ED Shaker with large displacement

How does it work?

How is it related to the components?

Examples

Applications

Many thanks for your attention!

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www.eco-shaker.com

IMV CORPORATION

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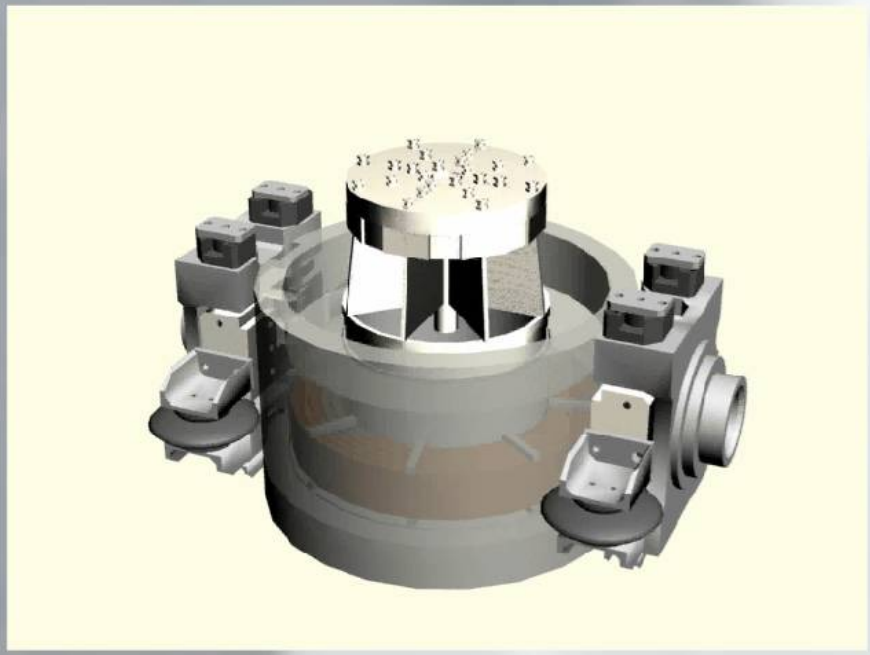
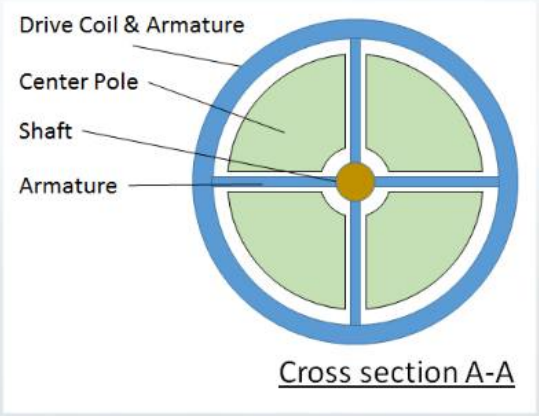
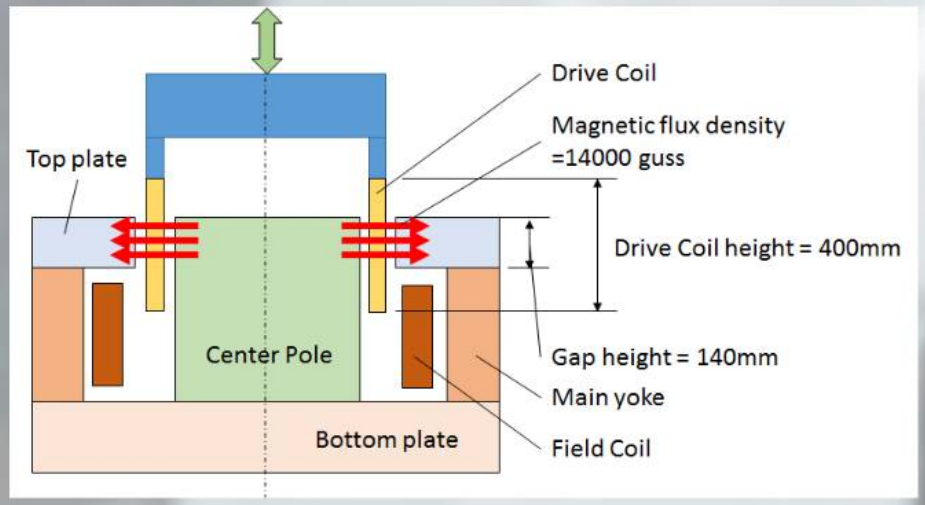
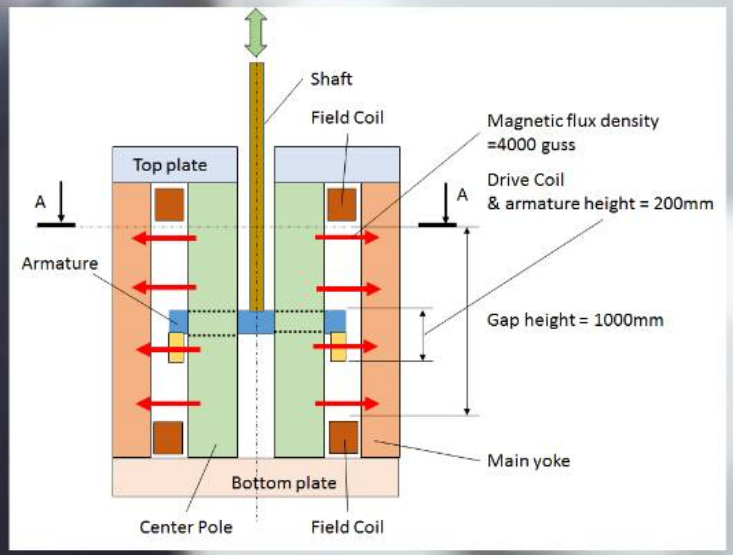
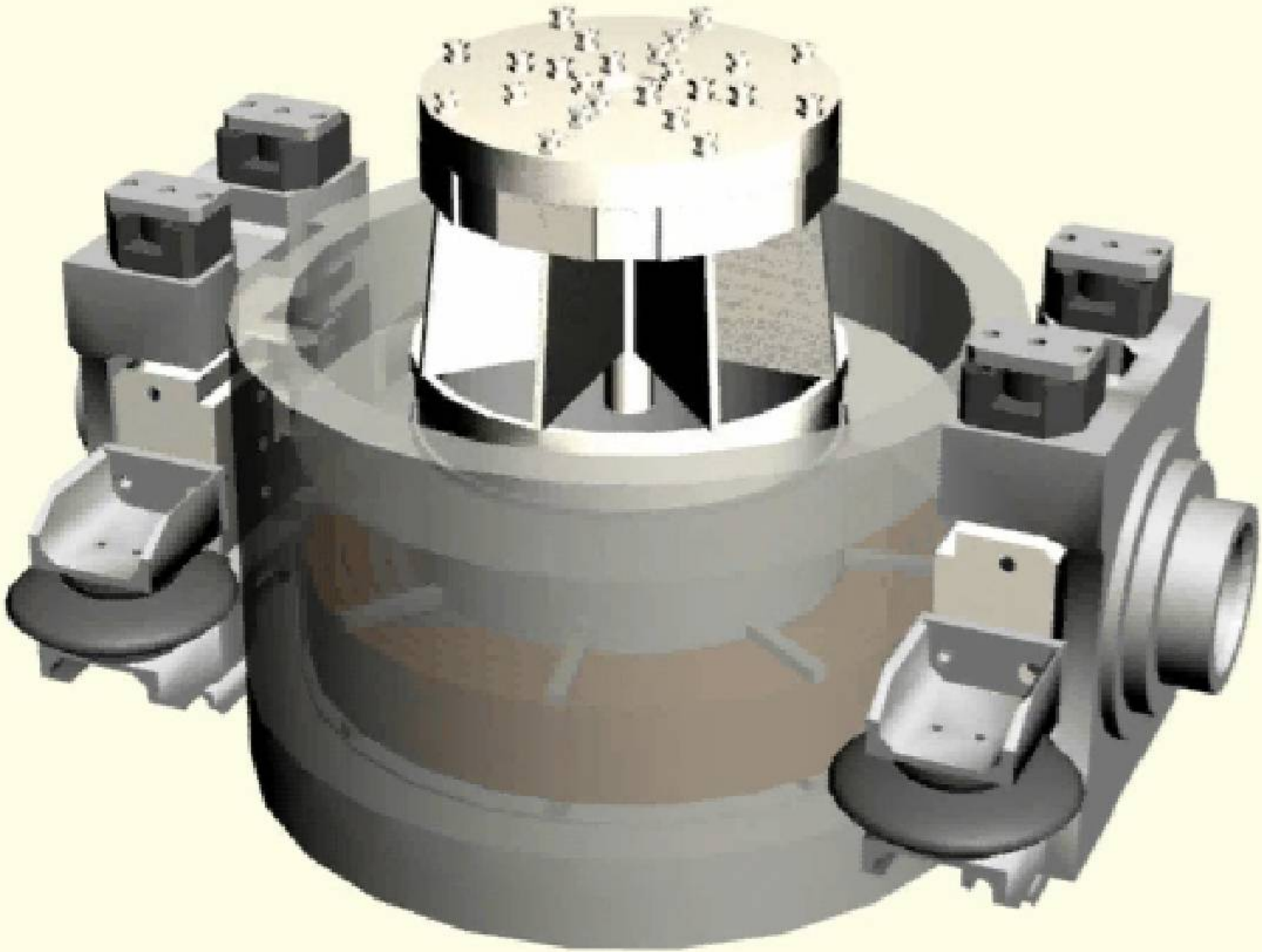
Examples

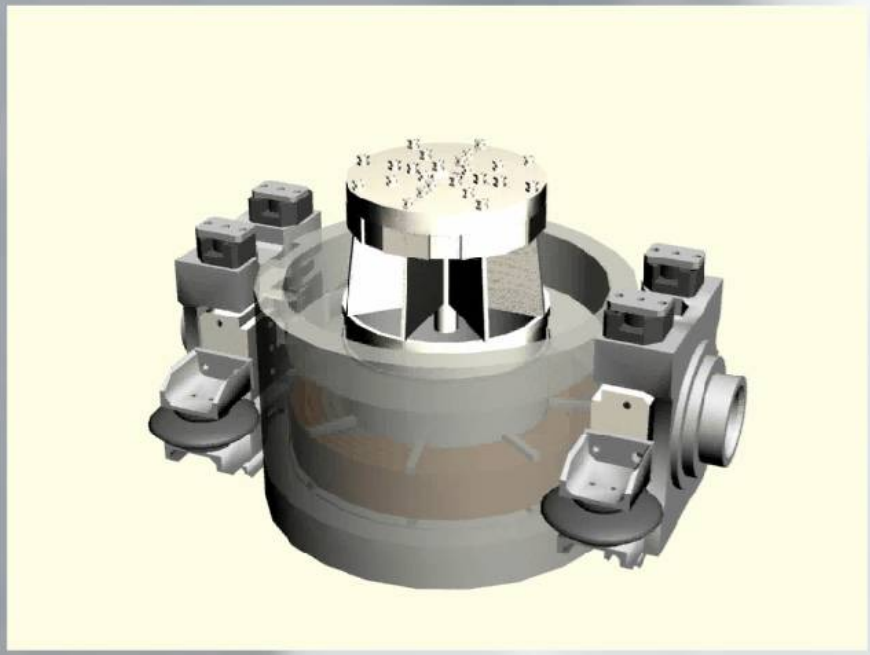


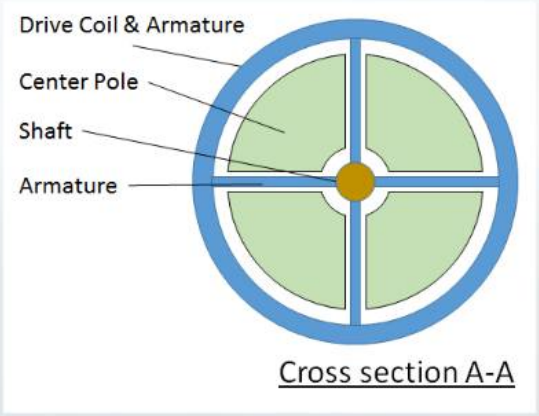

Drive Coil & Armature
Center Pole
Shaft
Armature
Cross section A-A


Top plate
Drive Coil
Magnetic flux density
=14000 guss
Drive Coil height = 400mm
Center Pole
Gap height = 140mm
Main yoke
Bottom plate
Field Coil


Shaft
Field Coil
Magnetic flux density
=4000 guss
Top plate
A
A
Drive Coil
& armature height = 200mm
Armature
Gap height = 1000mm
Main yoke
Bottom plate
Center Pole
Field Coil



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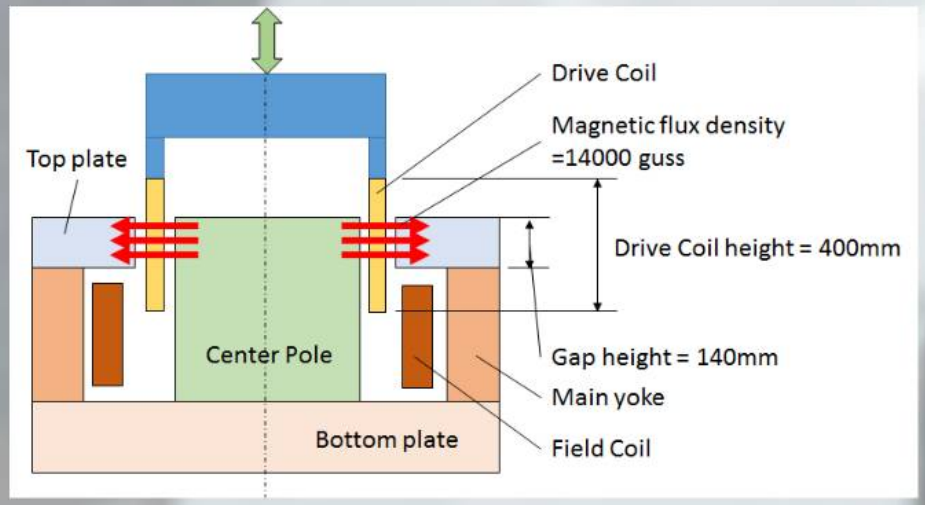
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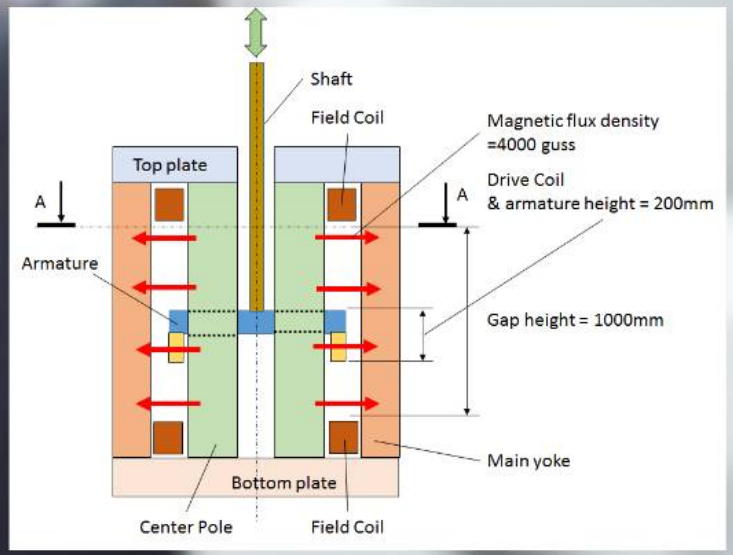
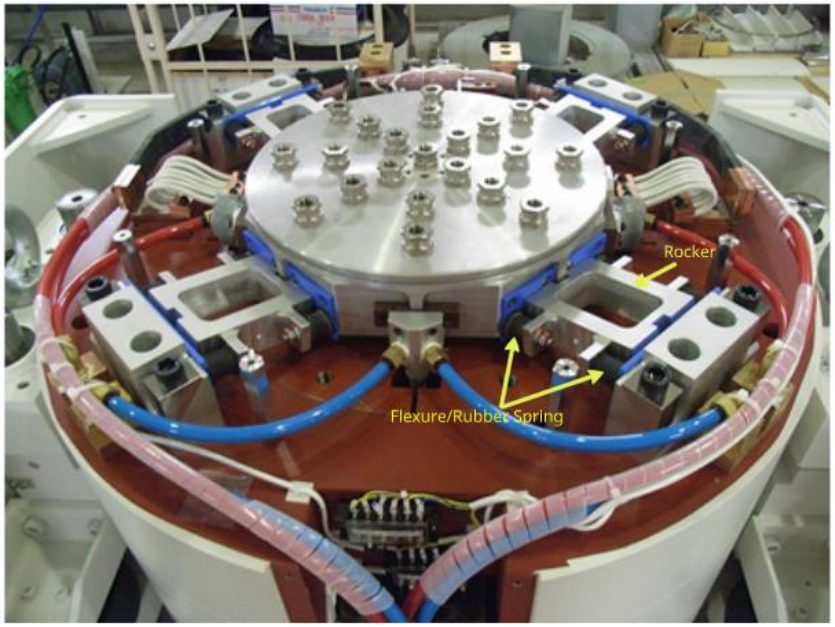
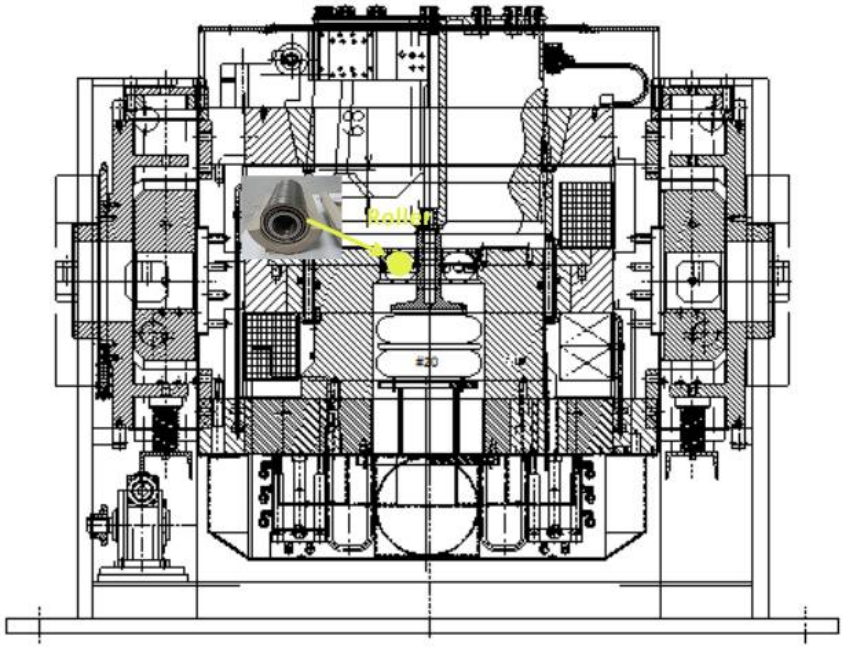
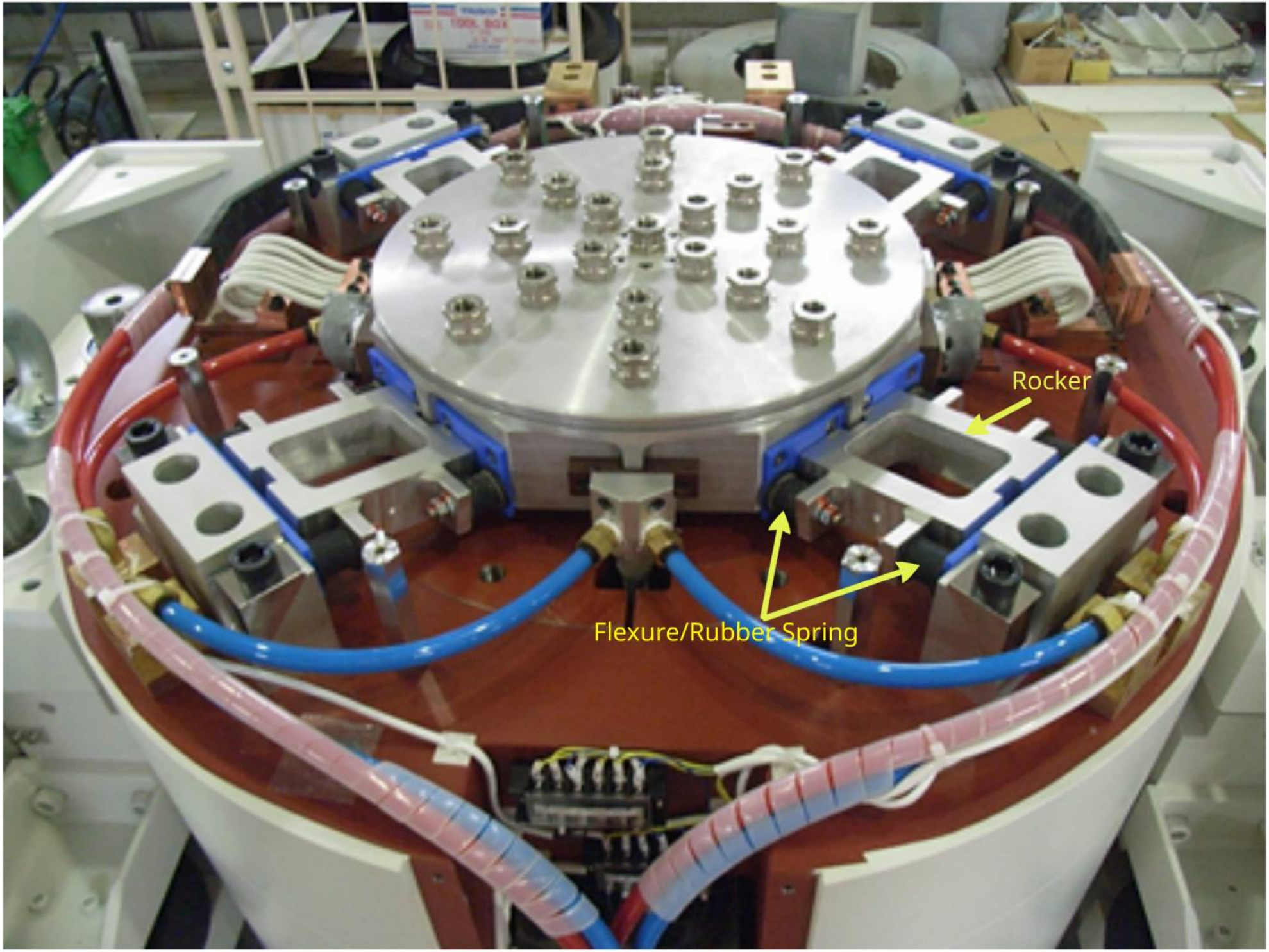
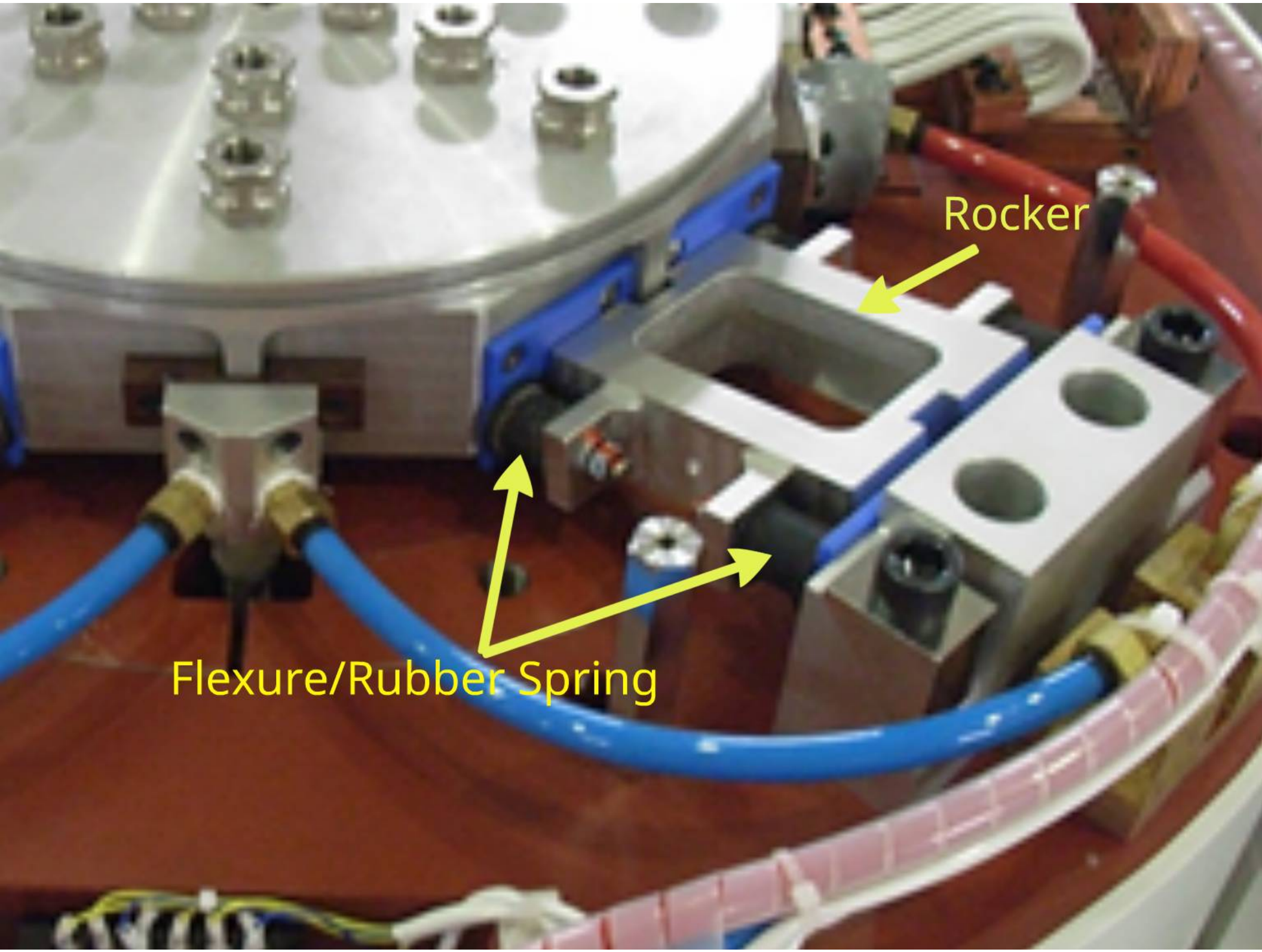

Shaft
Field Coil
Magnetic flux density
=4000 guss
Top plate
A
A
Drive Coil
& armature height = 200mm
Armature
Gap height = 1000mm
Main yoke
Bottom plate
Center Pole
Field Coil

50 mm pk-pk






Rocker
Flexure/Rubber Spring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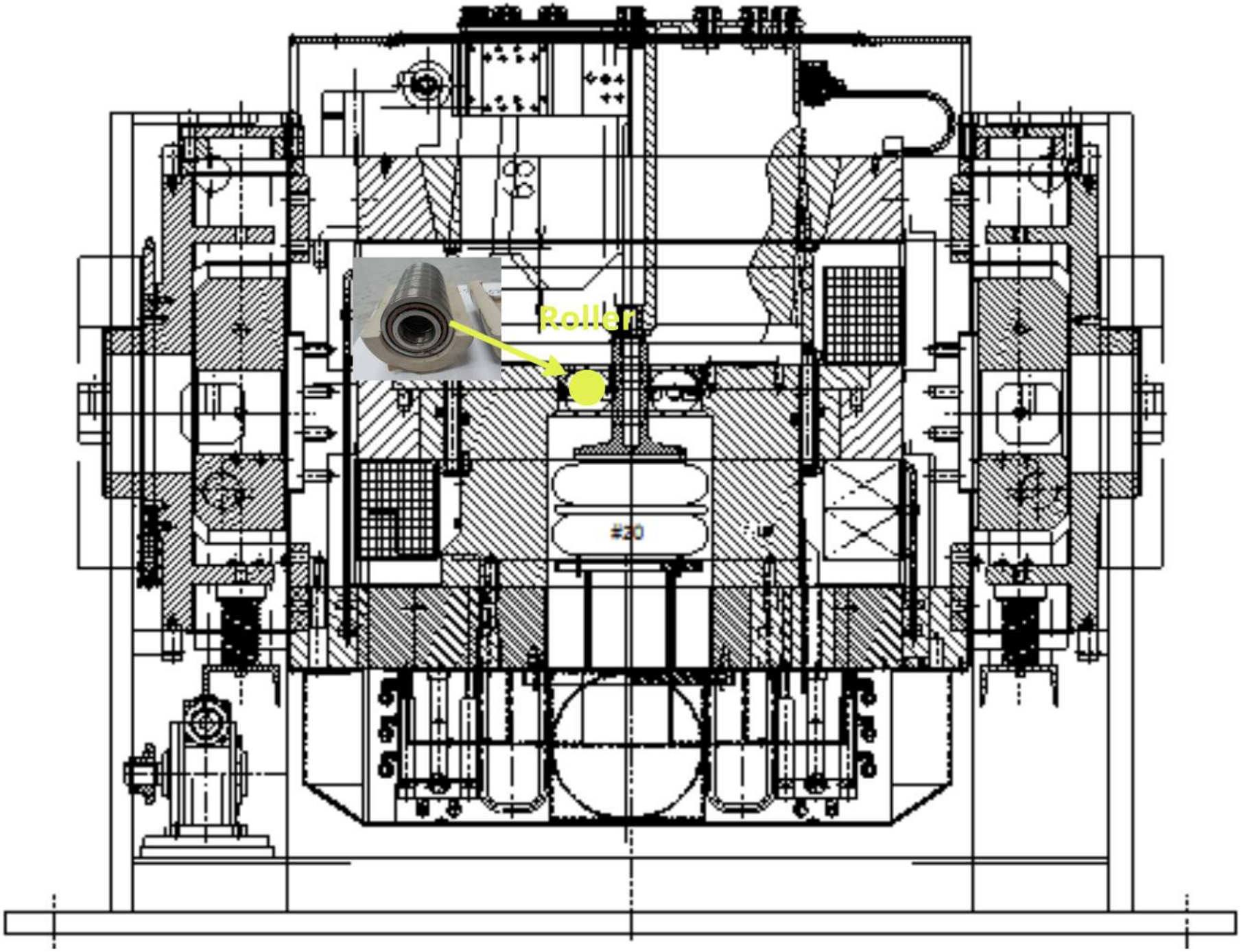
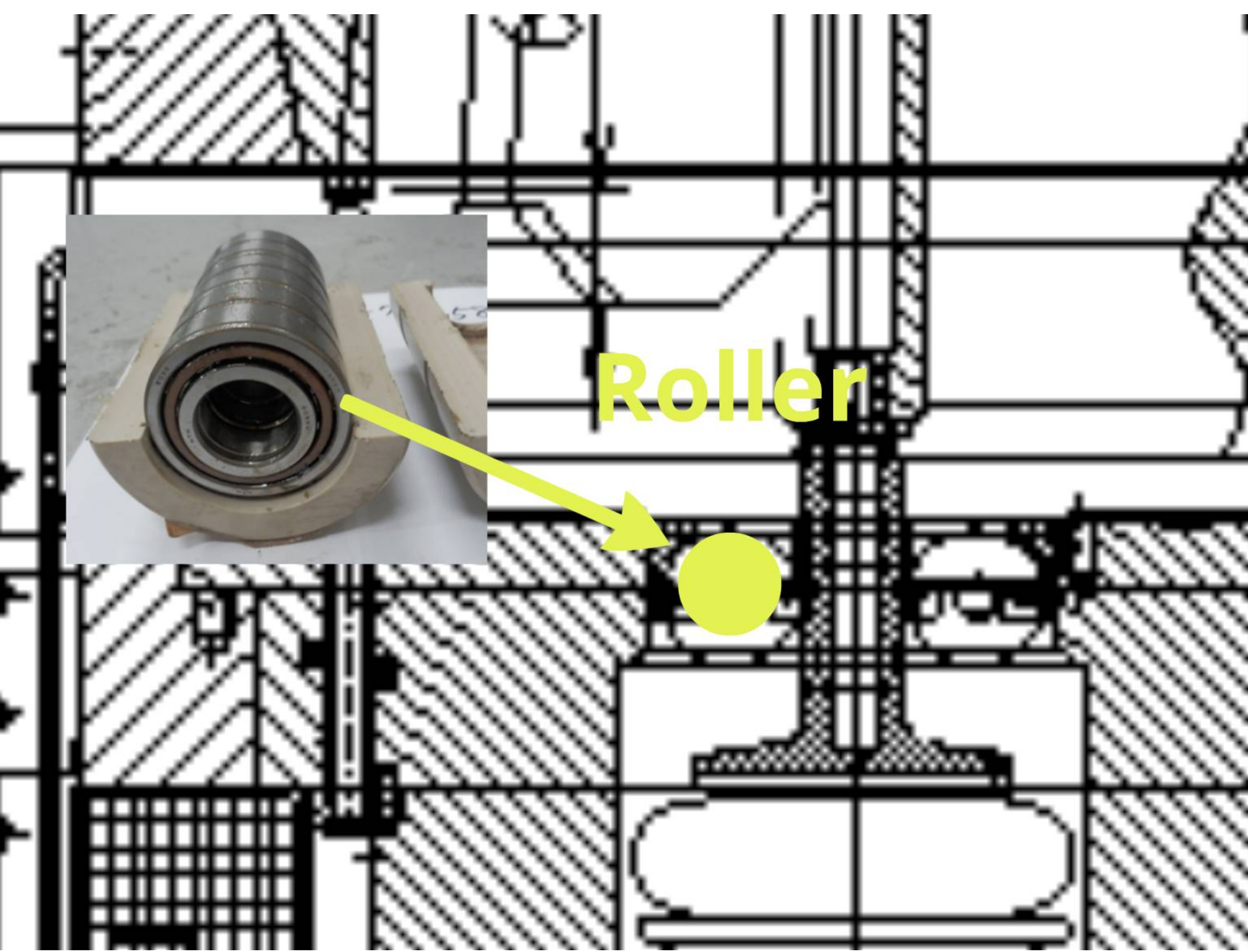
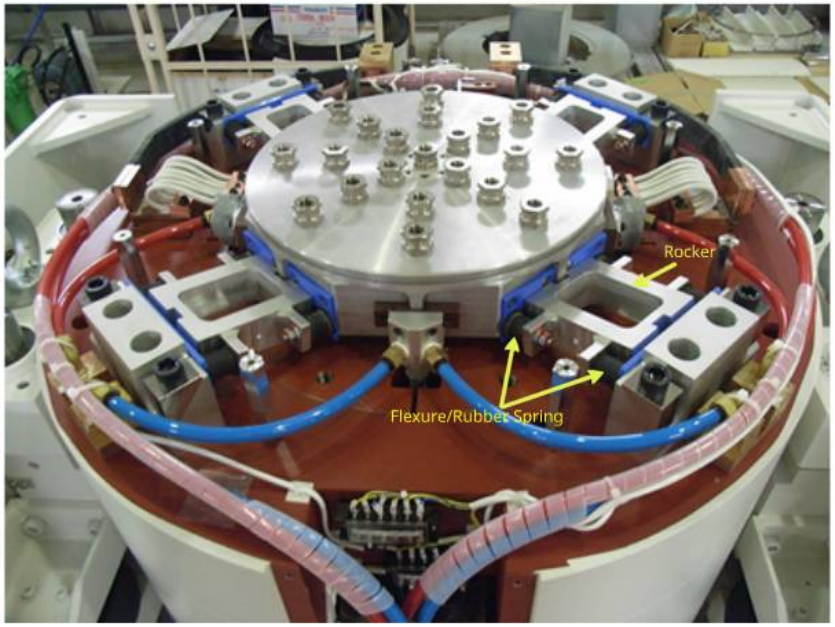
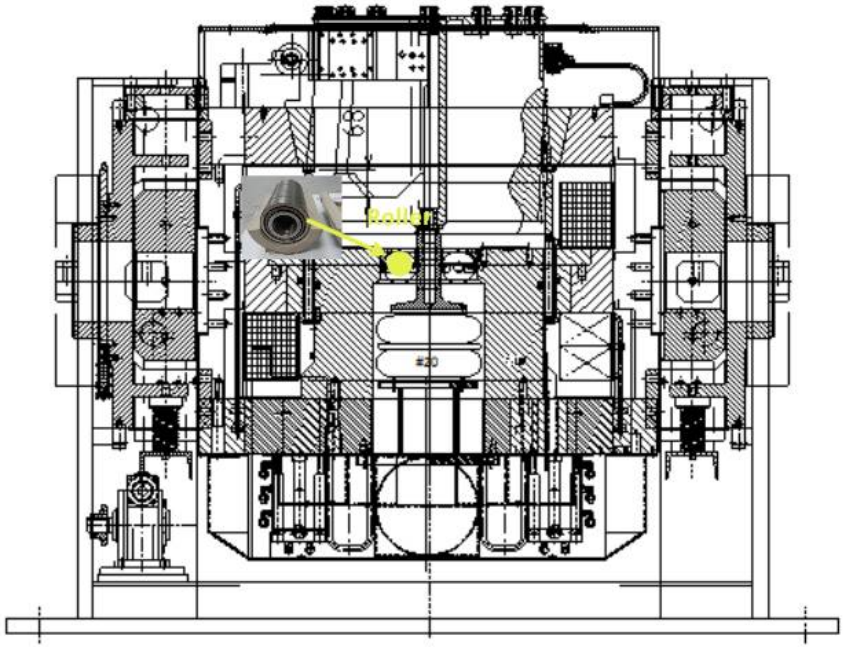

Roller
#30

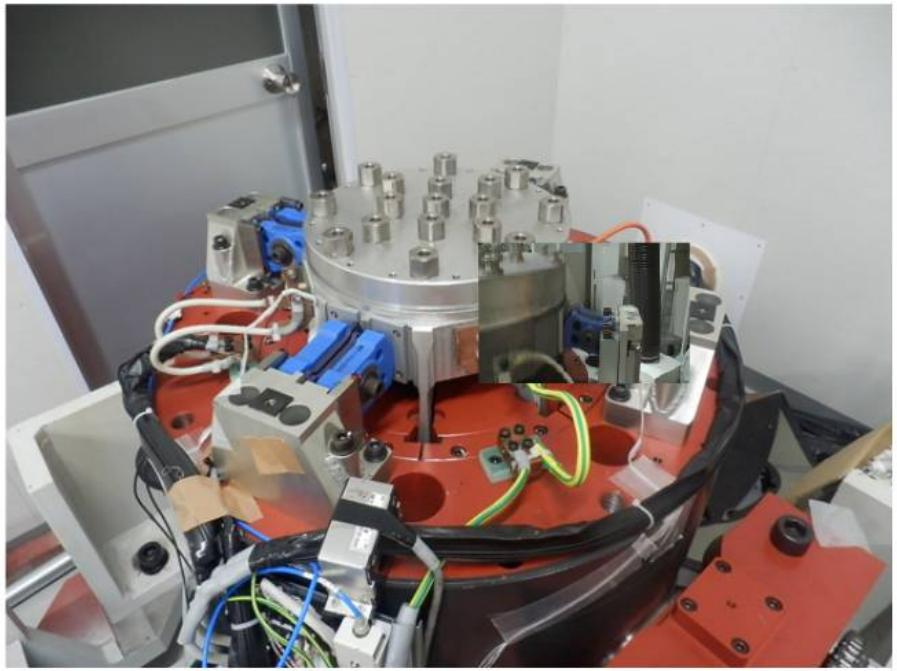

Roller

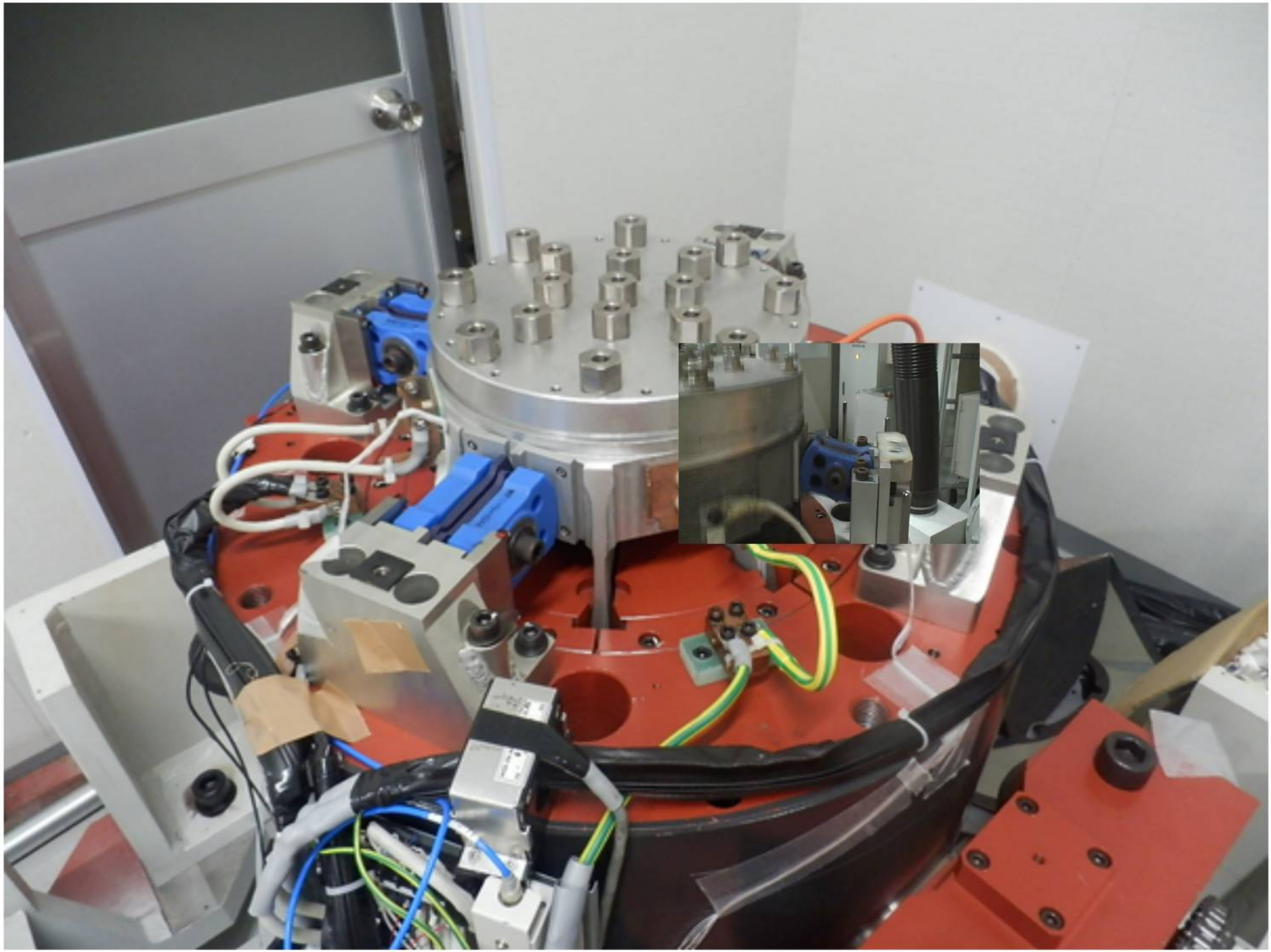
50 mm pk-pk

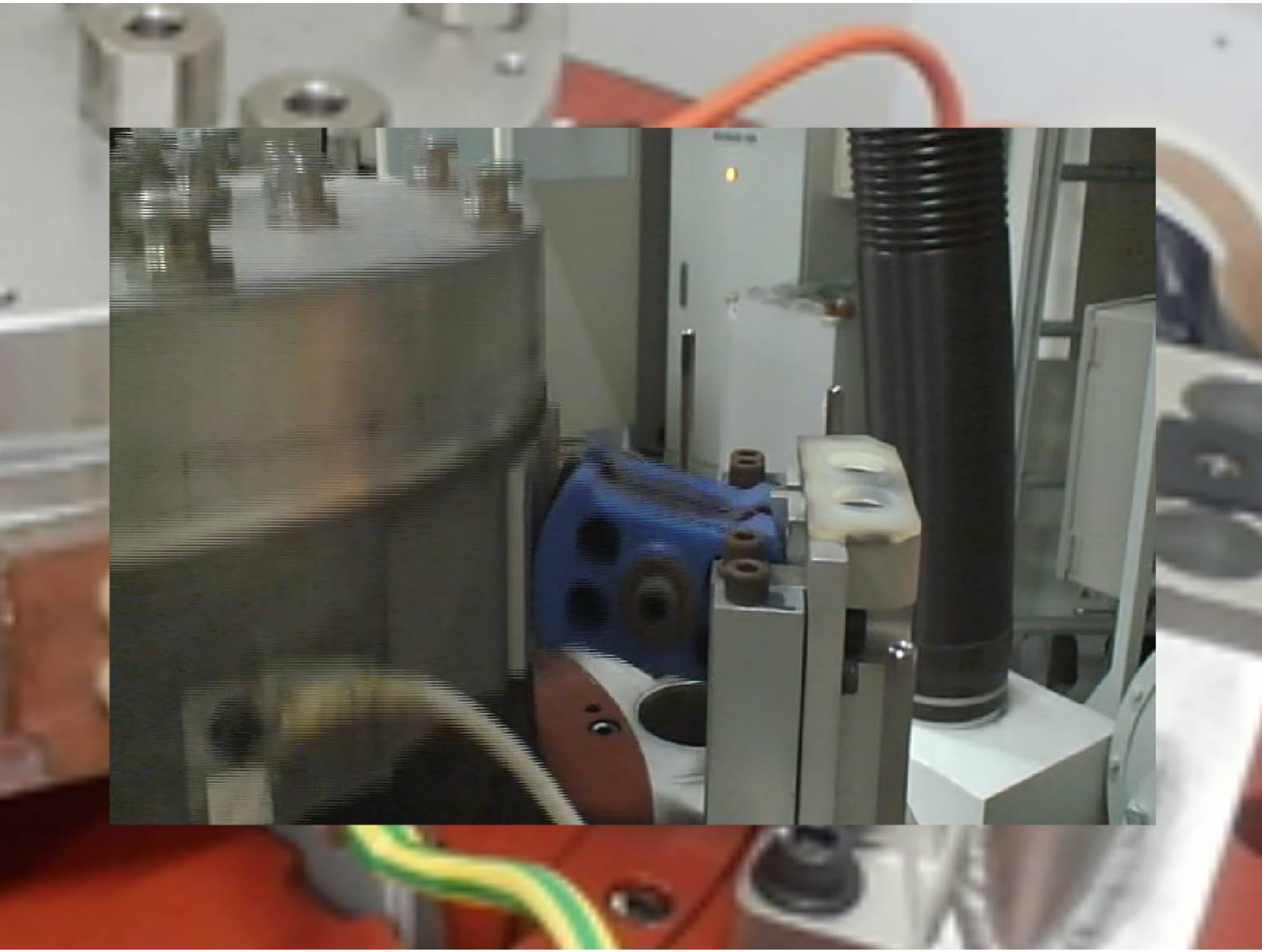


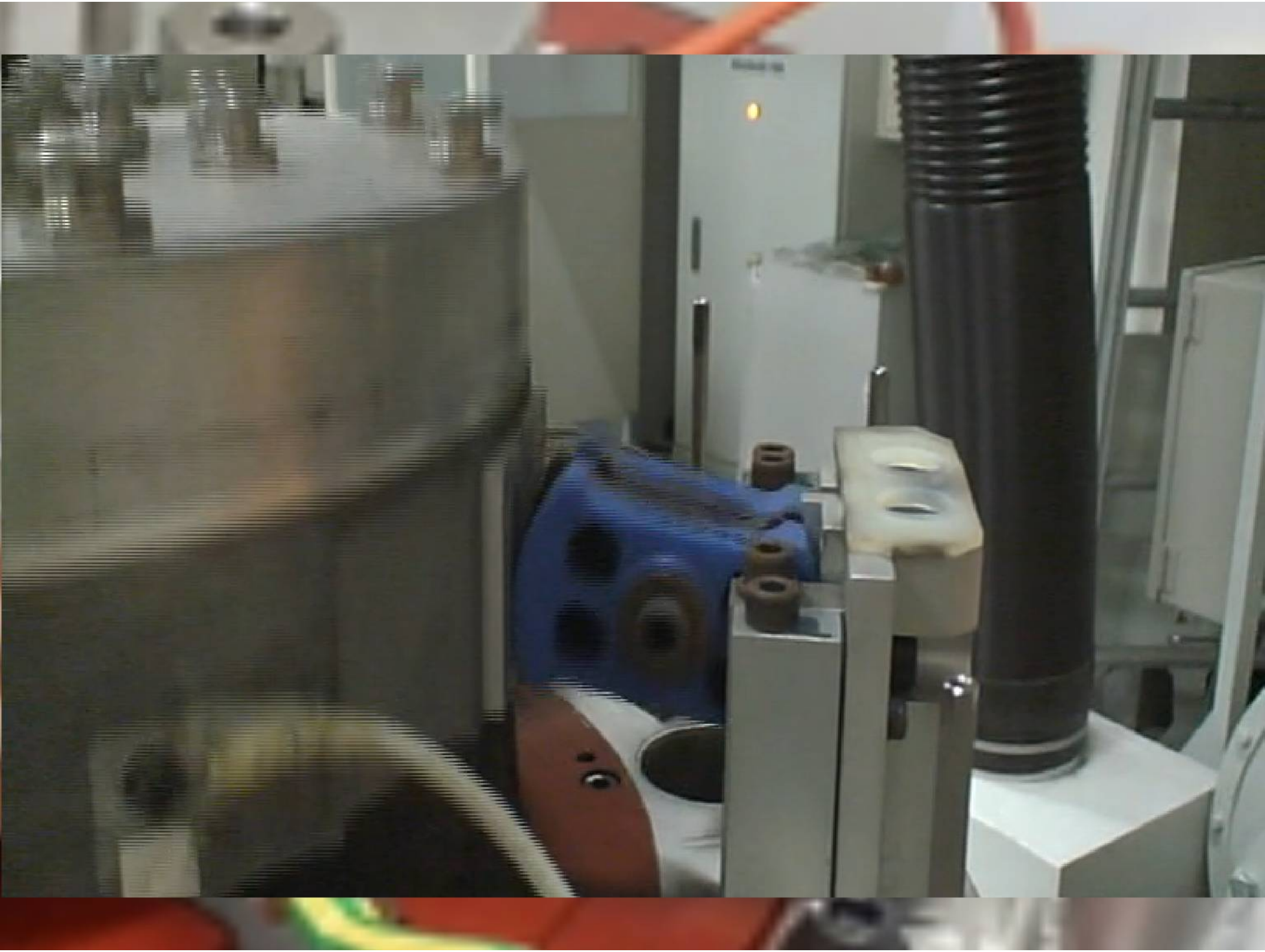


100 mm pk-pk

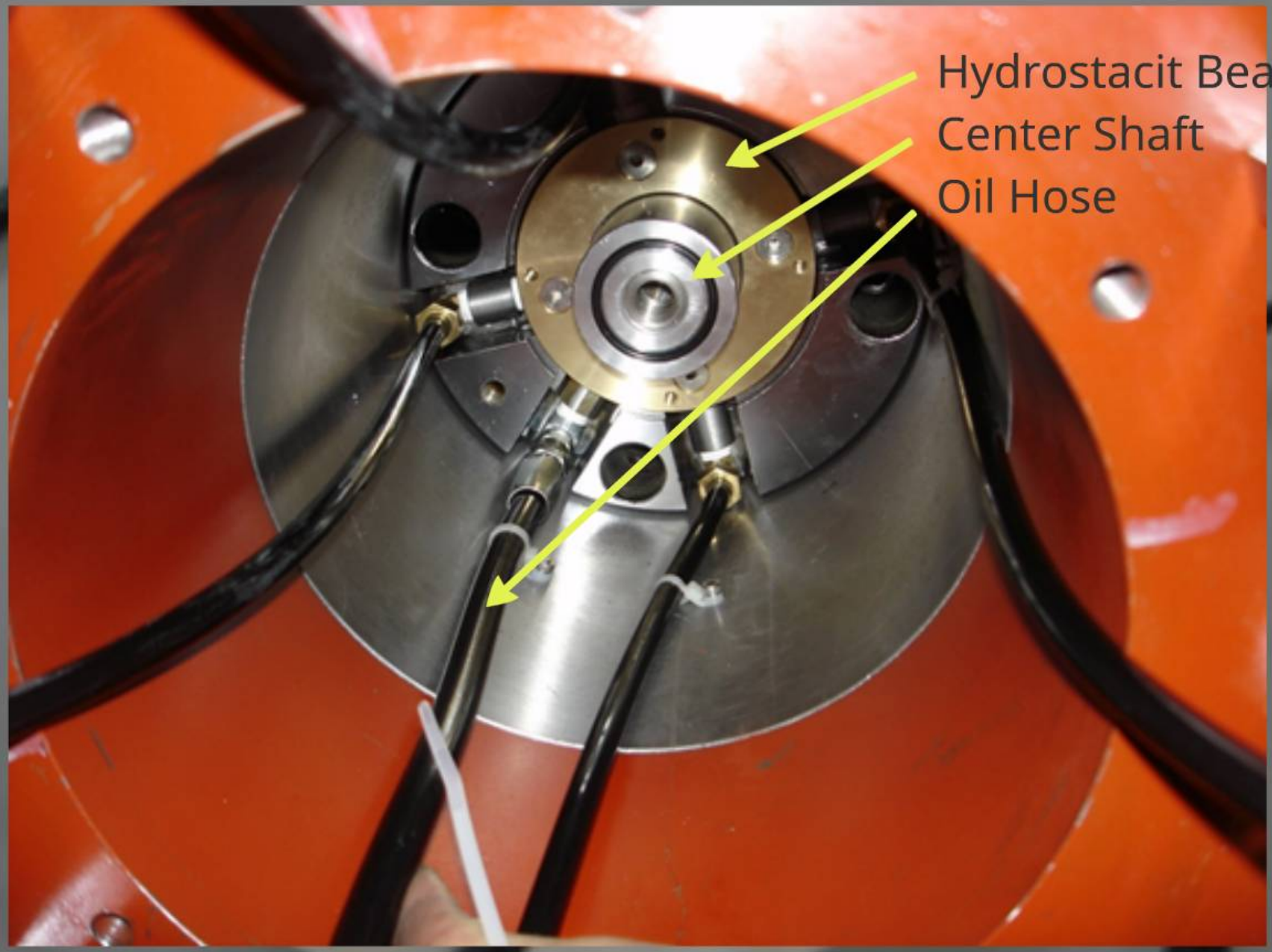









Hydrostacit Bearing
Center Shaft
Oil Hose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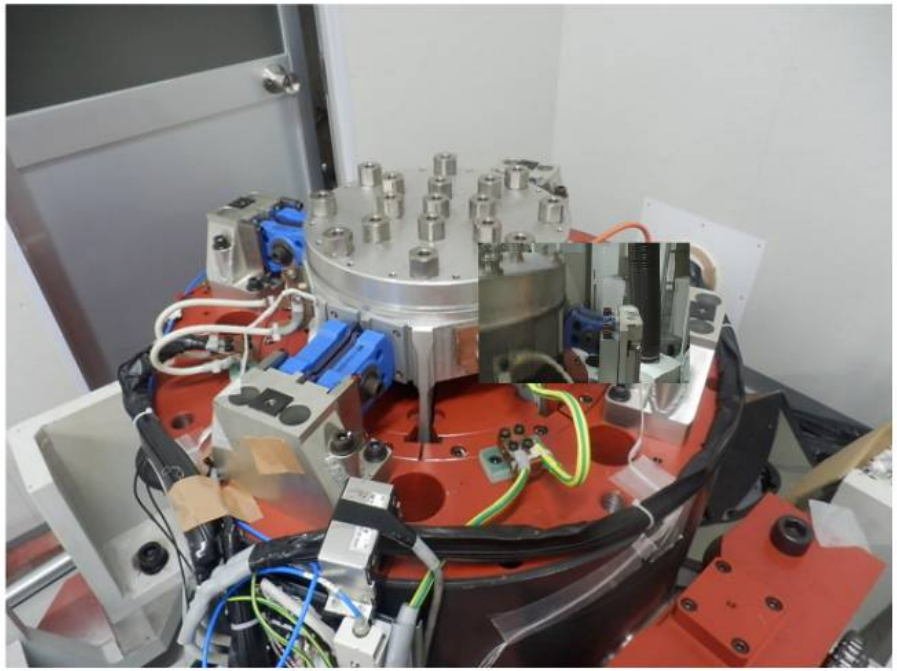
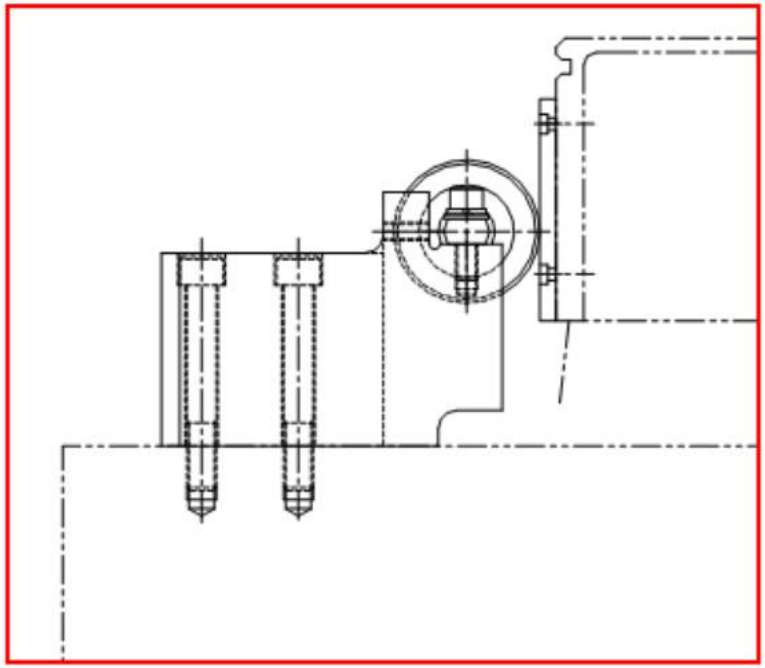
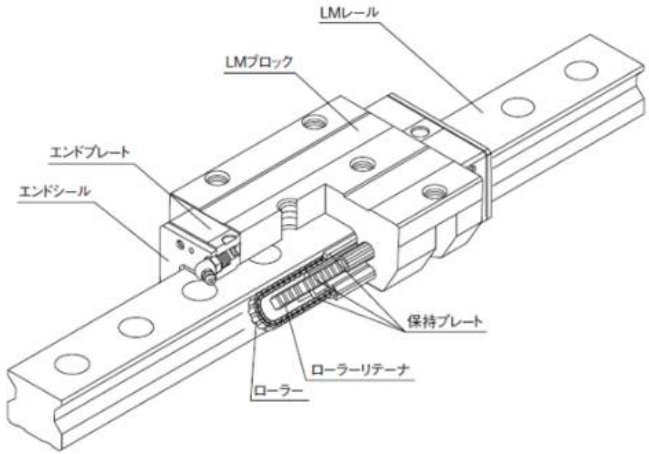
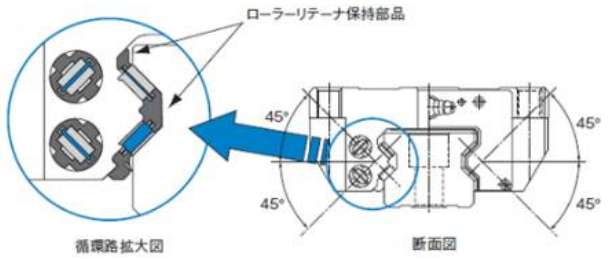
100 mm pk-pk



250 mm pk-pk




LMレール
LMブロック
エンドプレート
エンドシール
保持プレート
ローラーリテーナ
ローラー


ローラーリテーナ保持部品
45°
45°
45°
45°
循環路拡大図
断面図

Summary Mechanical

Uper Guidance

Bearing Type	Used for	Typical max displacement	Cross Acceleration	Overturning moment restrain	Main Advantage	Max Frequency
Flexure (ruber or spring)	Standard Shaker	50mmp-p	Low	Low	Low distotion	Over 2000Hz
PSG	Standard Shaker	100 mm pk-pk	Low	Middle	Low distotion	Over 2000Hz
Roller (bearing built-in)	Standard Shaker	250mmp-p	Middle	Middle	High reliability	2000Hz
Mechanical Linear Bearing	Long Stroke Shaker	Up to 250mmp-p	High	High	Long stroke and small size	500Hz

Lower Guidance

Bearing Type	Used for	Typical max displacement	Cross Acceleration	Overturning moment restrain	Main Advantage	Max Frequency
Roller (bearing built-in)	Standard Shaker	100mmp-p	Middle	Middle	Low distotion and high reliability	Over 2000Hz
Hydrostatic bearing	Standard Shaker (special used)	50mmp-p	Low	High	Low distotion and high overturning moment restrain	Over 2000Hz
Mechanical Linear Bearing	Long Stroke Shaker	250mmp-p	High	High	Long stroke and small size	500Hz
Nothing	Long Stroke Shaker	Up to 250mmp-p	-	-	Very long stroke	200Hz

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					size	

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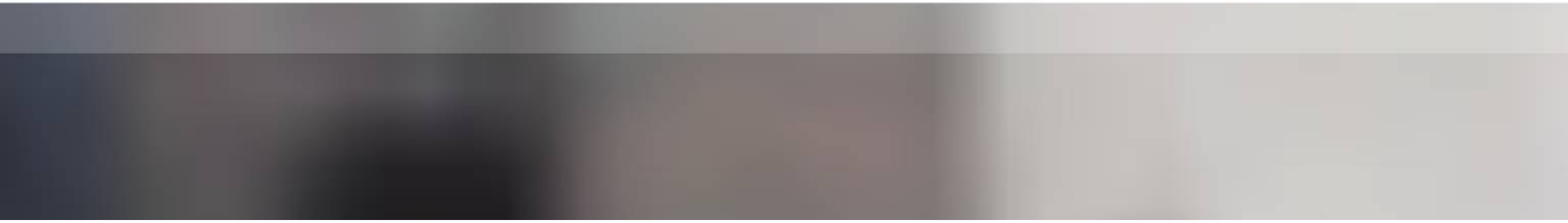
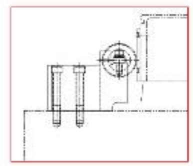
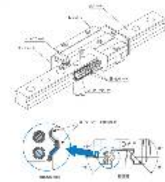


50 mm pk-pk

250 mm pk-pk





100 mm pk-pk

Summary Mechanical

Uper Guidance

[illegible]	[illegible]	Typical max displacement	[illegible]	Overturning moment restraint	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Standard Shaker	100 mm pk-pk	Low	Middle	Low distortion	Over 2000Hz
[illegible]	[illegible]	[illegible]	Middle	Middle	[illegible]	[illegible]
Mechanical Linear Bearing	Long Stroke Shaker	[illegible]	High	High	[illegible]	[illegible]

Lower Guidance

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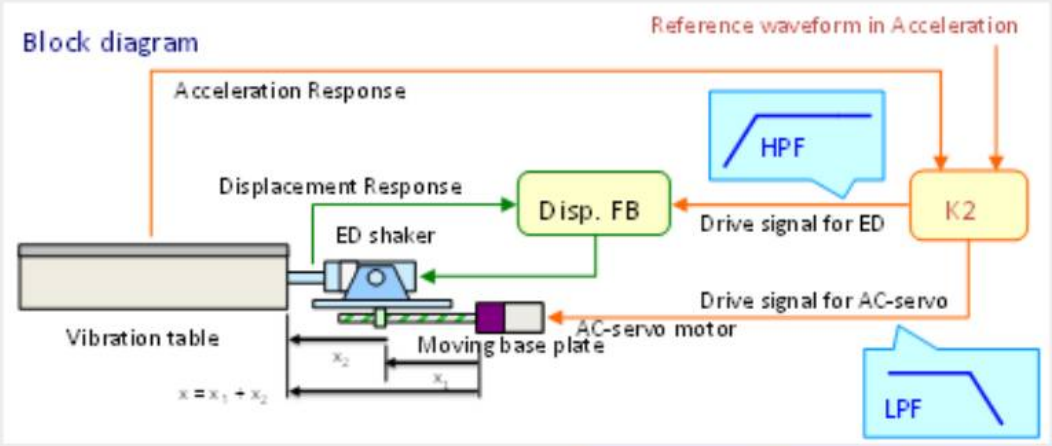
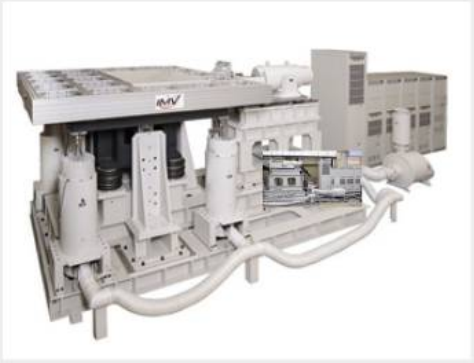
[illegible]	[illegible]	[illegible]	-	-	[illegible]	[illegible]

Applications

Application	Shaker type	Structure	Typical Displacement	Typical max. Frequency	memo
Earthquake test	ED Shaker	Single Yoke Type	300mmp-p	100 Hz	Big Flux Density
	Hybrid ED Shaker	Servo motor + ED Shaker	600mmp-p	100Hz	Big Flux Density
	Servo Hydraulic	Servo valve	600mmp-p	50 Hz	
Rough Road test on the vehicle	ED Shaker	Single Yoke Type	250mmp-p	200 Hz	Big Flux Density
	Servo Hydraulic	Servo valve	250mmp-p	50 Hz	
Air bag test	ED Shaker	Duble yoke type	800mmp-p	Only use shock test	Small Flux Density, big amplifie

Hybrid #1 600 mm pk-pk





Direction		Horizontal	Vertical
Frequency		0.1~200 Hz	0.1~200 Hz
Force	Sine	8.0 kN	24.0 kN
	Shock	20.0 kN	36.0 kN
Acceleration without load	Sine	8.0 m/s²	12.0 m/s²
	Shock	20.0 m/s²	18.0 m/s²
Velocity		1.0 m/s	0.7 m/s
Displacement		600 mm p-p	200 mm p-p
Table size, Payload		2500 mm x 2500 mm, 1500kg	


We introduce IMV's advanced Earthquake resistance test system
which has used new technology.
Here is the simulation scene of the Southern Hyogo Earthquake
which happened on January 17th, 1995.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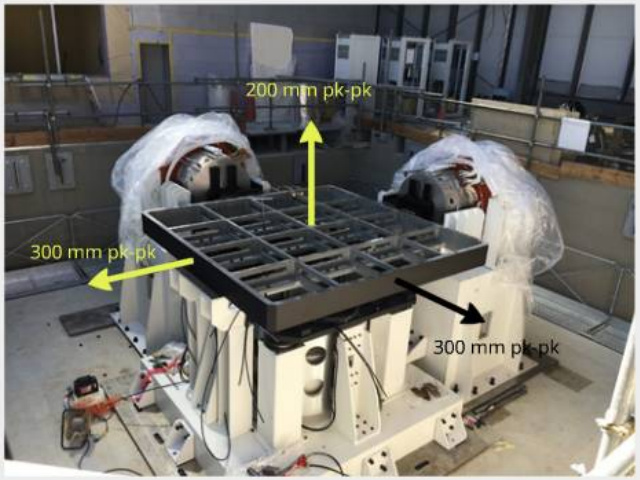
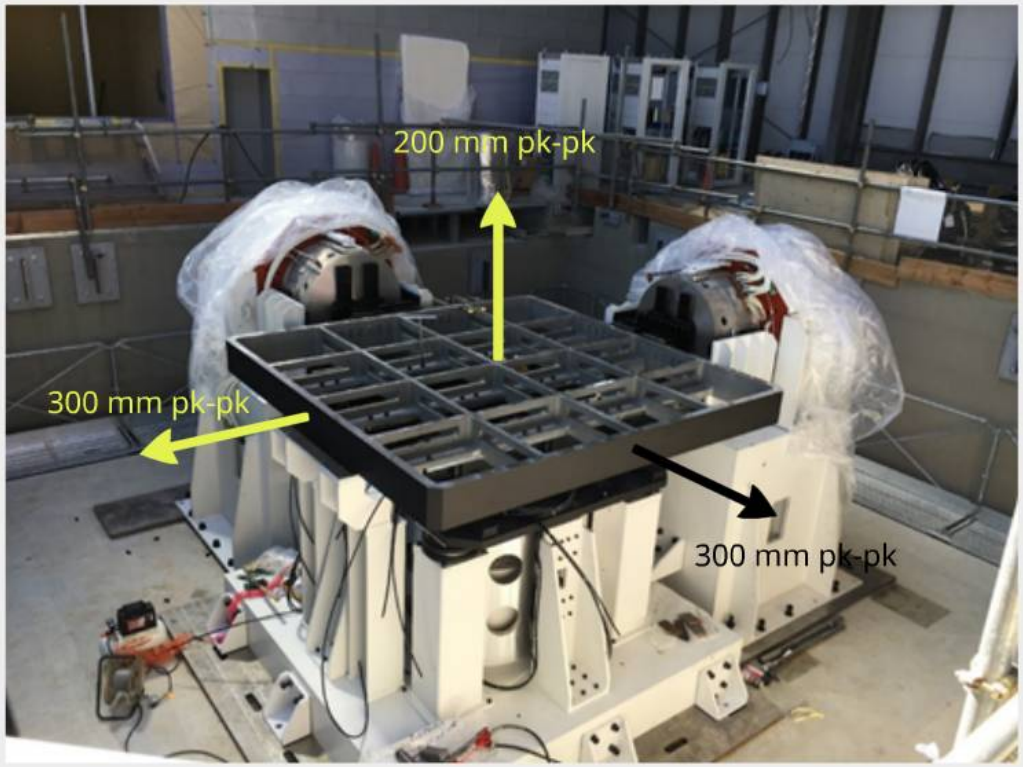
3D LS 300/200 mm pk-pk



TS-16000-25L	
Rated Force (Shock)	160,000 N peak
Usable Frequency Range	0.5 – 100 Hz
Maximum Acceleration	40 m/s^2 peak (Shock)
Maximum Velocity	1.5 m/s peak (Shock)
Maximum Displacement	X & Y axis 300 mm peak-peak Z axis 200 mm peak-peak
Mass of Moving Element	X & Y axis 2,400 kg Z axis 3,700 kg
Table Size	2,500mm X 2,500 mm
Maximum Payload	2,500 kg

3D ES 300/200 mm pk-pk



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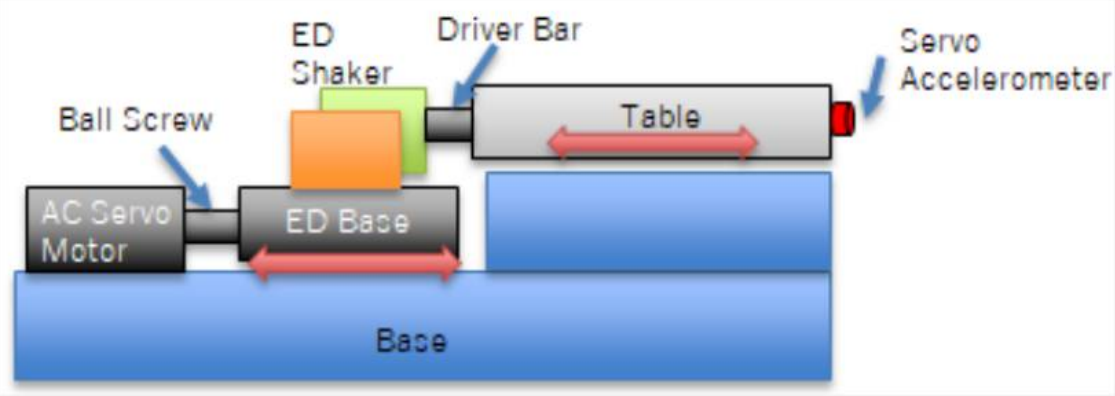
Hybrid #2 700 mm pk-pk

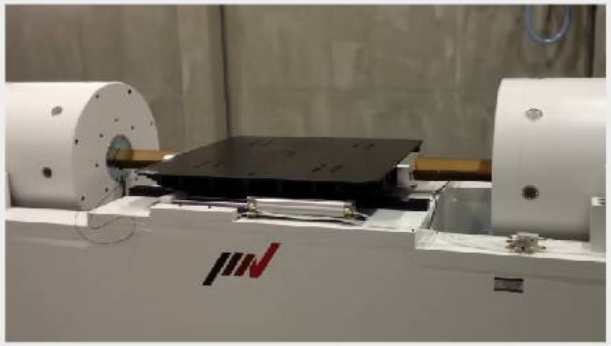


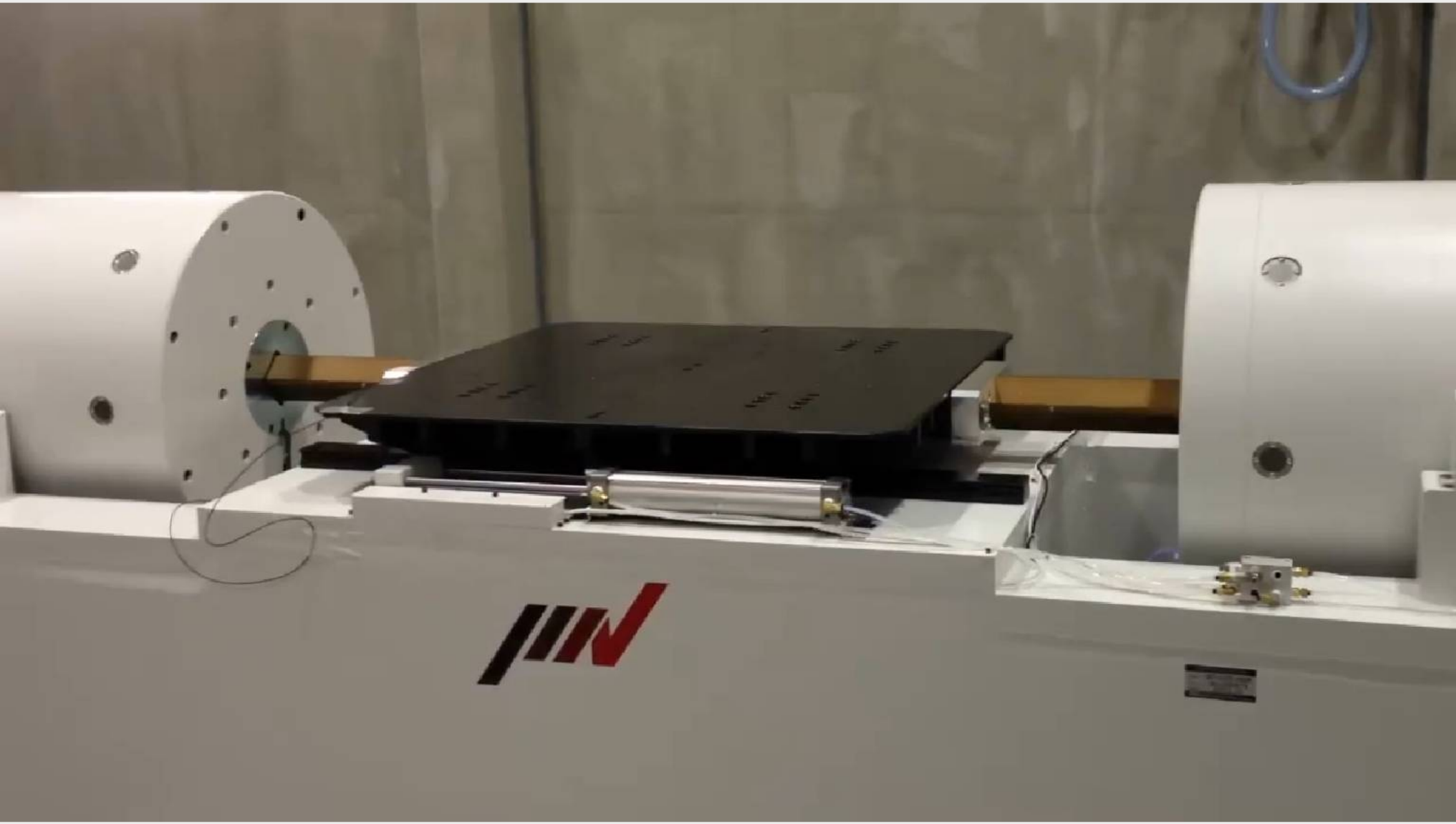
0.1 Hz – 1 Hz : AC Servo Motor(600mmp-p stroke)
1 Hz – 200 Hz : ED Shaker(250mmp-p stroke)

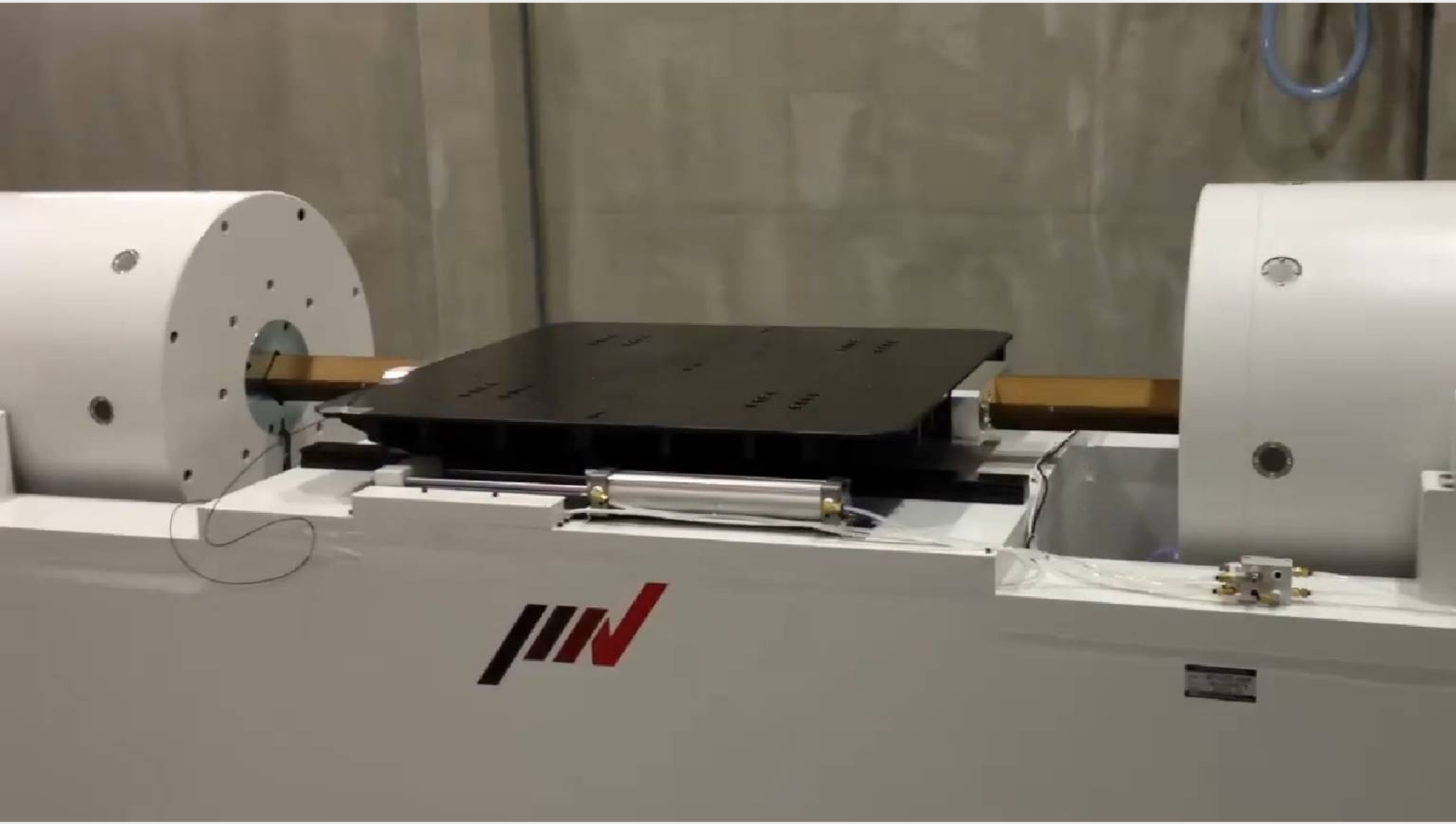
CVL-14000-30X20L	
Rated Force (Sine)	70,000 N
Rated Force (Shock)	140,000 N peak
Usable Frequency Range	0.1 – 200 Hz
Maximum Acceleration	10 m/s^2 (Sine) 20 m/s^2 peak (Shock)
Maximum Velocity	1.0 m/s (Sine) 1.5 m/s peak (Shock)
Maximum Displacement	700 mm peak-peak
Mass of Moving Element	2,300 kg
Table Size	3,000 (Exciting Direction) X 2 000 mm
Maximum Payload	5,000 kg

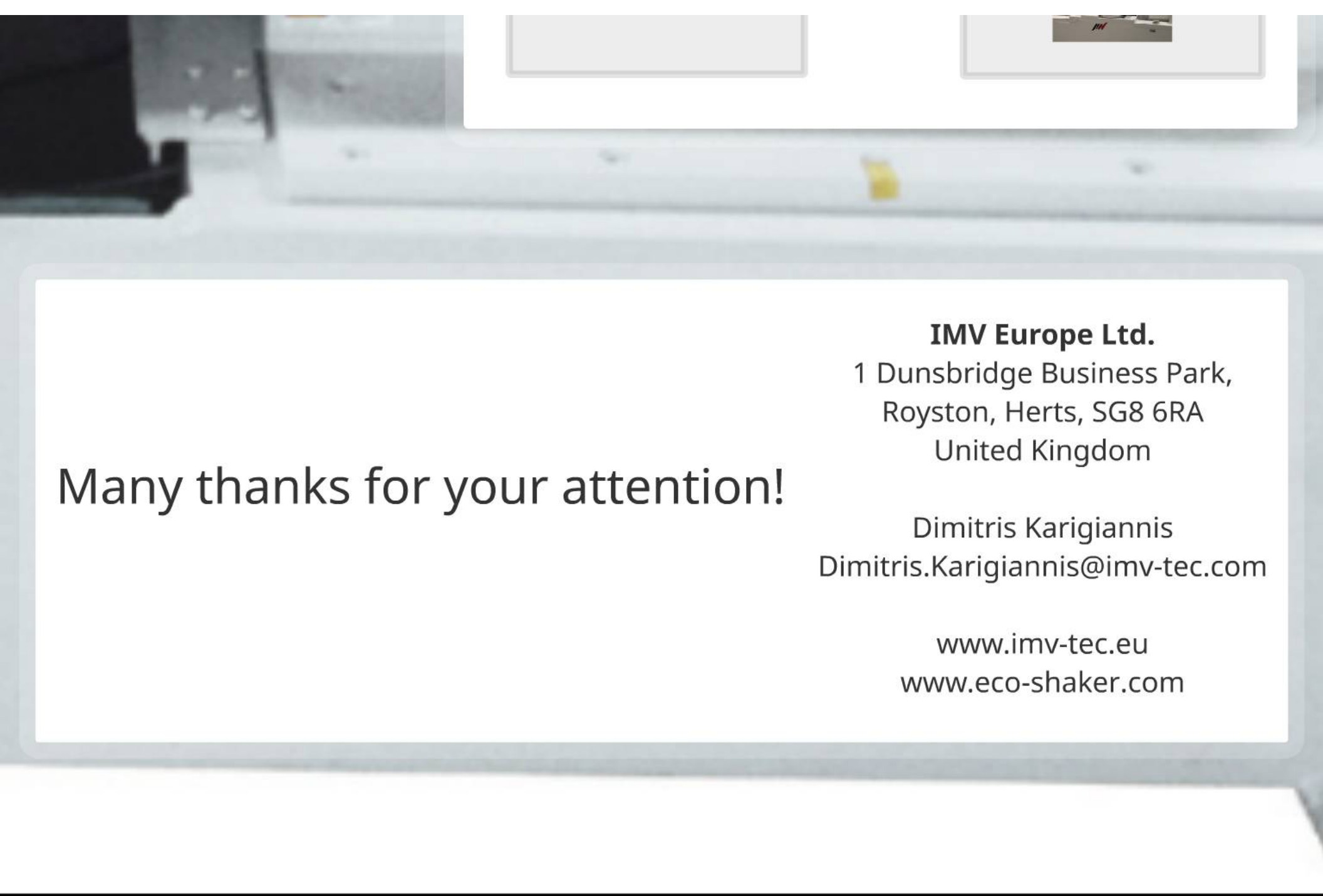
Schock-Test 600 mm pk-pk

VDS-6000-600H	
Rated Force (Shock)	58,800 N peak
Maximum Acceleration	326 m/s^2 peak (Shock)
Maximum Velocity	6 m/s peak (Shock)
Maximum Displacement	600 mm peak-peak
Mass of Moving Element	180 kg
Table Size	1,000mm X 1,000 mm
Maximum Payload	500 kg









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