
Y Achse rechts 0 Grad vorher	4	4,2	0	0		
Y Achse rechts 0 0 Grad nachher	23	10	0	0		
Differenz oben	19	5,8	0	0		24,8
Y Achse rechts 3. Achse vorher	2,4	0	0	0		
Y Achse rechts 3. Achse nachher	3,1	0	0	0		
Differenz unten	0,7	0	0	0		0,7

Z Achse

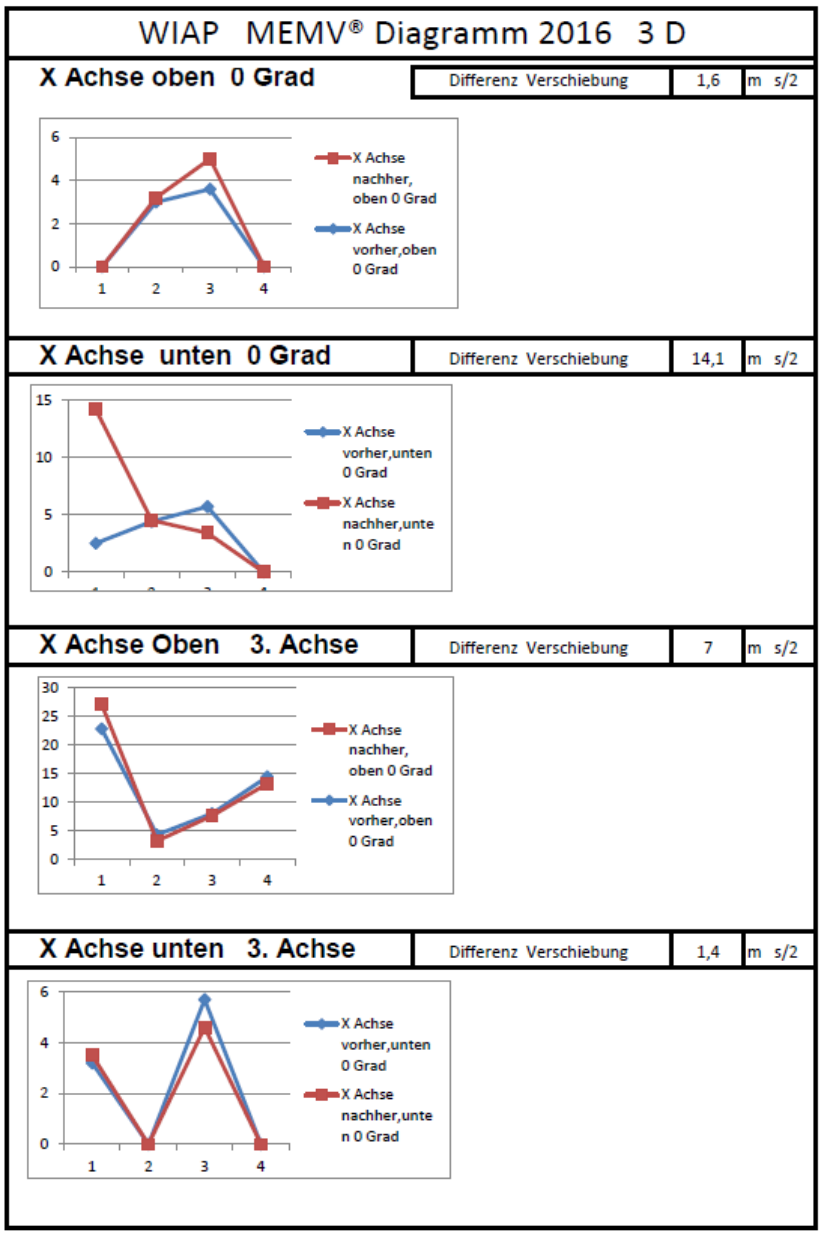
Z Achse oben links 0 Grad vorher	5,2	0	5,7	0		
Z Achse oben links 0 Grad nachher	6,3	0	10,3	0		
Differenz oben	1,1	0	4,6	0		5,7
Z Achse oben links 3 Achse	8,1	0	0	0		
Z Achse oben links 3. Achse nachher	5,8	0	6,6	0		
Differenz unten	-2,3	0	0	0		2,3
						0
						0

Veränderung Total 0 Grad LC20						41,2 m s/2
Veränderung 90 °						14,3 m s/2
Total Veränderung						55,5 m s/2
Total Anzahl Messpunkte						
Vermessen an diesem Werkstück						

Page 3 = Graphical representation to page 6 all axes

and determines measurements

0 Grad / 45 Grad WM 850_20_D



7.c MEMV WM 850-30 measurement method G single measurement with Amp, and RPM

HEM mode measurement

Rapport Rapport template for detecting type WM 850.30

WIAP® MEMV® Diagramm 2016 4 D

Kunde:		Stückart:		
Operateur:		Zeichn.Nr:		
Datum:		Material		Gewicht

Erreger Energie Prozent	% 2D	70	% 3D	100	% 4D	100

		2D		3D			4D		
1. Drehzahl	0					0			0
2. Ampere	0					0			0
3. Beschleunigung	0					0			0
4. Ablauf	Start	Laufzeit	Min	Laufzeit	Min		Laufzeit	Min	0

		2D		3D			4D		
1. Drehzahl	0					0			0
2. Ampere	0					0			0
3. Beschleunigung	0					0			0
4. Ablauf	Start	Laufzeit	Min	Laufzeit	Min		Laufzeit	Min	0

		2D		3D			4D		
1. Drehzahl	0					0			0
2. Ampere	0					0			0
3. Beschleunigung	0					0			0
4. Ablauf	Start	Laufzeit	Min	Laufzeit	Min		Laufzeit	Min	0

		2D		3D			4D		
1. Drehzahl	0					0			0
2. Ampere	0					0			0
3. Beschleunigung	0					0			0
4. Ablauf	Start	Laufzeit	Min	Laufzeit	Min		Laufzeit	Min	0

		2D		3D			4D		
1. Drehzahl	0					0			0
2. Ampere	0					0			0
3. Beschleunigung	0					0			0
4. Ablauf	Start	Laufzeit	Min	Laufzeit	Min		Laufzeit	Min	0

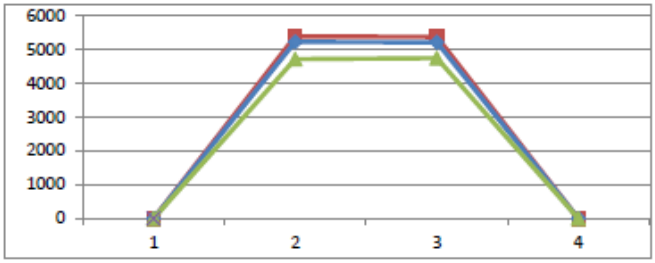
Operateur		Datum:			
Document Nr.	WI_8_f_19_j54_LC20	create	s_Uja_w_		hp

Rapport Rapport protocol type WM 850.30

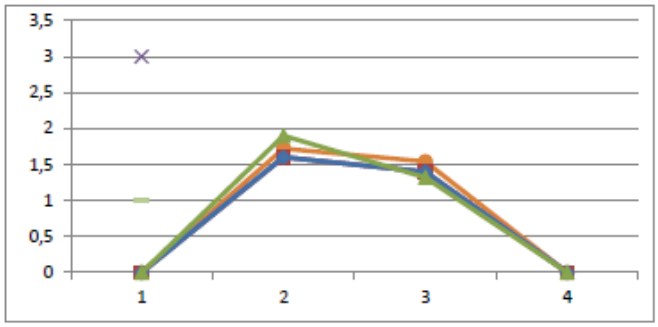
WIAP® MEMV® Diagramm 2016 4 D

Kunde:	Schwind			Stückart:	Platte 2				
Operateur:	sw,jw			Zeichn.Nr:					
Datum:	24.11.2016			Material			Gewicht		
Erreger Energie Prozent		% 2D	35	% 3D	35		% 4D	35	
	2D			3D			4D		
1. Drehzahl	0	5381	*5372*	5221	*5208*	0	*4712*	*4740*	0
2. Ampere	0	1,72	*1,54*	1,6	*1,4*	0	*1,9*	*1,32*	0
3. Beschleunigung	0	8,59	*9,68*	3,28	*3,31*	0	*2,62*	*2,68*	0
4. Ablauf	Start	20 Min		20Min			20Min		0

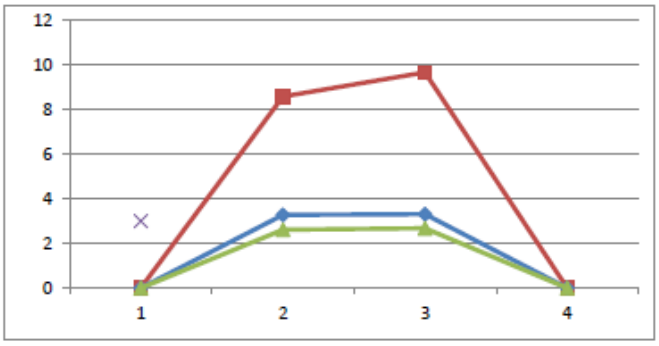
1. Drehzahl	
Differenz Wert	
Drehzahl	
Vorher / Nachher	
Spitzverschiebung	
Drehzahl / RPM	
2D RPM	-9
3D RPM	13
4D RPM	28
Total Dif.	50



2. Ampere	
Differenz Wert	
Ampere	
Vorher/ Nachher	
Spitzverschiebung	
Ampere	
2D Amp	0,18
3D Amp.	0,2
4D Amp.	-0,03
Total Dif.	0,41



3. Beschleunigung		
Differnez Wert		
Beschleunigung		
Vorher/Nacher		
Spitzverschiebung		
1G= 10 M/s/2	mm/s 2	
2 D Beschl. G	101,09	3.step
3 D Beschl G	3,00	2.step
4D Beschl. G	6,00	1.step
Total Dif. G	110,09	



Operateur		Datum:		
Document Nr.	Wi_8_f_19_j54_LC20	create	s_i_hp_w_	27102016hp

7.d. MEMV WM 850-40 measurement method G single measurement

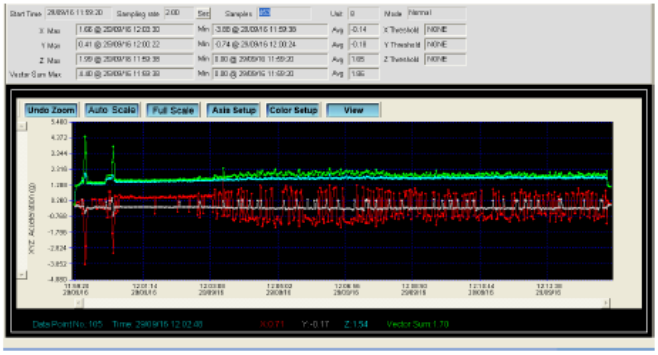
Data logger MAN 6 x 3 D multipoint measurement

VEM mode measurement

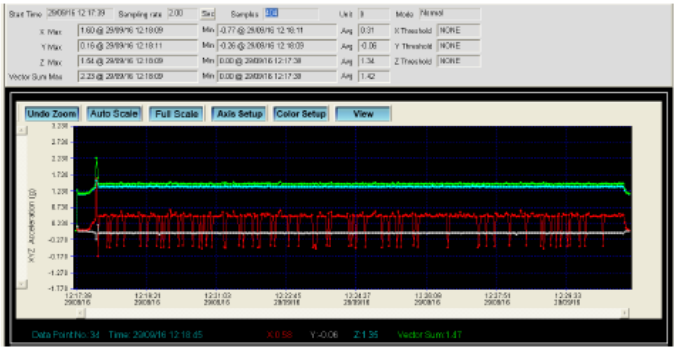
This protocol is 8 data logger in which D 3 system measuring. It is 3 x rotated the axial direction of the pathogen and all 3 axes are measured, it is thus determined where the dead point was. In which the axial direction of the G shift takes place and how much the shift also is. Annealed components which we vibration Relax usually have only one axis a small shift, but not in all three axes.

Auswertung Schaewer W1G FA165015 **GEGLÜHT!** **Reihenfolge: DL4 u. DL2 u. DL3 u. DL1**

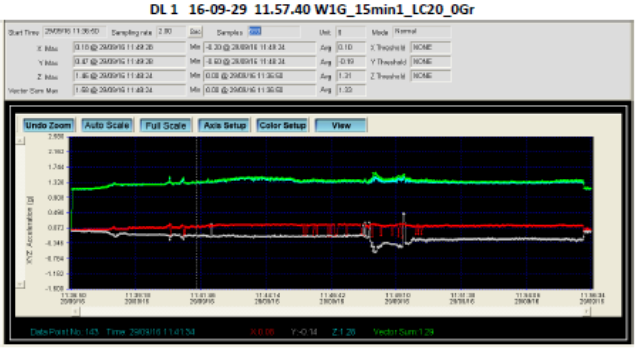
DL1 16-09-29 12.17.09 W1G_15min2_LC20_45Gr



DL1 16-09-29 12.00.24 W1G_15min1_LC20_90Gr



DL 1 16-09-29 11.57.40 W1G_15min1_LC20_0Gr



7.g MEMV WM 850-60 compilation Various measurements evaluation

ZM mode measurement

This protocol shows the compilation of the previous multi-point measurements, and to be used for quality assurance by stamp and signature of the operator and the QA department. Here, the shot G is determined shift.

Sammel Test Bericht 3 Messmethoden WM 850_60_A

WIAP® MEMV®

Metall entspannen mit Vibration

Position		3 D Messsonde	3 D Messsonde	3 D Messsonde	Total 3 D Messung	HM Messung	HM Messung	HM Messung	Total HM Messung	Konv Messung	Konv Messung	Konv Messung	Total-Konv Messung
		2D	3D	4D		2D	3D	4D		2D	3D	4D	
	mm/s2												
1	Walze 1 ungeglüht	72,3	29,2	11,3	113	11,7	39,4	19,2	70,3	35	100	18	153
2	Walze 1 geglüht	18	16,8	6,7	41,5	15,3	39,4	11,7	66,4	2	90	0	92
3	Walze 2 klein	77	234	0	154	16,2	12,6	0	137	keine sonde			
4	Walze 3 Mittel	104	36,8	41	182	14	35	37,8	86,8	100	55	160	315

Daten Auswertung
3D Messon Gemessen mit 4 Datenlogger
HM Messun Gemessen mit Messprüfstab
Konv. Messung mit Messonde über das Steuergerät

2D = Längsrichtung
3D= Schraegrichtung
4D= Querrichtung

Hinweis
Bei der Welle, Konv Messung 2 konnte die Sonde nicht befestigt werden, weil der Magnet nicht stark genug war.

Messung druchgeführt
Caroline Widmer
Sven Widmer
Jim Widmer

Hans-Peter Widmer

Datum: 24.11.2016

Unterschrift:

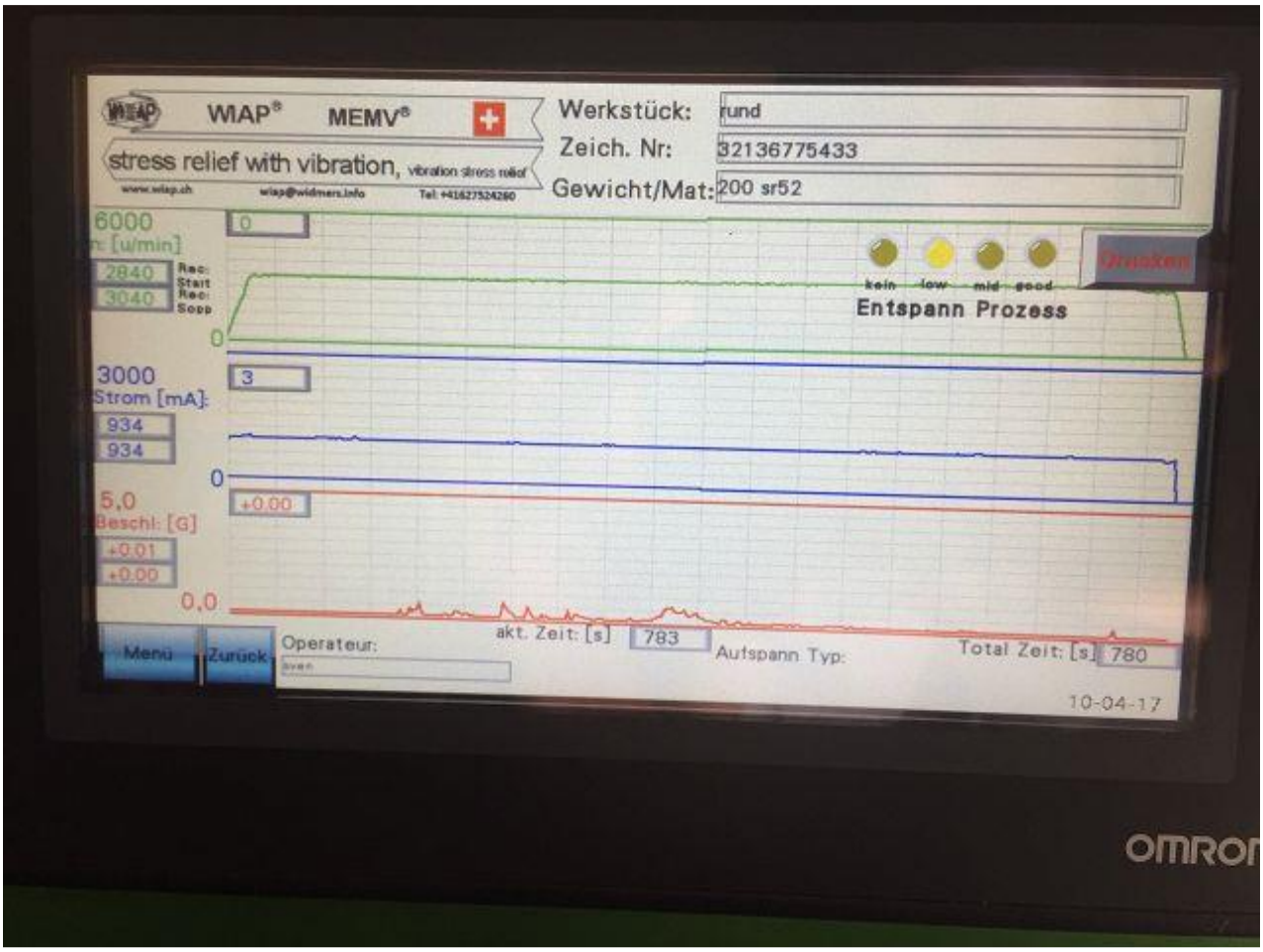
Stempel
WIAP AG-LTD-SA
CH - 5745 SAFENWIL - SCHWEIZ
TEL: +41 62 752 42 60
Fax:+ 41 62 752 48 61
www.wiap.ch

7.h MEMV WM 850-70 measurement expression of HMI device

GM mode measurement

This protocol shows the result of Einsonden solution, the displacement of the G value of the Amp. Displacement and RPM shift between before and after. This old single point method is superficial. 1. Only one measuring probes 2. The motor must be data only at one measuring point, the speed shift says insufficient. Alone in crossing down the self-resonant point between before and after a sub Scheid is seen but it does not say what it means.

The term comes directly from the HMI device,



7.i MEMV WM 850-80 measurement printout of computer of WM 850-70

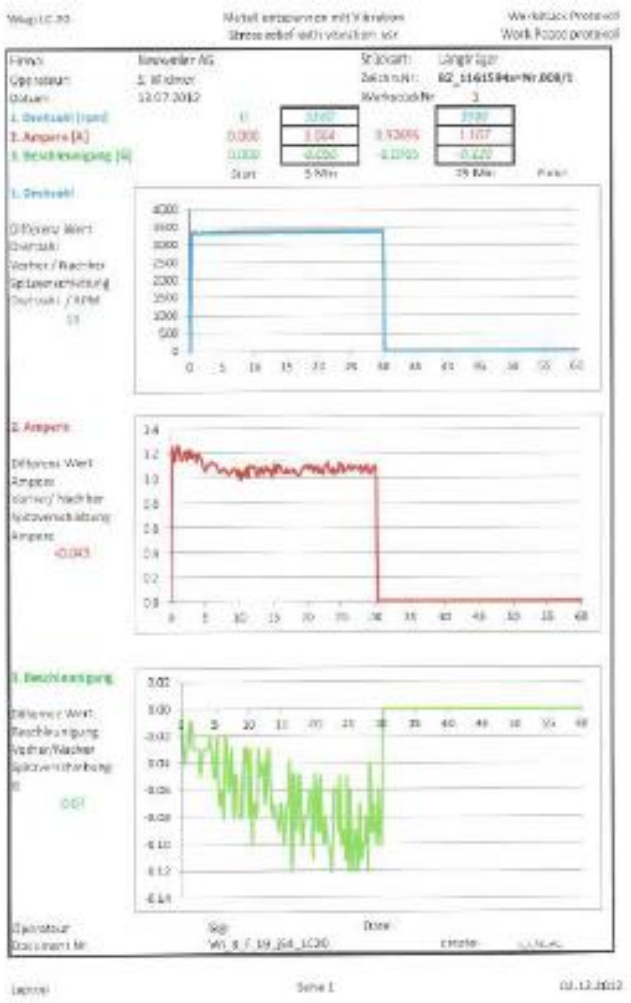
GM mode measurement

Computer printout of the files do from the HMI

This protocol shows the result of Einsonden solution, the displacement of the G value of the Amp. Displacement and RPM shift between before and after. This old single point method is superficial. 1. Only one measuring probes 2. The motor must be data only at one measuring point, the speed shift says insufficient. Alone passes over the self-resonant point between before and after a sub Scheid is seen but it does not say what it means.

The term comes directly from the computer which through the PLC program and USB is Spiesen. Device,

MEMV WM850_80A_DK Daten Kommunikation Muster



7.i MEMV WM 850-90 Full analysis evaluation of all measurements

VAM mode measurement

This sophisticated measurement techniques creates a product capability to create evaluation whether a component is suitable to be able to relax vibration. As a rule, such a measurement ranges for each component type.

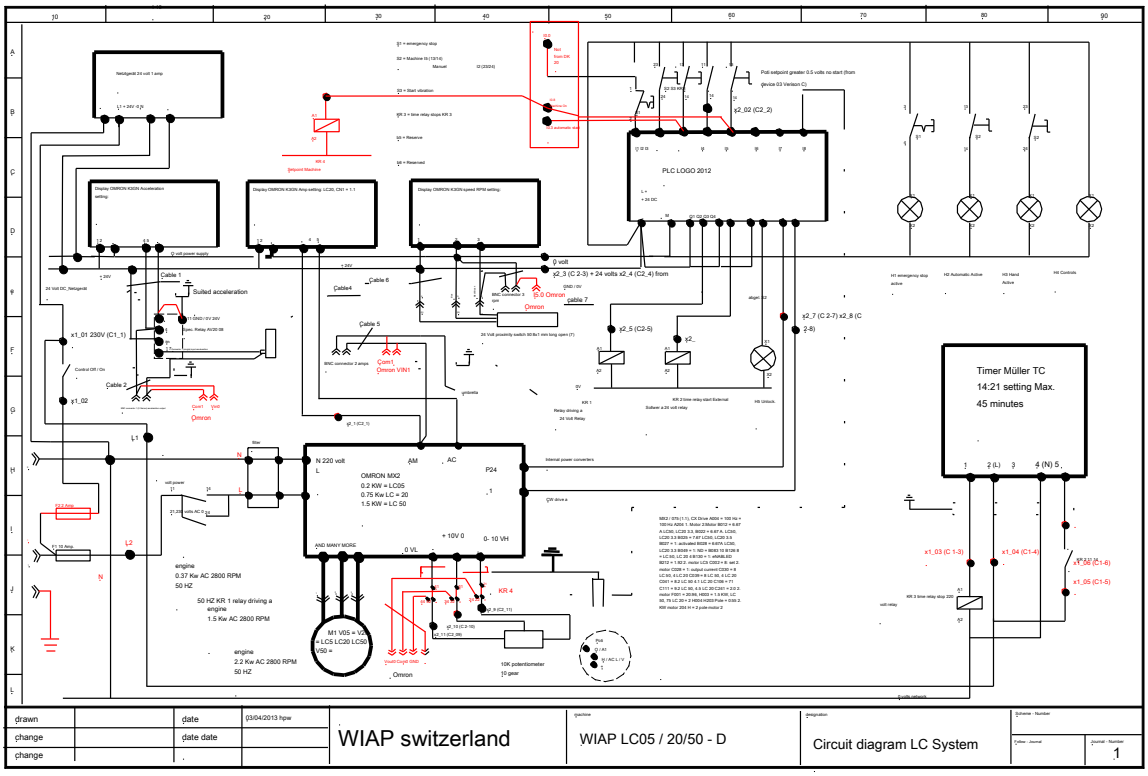
Importance of the component must be relaxed MEMV following exactly the same system on it, which MEMV operators must make security certificates

8. wiring diagram:

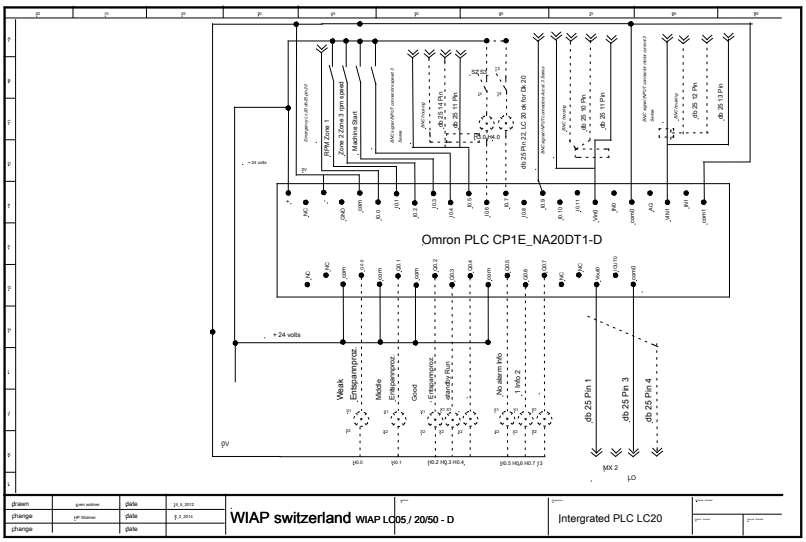
METAL RELAXATION SYSTEM

WIAP MEMV_E - D

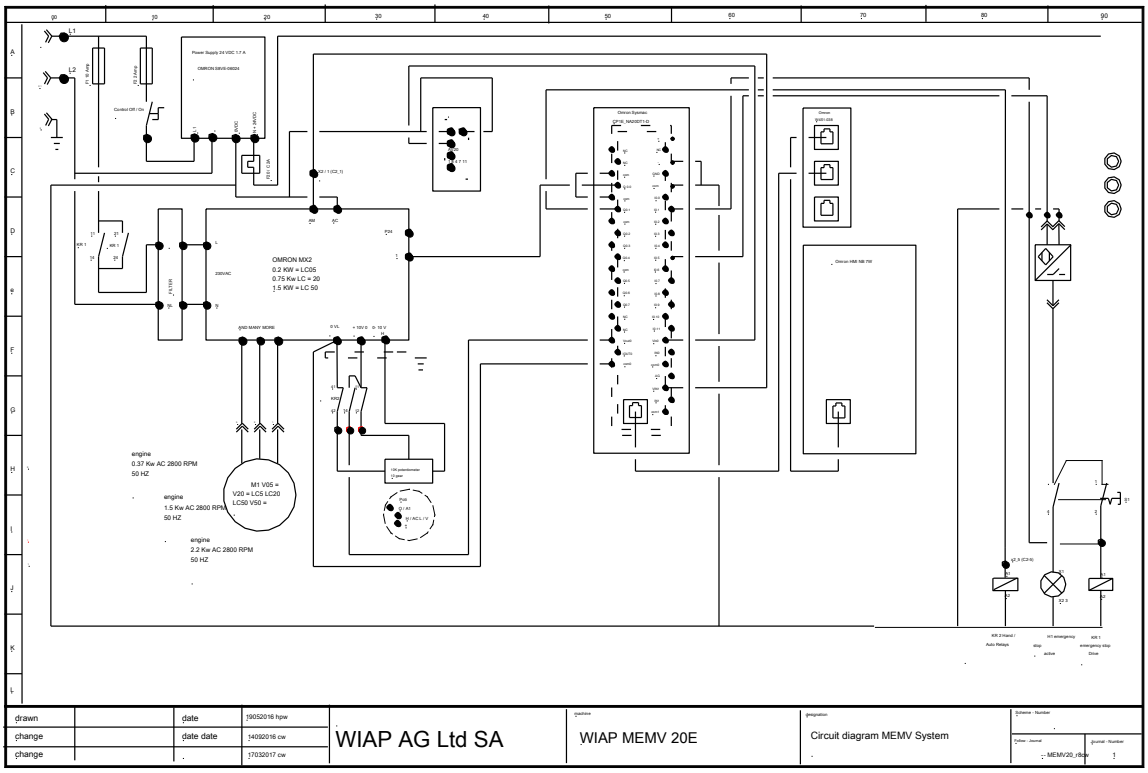
Electric schema version LC



Electric schema version DK20



Electric schema version MEMV E



9. Various pictures:

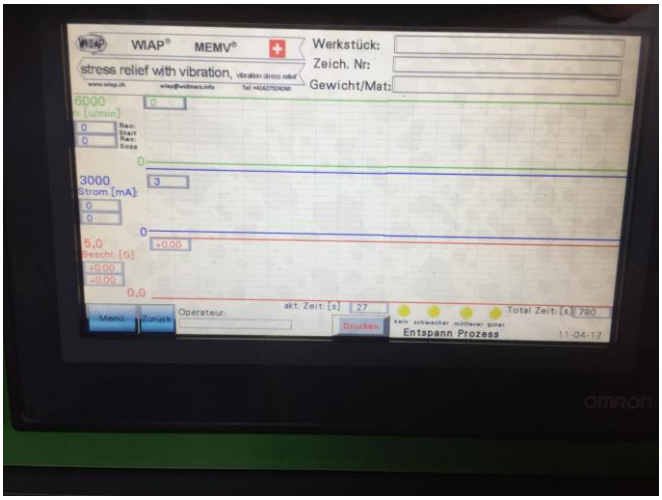
V05_Simplex, V20 and V50 Simplex Simplex

Device with clamps.

WIAP MEMV E control unit in transport box

Protection transport box for the storage device

and transport



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

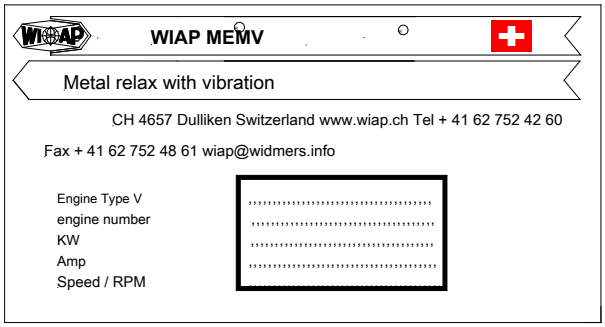
Box for the rubber documents

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-b By the present method and apparatus for vibration relaxation of workpieces at least voltages in the vicinity of a cyclical 0.1 yield strength can be achieved in order to reduce both the macroscopic and microscopic residual stresses in the workpiece, that is, the second voltages

and the third kind. This is the
Vibration relaxation to a safe and reliable method. Hereinafter, preferred embodiments will be described with reference to the drawing. Fig. 1 shows a schematic plan view of a first embodiment of an apparatus for vibration relaxation; Fig. 2 shows a cross section along the line A - A in Fig. 1; Fig. 3 shows a second embodiment of an apparatus for vibration relaxation. Figs. 1 and 2 in particular also serve to better understand the procedure. In the present embodiment, it goes to the vibration relaxation of a workpiece 1, wherein, for convenience, a plate-like workpiece is illustrated. In practice, it will be common to complex, welded workpieces that can partly also have circular cross-sections. On the workpiece 1 is a, likewise non-positively but detachably attached indicated schematically apparatus for vibration relaxation. For example, this can be done by clamping or by means of clamps. however, the workpiece must be mounted such that vibrations are possible and are not obstructed as by a bracket, or workbench. are known as rubber bearings of various kinds and shapes.

in the
Embodiment according to FIGS. 1 and 2, the apparatus for vibration relaxation 2 on two vibrators 3 and 4 which are arranged at right angles to each other. These vibrators can be constructed identical to each other and have a technically manner known per se each have a drive 5 and 6, which each is associated with an eccentric 7 and 8. FIG. From the latter only the housing is indicated. In principle, 5 and 6, at least one respective cam disc can be arranged on the axis of the actuators, resulting in each case by converting the driving rotation into a translational one, two-dimensional shaking or vibratory motion, whether in the X / Y or X / Z-axes. In actuators 5 and 6 are in the preferred example to electric motors with variable speed, which technically makes the most sense. In theory, as well as other rotary motors or other types of drives are also possible. The apparatus for vibration relaxation 2 is associated with a controller 9, which serves for the setting and monitoring of the respective vibration. Essentially, this involves turning on and off, or the setting of the speed-determining power supply and thus the frequency of the vibration and

possibly also the amplitude. The speed of an electric motor can be known by changing the power supply, determine for example by means of a variable transformer. About the eccentric 7 and 8 this results in a change of having an effect on the workpiece 1 vibration frequency. For monitoring and controlling the vibration of at least one sensor may also be present. In the present embodiment here, there are two

Sensors 10 and 11. This can, for example,

its accelerometer. For the method of vibration relaxation is indicative that is not only worked easily by a vibrator 5 in the X / Y-axes, but the workpiece is 1 vibrates in three axes X, Y and Z. These are relative to each other at an angle, that the workpiece 1 is not only vibrates in relation to a plane, but in three dimensions. In practical determination tests, where the workpiece twenty measurement points, respectively sensors were mounted, it has surprisingly been shown, that this reaches all the tension zones and junctions in the workpiece 1 and effectively relaxed in this method. In the illustrated embodiment, the Y-axis lies in the horizontal plane perpendicular to the X-axis, while the Z-axis is in the vertical perpendicular to the X axis, as is customary with working machines for Axis. is not mandatory, however, that is simultaneously vibrated in all three axes X, Y and Z. Rather, in the X / Y axes on the one hand and in the X / Z-axes on the other hand, are vibrated also separated in time. This change can be done either by manual intervention or by a flow of control. 9 The substance may have different procedures. In a first variant may be vibrated in a first process step in the X and Y axes. Subsequently Conversely, in a second process step in the X and Z axes, that is, first X / Z, then X / Y is also, of course. Rather, in the X / Y axes on the one hand and in the X / Z-axes on the other hand, are vibrated also separated in time. This change can be done either by manual intervention or by a flow of control. 9 The substance may have different procedures. In a first variant may be vibrated in a first process step in the X and Y axes. Subsequently Conversely, in a second process step in the X and Z axes, that is, first X / Z, then X / Y is also, of course. Rather, in the X / Y axes on the one hand and in the X / Z-axes on the other hand, are vibrated also separated in time. This change can be done either by manual intervention or by a flow of control. 9 The substance may have different procedures. In a first variant may be vibrated in a first process step in the X and Y axes. Subsequently Conversely, in a second process step in the X and Z axes, that is, first X / Z, then X / Y is also, of course. In a first variant may be vibrated in a first process step in the X and Y axes. Subsequently Conversely, in a second process step in the X and Z axes, that is, first X / Z, then X / Y is also, of course. In a first variant may be vibrated in a first process step in the X and Y axes. Subsequently Conversely, in a second process step in the X and Z axes, that is, first X / Z, then X / Y is also, of course.

In a second variant, according to
first two process steps according to the first variant, in a third method step
are simultaneously vibrated in all three axes X, Y and Z.
Of course, the order can be changed, and the third step are applied, for example, as the first or between the two other steps, too. The third variant would be to vibrate in a single process step in all three axes X, Y and Z. It goes without saying that the above-mentioned variants, alternately are arbitrarily combined with one another and repeatable, so that there are a total of more than just two or three steps any time sequence. In all imaginable types Other variables can be added with regard to the speed of the drives or 5 and 6, or the frequency of the vibration. Similarly, the acceleration can be a variable. Also possible are different amplitudes of vibration or changes thereof. Finally, the vibration time should be mentioned. All possible variables to a total of all axes

impact or X, Y and Z may also be targeted to individual axis pairs X / Y or X / Z. Likewise time graduations, or varying the parameter during the respective vibration are possible. As two of many possible examples of how the vibration might actually look like, some variables or parameters are: a) The drives 5 and 6 rotate at a speed of 2800

U / min, at an acceleration from 0.15 to 0.30 m / s in the first drive 5 and an acceleration from 0.30 to 0.55 m / s in the second drive 6 and an amplitude of 0.94 mm for the first eccentric 7 and 1, 75 mm for the second eccentric. 8
b) The actuators 5 and 6 rotate at a speed of 3500 rev / min, at an acceleration from 0.30 to 0.70 m / s in the first drive 5 and an acceleration from 0.70 to 1.20 m / s² during second drive 6, and an amplitude of 0.94 mm for the first eccentric 7 and 1.30 mm for the second eccentric 8. the speeds may also be lower or higher, for example 4200 rev / min. Useful the temporal separation or staggering of the duration of the two actuators 5 and 6 may be, as the eccentric can possibly interact 7 and 8 at least in the common axis X with respect to the effect. From Fig. 3 is a second embodiment of a device for

vibration relaxation

forth, wherein only one vibrator 3 is present ist.Dieser has a drive 5, here an electric motor and two eccentric 7 and 8. It can also be eccentrics or three and have more individual or eccentric. In the present case, the eccentrics each have more eccentric. An eccentric 7 or 8 can thus also consist of a multi-part eccentric. The eccentricity is steplessly adjustable in the preferred embodiment. That is, the position of the eccentric or eccentrics with respect to the drive shaft is adjustable in this example. So that the inflowing into the workpiece energy can specify exactly. The special feature of the embodiment of FIG. 3 is that instead of two only one drive 5, the eccentric 7 and 8 drives. The latter are perpendicular

arranged to each other, the force of the drive axis of the drive 5, or the electric motor, is deflected by a force deflector 12 from the axis 13 of the first cam 7 to the axis 14 of the second eccentric. 8 In the force reversing mechanism 12 is, in this embodiment, a bevel gear with a first bevel gear 15 on the first axis 13 and a second bevel gear 16 on the second axis 14, which reach through a respective gearing into each other. Also possible are other types of force deflection, the direction of the second axis 14 is unimportant. In each case, a drive 5 for vibration is sufficient relaxation in all three axes X, Y and Z.

but the advantage of the embodiment of Fig. 3 is not only in the saving of a second drive 6 but also in the compact construction. In practice it is to be expected very different workpieces 1, which applies it to relax by vibration. This means that the respective work pieces 1 may be a variety of geometries and

have mass. May occasionally it is not possible, attaching thereto a larger device for vibration relaxation or two separate vibrators. Also in the embodiment according to FIG. 3, a separate operation of the two cams can be 7 and 8 are provided. For example, this could be done by mechanical uncoupling force deflection in the range of 12th In this case, by separating the two bevel gears 15 and 16 by a linear displacement 17 in the axis 13 of the first

Eccentric 7 and / or by a corresponding shift 18 in the axis 14 of the second eccentric 8. Corresponding displacement devices may be provided as known in the art. As a further execution would also be a

Combination of vibration relaxation with a heat relaxation possible. According to FIG. 2, the device 19 could comprise for this purpose at least one heating device. This can be a technically known per se, hot plate or heating mat, and these would be better to arrange under the workpiece 1 in the second case. In contrast to pure relaxation heat could possibly be used at lower temperatures. Already at 250 ° C Changes in material properties can occur. This would make it possible for example to relax special Verschleissguss- workpieces that can not be handled in the best possible alone with either one or the other method of relaxation. The heat can be supplied simultaneously with the vibration or even previously.

The device in detail as drawn differently

form, especially as illustrating the Fig. 1 and 2, the basic idea only schematically. The vibrators 3 and 4 or 7 and 8, the eccentric need not be performed necessarily drawn just as in Fig. 3. The operative connection between the device and the workpiece 1 can be prepared in any manner. Particularly when it comes to mass-produced workpieces, a connection by means of corresponding formations is conceivable, so that the apparatus and the workpiece 1 in each case mono- would be plugged together. Instead of the device on the tool 1 can also be reversed, the workpiece 1 on the device

to be ordered. It is also possible the simultaneous vibration of two or more workpieces 1 by a single device. It is also not absolutely necessary that the three axes X, Y and Z are each precisely at a 90 ° angle. To the extent nevertheless a three-dimensionality is given deviations from right angles are quite possible,

including an acute or an obtuse angle.

10-C Explanation Summary 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 proof stress be achieved to both

the macroscopic and the microscopic

to reduce internal stresses in the workpiece (1). 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 eccentrics 7,

8) is applied to the at least one workpiece (1).

(Fig. 1)

sketch Sc hweiss V engine 3D

Fig. 1

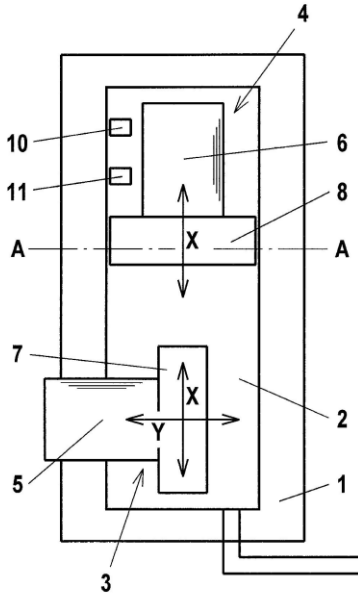
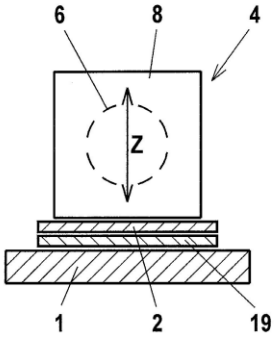
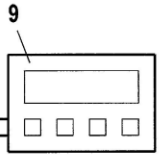


Fig. 2





9-E sketch Sc hweiss V engine 3D

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_b The present design concerns a device for

Vibration relaxation of workpieces during the machining of workpieces of metal, for example, during welding, caused in the workpiece voltages. These undesirable stresses remain in the workpiece. Also casting, forging or machining operations can cause permanent tensions. These stresses reduce the load capacity of the workpiece and can have a negative impact, if the workpiece to another, in particular machining is to be subjected. In addition to the impaired dimensional stability even later corrosion resistance of the workpiece may suffer. Known and widespread is the relaxation of workpieces by heating or annealing. but this is time-consuming, energy-consuming and expensive. but it is not without problems also relative to the workpiece, for both the heating and the cooling can easily change its dimensional stability and distort the workpiece. Flame-related workpieces have locally on a state of tension, which communicates with the environment in balance. If this workpiece annealed posed by deformation of a new state of tension and the workpiece is then bent. Subsequent processing is then do not have a great influence on the straightness. In addition, annealing scale, which must be removed in a further step back from the workpiece surface forms during it. For example, by sandblasting, which can lead to new tensions in the workpiece. Decades ago, it was proposed that the metal through the Flame-related workpieces have locally on a state of tension, which communicates with the environment in balance. If this workpiece annealed posed by deformation of a new state of tension and the workpiece is then bent. Subsequent processing is then do not have a great influence on the straightness. In addition, annealing scale, which must be removed in a further step back from the workpiece surface forms during it. For example, by sandblasting, which can lead to new tensions in the workpiece. Decades ago, it was proposed that the metal through the Flame-related workpieces have locally on a state of tension, which communicates with the environment in balance. If this workpiece annealed posed by deformation of a new state of tension and the workpiece is then bent. Subsequent processing is then do not have a great influence on the straightness. In addition, annealing scale, which must be removed in a further step back from the workpiece surface forms during it. For example, by sandblasting, which can lead to new tensions in the workpiece. Decades ago, it was proposed that the metal through the posed by deformation of a new state of tension and the workpiece is then bent. Subsequent processing is then do not have a great influence on the straightness. In addition, annealing scale, which must be removed in a further step back from the workpiece surface forms during it. For example, by sandblasting, which can lead to new tensions in the workpiece. Decades ago, it was proposed that the metal through the posed by deformation of a new processing caused

Residual stresses by shaking or vibration of the workpiece to reduce again.

For this purpose, the workpiece is vibrated on a vibration table or by means of an attached vibration device or vibrated. That may be about 5 to 30 minutes. For larger and heavier workpieces also significantly longer vibration times were known, but this is to be avoided for several reasons. When vibrating the residual stresses over the entire workpiece are brought into balance, not just on the surface. The workpiece can be processed further. Of the

Residual stress relaxation is strongest at the beginning of the vibration, but then the effectiveness levels off quite quickly. This process is often associated with several unknowns and needs some material and expertise or proper instruction. Although it

has with respect to the heat relaxing numerous advantages, namely less time
and energy, avoiding thermal distortion and scale of contamination
of the workpiece, becomes of the commitment of
Vibration hotsprings often spared. There are three types of residual stresses. The internal stress of the first type is macroscopically and thermally formed by the fact that the edge and the core of a workpiece after appropriate heating to cool down at different rates. The stresses of the second kind, it comes through phase transitions or formation of precipitates local fabric tension. The residual stress of the third type dislocations are surrounded by a field of tension.

Prerequisite for many proven successful form of stabilization by vibration is a reduction of the macroscopic residual stress in the workpiece, that is, the voltages of the first type. The voltage degradation caused an at least local exceeding the yield point, which is influenced by various factors. Mention may be high residual stresses that are superimposed on the rectified voltages or load

local increases of load and
Residual stresses by notches, cracks or flaws.
The difficulty is to reach all areas of a workpiece reliably and relax by vibration. First, an attempt was made to vibrate in two to each other perpendicular directions. In numerous experimental tests and measurements has, however, been found that the corresponding device also not optimal

is, or that the outcome of the
vibration stress relieving by a new, further developed and the
Vibration possibilities expanding device still would be greatly enhanced. Based on these findings, the design continues the task of creating a device for vibration relaxation of workpieces, which leads to optimal results of vibration stress relieving and is practicable for metal processing companies. Thanks to the construction of the device according to even complex

Workpieces, relax reliable example with welded bars. The construction corresponds to the device according to the features of
Claim 1. Further advantageous embodiments of the design concept are evident from the dependent claims. Hereinafter, preferred embodiments of the construction will be described with reference to the drawing. Fig. 1 is a rotating means of the construction according shows apparatus for vibration relaxation of workpieces; Fig. 2 shows a vibrating means of the same apparatus, Fig. 3 shows a on the rotation device of FIG. 1 arranged

A vibratory device according Fig. 2;

FIG. 1

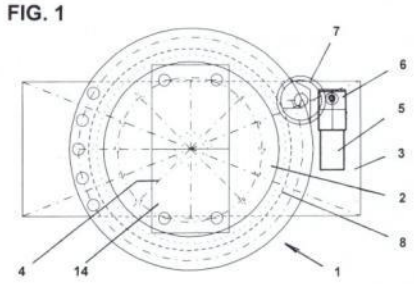


FIG. 2

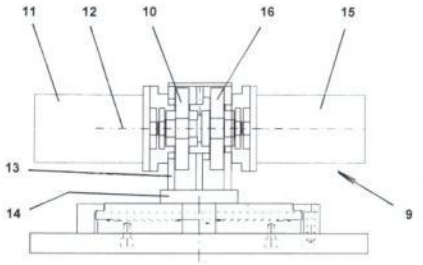


Fig. 4 shows an example of the practical use of the construction according to

FIG. 3

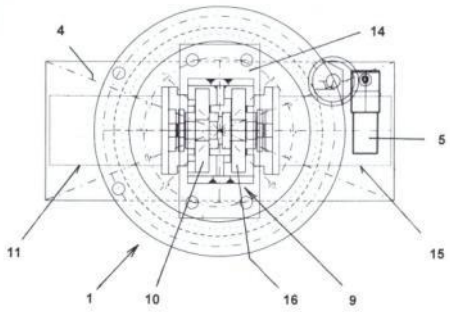
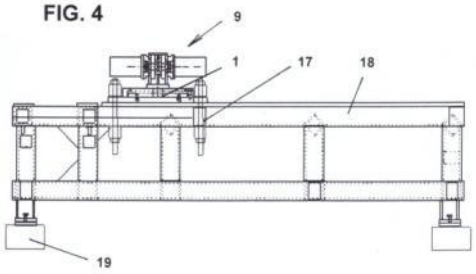


FIG. 4



Device according to FIG. 3.

The apparatus for vibration relaxation of workpieces comprises a rotating device 1 according to Fig. 1 on. That is, a device which is arranged on a fixed member 3 with a rotatable element 2, for example in the form of a base plate. The rotatable element 2 can, as in this example, be formed as a hub, since the circular shape is not necessarily the most sense, however. In practical use this rotary device 1 usually disposed horizontally. The rotatable element 2 could be each manually rotated in a desired rotational 4 position. It makes more sense but to provide for this purpose a motor rotary drive 5, as in the present embodiment. To this end, 1, a rotary drive is shown in FIG. 5 is provided with an electric motor, communicating via a gear 6 and driving gear 7 to the rotatable element 2 in operative connection. The latter can take place in that the driving wheel is a gear 7 and on the periphery of the rotatable element 2 is a ring gear 8 is present or this rotatable member is in turn rotatably connected to a separate, second gear or sprocket. These could of course other active compounds, to a technically known drive belt. To determine the rotatable member 2 securely in the intended rotational position of each, may additionally include a lock or a brake second gear or ring gear is connected. These could of course other active compounds, to a technically known drive belt. To determine the rotatable member 2 securely in the intended rotational position of each, may additionally include a lock or a brake second gear or ring gear is connected. These could of course other active compounds, to a technically known drive belt. To determine the rotatable member 2 securely in the intended rotational position of each, may additionally include a lock or a brake

to be available. There are for this purpose technically different, suitable known locking devices. For example, at least one actuated by a piston retainer from below to the rotatable element 2 can be pressed so that it can no longer move. It is only important that the locking device engages quickly and reliably and can be just as quickly solved simply and again when the rotatable element 2 is to be moved to a different rotation 4 position. Detecting and solving should preferably also can be made by motor and controlled. But the catch or brake is particularly important when the rotatable element 2 is manually rotated in its simplest form. The vibration device 9 of FIG. 2 has at least one eccentric 10 with at least one vibration drive 11, for example an electric motor. This electric motor is commercially available per se, the vibration caused by the eccentric 10 causing by the rotating imbalance. The eccentric 10 is essentially a shaft mounted on the axis 12 of the electric motor control disc,

the weight center

is outside of this shaft axis 12th The vibration drive 11 is arranged on a bracket 13 which is in this case on a plate fourteenth This in turn is arranged on the rotatable element 2 of the rotating device 1, so that the vibration device can be brought 9 by the rotating device 1 in a desired rotational 4 position. In the illustrated embodiment, the shaft axis 12 is horizontal vibration of the engine 11,

in contrast to

2. The terms horizontal and vertical are perpendicular to the axis of rotation of the rotatable element ultimately depends on the mounting position of the device for vibration relaxation at the respective workpiece. However, the axis of rotation of the rotatable element 2 must be able to change its orientation relative to the workpiece in every case. In addition, in this embodiment is the shaft axis 12 at right angles to said axis of rotation. Prior to the operation of the construction of the device according to the vibration relaxation of workpieces will be discussed in more detail,

should yet a further development of

be construction concept explained. In the illustration of FIG. 2 are not only a first vibration drive 11, but two 11 and 15 present. Each of the first 11, as well as the second vibration drive 15 lie in the same axis corresponds to the shaft axis 12th And the second vibration drive 15 is provided with an eccentric 16th The two vibratory drives 11 and 15 are operated in a preferred embodiment so that they run the same direction and synchronously. A deviating operation remains expressly reserved. However, the position of the two eccentrics 10 and 16 to each other is adjustable. This allows an adjustment of the strength and type of vibration, as will be explained below.

ie adjust the axis of vibration. These two devices 1 and 9, comprising apparatus for vibration relaxation is detachably fastened by means of at least one corresponding fastening device 17 in a relaxing to workpiece 18, as shown in Fig. 4. The workpiece 18 should turn on at least one rubber-elastic

be mounted element 19 to enable the vibration. The at least one fastening device 17 may be a known clamp. but it can also be used with similar means of bolts and nuts held ridges or flanges, as well as clamping flanges or the like. Essential that the design Correct device is held so tightly to vibration relaxation that they caused by the by itself, neither solve severe vibration unintentionally can still change their position only. From Fig. 4 it is apparent that it may be a complex part with a plurality of lands and welds when too relaxing workpiece 18 also. The lands and welds of such a component, or the workpiece 18,

arranged. The Proper construction device to Vibration relaxation, which has a controller in a preferred embodiment, with the blank, all functions controlled and monitored, can be put into operation as soon as it is securely attached to the workpiece 18th Regardless of the mounting direction of the fixed member 3 of the rotator 1, the rotational position 4 and thus the axis of vibration of the vibration device 9 is adjustable. So the direction

Is in each primary vibrates with a lower

Radiating vibration of these unwanted vibration axis is left and right naturally not completely excludable. The axis of vibration can be successively brought into different rotational positions. 4 For example, according to the orientation of the webs and welds the workpiece 18. However, the internal stresses of the workpiece 18 may extend in different directions, which are not limited to the visible external geometry of the workpiece 18th Suspected, but preferably measured voltage axes are vibrated in succession and relaxed. The illustrated embodiment with two vibratory drives 11 and 15 allows, beyond the adjustment of the rotational position 4, further adjustment options. For example, when the second eccentric 16 of the second vibration drive 15 relative to the first eccentric 10 of the first vibration drive 11 is arranged rotated by 180 °, the two eccentrics standing on symmetrical opposite positions cancel each other out and there will be no imbalance. At least none that generates vibrations necessary for relaxation. however, are both eccentric 10 and 16 equal to 0 °, then the vibration force of unbalance is over that of a single eccentric doubling of course, the increased vibration force also affects the required vibration time. Now it is obvious, At least none that generates vibrations necessary for relaxation. however, are both eccentric 10 and 16 equal to 0 °, then the vibration force of unbalance is over that of a single eccentric doubling of course, the increased vibration force also affects the required vibration time. Now it is obvious, At least none that generates vibrations necessary for relaxation. however, are both eccentric 10 and 16 equal to 0 °, then the vibration force of unbalance is over that of a single eccentric doubling of course, the increased vibration force also affects the required vibration time. Now it is obvious,

that a number of intermediate positions are possible between these two end positions, which can take each other these two eccentrics 10 and sixteenth The means on the one hand, that the vibrating force can, except for the change also possible change in the rotational speed of the eccentrics 10 and 16, by adjustment of the unbalance. On the other hand, has the respective rotational position of the two eccentrics 10 and 16 each also have an influence on the vibration rhythm. It can be produced a syncopated vibration, with short clocked successive vibration shock. Also be the result of the vibration relaxation can be improved because, for example, corners and recesses of the workpiece 18 can be better achieved than would be the case with a conventional, uniform vibration. The adjustment of the eccentrics 10 and 16 in a new rotational position could each other by the respective vibration drive 11 and / or take place 15th Ultimately, it's all about, to move one of the two eccentric slowly over the other in a different rotational position. Thereafter, both can quickly be eccentric 10 and 16 together for the purpose of generating the desired vibrational

are rotated in the shaft axis 12th

Of course, it is within the scope of the construction according to claim 1, the apparatus for vibration relaxation of workpieces otherwise than as drawn form. In theory, albeit less advantageously, another arrangement of the eccentric 10 and / or 16, for example, with a vertical shaft axis 12 would be conceivable, according to the rotational axis of the rotatable member 2. Further, the two eccentrics could be driven by a single vibration actuator 11 10 and sixteenth The two eccentrics 10 and 16 would still be adjusted separately from each other if the advantage of the change of position should be added to each other relative to the common shaft axis 12th More than two eccentrics 10 and 16 are also not completely excluded.

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) having 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 design according to

Device even complex workpieces, for example by 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-B The present description explains a method of measuring the residual stress of workpieces during their vibration. When machining workpieces made of metal, for example during welding, are formed in the workpiece voltages. These undesirable stresses remain in the workpiece. Also casting, forging or machining operations can cause permanent tensions. These stresses reduce the load capacity of the workpiece and can have a negative impact, if the workpiece to another, in particular machining is to be subjected. In addition to the

impaired dimensional stability can also latter Corrosion resistance of the workpiece suffering. Known and widespread is the relaxation of workpieces by heating or annealing. but this is time-consuming, energy-consuming and expensive. It is also relative to the workpiece not without problems, since both the heating and the cooling can easily change its dimensional stability and distort the workpiece. Flame-related workpieces have locally on a state of tension, which communicates with the environment in balance. If this workpiece annealed posed by deformation of a new state of tension and the workpiece is then bent. Subsequent processing is then do not have a great influence on the straightness. In addition, annealing scale, which must be removed in a further step back from the workpiece surface forms during it. For example, by sandblasting, which can lead to new tensions in the workpiece. Decades ago, it was proposed to reduce the residual stresses induced in the metal through the processing by shaking or vibration of the workpiece again. For this purpose, the workpiece is on a

shaken vibration table or by means of an attached vibration device or vibrated. That may be about 5 to 30 minutes. For larger and heavier workpieces also significantly longer vibration times were known, but this is to be avoided for several reasons. When vibrating the residual stresses over the entire workpiece are brought into balance, not just on the surface. The workpiece can be processed further. The residual stress relaxation is strongest at the beginning of the vibration, but then the effectiveness levels off quite quickly. This process is often associated with several unknowns and requires some materials and expertise or proper instruction. Although it has many advantages over the heat relax, namely

less time and energy, avoiding thermal distortion and scale of contamination

of the workpiece, becomes of the commitment of Vibration hotsprings often spared. There are three types of residual stresses. The internal stress of the first type is macroscopically and thermally formed by the fact that the edge and the core of a workpiece after appropriate heating to cool down at different rates. The stresses of the second kind, it comes through phase transitions or formation of precipitates local fabric tension. are with the stresses of the third kind

Dislocations surrounded by a tension prerequisite for many proven successful form of stabilization by degradation of the vibration is a macroscopic residual stress in the workpiece, that is, the voltages of the first type.

The stress relief due to an at least local exceeding the yield point, which is influenced by various factors. Mention may be high residual stresses that are superimposed on the rectified load voltages or local increases of load and residual stresses by notches, cracks or flaws. The difficulty

is that the residual stresses of a Workpiece are hardly measurable. Especially since the workpiece for this purpose must not be destroyed. Instead, side effects are measured. Although one example, has tried to X-ray workpieces, but that can be seen only near-surface areas. In metal processing factories and workshops this suitable rather for testing laboratories approaches are hardly feasible. Attempts were also made to understand the stress relief hole with test method, but allows best only conclusions about the well area. Further, it has been attempted with limited success to draw by measuring the changing power consumption of the electric motor used to drive an eccentric conclusions as to the progress of the vibration relaxation. This too is ultimately mean very little. Even the application of a sensor on the workpiece itself, not really lead to reliable results. On the basis of these findings, the task sets, a method for measuring

the residual stress of workpieces to provide the use in vibration Relax

is is practicable for metal processing plants and

performs reliable measurement results. Thanks to the obtained by the method values with regard to the residual stress of workpieces, can the subsequent relaxation, that is, the voltage degradation and the shape stabilization of the workpieces more efficient and targeted perform. This is especially true for the vibration relaxation. Mainly for testing purposes, this measuring method is also commonly used to determine residual stresses can be used, of course even with workpieces that have been relaxed in other ways. It has been always thought that a workpiece thereby vibrate uniformly, that is, at every point of its surface and its volume approximately equal. Through many attempts by the present process has been recognized, however, that this is not the case. Actually result in vibration relaxation areas, in which the material of the workpiece respond differently to the induced vibration. The G-value, corresponds to 1G = 9.81 m / s² is the same everywhere. Rather, these shifts and G-value on the axis of vibration is variously changed according to the prevailing there in each case, different residual stresses of the respective workpiece. this is detected accurately by the method which can be used to significantly better results by the relaxation vibration relaxation. both the time and the energy consumption can also be reduced by more targeted work. Preferred embodiments are described with reference to the sketches. Rather, these shifts and G-value on the axis of vibration is variously changed according to the prevailing there in each case, different residual stresses of the respective workpiece. this is detected accurately by the method which can be used to significantly better results by the relaxation vibration relaxation. both the time and the energy consumption can also be reduced by more targeted work. Preferred embodiments are described with reference to the sketches. Rather, these shifts and G-value on the axis of vibration is variously changed according to the prevailing there in each case, different residual stresses of the respective workpiece. this is detected accurately by the method which can be used to significantly better results by the relaxation vibration relaxation. both the time and the energy consumption can also be reduced by more targeted work. Preferred embodiments are described with reference to the sketches. which can be used to significantly better results by the relaxation vibration relaxation. both the time and the energy consumption can also be reduced by more targeted work. Preferred embodiments are described with reference to the sketches. which can be used to significantly better results by the relaxation vibration relaxation. both the time and the energy consumption can also be reduced by more targeted work. Preferred embodiments are described with reference to the sketches.

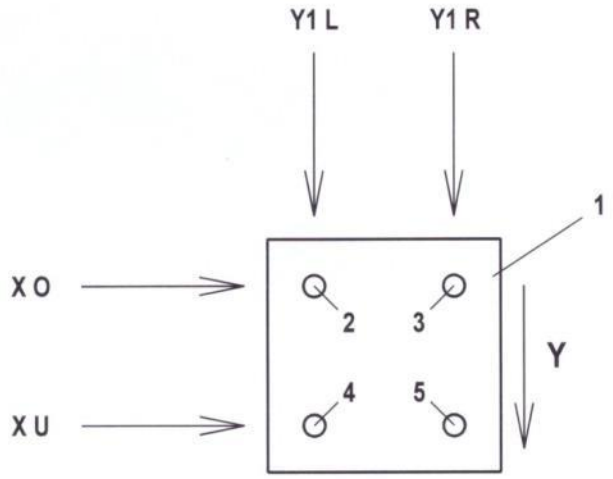


Fig. 1

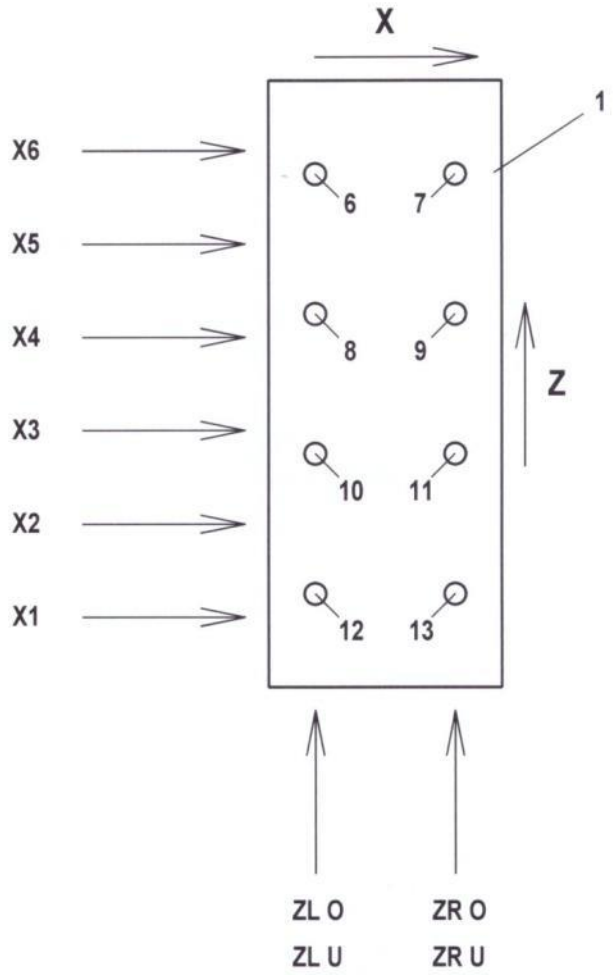


Fig. 2

Diagram 1 shows a geometrically simple, elongated workpiece from its
Narrow side, that is, the lengthwise direction; Diagram 2 shows the same workpiece from above, that is to say the top of the illustration according to sketch 1. The to be measured and relaxing workpiece 1 is made of metal, for example steel. For simplicity, a rod-shaped workpiece is shown. In practice, it will be common to complex, welded workpieces that can partly also have circular cross-sections. On the workpiece 1, a device not shown for vibration relaxation is frictionally but releasably attached. For example, this can be done by clamping or by means of robust clamps. The workpiece 1, however, must be mounted such that vibrations are possible and are not obstructed as by a bracket, or workbench. are known as rubber materials of different type and shape. The not shown, technically

However, known apparatus for vibration relaxation has
usually at least one eccentric on which is set in rotation by a drive, for example an electric motor. It is measured on the workpiece 1 at a plurality of measuring points which are distributed over this workpiece. 1 In this example, there are twelve measurement points 2 to 13. However Their exact number is not relevant. It is crucial that in more than one measurement axis at least two measuring points 2 to 13 are present. The general orientation of these measuring axes corresponds to the

respective
Vibration axis, So the direction in the the workpiece 1 for
Vibration relaxation of a rapid succession of strokes, or unbalanced movements subject. In the example of the
Drawing in all three dimensions X, Y and Z measuring axes exist, ie in the width, height and length of the workpiece. In Diagram 1, thus in the view of the narrow side of the workpiece 1, is a top measurement axis XO, that is X above, and XU, so to see X below. In the top measurement axis two measuring points 2 and 3 are provided, and in the lower measurement axis is also two measuring points 4 and

5. The above-mentioned measuring points of the dimension X thus refer to the width of the workpiece 1. In relation to the dimension Y, ie
the height of the workpiece 1, two measuring axes Y1 L, that is, a first measuring axis and links Y1 R, that is, a first measuring axis law recognizable. The next two axes Y1 and Y1 R L in sketch 1 are directed to the top of the workpiece 1 and are in plan view according to drawing 2 from above perpendicular to the local measuring points 6 - 13. The axes

ZL O, ZL U and ZR O and ZR U refers to the third dimension Z, namely the length of the workpiece 1, wherein here on top of the measuring points 12, 10, 8 and 6 on the one hand and 13, 11, 9 and 7 on the other hand, you can see. The same would be seen in this example from the underside of the workpiece first

In summary, parallel sensing axes can be present in each dimension X, Y and Z several. For actual measuring method: at said measuring points 2 - 13, a sensor is respectively set, more specifically, an acceleration sensor. Such acceleration sensors are technically different

Names, also known as accelerometers or G-sensors. the acceleration is measured. This is done mostly by which is determined on a test mass, here the workpiece 1, acting inertial force. This allows to measure whether a shift of the G value takes place. Recorded measurement values are called Akzelerogramm. In the present specification is preferably measured by means of in each case connected to a control device, acceleration sensors simultaneously at all measuring points. but it would also be possible to manually set a pin-like accelerometer sequentially at these measurement points 2 13, of course, there is no uninterrupted, continuous control. Now the device is switched to the vibration relaxation and thus ramped up the vibration of the workpiece. 1 The vibration is amplified until the natural resonance of the workpiece 1 is nearly reached. That is, there occurs a probing to the G-value. This is dependent on workpiece due to the dimensional stability. This G value can be defined in a formed as a solid body work as follows: 1G = 9.81 m / s². The G-value can in this measurement at any of the various measurement points 2 - are exceeded. 13 However, if the workpiece 1 is deviated from a standard size, it is because it has different mass, a different material and / or potential weak points, such as welding seams of welded fins or the like, a lower or higher value than the aforesaid G-value as a limit for the natural resonance of the workpiece 1 angenommen.Ein such a limit value can also be calculated by a until the self-resonance of the workpiece 1 is almost reached. That is, there occurs a probing to the G-value. This is dependent on workpiece due to the dimensional stability. This G value can be defined in a formed as a solid body work as follows: 1G = 9.81 m / s². The G-value can in this measurement at any of the various measurement points 2 - are exceeded. 13 However, if the workpiece 1 is deviated from a standard size, it is because it has different mass, a different material and / or potential weak points, such as welding seams of welded fins or the like, a lower or higher value than the aforesaid G-value as a limit for the natural resonance of the workpiece 1 angenommen.Ein such a limit value can also be calculated by a until the self-resonance of the workpiece 1 is almost reached. That is, there occurs a probing to the G-value. This is dependent on workpiece due to the dimensional stability. This G value can be defined in a formed as a solid body work as follows: 1G = 9.81 m / s². The G-value can in this measurement at any of the various measurement points 2 - are exceeded. 13 However, if the workpiece 1 is deviated from a standard size, it is because it has different mass, a different material and / or potential weak points, such as welding seams of welded fins or the like, a lower or higher value than the aforesaid G-value as a limit for the natural resonance of the workpiece 1 angenommen.Ein such a limit value can also be calculated by a That is, there occurs a probing to the G-value. This is dependent on workpiece due to the dimensional stability. This G value can be defined in a form
Standard size takes. If it is assumed, for example, as the standard size of a workpiece, which is a solid body made from steel and the mass comprises 100 x 100 x 100 cm, then this can be taken as a factor of 100%. Is this cube-shaped workpiece but a hollow body, then the weight is reduced while maintaining the same volume. That is, the workpiece has a smaller amount of steel. Accordingly,

starting from the said 100%,

a workpiece-dependent, for example, 20% to 35% reduced limit calculated. The latter limit is allowed in the aforementioned hollow workpiece without that it can be damaged when vibration relaxation. would accordingly

in the theoretical case that this actually

Vibration Relaxing workpiece 1 has a volume and weight of over 100%, the other way around procedure. Also can be moved if, in the choice of materials only the weight, but not change the volume. By adjusting the acceleration values of the vibrational relaxation, the for

each workpiece 1 suitable value be set as a limit. Thus, for example, workpieces can be relaxed vibration in the form of a thin-walled hollow body. With measurement point rows described in this case by,

or measuring axes, any weak points

be reliably detected. An example of a procedure: The vibration is so long ramped to the critical natural resonance of the workpiece touched, ie is almost reached. That may be at approximately 2800 r / min of the vibration generating eccentric. but that also depends on the type of eccentric used and on the setting stages. From experience, it usually comes at about 3300 to 6000 rev / min for self-resonance, which may not be exceeded, so that the workpiece 1 is not put into uncontrolled excitement, which even could solve the device for vibration relaxation from the workpiece 1 in the worst case. When a Eigenresonanz- or critical limit has almost been reached, the raising of the vibration is stopped and / or slightly down, for example by 5%. The vibration is kept stable for a certain time, for example for 2 minutes, so that the workpiece can calm down. During this time is continuously or periodically measured, for example, every 5 seconds, and calculates an average. This refers to all the measurement axes X, Y and / or Z, with the above-mentioned procedure should be repeated several times. The measured difference between before and after is

the G-shift, ie the change in the measured values. This is the proof that a voltage was reduced. Thanks to the measurement in a plurality of measurement axes and multiple accelerometers can be recognized also, where tensions have been reduced and where not. The aforementioned control device may either directly or via a

second control device which is used to control the vibration relaxation, regulate or vibration optimally finish if necessary, either by normal shutdown or in an emergency by immediately stopping. Alternatively or additionally, the rules or stop the vibration relaxation can be done manually because of the displayed by the acceleration sensors, or from the controller values. A display of measured values is obviously useful in any case. An additional possibility, the vibration relaxing and this subject workpiece 1 to monitor even better is to use at least one acoustic sensor. For example, if a Aufspannbride, a workpiece 1 holding clamp or a weld seam of the workpiece 1 starts to dissolve, changed by the vibration of the resulting sound. This makes it possible to stop the vibration before possibly damage or even injury to the operator may result. also form the method in detail other than drawn, especially as the sketch representing only schematically the basic idea. 1 and 2 In most cases, it may be useful

the measuring points 2 - 13 to be arranged at regular intervals, but as the most diverse workpieces to relax, it can also be deviations from this regularity. Among other things, for the same reason, it may be occasionally useful to the X at least two measurement axes, and / or Y and / or Z to each other to align in an angle other than as drawn in the example, approximately at a 90 ° angle. In any case

is in any selected

Measuring axis a series of at least two measuring points: 1 - 13 provide Finally, it should noted that the method of measuring the residual stress even with such workpieces 1 can be used for testing purposes, which were not relax due to vibration, but, for example by heating or annealing. The measurement method requires, however, a vibration.

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. At a plurality of measurement points (6 -
13) are measured acceleration values. 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 today

Mounting clamp to

use and with 4 points to attach a vibrator not only by 2.

13-B have clamps in usually two clamping arms . With in each case a stop for clamping one workpiece , At least one of these two

Stops is arranged on a threaded spindle . so that the stops are displaced to each other. It is furthermore known . to arrange a clamping arm displaceable on a guide. The each Components of the clamps are in the prior art welded together or by forging . Casting or burning produced . whence

at various USAGE - give compounds of these clamps vulnerability can , A vulnerability is especially the approach of spindle guide for d i e screw on the respective clamping arm. As an example of special requirements with s i ch-making THROUGH USE of clamps mentioned here, the vibration relaxation. When machining workpieces made of metal . for example be i m Welding . arise in the Workpiece voltages , These undesirable remain voltages in the workpiece back.

These in the metal by the Machining stresses caused can degrade again by shaking or vibration of the workpiece. For this purpose, the work - piece preferably fixed by means of clamps on a vibration table and means one Vibratory device to vibrate added. That can

each about 5 to 30 minutes last , In this Vibrationsent stress resulting vibrations in several axes . not only in the axial direction of the screw. Neither the clamp still the workpiece nor the vibrator may thereby out move away their location , The means that the clamp with exceptionally high compressive strength must be tightened , It lies On the hand . that the clamps on the one exceptional Belas- tung exposed are , especially Yes the clamps . in contrast to vibration relaxed workpiece . always again shaken anew . be exposed to strong vibrations or , In commercially available screw clamps therefore there is a risk . it dung break for signs of fatigue coming . wherein the said extension of the spindle guide For

the screw spindle on the clamping arm is the most endangered vulnerability. Themselves expectorant Workpieces or vibration exciter can damaged and unusable become. Not last there is a risk of injury for the personnel involved in this work staff. Based on this Knowledge is the Construction be the tasks . to create a vice . at of the the question Components are connected to each other . that a tear or at all Fall can be excluded exceptional costs itself and the example in devices to is used vibration relaxation. The construction Correct clamp corresponds the characterizing features

the Gedankenss 1 , Further advantageous embodiments of the design concept are from the dependent ersicht development I I. Of course, the Proper construction . robust and vibratory stable not clamp just for the vibration relaxation one settable . but everywhere . where strong personnel occurrence . so for any . safety-related tasks . up to the disaster.

following become preferred Ausführungsbeispi ele of the construction Toggle hand

of the drawings.

FIG. 1 shows a view of a first embodiment of the construction according to clamp ;

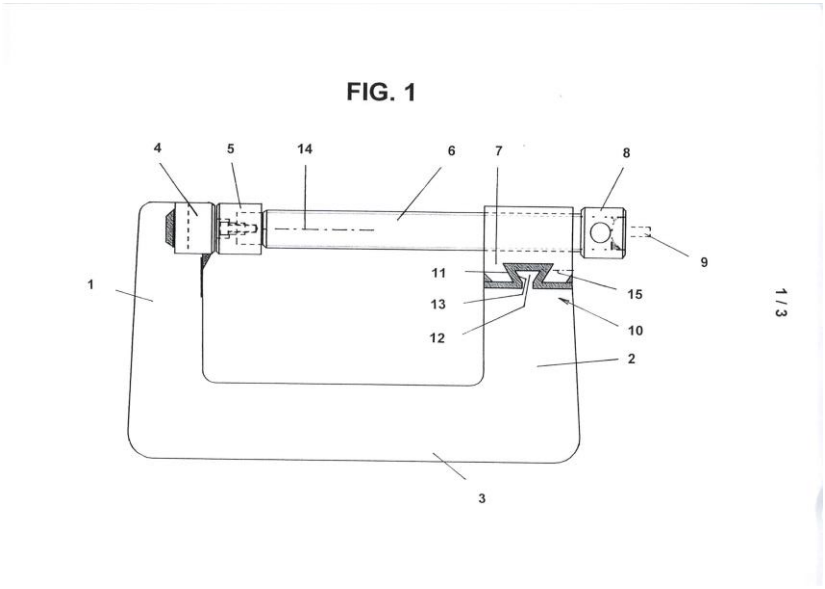


Fig. 2 - 3 show details of the clamp after Fig , 1;

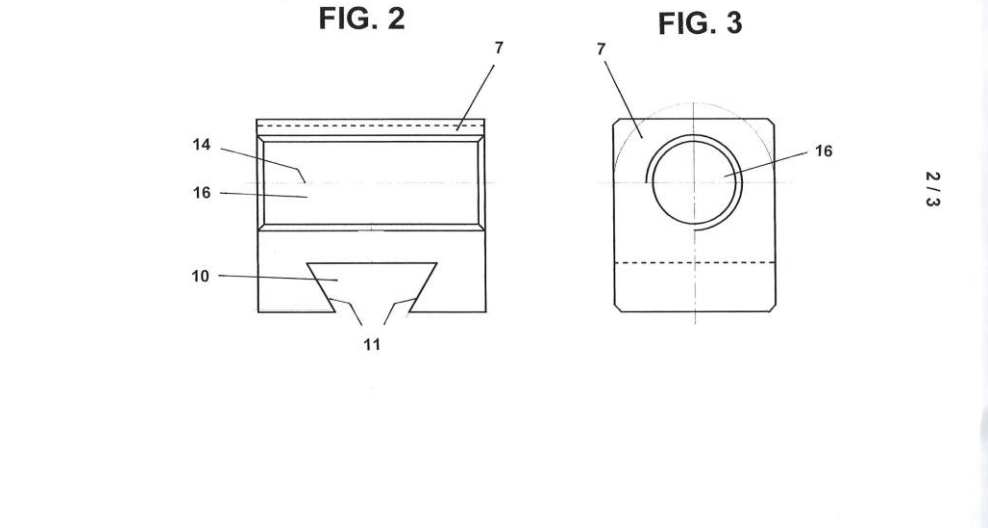
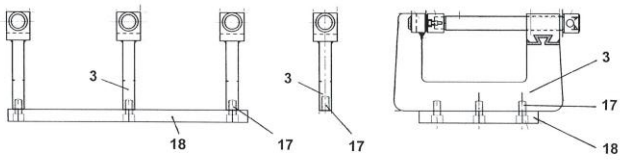


Fig. 4 - 6 show a second Embodiment.

FIG. 6 FIG. 5 FIG. 4



the screw clamp has according to FIG , 1 two clamping arms 1 and 2 on . the by means of
one connecting web 3 fixed together are connected. At two clamping arms 1 and 2 is each on attack 4 and 5
for a non-clamping
shown Workpiece. At least one this two stops 5 is attached to a screw spindle 6 angeo r d- net so that the attacks
4 and 5 to each other
movable are , N i cht it is excluded, the connecting web trainees 3 as a guide rail the path along which a
tension arm 2 is slidable. the screw 6 is in a thread having lockers l - guide 7 held on the corresponding
clamp arm 2 and can be connected to a Betätigungselemen t 8th

turned become. The latter can be a handwheel be or also center Is a lever
rotatable se in , One more way is that . at the actuator 8 a
Facility to the to provide the application of a drive. This can be a recess .
to the example a polygonal . to the fix a turning tool or a device with a rotary drive. Further is also one survey
or e i n bolt 9 .
for direct Attaching the drill chuck, for example, e i nes cordless screwdriver conceivable , This is
especially there Interesting . where a plurality from
clamps e i ngesetzt w i rd . each Closed e Müs n opened and again se n , To a e d era rtig e Ano r dn u ng w ir d sp ä ter
still eingegangen-
critical is the extension of the spindle guide 7 on clamping arm 2. Treatment is known
it . these two components to weld together , Here is the Connection designed to . that the both components .
namely the spindle guide 7 and the clamping arm 2 . in one another to grab. the interlocking cross Connection
is undercut by at least one Nu t reaches 10 . so that you themselves not readily to solve can , In a bevo r -
ferred version is this undercut groove 1 0 sc H walbenschwanz- shaped. This means . you has
wedge-shaped to each other

extending Inside- walls 11 on. in this Embodiment is themselves
the undercut groove 10 at the spindle guide 7 . while of corresponding .

in marriage to his The End dilating the web 12 Spanna r is arranged m 2.
In this Embodiment, the web 12 APART n at the ongoing external walls 13 ,
Of course, can be d i ese arrangement also turn . so web 12 on the spindle guide 7 and groove 10 the clamping arm 2 , Technically feasible is it . of the groove 1 0 and bridge connection formed 12 transversely z ur screw align 6 .
preferably according to FIG. 1 in the 90 ° Angle to the longitudinal axis 14. verse t eht themselves from even . that a further compound . respectively
data link is possible . whether by S c hrauben ode r by welding ,
implied is the possible location a r screw 15 . here the parallel to
said longitudinal axis 14 extends , The double encryption binding by clamping and welding would be the most optimal . i nsbeson - particular when initially explained Einsat z
the construction according to Sch r a u b- forcing at Vibration Relax In any
case leaves the spindle guide 7 on tension arm 2 festklem- men , At least is
lifting upward . ie in the longitudinal direction of the tensioner arm 2 . not possible.
And Although also not . when all - overdue swing i ssnaht breaking by fatigue. The captured Who k - piece is from damage for sure. Figs , 2 and 3 show the spindle guide 7 in comparison with FIG , 1 comparable grösserter representation ,
Good to see here is the threaded hole 1 6 for the screw spindle and the transversely in the 90 ° Angles arranged groove 10 with the wedge-shaped mutually facing inner walls 11 , This type of connection m i a t undercut groove 10 can of course also on the opposite lying Clamping arm 1 verwirk- union ,

There's more, however, about a spindle guide 7 . but indirectly or directly to a stop 4 , Conceivable is there is therefore also a different orientation of said groove 10th Figs. 4 and 5, in principle, the same clamp. At the connecting web 3 of the two clamping arms 1 and 2 is t

however, Any artwork least an attachment means 17 is present . the clamp on a support 18 fix to , In its simplest form, it is in the Befest igungseinrichtungen 17 to

Screw or threaded holes. Essential i st only . that the clamp With the side of the connecting web of the screw spindle 6 facing away at an adjacent component . here, the support 18 .

can be attached. This document 18 may be part of an apparatus for vibration relaxation or i n such a used or at arranged her
be , As in Fig. 6 shown . can thanks of the Befestigungseinrich- obligations 17, a plurality clamps securely on a
be arranged base 18 reasonable and there hold a workpiece. Ge rade in case Vibration relaxation it Yes so . that this workpiece Any artwork least zwe i is welded together components and may comprise a wide variety of forms. It i st therefore Not always easy to hold and can be hard during vibration relaxation to kontro llierende Set energies .

the particularly high demands on the Screw used filters.

It is within the scope of the construction of the screw concept 1 forcing the individual and different form as drawn , The shape and proportions of the clamp could be chosen differently. So let the groove 10 and the ridge 12 are also different forms . for example, by the dovetail is amended to . that each side several wedge-shaped to each other
extending Interior walls 11 are present, thereby

sawtooth form paragraphs , theoretically it also conceivable . that a spindle guide 7, two or more screw spindles holds. 6 Also could on the spindle guide 7 and or the clamping arm 2 more than one groove 10 be parallel coexist.

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)
in one another formed cross. For this purpose, at least one undercut groove (10) and at least an engaging into this web (12)
available , This made groove (10) and Web (12) compound formed i st in the preferred example
in 90 ° - Angle to the longitudinal axis (14) the screw
spindle (6) aligned. In addition, a screw or weld connection in between the spindle guide (7) be provided and the tensioning arm in question (2). This rugged and vibration-resistant Schraubzw i length is particularly suitable for temporarily holding workpieces to devices for vibration relaxation . since it is the local, exceptional loads suited to tackle.

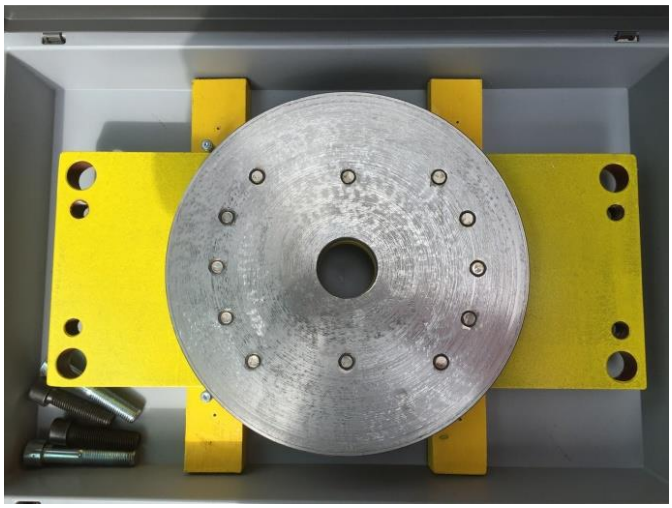
14. Accessories

14 4.21 **Rotating plate with clamping ring**

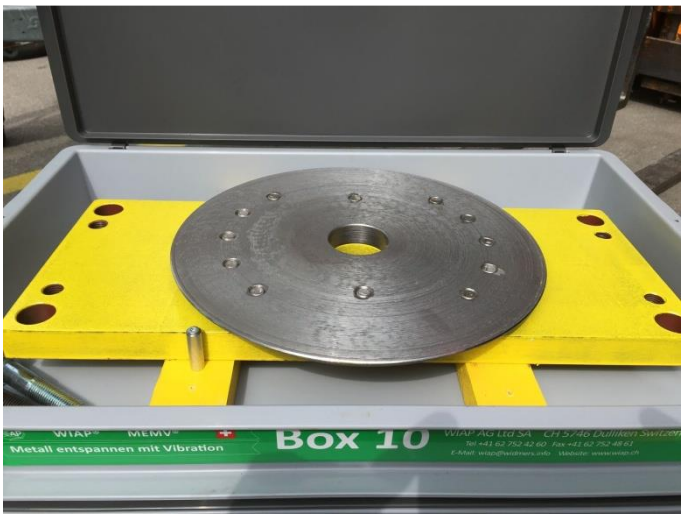
for V05 / V20

In transport 80x400x600 mm

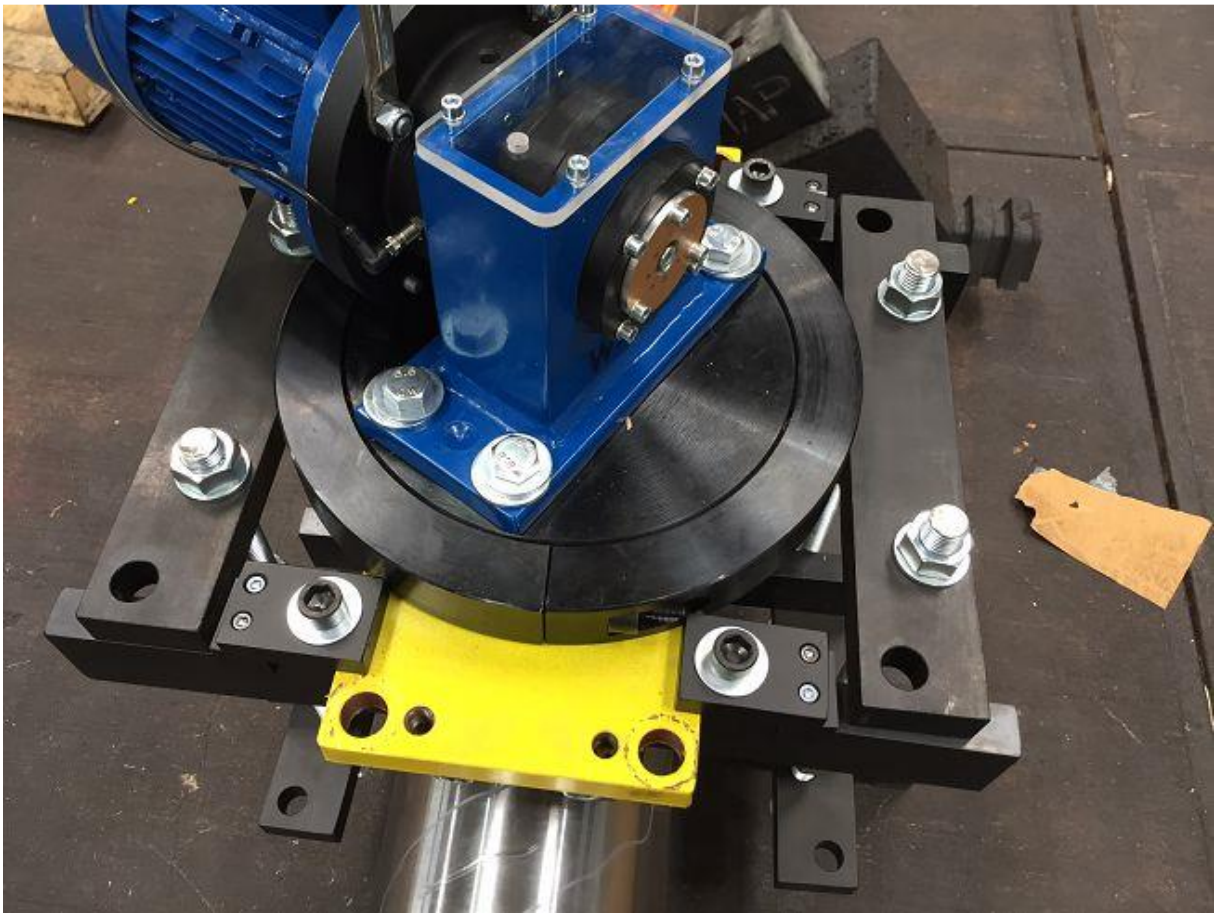
item 14.2 Rotating ring lower part Version H



Rotating ring lower part Version H



Rotating ring lower part Version H



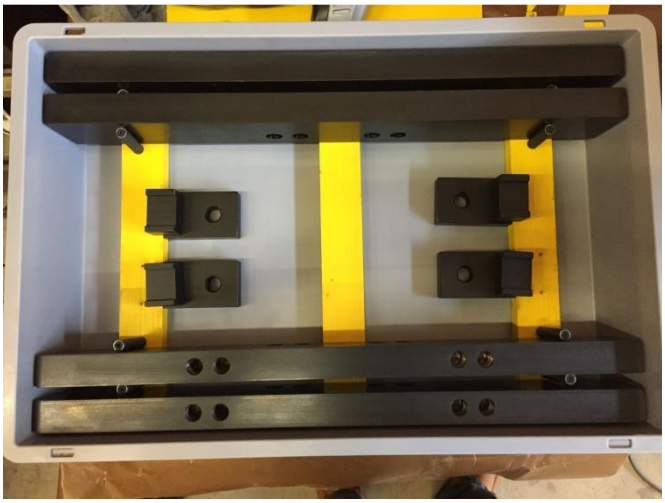
14. 4 21A **Automatic turntables**

Clamping the pivot plates and twisting in
div. Of degrees

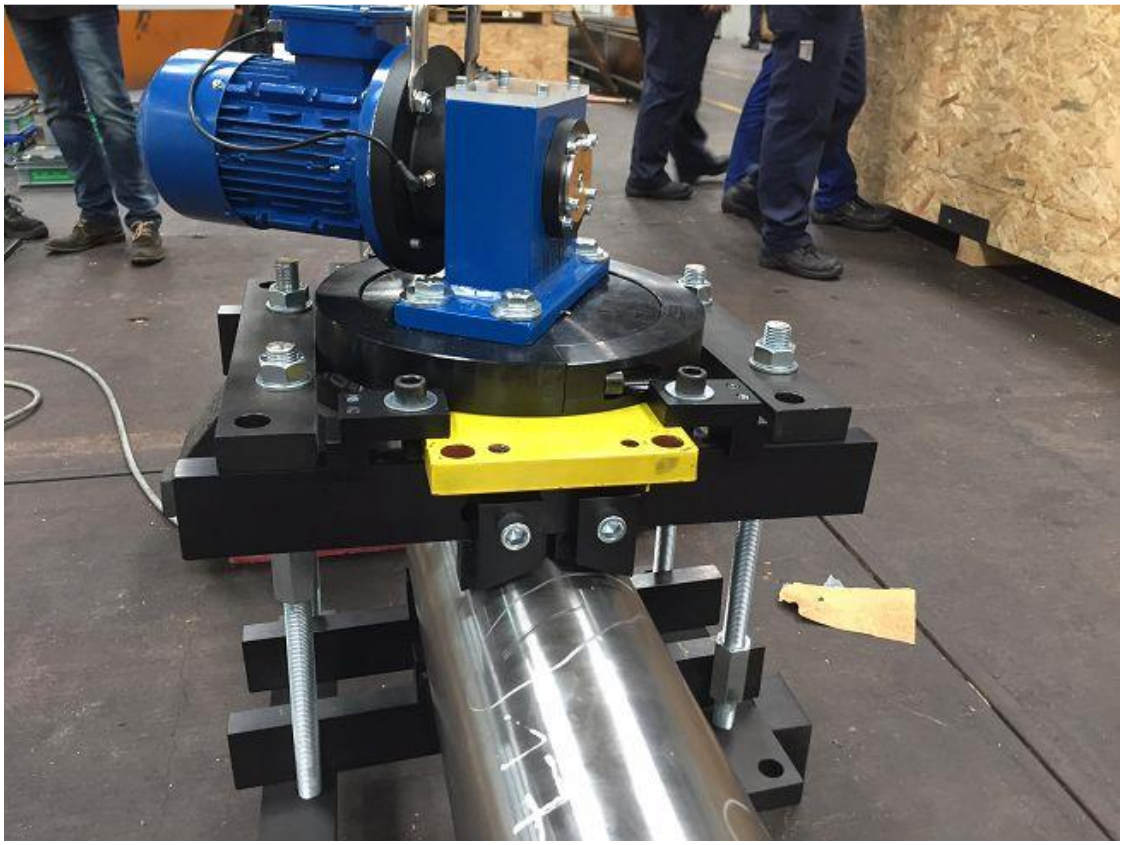
14. 4,21B software and PLC extension for turntables automatic with
electric control

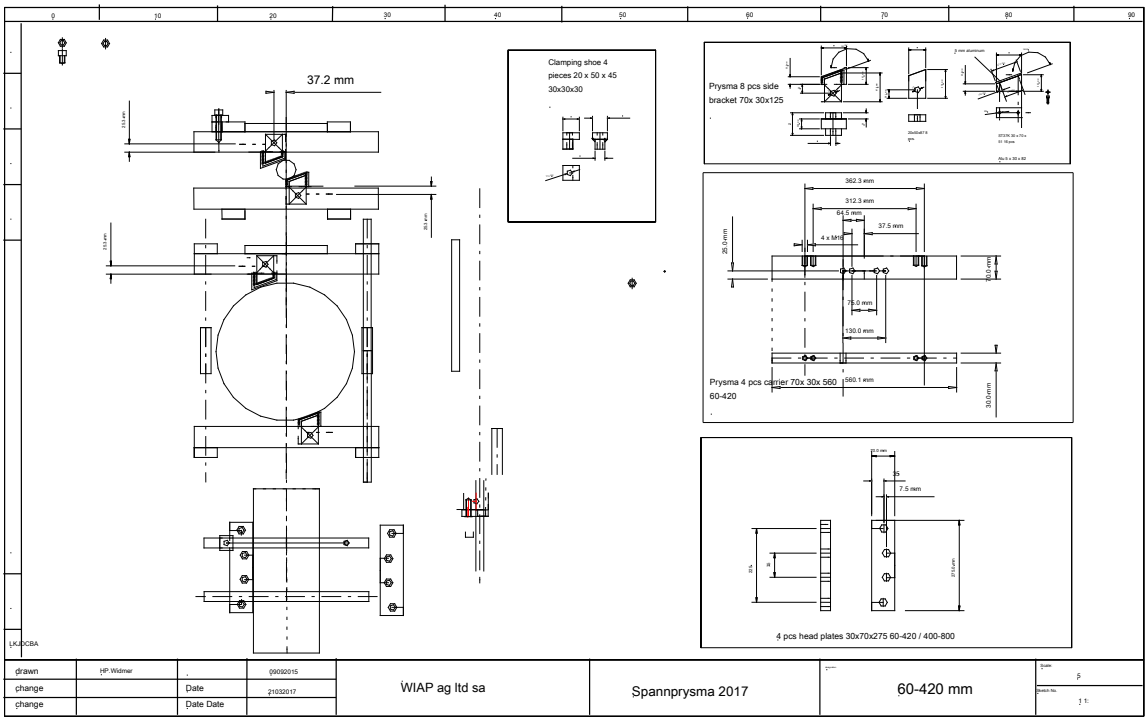
14 4.20 **Prisms set for round parts up to 420mm**

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



Chuck shafts diameter 60-420

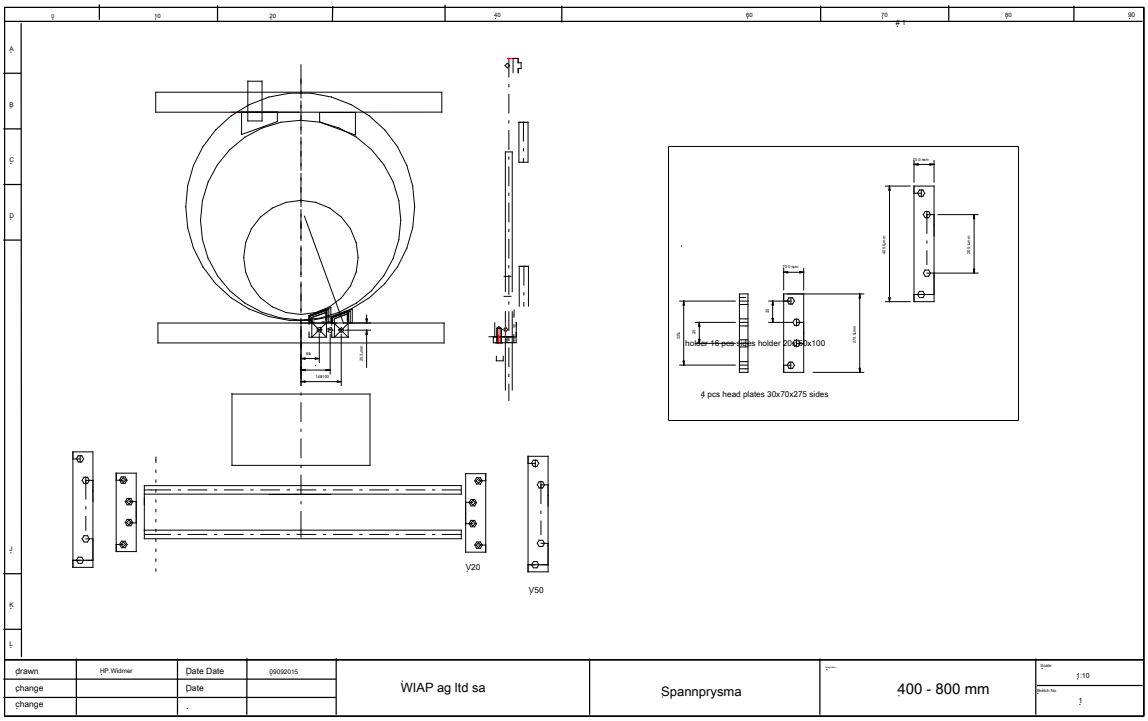




14 4.22 **Prisms set for round parts up to 800mm**

Diameter 400 to 800 mm in transport
200x400x600 mm; 176 kg

Mounting clamp set waves 400 to 800 mm



14 4.23 **Motors footplate** Stk. EUR 535.00

Dimension of the plate 25 x 250 x 500 mm in transport
80x400x600 mm; 27.4 kg

14 30.04 **Second vibrator, infinitely variable 2-axis** Stk. EUR 3'750.00

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

14. 30.4 A **Reduced price V05 V20 instead**

If only one MEMV is ordered 05 not 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, 2.2 KW AC motor; 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 42 kg V50 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, continuously 2-axis**

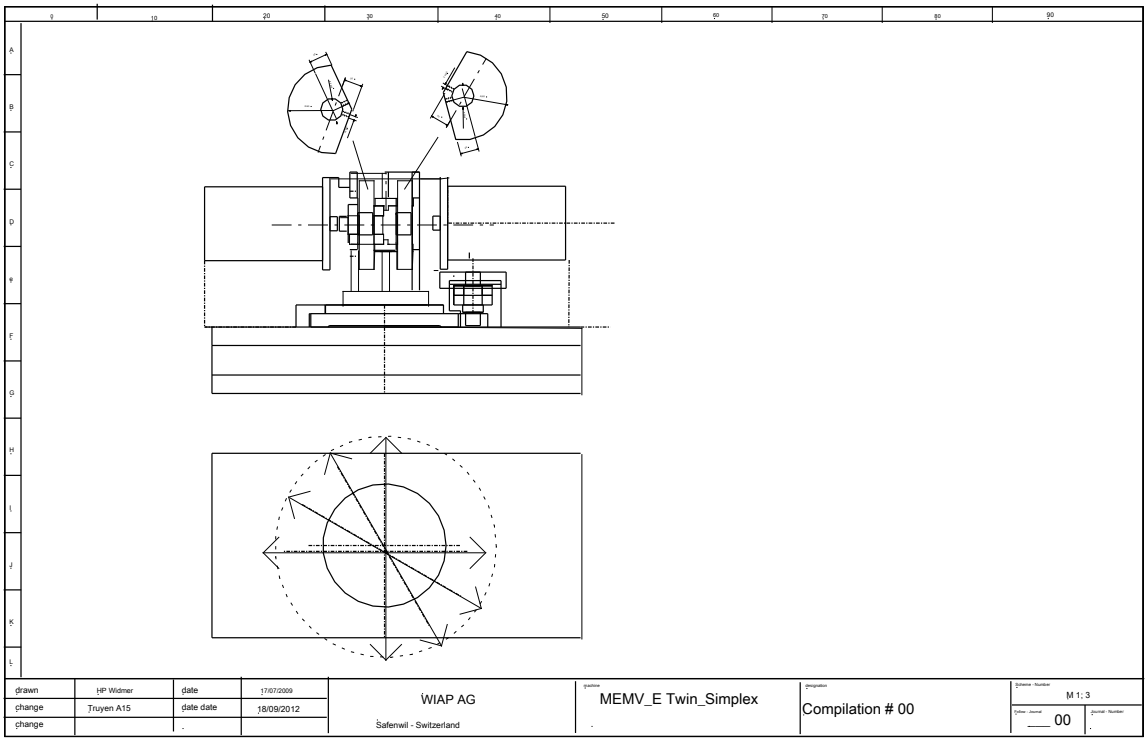
vibration exciter

for 200 tonnes V200

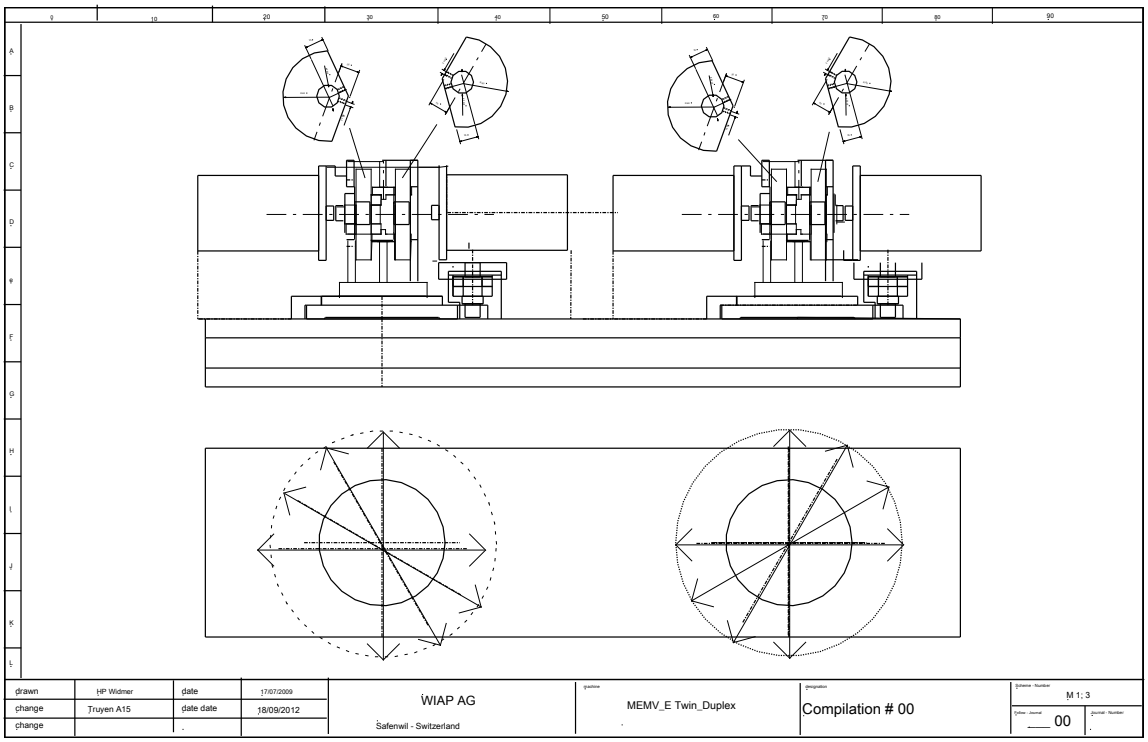
- Consisting of housing, AC motor 11 KW; Eccentric;
- Pulse generator for workpiece weights up to 200 tons
- 15 meter cable with plug

- Change inverter up to 11 KW
- Caddies from Pos. 1
- New large base plate 75x800x1250 mm
- Special transportation Box no. 9

14/4/36 Vibrator type V5 Twin Simpex, V20 Twin Simplex, V50 Twin simplex



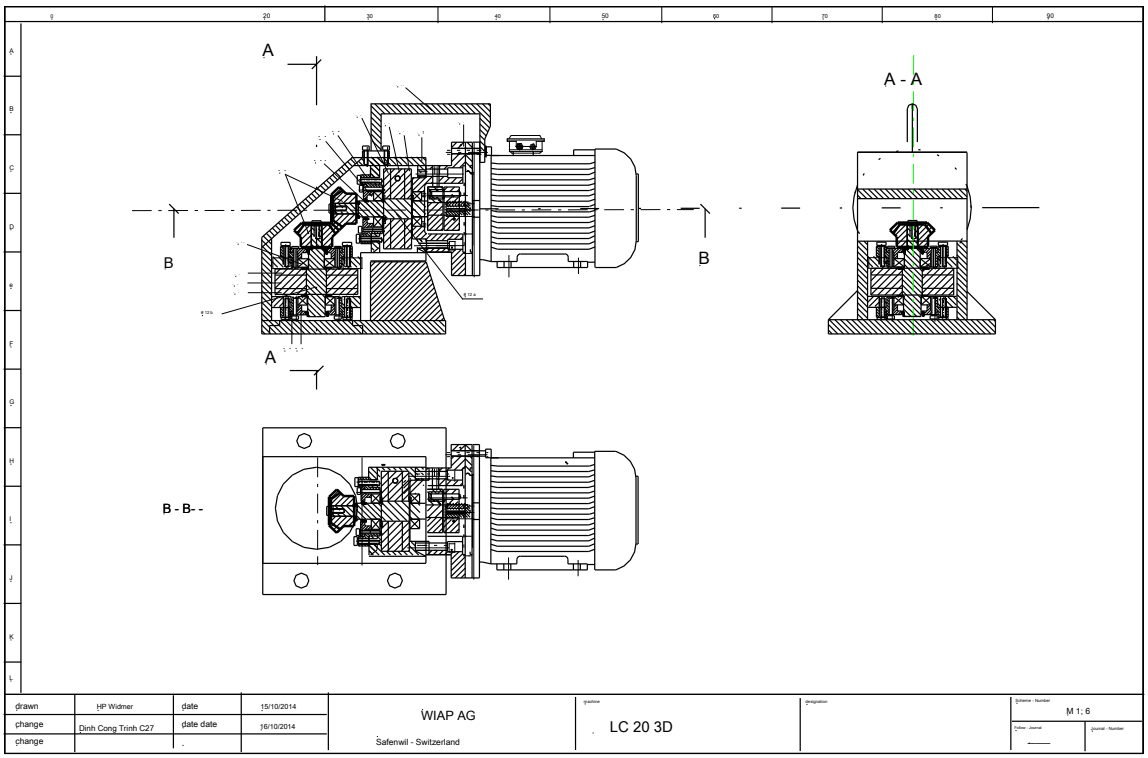
14/4/37 Twin Douplex vibrator type V5 Twin Dulex, V20 Twin duplex, V50 Twin Duplex



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**

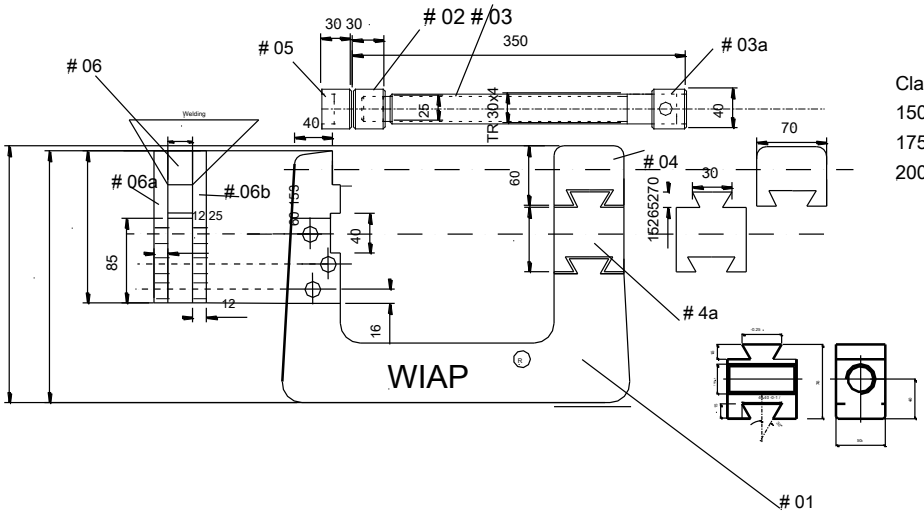
consisting of 2 clamps in Box

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



Shaft

Clamp ST 100 = 265 = 315
150 Clamp ST ST Clamp
175 = 340 = 365 Clamp ST
200

frame

Clamp ST 100 = 279 = 330
150 Clamp ST ST Clamp
175 = 354 = 379 Clamp ST
200

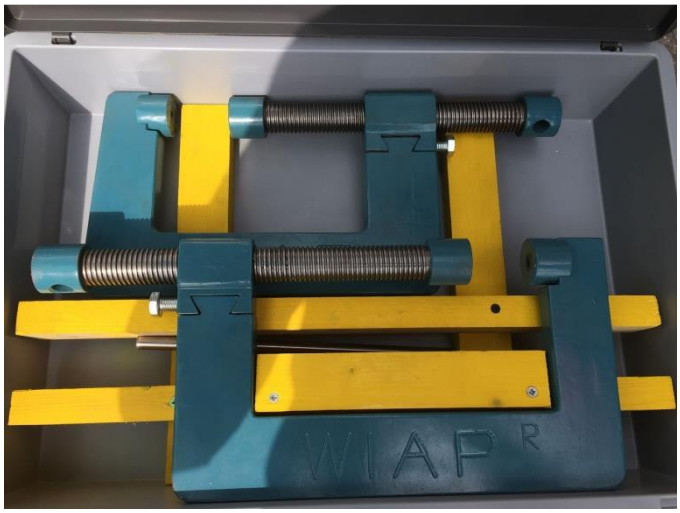
14 4:51 **0-175 clamp 2 pieces**
Box 80x400x600 mm; 20.5 kg

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

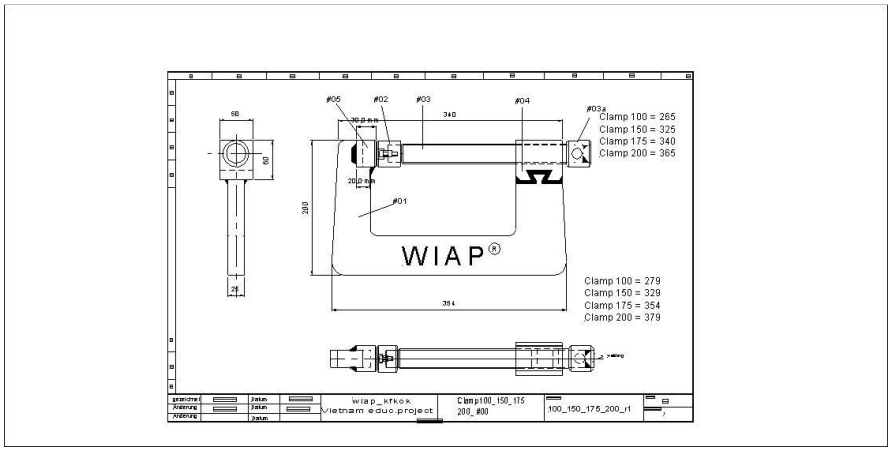
14 4.55 **0-400 clamp 2 pieces**
Box 80x400x600 mm



Screw Set Type 175mm

Available versions, wingspan

100,150,175,200, mm	Security / Safety	version
150, 175,200,250,300,400	Welded / Welding version	

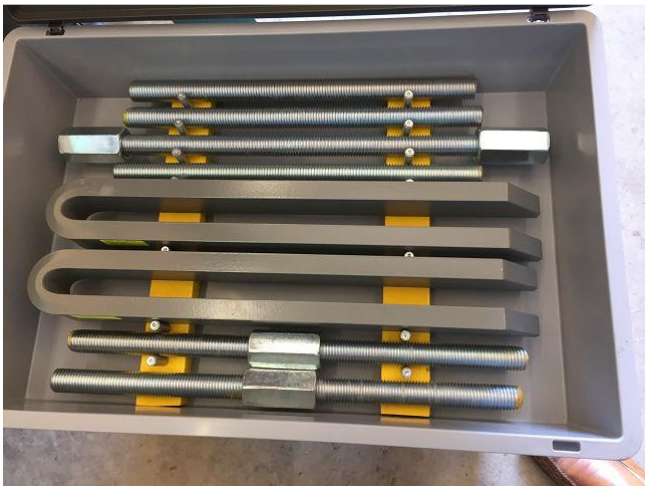


14 4.70 **Turnbuckles M24 Box Set Box**

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

14 4.71 **Clamping flanges Set 01**

2 x L clamping flanges 500 for M24
M24 x 4 x 500 10 10 M24 nuts piece
washers Box 80x400x500 mm; 25 kg



Mounting clamp set 500mm

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

14 4.80 **magnetic holder** for measuring probe

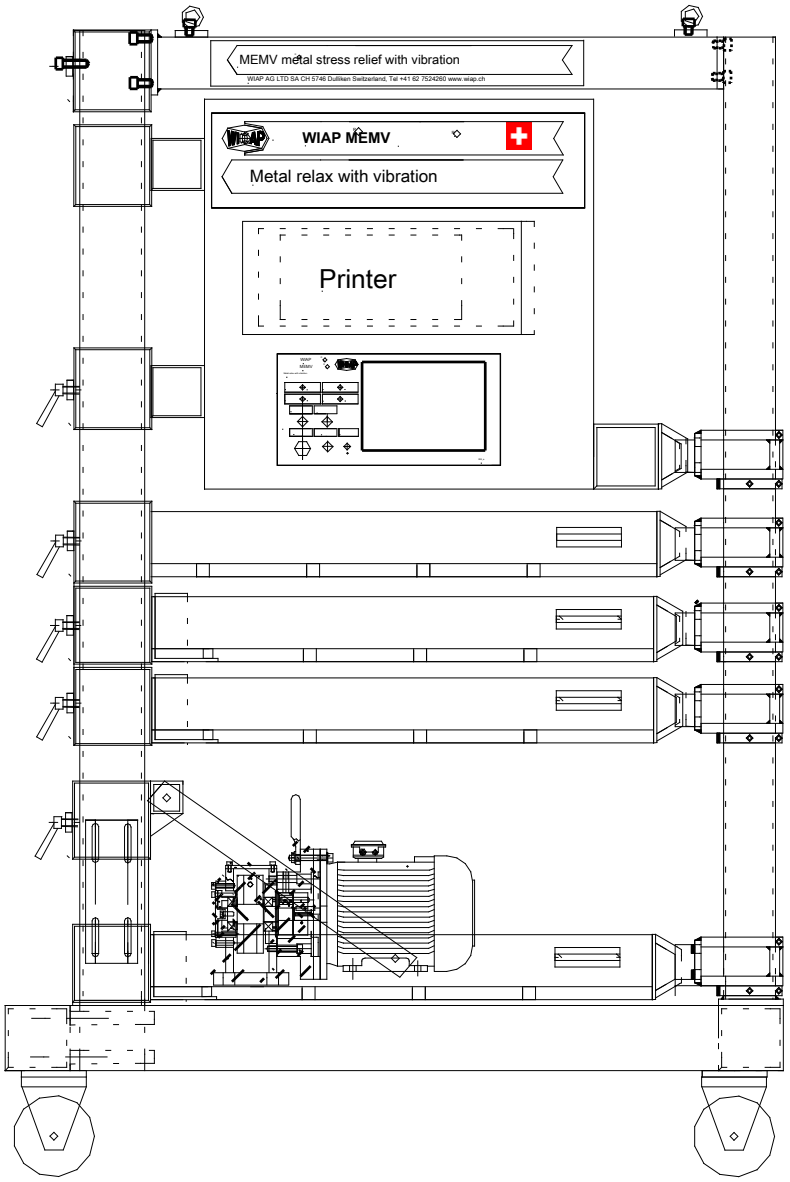
14 4.81 **Probes holder** for large waves to 420

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

14 4.90 **vibration table** 800 x 1200 800 mm floor height 240mm rubber buffering Maximum load approximately 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 device easy disassembly of Foreign work

- 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

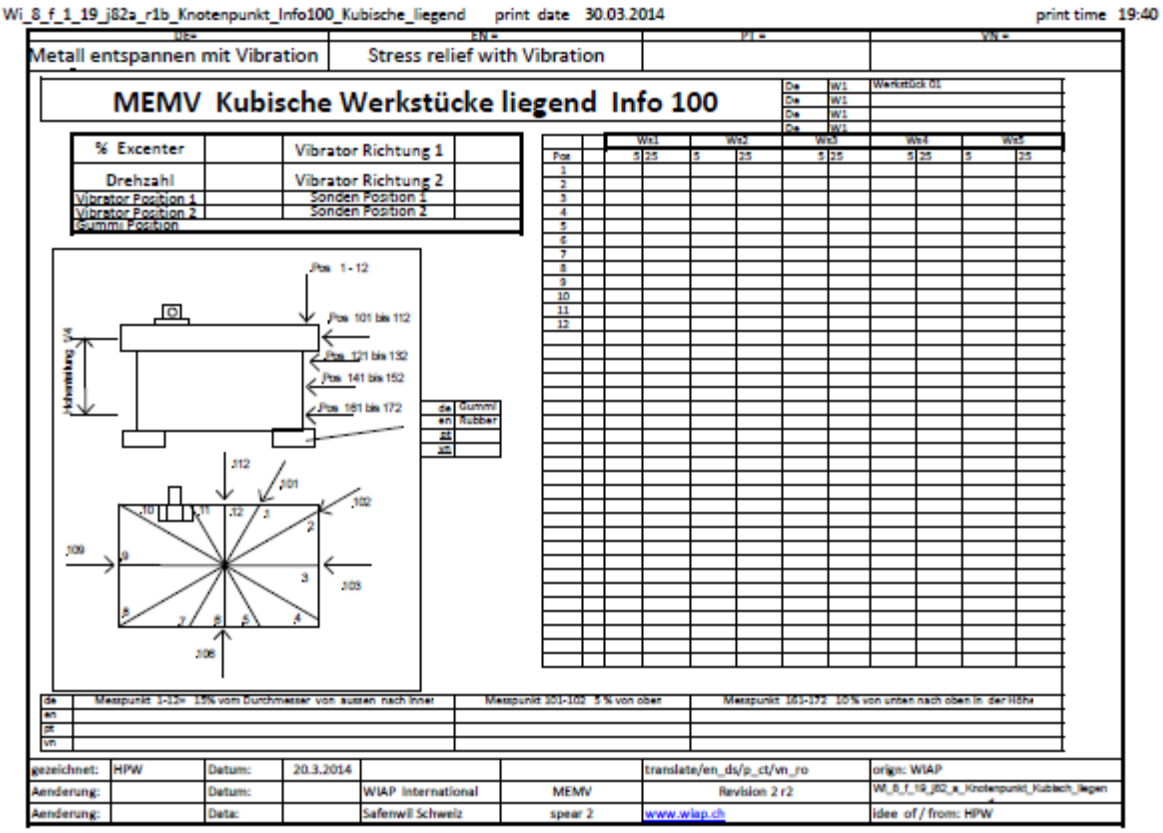
- Storage space for: special platen

- 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.

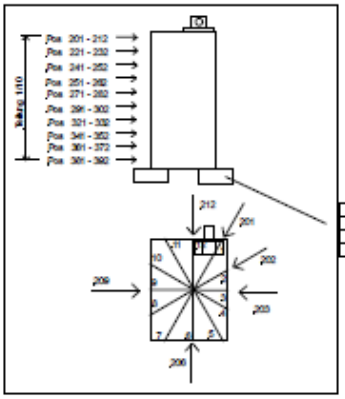


Wi_8_f_1_19_j82a_r1b_Knotenpunkt_Info200_Kubische_stehend print date 30.03.2014 print time 20:31

DE=	EN =	PT =	VN =
Metall entspannen mit Vibration	Stress relief with Vibration		

MEMV Kubische Werkstücke stehend, Info 200

% Excenter		Vibrator Richtung 1	
Drehzahl		Vibrator Richtung 2	
Vibrator Position 1		Sonden Position 1	
Vibrator Position 2		Sonden Position 2	
Gummi Position			



de	Gummi
en	Rubber
pt	
zh	

Pos	Wz1		Wz2		Wz3		Wz4		Wz5	
	5	25	5	25	5	25	5	25	5	25
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										

De	W1	Werkstück 01	
De	W1		
De	W1		
De	W1		

de	Messpunkt 1-12= 15% von aussen nach Inner	Messpunkt 201-212 5 % oben	Messpunkt 381 bis 392 5 % von unten nach oben in der Höhe		
en					
pt					
zh					

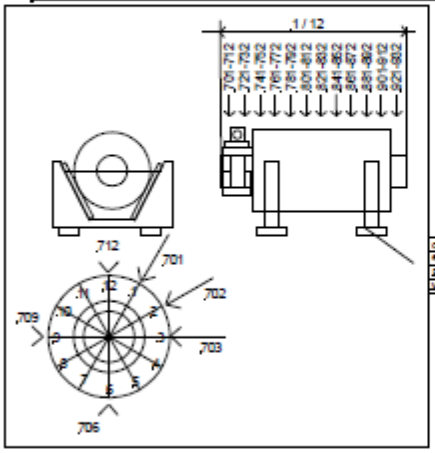
gezeichnet:	HPW	Datum:	20.3.2014			translate/en_ds/p_ct/vn_ro	orign: WIAP
Aenderung:		Datum:		WIAP International	MEMV	Revision 2 r2	Wi_8_f_19_j82_a_Knotenpunkt_Kubisch_liegen
Aenderung:		Data:		Safenwil Schweiz	spear 2	www.wiap.ch	idee of / from: HPW

Wi_8_f_1_19_j82a_r1b_Knotenpunkt_Info700_Rotations_liege print date 30.03.2014 print time 19:43

DE=	EN =	PT =	VN =
Metall entspannen mit Vibration	Stress relief with Vibration		

MEMV Rotationssymetrische liegende Werkstücke, Info 700

% Excenter		Vibrator Richtung 1	
Drehzahl		Vibrator Richtung 2	
Vibrator Position 1		Sonden Position 1	
Vibrator Position 2		Sonden Position 2	
Gummi Position			



de	Gummi
en	Rubber
pt	
zh	

Pos	Wz1		Wz2		Wz3		Wz4		Wz5	
	5	25	5	25	5	25	5	25	5	25
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										

De	W1	Werkstück 01	
De	W1		
De	W1		
De	W1		

de	Messpunkt 1-12= 15% vom Durchmesser von aussen nach Inner	Messpunkt 701-712 links / 1/24 von aussen	Messpunkt 921-932 rechts 1/24 von aussen		
en					
pt					
zh					

gezeichnet:	HPW	Datum:	20.3.2014			translate/en_ds/p_ct/vn_ro	orign: WIAP
Aenderung:		Datum:		WIAP International			Wi_8_f_19_j82a_r1_Rotat_liegend
Aenderung:		Data:		Safenwil Schweiz	spear 2		idee of / from: HPW

Wi_8_f_1_19_j82a_r1b_Knotenpunkt_Info1000_Rotations_steh print date 30.03.2014 print time 19:43

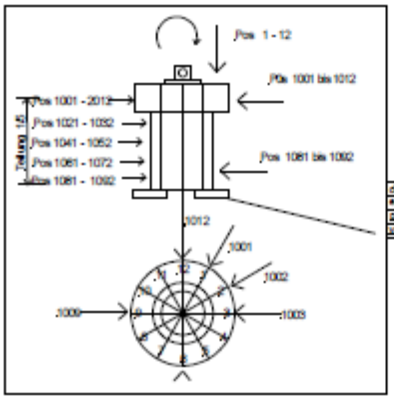
DE =	EN =	PT =	VN =
Metall entspannen mit Vibration	Stress relief with Vibration		

MEMV Rotationssymetrisch stehende Teile, Info 1000

% Excenter		Vibrator Richtung 1	
Drehzahl		Vibrator Richtung 2	
Vibrator Position 1		Sonden Position 1	
Vibrator Position 1		Sonden Position 1	
Gummi Position			

De	W1	Werkstück 01														
De	W1															
De	W1															
De	W1															

		Wz1		Wz2		Wz3		Wz4		Wz5	
Pos		5	25	5	25	5	25	5	25	5	25
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											



de	Gummi
en	Rubber
pt	
vn	

de	Messpunkt 1-12= 15% vom Durchmessen von aussen nach Inner / Messpunkt 101-101 oben 1/10 von ober / Messpunkt 1081-1092 1/10 von unter
en	
pt	
vn	

gezeichnet:	HPW	Datum:	19.3.2013			translate/en_ds/p_ct/vn_ro	origin: WIAP
Aenderung:		Datum:		WIAP International	MEMV	Revisio	Wi_8_f_19_82ja_Knotenp_Rotat_stehe
Aenderung:		Data:		Safenwil Schweiz	spear 2	www.wiap.ch	idee of / from: HPW

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 aircraft manufacturers, 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.

Wi_8_f_1_19_j82a_r9c_Ausbildung_mit_Diplom print date 25.06.2015 print time 11:40

DE=	EN =	PT =	VN =
Metallentspanner Diplom 1/4			

Modul 1 Metallentspannen mit Vibration Teil 1

1 Ausbildungsmodul Glüh Information
2 Kontrolle des benötigen Materials, wie Schraubzwingen, Sonde, Sondenkabel, Sondenzange Vibrator Steuergerät LC, 8 Gummi
3 Lesen der Betriebsanleitung , vorallem die Gefahrenhinweise
4 Das Werkstück auf 3 Gummiunterlagen stellen, sofern es zumutbar ist, ansonsten auf 4 Unterlagen, oder falls das Werkstück sehr schwer ist, auf mehrere Gummiunterlagen. Die Positionen der Gummis im Zusatzprotokoll festhalten, gemäss Info 100, Info 200, Info 700 oder Info 1000
5 Installieren des Vibrators. Gut befestigen mit den mitgelieferten Schraubzwingen.
6 Sehr gut befestigen. Beachten, dass die Schraubzwingen befettet sind.
7 Einstellen der Exzenterstufe nach der Gewichtstabelle in der Betriebsanleitung.
8 2 Stk. 6 mm Inbus und in der Betriebsanleitung nachlesen.
9 Das Wiap LC Steuergerät in der Nähe des zu entspannenden Bauteils aufstellen.
10 Es sollte keinen Durchgang haben zwischen dem Bauteil und dem Steuergerät, um das dünne Sondenkabel nicht betreten zu müssen.
11 Das Motorenkabel am Steuergerät einstecken.
12 Das Sondenkabel am Steuergerät einstecken; jedoch die Sonde noch nicht befestigen.
13 Das Netzkabel 220 Volt am Steuergerät einstecken.
14 Das 10-gang Potentiometer am Steuergerät nach links auf Null stellen.
15 Achtung: es ist ein 10-gang Potentiometer und muss ev. mehrmals zurück gedreht werden, bis es auf Null ist.
16 Die LC Anlage starten und mit dem Potentiometer die Drehzahl auf ca 2500 U/min. drehen
17 Danach langsam pro 30 Sekunden nur 100 U/min. hochdrehen.
18 Dies bis ca. 2700 U/min.
19 Mit dem Vibro Pen den Knotenpunkt an 12 Messpunkten ermitteln.
20 Radial und axial unterschiedliche Richtungen.
21 Wenn der Unterschied mehr als 50% ist von der stärksten zur schwächsten Stelle, den alternativ Platz des Vibrator für eine zweite Aufspannung festlegen. Bei sehr extrem steifen Werkstücken 3 Aufspannungen vorsehen.
22 Die Anlage stoppen.
23 Befestigung der Messonde am Bauteil ca. in der Mitte zwischen der stärksten und schwächsten Vibratisonszone.
24 Reset der Zeitschaltuhr, 30 Minuten einstellen oder gemäss der Tabelle in der Betriebsanleitung
25 Das Potentiometer wieder auf Null zurückdrehen.
26 Die LC Anlage starten und mit dem Potentiometer die Drehzahl auf ca. 2500 U/min. gehen Danach langsam pro 30 Sekunden nur 100 U/min. hochdrehen. Bis ca. 2700 U/min.

Den G Wert beachten; er sollte in der Zone 6 G Anzeigen, wenn nicht sollte die Exzenterstufe weiter nach oben gestellt werden. D.h z.B. anstelle 60 % auf 85 % Das bedeutet, wenn der G Wert gut ist, geht der Prozess weiter. Wenn der G Wert zu schwach oder zu hoch ist, muss die Exzenterstufe verstellt werden.
27 Jetzt langsam an den Eigenschwingungspunkten vorbei drehen.

Diese Ausbildungsanleitung ersetzt alle anderer von uns und auch in früheren Jahren erstellten Anleitungen

Hinweis: Einige LC Anlagen haben im Kaltlauf ein wenig höhere Ampereanzeige. Das kommt daher, weil das Gehäuse nach ca. 20 Laufminuten etwas warm wird und somit etwas leichter läuft. Dadurch dehnt sich das Gehäuse mehr als die Exzenterwelle und darum sollte zu Beginn eine 10 Minuten Einlaufzeit für eine perfekte Protokollierung in Kauf genommen werden.

Anforderungen an den Metallentspanner für das Modul 1

1. Er sollte in der Lage sein, 25 kg tragen zu dürfen
2. Er soll sauber protokollieren können
3. Er soll Messmittel Erfahrung haben, d.h Sauberkeit und mit Vorsicht mit den Geräten umgehen
4. Durchhaltevermögen

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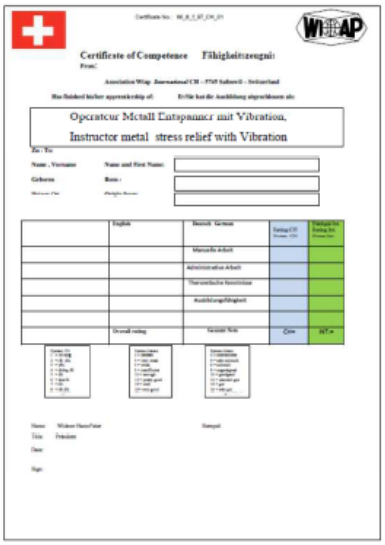
Modul 1 Metallentspannen mit Vibration Teil 2

28 Beachten des G Wertes. Drehen der Drehzahl über den ersten Eigenresonanzpunkt schnell, damit das Bauteil nicht in die Katastrophen Resonanz geraten kann.
Darauf achten, dass die Schraubzwingen gut festgezogen sind mit einer Verlängerung , damit sie sich auf keinen Fall loslösen können, auch wenn die die Katastrophen Resonanz angekratzt wird.
29 Die Drehzahl hochdrehen bis die Beschleunigung einen Wert von ca 10 G erreicht. Es sei denn, eine ganz leichte Konstruktion, welche extrem Geräusche macht.
Hier soll der G Wert nicht angestrebt werden, wenn dadurch der Lärm über 90 dB ansteigen sollte.
30 Wählen des Eigenresonzpunktes von zB. 3800 U/min.
Langsam an den Punkt heranfahren. Dann die Drehzahl 3% zurückdrehen.
31 Im Handprotokoll die Wert notieren.
Links im Protokoll. Siehe Punkte 19 bis 21
32 Jetzt kann der Prozess 15 oder 28 Minuten laufen, je nachdem 1 oder 2 Aufspannungsmethoden ausgeführt werden.
33 Mit dem Vibro Pen den Knotenpunkt an 12 Messpunkten ermitteln und eintragen auf der Liste Wi_8_f_19_82ja
Info 100 Kubische Werkstücke liegend
Info 200 Kubische Werkstücke stehend
Info 700 Rotationssymetrische Werkstücke liegend
Info 1000 Rotationssymetrische Werkstücke stehend
34 Die restliche Zeit nützen, um das neue Werkstück vorzubereiten.
Darum sollten immer mind. 8 Gummi vorhanden sein
35 7 Minuten vor Schluss des Vibrierens, eine Nachkontrolle durchführen.
Mit dem Vibro Pen messen und die Werte eintragen.
36 3 Minuten vor Schluss den Beschleunigungswert eintragen
im Standard Protokoll, manuell.
37 30 Minuten, die Anlage stoppt automatisch
38 Das Potentiometer auf 0 zurückdrehen.

39 Bei neuen, gleichen Werkstücken kann der ganze Entspannungsprozess abgekürzt werden, reduzierter Vibro Pen Test, ausser sporadischen Kontrollen.



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Aenderung:	an	Data:	24.06.2015	Switzerland	spear 2	www.wiap.ch	idee of / from: HPW

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Modul 2 Metallentspannen mit Vibration

200 Materialkontrolle der Boxeninhalte
1 Laptop, 1 DK 20 Gerät, 1 Drucker, je ein 230 V Kabel
3 Stk. BNC Kabel
205 Vorbereitung gemäss Modul 1 Positionen 1 bis 13.
210 Das DK 20 Gerät neben das LC Gerät stellen.
216 Den Laptop in bediennähe stellen
220 Installation des Druckers.
222 Installation der 3 BNC Kabel, sowie die Gerätenetzkabel zwischen dem LC Gerät und dem DK20 Gerät
225 Anschluss des Netzwerkkabels, wenn Wireless Störungen hat
229 Laptop einschalten und hochfahren
230 Das DK 20 Gerät einschalten und warten bis das Standby Signal kommt.
231 Am Laptop die besondere Excel Tabelle für das DK 20 aufstarten.
235 Das Potentiometer am LC Gerät nach links auf 0 drehen.

237 Reset der Zeitschaltuhr auf 30 Minuten
240 Die LC Anlage starten und mit dem Potentiometer die Drehzahl auf ca. 2500 U/min. drehen
Danach langsam pro 30 Sekunden nur 100 U/min. hochdrehen bis ca. 2700 U/min.

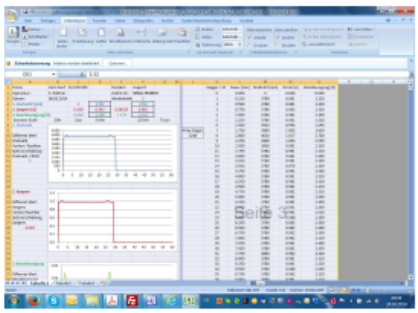
250 Beachten des G Wertes. Er sollte in der Zone mit 6 G anzeigen, wenn nicht, sollte die Exzenterstufe weiter nach oben gestellt werden. Das heisst, z.B. anstelle 60% auf 85%.
Das heisst, wenn der G Wert gut ist, geht der Prozess weiter. Wenn der G Wert zu schwach oder zu hoch ist, muss die Exzenterstufe verstellt werden.
243 Jetzt langsam an den Eigenschwingungspunkten vorbei drehen.
Wahl des Eigenschwingungspunktes bei dem der G Wert zwischen 6 und 12 liegt.
An den Eigenschwingungspunkt fahren und die Drehzahl 3% zurückdrehen.
30 Sekunden warten, ohne Regulierung. Die Excel Tabelle zählt in der Zeit 5 Takte nach unten
Die Drehzahl nicht verstellen, weil sonst der ganze Prozess wieder geresetet wird und von vorne beginnt.
250 Wenn die 5 Linie der Excel Tabelle durchgezählt hat, die Drehzahl langsam 3% nach oben drehen.
255 Auf 3 Taktzeilen der Excel Tabelle warten, das heisst 3 x 6 Sekunden = 18 Sekunden
Dann die Drehzahl wieder 3% zurückdrehen und 22 Minuten laufen lassen.
260 Die Drehzahl wieder 3% nach oben drehen und mind. 3 Taktzeilen d.h. 18 Sekunden lassen, bevor sie wieder nach unten gedreht werden kann.
265 Mit der Massnahme ist der Unterschied der Ampere und Beschleunigung protokolliert und es kann die Veränderung zwischen vorher und nachher ermittelt werden.

270 Nach 30 Minuten stellt die Anlage automatisch ab.
Die Protokolliersoftware legt die Excel Tabelle in den Standby Modus.

275 Die Datei soll abgespeichert werden.

Anforderung an den Metallentspanner für das Modul 2

1. PC Kenntnisse
2. Excel Kenntnisse
3. Gewissenhaftes, sauberes Arbeiten
4. Umgang Kenntnisse mit elektrischen Geräten
5. Durchhaltevermögen



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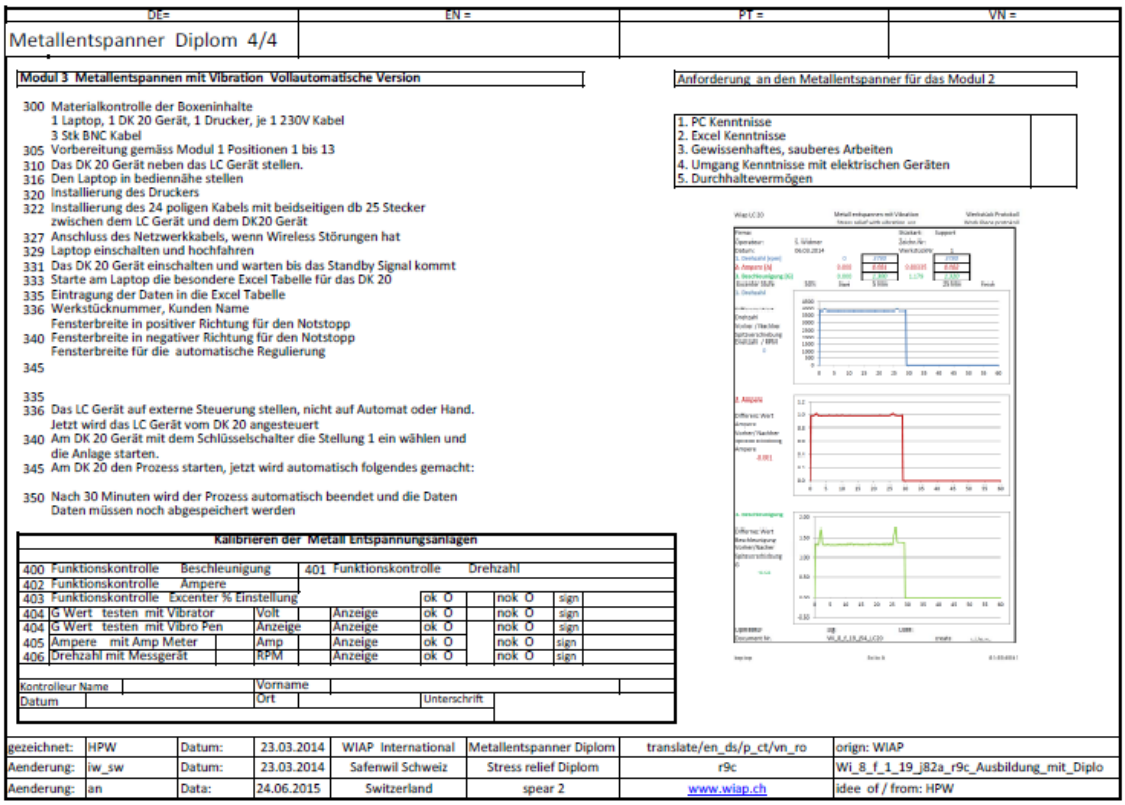

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Modul 3 Metallentspannen mit Vibration Vollautomatische Version

300 Materialkontrolle der Boxeninhalte
1 Laptop, 1 DK 20 Gerät, 1 Drucker, je 1 230V Kabel
3 Stk BNC Kabel
305 Vorbereitung gemäss Modul 1 Positionen 1 bis 13
310 Das DK 20 Gerät neben das LC Gerät stellen.
316 Den Laptop in bediennähe stellen
320 Installierung des Druckers
322 Installierung des 24 poligen Kabels mit beidseitigen db 25 Stecker zwischen dem LC Gerät und dem DK20 Gerät
327 Anschluss des Netzwerkkabels, wenn Wireless Störungen hat
329 Laptop einschalten und hochfahren
331 Das DK 20 Gerät einschalten und warten bis das Standby Signal kommt
333 Starte am Laptop die besondere Excel Tabelle für das DK 20
335 Eintragung der Daten in die Excel Tabelle
336 Werkstücknummer, Kunden Name
Fensterbreite in positiver Richtung für den Notstopp
340 Fensterbreite in negativer Richtung für den Notstopp
Fensterbreite für die automatische Regulierung
345

335
336 Das LC Gerät auf externe Steuerung stellen, nicht auf Automat oder Hand.
Jetzt wird das LC Gerät vom DK 20 angesteuert
340 Am DK 20 Gerät mit dem Schlüsselschalter die Stellung 1 ein wählen und die Anlage starten.
345 Am DK 20 den Prozess starten, jetzt wird automatisch folgendes gemacht:

350 Nach 30 Minuten wird der Prozess automatisch beendet und die Daten
Daten müssen noch abgespeichert werden

Kalibrieren der Metall Entspannungsanlagen

400	Funktionskontrolle Beschleunigung		401	Funktionskontrolle Drehzahl				
402	Funktionskontrolle Ampere							
403	Funktionskontrolle Excenter % Einstellung				ok Ö		nok Ö	sign
404	G Wert testen mit Vibrator	Volt		Anzeige	ok Ö		nok Ö	sign
404	G Wert testen mit Vibro Pen	Anzeige		Anzeige	ok Ö		nok Ö	sign
405	Ampere mit Amp Meter	Amp		Anzeige	ok Ö		nok Ö	sign
406	Drehzahl mit Messgerät	RPM		Anzeige	ok Ö		nok Ö	sign

Kontrolleur Name | Vorname
Datum | Ort | Unterschrift

Anforderung an den Metallentspanner für das Modul 2

1. PC Kenntnisse
2. Excel Kenntnisse
3. Gewissenhaftes, sauberes Arbeiten
4. Umgang Kenntnisse mit elektrischen Geräten
5. Durchhaltevermögen

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Each WIAP complexes owners can request these training materials in WIAP.

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, niederampl itudigen vibrations. Escapes pressure from the fringes of the seams.

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