

# Vibration Test System TV 59416/AIT-590

## DESCRIPTION

TIRA water-cooled shakers are hydrostatically guided and cooled down by an closed-loop water cooling system. The external cooling unit also provides the guidance lubricant for the single hydrostatic bearing which enables low axial stiffness. Water-cooled vibration test systems have the advantage of generating very high forces to test heavy payloads at high acceleration. Payloads of up to 1300 kg (2866 lb) are possible.

TIRA shakers are designed for long-time operation. They are distinguished by their high transverse vibration strength and high axial stiffness. The electrodynamic shaker stands out for its rugged design and high stiffness. It is pivotally mounted and can be operated in horizontal and vertical direction.

A built-in automatic, pneumatic operated load compensation system allows the realization of the nominal vibration displacement, even with heavy test loads.

TIRA's "AIT" system is a vibration isolation unit integrated in the frame for guiding the shaker horizontally and vertically. At low frequencies it guarantees the optimum vibration isolation as well as an exact guidance of the shaker body in the direction of excitation.

TIRA shakers, amplifiers and vibration control systems represent a complete test system offering the users the possibility to establish proof of the quality of their products according to national and international standards (such as DIN, ISO, BS, MIL, IEC, ASTM). Shakers with higher force on request available.



## AMPLIFIER A 5 85 3 293

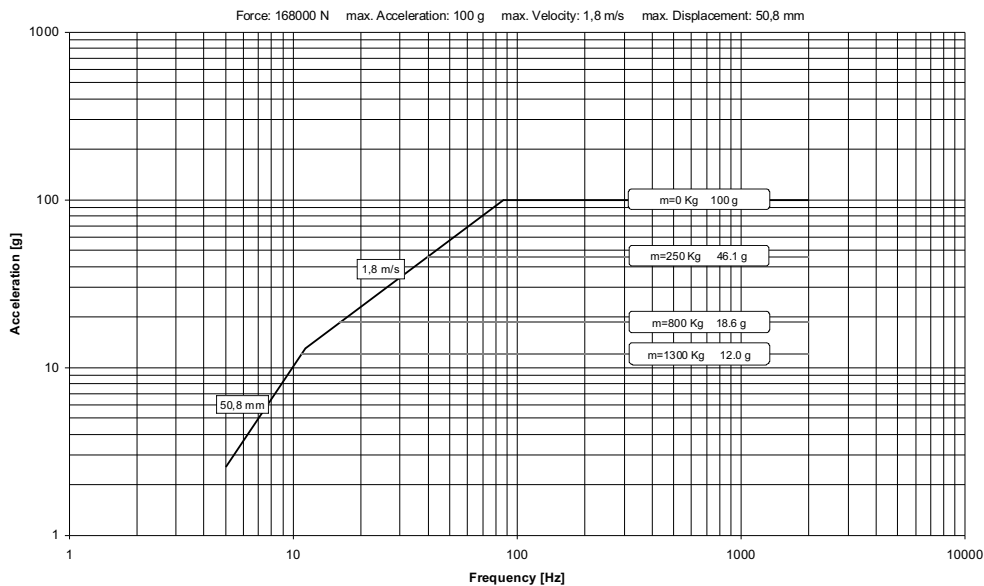
KVA ratings	293000 VA
Frequency range	DC - 4 kHz
Voltage, max.	150 V
Current, max.	1950 A
Load resistance	1 Ohm
Input voltage	2.5/5/10 V
Distortion	< 0.7 %
Signal to noise ratio	> 90 dB
Field voltage, max.	240 V
Field current, max.	355 A
Weight	2900 kg (6393.4 lb)
Size (WxHxD)	2800 x 2400 x 1000 mm (110.2 x 94.5 x 39.4 in)

# TECHNICAL SPECIFICATION VIBRATION GENERATOR S 59416/AIT-590

Rated peak force (N   lbf)	Sine/Random/Shock	168000/168000/336000	37768/37768/75536
Frequency range (Hz)		5-2000	5-2000
Max. rated travel (mm   inch)	Pk-Pk	50.8	2.0
Max. velocity (m/sec   inch/sec)	Sine/Random/Shock	1.8/1.8/2.5	71/71/98
Max. acceleration (g)	Sine/Random/Shock	100/100/250	100/100/250
Rated current (A)		1800	1800
Nominal impedance (Ohm)		0.03	0.03
Suspension stiffness (N/mm   lbf/inch)		70	399.7
Max. weight tested (kg   lb)		1300 (7 bar)	2866 (102 psi)
Effective moving mass (kg   lb)		122	269
Main resonance frequency (Hz)		1800	1800
Weight with/without trunnion (kg   lb)		8450/6200	18629/13669
Stray magnetic field (mT)	without/with degauss kit	<20 / <1	<20 / <1
Armature (ø/mm   ø/inch)		590	23.2
Interlocks	Temperature, overtravel, overcurrent, compressed air, water flow rate, water pressure		

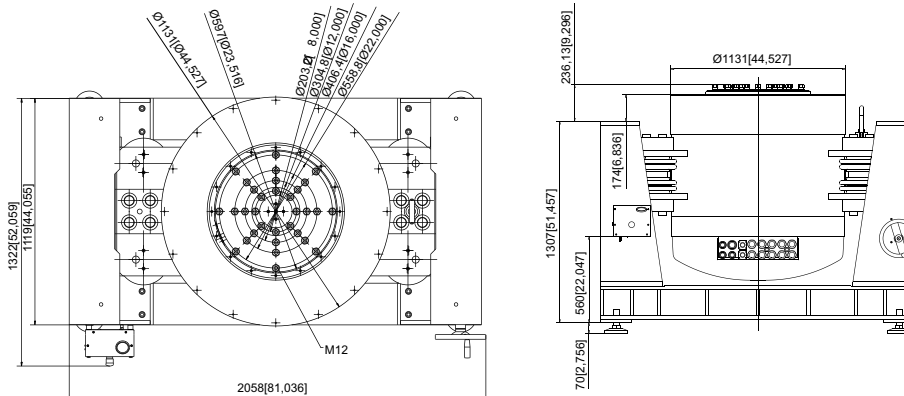
## PERFORMANCE DIAGRAM

### System Performance TV 59416AIT-590



## DIMENSIONS (mm/inch)

S 59416/AIT-590 (Example drawing)



Subject to modifications

## TECHNICAL SPECIFICATION COOLING UNIT C 59416

<b>Environmental conditions:</b>	
Temperature	5 - 30 °C (41 - 86 °F)
Relative humidity	10 - 80 %
Energy transfer	max. 3 KW
<b>Electric energy:</b>	
Electric supply	3~N 400 V, 60 Hz
Connection	CEE-Connector 16 A
Fuse	K 16 A
<b>Process water:</b>	
Temperature	5 - 30 °C (41 - 86 °F)
Volume flow at max. supply temperature	14 m³/h (8.25 ft³/min)
Working pressure: Supply - static	8 bar ( 800 kPa)
Working pressure: Dynamic differential pressure	3 bar ( 300 kPa)
Cooling load	max. 160 kW
Nominal width of supply pipes	40 mm (1.57 inch)
Connections	R 1 1/2 female
pH-value	7 ±1
Dimensions of dirt particles	<25 µm
Water hardness (total/carbonate)	<8 °dH / <5 °dH

## DESCRIPTION

The cooling aggregate includes for the water-cooled 168kN shaker the complete primary circuit of shaker cooling system and the hydraulics of the shaker's hydrostatic bearing. The unit is designed as a mobile compact device and should be preferably placed next to the amplifier rack.

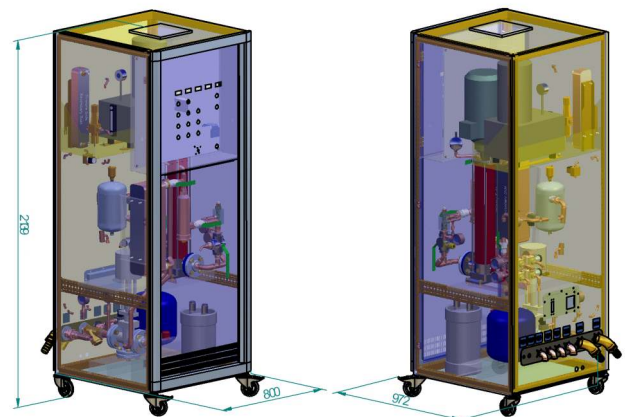
The primary circuit of the cooling unit is for functional reasons based on deionised water. The extraction of the heat capacity is carried out by a secondary process water circuit, which is provided by customer. All necessary elements for energy extraction are involved into the device. In order to achieve a good supervision of circuits there are pressure gauges and flow indicators at many positions available. The device includes an own control circuit based on Siemens-SPS. The control elements and indicators are placed at the front panel. This control works through signal link-ups in cooperation with the superordinated shaker control.

The front and side walls are designed with swing doors to ensure a good accessibility to all built-in components.

Medium connections are placed at the lower part of the rear panel. The process water connection should be realised with hoses of at least 3 m length to maintain local mobility of the unit for maintenance and service. The connection lines to the shaker – there are 3 x supply lines and 1 x return line cooling circuit, 1 x supply line and 1 x return line hydraulic circuit – are accomplished by hoses of 5 m length and shaker dockable, on both ends free from leakage self-sealing-couplings. Electrical connection with 5 m cables is available. Signal link-up is protected with a cable of the same length in the electric cabinet of the shaker.



Weight 600 kg (1323 lb)



Dimensions WxHxD: 800x2139x972 mm (31.5x84.2x38.3 inch)

Subject to modifications