

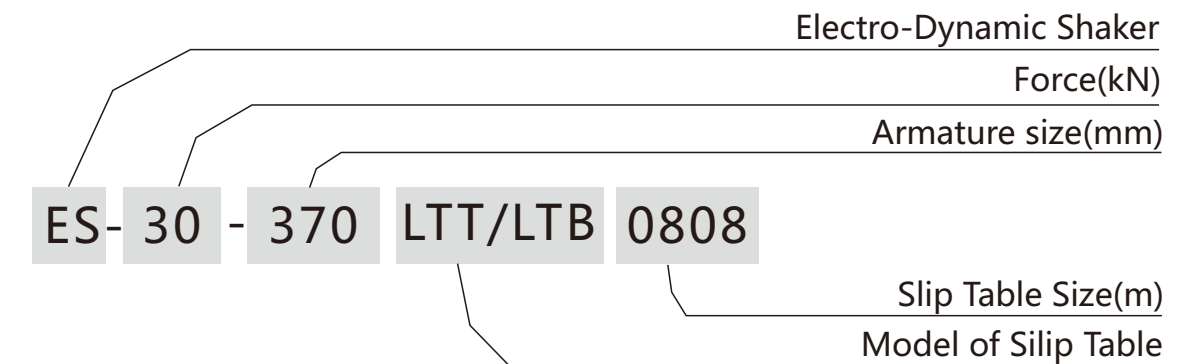
Company Profile

In past 20 years nearly, Dongling's development attracts the attention all of world, and has come to the forefront of the global research and development, technology, production and marketing of test equipments, and shows its own strength on a number of national projects.

Today, Dongling have achieved considerable progress in environmental testing, reliability testing, fatigue testing, and strength testing for nearly 300 products, with product technologies and standards at or close to the highest international level. Products and services are widely used in aerospace, aviation, ship buildings, weapons, cars, rail transit, electronics, and civilian areas, etc. Dongling has become a leading supplier and service provider of domestic and international test equipment and integrated solutions.



System Model



Test condition and Standard choice methods of Vibration device

To select vibration device, the most important thing is to set proper needed force during the test process. The test required force can be decided on the basis of the following test condition setting and the calculated force value.

1. Setting up test condition

- Frequency and frequency range
- Max. Acceleration
- Max. P-P displacement
- Max. Velocity
- Weight of Specimen and fixture
- Assumed value of fixture weight m_1 (kg)
Taking into consideration of the tested specimen, weight of the fixture and vibration performance, choose the best fixture from the fixture list. Take the weight of the fixture as the assumed value. (Need negotiation for special specification)
- Assumed value of armature weight m_0 (kg)
Choose from the series list. Take the weight of the armature as the assumed value.

2. Calculation of the force

Figure out the required force under vibration test condition according to the following formula.

Formula of force F

$$F = (m_0 + m_1 + m_2) \times a$$

F : Force (N)
A : Acceleration
 m_0 : Weight of armature
 m_1 : Weight of fixture
 m_2 : Weight of specimen

E.g.: If the weight of the armature $m_0=30\text{kg}$, weight of the fixture $m_1=45\text{kg}$, weight of the specimen $m_2=35\text{kg}$, maximum acceleration $a=98.0\text{m/s}^2$ and the model of test device is ES-30-370LTT/LTB0808, then the test required force would be:

$$F = (30\text{kg} + 45\text{kg} + 35\text{kg}) \times 98.0\text{m/s}^2 = 10780\text{N}$$

This value is the minimum force. The actual required force would be 1.2~1.3 times more, so it needs $10780\text{N} \times 1.3 = 14014\text{N}$ or above force.

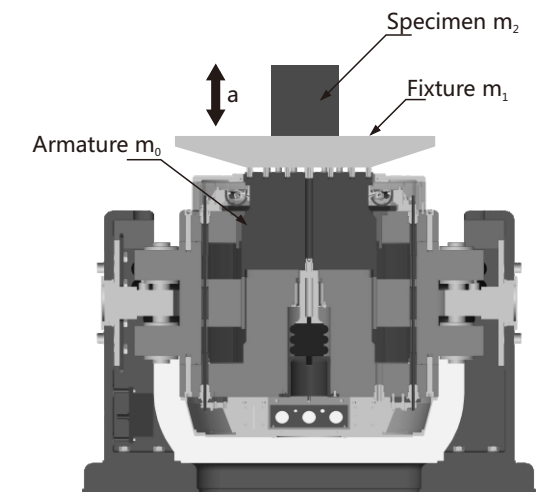
3. Selection of the vibration test device

According to the previous calculation, F-15000BD/LA16AP vibration test device would be a proper choice. Check the following items of the selected vibration test device.

Specification of vibration test device

- Frequency range
- Max. Acceleration
- Max. P-P displacement
- Max. Velocity

Choose the corresponding vibration test device if it can meet the specification of the test condition. If there are some parts that surpass the maximum capacity of the device, choose the test device that can meet the test condition firstly, then calculate the force on the basis of this.



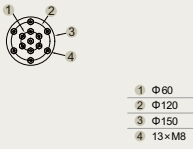
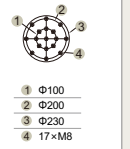
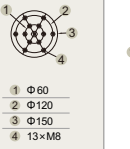
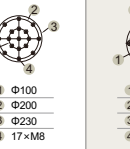
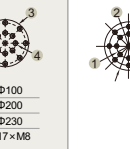
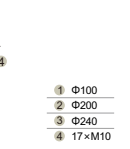
Electro-dynamic Vibration Test System

Air Cooled Series

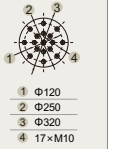
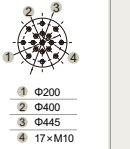
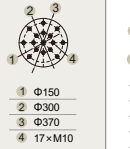
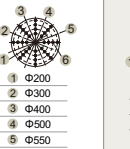
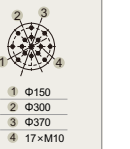
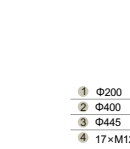
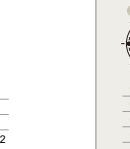
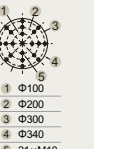
The air-cooled series electro-dynamic vibration test system has the advantages such as wide frequency range, excellent indicators, high reliability, small floor space, easy to move, and easy to operate. At present, this series has a variety of models of vibration generators to choose. The exciting force range is from 1 kN to 70 kN and maximum load is from 70 kg to 1000 kg. Also, the climate and mechanics environmental testing equipments are provided.

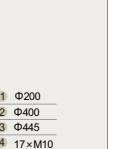
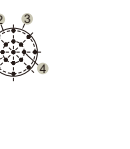
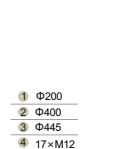
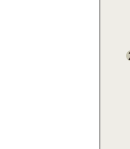
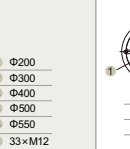
Performance Characteristics

- Sinusoidal excitation force range: 1kN ~ 70kN
- Random to sinusoidal excitation force ratio 1:1
- Two-times-of-sine shock force (Three times optional)
- Displacement peak-to-peak value of 25mm, 40mm, 51mm, 76mm or 100mm
- Lightweight armature with optimized design and strong vibration-resistant performance, better vibration isolation effect of air spring at trunnion position
- Strong bearing capacity of air spring in central room, and good low-frequency performance
- Double magnetic circuit design, with low flux leakage and uniform magnetic field
- Sine, Random and Shock etc. test function
 - Good cooling effect and low noise fan

System model	ES-1-150	ES-1.5-150	ES-2-150	ES-2-230	ES-3-150	ES-3-230	ES-6-230	ES-10-240	ES-10d-240
									
Rated sine/random force (kN)	1	1.5	2	2	3	3	6	10	10
Shock force (kN)	2	3	4	4	6	6	12	20	20
Frequency range (Hz)	DC-4500	DC-4500	DC-4000	DC-2500	DC-4000	DC-2500	DC-3500	DC-3000	DC-5000
Max.acceleration (m/s²)	500	750	1000	250	1000	350	1000	1000	1000
Max. velocity (m/s)	2	2	2	1.5	2	1.5	1.8	1.8	1.8
Max.displacement (mm)	25	25	25	40	25	40	51	51	51
Max. load (kg)	70	70	70	140	120	140	300	300	300
Shaker model	ET-1-150	ET-1.5-150	ET-2-150	ET-2-230	ET-3-150	ET-3-230	ET-6-230	ET-10-240	ET-10d-240
Mass of moving elements (kg)	2	2	2	8	3	8.5	6	10	10
Armature diameter (mm)	150	150	150	230	150	230	230	240	240
Weight (kg)	About 395	About 395	About 395	About 430	About 480	About 430	About 590	About 900	About 900
Body suspension natural frequency (Hz)	3	3	3	3	3	3	3	2.5	2.5
Dimension (L×W×H:mm)	696×530×653			764×530×698			826×530×720	1046×660×783	980×600×813
Power amplifier model	SDA-1	SDA-1.5	SDA-2	SDA-2	SDA-3	SDA-3	SDA-6	SDA-10	SDA-10
Power (kVA)	1	1.5	2	2	3	3	6	10	13.2
Power supply requirement (kVA)	4	4.5	5.5	5.5	6.5	6.5	16	21	23
Weight (kg)	About 160	About 160	About 200	About 200	About 200	About 200	About 240	About 400	About 400
Dimension (L×W×H:mm)	607×820×1465								
Cooling type	Air cooled								
Blower model (kW)	B-200	B-200	B-200	B-200	B-200	B-200	B-1000	B-1000	B-1000
Power (kVA)	0.75	0.75	0.75	0.75	0.75	0.75	4	4	4
Air flow (m³/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.33	0.33	0.33
Air pressure (kPa)	1	1	1	1	1	1	3.5	3.5	3.5
Weight(kg)	30	30	30	30	30	30	115	115	115

Optional accessories • Slip table • Head expander • Movable device • Temperature Chamber • Fixture • Sensor • OPCS • MPCS • RMT • Auto rotation mechanism • Vibration controller

System model	ES-20-320	ES-20-445	ES-30-370	ES-30-550	ES-40-370	ES-40-445	ES-50-445	ES-60-445	ES-20LS3-340
									
Rated sine/random force (kN)	20	20	30	30	40	40	50	60	20
Shock force (kN)	40/60*	40/60*	60/90*	60/90*	80/120*	80/120*	100/150*	120/180*	40/60*
Frequency range (Hz)	DC-3000	DC-2800	DC-2800	DC-2000	DC-2800	DC-2700	DC-2700	DC-2700	DC-3000
Max.acceleration (m/s²)	1000	700	1000	500	1300	800	1000	1000	800
Max. velocity (m/s)	2/2.5*	2/2.5*	2/2.5*	2/2.5*	2/2.5*	2/2.5*	2/2.5*	2/2.5*	2/2.5*
Max.displacement (mm)	51	51	51	51	51	51	51	51	76
Max. load (kg)	300	300	500	500	500	800	800	800	300
Shaker model	ET-20-320	ET-20-445	ET-30-370	ET-30-550	ET-40-370	ET-40-445	ET-50-445	ET-60-445	ET-20LS3-340
Mass of moving elements (kg)	20	28	30	55	35	50	50	60	25
Armature diameter (mm)	320	445	370	550	370	445	445	445	340
Weight (kg)	About 1695	About 1700	About 2490	About 2540	About 2490	About 4500	About 4500	About 4500	About 1695
Body suspension natural frequency (Hz)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Dimension (L×W×H:mm)	1182×758×1052			1288×852×1145			1700×1130×1264		
Power amplifier model	SDA-20	SDA-20	SDA-30	SDA-30	SDA-40	SDA-40	SDA-50	SDA-60	SDA-20
Power (kVA)	20	20	30	30	40	40	50	60	20
Power supply requirement (kVA)	42	42	48	48	73	73	82	95	42
Weight (kg)	About 450	About 450	About 500	About 500	About 550	About 500	About 550	About 600	About 450
Dimension (L×W×H:mm)	620×1010×1960								
Cooling type	Air cooled								
Blower model (kW)	B-2000LN	B-2000LN	B-3000	B-3000	B-5000	B-5000	B-5000	B-7000	B-2000LN
Power (kVA)	7.5	7.5	7.5	7.5	15	15	15	22	7.5
Air flow (m³/s)	0.71	0.71	0.46	0.46	1.1	1.1	1.1	1.6	0.71
Air pressure (kPa)	3.5	3.5	8.8	8.8	7.7	7.7	7.7	8	3.5
Weight(kg)	140	140	180	180	255	255	255	340	140

System model	ES-30LS4-445	ES-40LS4-445	ES-50LS3-445	ES-50LS4-445	ES-60LS3-445	ES-60LS4-445	ES-60LS3-550	ES-70LS3-550	ES-70LS3-480
									
Rated sine/random force (kN)	30	40	50	50	60	60	60	70	70
Shock force (kN)	60/90*	80/120*	100/150*	100/150*	120/180*	120/180*	120/180*	140/210*	140/210*
Frequency range (Hz)	DC-2600	DC-2600	DC-2700	DC-2600	DC-2700	DC-2600	DC-2500	DC-2500	DC-2700
Max.acceleration (m/s²)	750	900	900	900	1000	900	730	850	1000
Max. velocity (m/s)	1.8/2.5*	1.8/2.5*	2/2.5*	2/2.5*	2/2.5*	2/2.5*	1.8/2.5*	1.8/2.5*	2/2.5*
Max.displacement (mm)	100	100	76	100	76	100	76	76	76
Max. load (kg)	500	500	800	800	800	800	1000	1000	1000
Shaker model	ET-30LS4-445	ET-40LS4-445	ET-50LS3-445	ET-50LS4-445	ET-60LS3-445	ET-60LS4-445	ET-60LS3-550	ET-70LS3-550	ET-70LS3-480
Mass of moving elements (kg)	40	45	55	56	55	56	82	82	70
Armature diameter (mm)	445	445	445	445	445	445	550	550	485
Weight (kg)	About 2540	About 2540	About 4500	About 4500	About 4500	About 4500	About 7300	About 7300	About 4500
Body suspension natural frequency (Hz)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Dimension (L×W×H:mm)	1190×840×1215		1700×1130×1246				1800×1180×1518		1700×920×1300
Power amplifier model	SDA-30	SDA-40	SDA-50	SDA-50	SDA-60	SDA-60	SDA-60	SDA-70	SDA-70
Power (kVA)	30	40	50	50	60	60	70	70	70
Power supply requirement (kVA)	48	73	82	82	95	95	95	118	118
Weight (kg)	About 500	About 550	About 650	About 550	About 700	About 700	About 700	About 700	About 700
Dimension (L×W×H:mm)	620×1010×1960								
Cooling type	Air cooled								
Blower model (kW)	B-3000	B-5000	B-5000	B-5000	B-7000	B-7000	B-7000	B-7000	B-7000
Power (kVA)	7.5	15	15	15	22	22	22	22	22
Air flow (m³/s)	0.46	1.1	1.1	1.1	1.6	1.6	1.6	1.6	1.6
Air pressure (kPa)	8.8	7.7	7.7	7.7	7.5	7.5	7.5	7.5	8
Weight(kg)	180	255	255	255	340	340	340	340	340

Optional accessories • Slip table • Head expander • Movable device • Temperature Chamber • Fixture • Sensor • OPCS • MPCS • RMT • Auto rotation mechanism • Vibration controller

Power Amplifier



Smart Power Amplifier

Smart power amplifier is composed of the logical unit, power unit and control unit, with prominent advantages of intelligent manipulation, stability and reliability, flexible configuration, efficient and energy saving, compact structure and easy maintenance.

Performance Characteristics

Technical Specifications

	Customer friendly operation Man-machine dialogue, modular design of the system, "fool" operation, multi-language switching, and authority management
	Powerful function Externally connect with industrial module, customized multimedia, running log, self-protection, and platform optimization
	Superior performance All-digital debugging, small harmonic distortion, good current sharing effect, and multi-node monitoring
	Easy to maintain System self-diagnosis, fault log, and power unit adopts N +1 mode parallel operation
	Test security Hardware and software dual protection, output force limit, linkage protection, and customized other protection needs
Power range	0.1~1000kVA
Output voltage	150Vrms
Input impedance	≥10kΩ
Signal-to-noise ratio	≥65dB
Harmonic distortion (resistive load)	< 1.0% (typical value)
Output voltage measurement error	≤1%
Output current measurement error	≤1%
Output current	≤4800A(120A step increase)
Output current crest factor	≥3
Peak power of the module unit	≥150%(20kVA)
DC stability	Output terminal zero drift ≤50mv/8h
Frequency response DC ~ 5000Hz	±3dB
Medium-frequency gain	≥80
DC / AC conversion efficiency	>95%
Nature of the load	Optional of resistive,capacitive,inductive
Parallel operation current unbalanceness	≤1%
Mean time between failures (MTBF)	>3000h

Controller



8
Synchronization
input channels

2
Output channels

Vibstar Vibration Controller

Vibstar vibration controller uses the United States TI's high performance floating -point DSP processor, with low-noise analog technology, achieves high performance and high reliability. It has Chinese and English interface.

Technical Specifications

Input

Number of input channels	8 synchronous input channel
Input impedance	>110 k
Maximum voltage input rang	±10 V
Maximum charge input range	±10000 PC
Signal-to-noise ratio	>100 dB
Analog / digital converter (ADC)	24 bit resolution
Dynamic range	114 dB Max. sampling frequency 192 KHz
Input interface	Optional of voltage,ICP and charge
Circuit characteristics	The input interface with built-in ICP flow source and charge amplifier

Output

Have two 10 v / 1 v range and an optional AC/DC coupling. Simulation of anti aliasing filter.	
Number of output channels	1 output channel,1 COLA output
Type of output signal	Voltage signal
Maximum output voltage range	±10 V
Output impedance	< 30 Ω
Amplitude accuracy	2 mV
Digital / analog converter (DAC)	24 bit resolution
Dynamic range	120 dB Max. sampling frequency 192 KHz
Circuit characteristics	Simulation anti-aliasing filter;output protection circuit

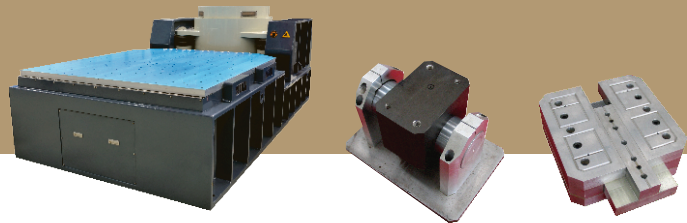
Random Performance Indicators

Dynamic range	90 dB
Control accuracy	±1 dB
Closed-loop time	100 m/S
Frequency range	DC~4800 Hz
Resolution	≤3200 line
Control strategy	Single channel,multi-channel weighted average,multi-channel maximum,multi-channel minimum

Sine Performance Indicators

Dynamic range	95 dB
Closed-loop time	10 m/S
Waveform distortion	<0.3%
Signal-to-noise ratio	Bigger than 100 dB
Frequency resolution	0.01%
Sweep frequency mode	Fix frequency,linear and logarithmic
Sweep frequency speed	Linear sweep 0~6000 Hz/min Logarithmic sweep 0~100 Oct/min
Frequency range	1 Hz~5000 Hz
Control strategy	Single channel,multi-channel weighted average,multi-channel maximum,multi-channel minimum

Slip Table Series



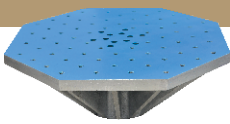
Hydrostatic Bearing Slip Table

Thickness (mm)	Frequency (Hz)		ES-30-370 ES-40-370		ES-40-445 ES-50-445 ES-60-445		ES-100-550		ES-160-590 ES-180-590		ES-200-650		ES-350-870	
	Effective mass (aluminum/magnesium) (kg)													
BT800 (800 X 800)	50	2000	50	2000	50	2000	50	2000	50	2000	—		—	
	107/75		112/80		136/100		163/127							
BT900 (900 X 900)	50	2000	50	2000	50	2000	50	2000	50	2000	—		—	
	132/91		137/96		162/117		189/144							
BT1000 (1000 X 1000)	50	2000	50	2000	50	2000	50	2000	50	2000	—		—	
	159/109		164/114		190/136		217/163							
BT1100 (1100 X 1100)	50	2000	50	2000	50	2000	50	2000	50	2000	—		—	
	188/129		193/134		221/157		248/184							
BT1200 (1200 X 1200)	50	2000	50	2000	50	2000	50	2000	50	2000	50	2000	—	
	221/151		226/156		255/179		282/206		282/206					
BT1300 (1300 X 1300)	50	2000	50	2000	50	2000	50	2000	50	2000	50	2000	—	
	256/174		261/179		291/204		318/231		318/231					
BT1400 (1400 X 1400)	50	1600	50	1600	50	1600	50	1600	50	1600	50	1600	—	
	294/199		299/204		331/230		358/257		358/257					
BT1500 (1500 X 1500)	50	1200	50	1200	50	1200	50	1200	50	1200	50	1200	50	1200
	334/226		339/231		372/258		399/285		399/285		534/420			
BT2000 (2000 X 2000)	—		—		60	1000	60	1000	60	1000	60	1000	60	1000
					773/525		800/552		800/552		935/687			
Work environment			Temperature range 5~35℃, humidity range ≤90% (non condensing)											
Note			① Effective mass includes slip plate, drive bar, swing pole. ② Above effective mass exclude armature and bearing (the effective mass of one BT hydrostatic bearing is 5kg)											

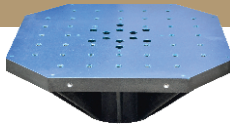
Medium-pressure Bearing Slip Table

Thickness (mm)	Frequency (Hz)		ES-30-370 ES-40-370		ES-40-445 ES-50-445 ES-60-445		ES-100-550		ES-160-590 ES-180-590		ES-200-650		ES-350-870	
	Effective mass (aluminum/magnesium) (kg)													
TBT800 (800 X 800)	50	2000	50	2000	50	2000	50	2000	50	2000	—		—	
	107/75		112/80		136/100		163/127							
TBT900 (900 X 900)	50	2000	50	2000	50	2000	50	2000	50	2000	—		—	
	132/91		137/96		162/117		189/144							
TBT1000 (1000 X 1000)	50	2000	50	2000	50	2000	50	2000	50	2000	—		—	
	159/109		164/114		190/136		217/163							
TBT1100 (1100 X 1100)	50	2000	50	2000	50	2000	50	2000	50	2000	—		—	
	188/129		193/134		221/157		248/184							
TBT1200 (1200 X 1200)	50	2000	50	2000	50	2000	50	2000	50	2000	50	2000	—	
	221/151		226/156		255/179		282/206		282/206					
TBT1300 (1300 X 1300)	50	2000	50	2000	50	2000	50	2000	50	2000	50	2000	—	
	256/174		261/179		291/204		318/231		318/231					
TBT1400 (1400 X 1400)	50	1600	50	1600	50	1600	50	1600	50	1600	50	1600	—	
	294/199		299/204		331/230		358/257		358/257					
TBT1500 (1500 X 1500)	50	1200	50	1200	50	1200	50	1200	50	1200	50	1200	50	1200
	334/226		339/231		372/258		399/285		399/285		534/420			
TBT2000 (2000 X 2000)	—		—		60	1000	60	1000	60	1000	60	1000	60	1000
					773/525		800/552		800/552		935/687			
Work environment			Temperature range 5~35℃, humidity range ≤90% (non condensing)											
Note			① Effective mass includes slip plate, drive bar, swing pole. ② Above effective mass exclude armature and bearing (the effective mass of one TBT medium pressure bearing is 5.5kg)											

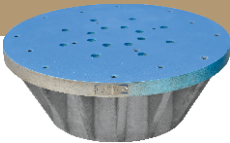
Head Expander Series



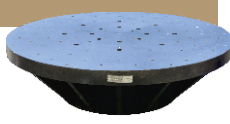
Square (aluminium alloy)



Square (magnesium alloy)



Round (aluminium alloy)



Round (magnesium alloy)

Square head expander specification								
Table diameter Model	-150	-200	-230 -240	-320	-370	-445 480	-550	-590
	7 2000	8 2000	10 2000	—	—	—	Effective mass (kg) Upper limit frequency (Hz)	
HE300S	—	—	—	—	—	—	—	—
HE400S	12 2000	13 2000	21 2000	—	—	—	—	—
HE500S	20 2000	23 2000	32 2000	32 2000	33 2000	—	—	—
HE600S	29 1200	37 1300	38 1300	40 2000	40 2000	53 2000	—	—
HE700S	—	—	43 1000	60 2000	80 2000	80 2000	—	—
HE800S	—	—	60 1000	70 1200	80 1300	85 1300	125 1800	135 1800
HE900S	—	—	80 700	95 800	95 1000	100 1000	120 1000	120 1000
HE1000S	—	—	73 400	100 600	110 800	185 1000	200 1000	210 1200
HE1100S	—	—	—	—	—	230 500	245 700	160 700
HE1200S	Effective mass (kg) Upper limit frequency (Hz)		—	—	—	250 400	265 500	280 500
HE1500S	—		—	—	—	350 400	400 400	420 400
HE2000S	—		—	—	—	—	900 300	1000 300

Square head expander specification								
Table diameter Model	-150	-200	-230 -240	-320	-370	-445 480	-550	-590
	7 2000	8 2000	—	—	—	—	Effective mass (kg) Upper limit frequency (Hz)	
HE300R	—	—	—	—	—	—	—	—
HE400R	10 2000	12 2000	14 2000	16 2000	—	—	—	—
HE500R	20 2000	21 2000	23 2000	30 2000	32 2000	—	—	—
HE600R	—	20 1000	30 1800	33 1800	38 1800	38 2000	—	—
HE700R	—	—	33 800	58 1500	69 2000	70 2000	—	—
HE800R	—	—	—	60 800	70 1200	72 1500	—	—
HE900R	—	—	—	—	85 1200	100 1200	—	—
HE1000R	—	—	—	—	—	140 1000	150 1100	160 1100
HE1100R	—	—	—	—	—	200 800	210 900	230 1000
HE1200R	Effective mass (kg) Upper limit frequency (Hz)		—	—	—	250 500	260 600	270 600
HE1500R	—		—	—	—	330 400	350 400	400 400