



Oscillating Line

Electromagnetic vibrating systems



We develop solutions!

Kendrion develops, manufactures and markets high-quality electromagnetic and mechatronic systems and components for industrial and automotive applications. For over a century we have been engineering precision parts for the world's leading innovators in passenger cars, commercial vehicles and industrial applications.

As a leading technology pioneer, Kendrion invents, designs and manufactures complex components and customised systems as well as local solutions on demand. Committed to the engineering challenges of tomorrow, taking responsibility for how we source, manufacture and conduct business is embedded into our culture of innovation. Rooted in Germany and headquartered in the Netherlands, our expertise extends across Europe to the Americas and Asia. Created with passion and engineered with precision.

In the business unit **Industrial Magnetic Systems (IMS)** the focus lies on electromagnetic actuators and mechatronic assemblies for applications in power engineering, safety engineering, machine building, automation technology and other industries. With the experience of our traditional brands Binder, Neue Hahn Magnet and Thoma Magnettechnik we are successful in our markets as an industry expert with a high technological competence.

We offer you both customer-specific and standardised products. Our assemblies are based on powerful and reliable single-stroke, holding, locking, spreader, control, rotary and vibratory solenoids and solenoid valves.

We always think in terms of solutions.

Our strength lies in new developments for our customers. Our engineers are specialists for innovative products with optimum technical properties. Furthermore, we develop mechanical assemblies, modern drive electronics and sensor systems to your requirements.

Our products are manufactured in Germany at the parent companies Donaueschingen and Engelswies as well as in the USA, China and Romania. This ensures efficient project management and a needs-oriented delivery for our internationally operating customers.

By means of segmented production areas we can implement both small quantities and large series with an optimum degree of automation.

We guarantee top quality.

All products are tested and developed in compliance with the norm DIN VDE 0580 for electromagnetic devices and components or according to industry-specific standards of our customers. In many cases our products are tested and certified by external associations, among others according to the CSA, VdS and ATEX guidelines. Our quality management system is certified according to DIN EN ISO 9001, and our environmental management system fulfils the norm ISO 14001.

With our subsidiaries in Switzerland, Austria, Italy, the USA and China and our worldwide distribution network we are your ideal partner on site.

Kendrion – We magnetise the world

www.kendrion.com

Oscillating Line - Creating Good Vibrations

Electromagnetic vibration systems, due to their special design they are particularly suitable for

- conveying
- vibrating
- dosing
- mixing
- compacting
- separating
- sorting



Oscillating Line include five product types, thus offering optimum solutions for many applications





Kendrion – Market Leader for Vibratory Solenoid

- Competent partner with more than 100 years of experience
- Wide product range
- Optimum solutions and individual adaptations
- Worldwide production and delivery
- Products are CE-compliant and meet the RoHS guideline
- Use of UL-compliant materials
- Corrosion protection



Oscillating Line

Electromagnetic vibration systems of the Kendrion Oscillating Line include five product types, thus offering optimum solutions for many applications.

Due to their special design they are particularly suitable for the conveying, vibrating, dosing, mixing, compacting, separating and sorting of bulk material. The components are used in feeding technology, automation, conveyor systems and process technology.

Vibration systems are AC-systems in which the force of an electromagnetic alternating field is used to generate a harmonious vibrating movement (linear or arc-shaped). With our system a gentle, steady and efficient material flow is achieved.

All products are manufactured and tested according to DIN VDE 0580/07.2000. For fine adjustment and individual adaptation we recommend our accessories. Please see the end of this catalogue for detailed information.



Product types

- Vibrating Solenoids (OAC)
- Inline Vibrators (OMW)
- Shaker Solenoids (OSR)
- Linear Vibrators (OLV)
- Arc Vibrators (OAB)

Vibrating Solenoid OAC

Vibrating solenoids of the OAC series are solenoids with UI core shape and two excitation windings connected in series. They are primarily installed in spring-mass-systems. The peak forces given in the table refer to operational temperature and 90 % of the rated voltage with a reference temperature of 35°C. Peak force F = magnetic force reached at nominal air gap in non-vibrating state. By means of vibrating solenoids directional, linear oscillations of the utilization equipment are generated.

Coil and bobbin are encapsulated in casting resin. Therefore, they are not susceptible to moisture and dust and suitable for rough conditions. The oscillating direction is determined by the geometrical arrangement of the springs in the spring-mass system. The effective amplitude here corresponds to twice the amplitude of the oscillating frequency of the whole system. Vibrating solenoids are infinitely adjustable by the operating voltage. They reach the full conveying power immediately upon switching on, and there are no troublesome starting and stopping effects of unbalance drives.

Fields of Application

- Oscillating conveyor drives
- Bunker drives
- Linear conveyor drives
- Vibration tables
- Screening technology



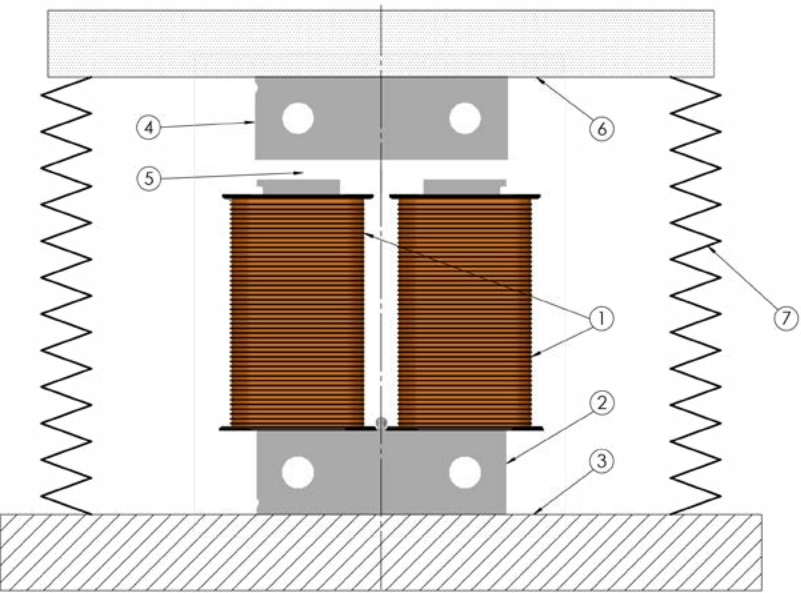
Accessories

- Phase Angle Control
- 33 43303B00 / 33 43304B00

Advantages

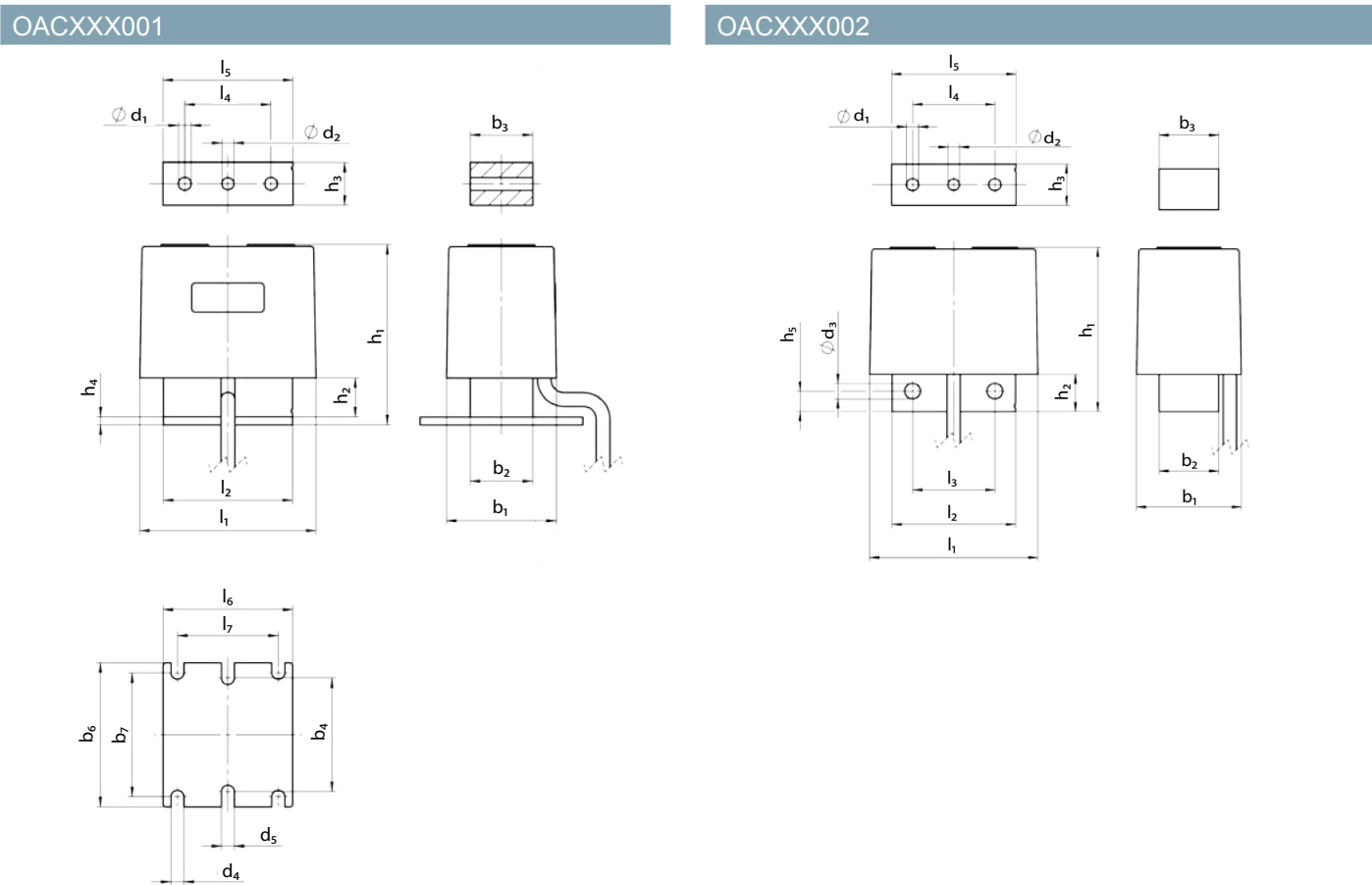
- High performance at small size
- Ideally minimized eddy current losses
- Infinite adjustability using drive voltage and/or frequency

Operating Principle



- 1 = Excitation winding
- 2 = Iron core (yoke)
- 3 = Counter load (free load)
- 4 = Armature
- 5 = Air gap
- 6 = Work load
- 7 = Spring system

Dimension Drawing



Dimension Table

Type	l ₁	l ₂	l ₃	l ₄	l ₅	l ₆	l ₇	b ₁	b ₂	b ₃	b ₄	b ₆	b ₇	h ₁	h ₂	h ₃	h ₄	h ₅	Ød ₁	Ød ₂	Ød ₃	d ₄	d ₅
OAC003001	44	30	-	11	30.5	30	32	26	12	12	22	32	-	42	9.8	10	2	-	3.5	4.1	-	-	4.5
OAC003002	44	30	20	11	30.5	-	-	26	12	12	-	-	-	40	9.8	10	-	5	3.5	4.1	4.6	-	-
OAC005002	60.5	45	29	15	46	-	-	31	15.6	15.6	-	-	-	59	15	15	-	7.5	5.1	-	5.1	-	-
OAC006001	64	45	-	-	46	45	35	43	20.8	20.8	40	50	43	63	14	15	3	-	-	5.1	-	4.5	4.5
OAC006002	64	45	29	15	46	-	-	42	20.8	20.8	-	-	-	60	14	15	-	7.5	5.1	-	5.1	-	-
OAC007001	77	54	-	20	54.5	54	40	44	20.8	20.8	45	60	45	77	19	20	3	-	5.1	5.1	-	-	6.6
OAC007002	77	54	37	20	54.5	-	-	44	20.8	20.8	-	-	-	74	19	20	-	10	5.1	5.1	5.5	-	-
OAC009001	90	66	-	44	66.5	66	50	56	31.85	31.85	66	83	66	92	20	22	4	-	6.5	6.1	-	6.6	6.6
OAC009002	90	66	44	44	66.5	-	-	56	31.85	31.85	-	-	-	88	20	22	-	11	6.5	6.1	6.5	-	-
WSB010001	119	86	-	-	86.5	86	63	66	35	35	69	95	69	120	27	30	4	-	-	6.1	-	9	9
WSB010002	119	86	60	60	86.5	-	-	66	35	35	-	-	-	116	27	30	-	15	6.5	-	6.5	-	-
WSB011001	119	86	-	-	86.5	86	63	85	53	53	84	110	84	121	27	30	5	-	-	6.1	-	9	9
WSB011002	119	86	60	60	86.5	-	-	85	53	53	-	-	-	116	27	30	-	15	6.5	-	6.5	-	-
WSB012001	119	86	-	-	86.5	86	63	132	100	100	-	160	134	124	27	30	8	-	-	10.2	-	-	9
WSB012002	119	86	60	30	86.5	-	-	132	100	100	-	-	-	116	27	30	-	15	13	-	13	-	-
WSB013001	220	150	-	110	150	150	110	175	100	100	-	180	140	131.5	33	39.5	6	-	17	-	-	12	-
WSB013002	220	150	110	110	150	-	-	175	100	100	-	-	-	129.5	37	39.5	-	20	17	-	17	-	-
WSB014001	225	150	-	110	150	150	110	225	150	150	-	230	190	131.5	37	39.5	6	-	17	-	-	12	-
WSB014002	225	150	110	110	150	-	-	225	150	150	-	-	-	129.5	37	39.5	-	20	17	-	17	-	-

Technical Data

Designation	OAC003001	OAC003002	OAC005002	OAC006001	OAC006002
Nominal air gap [mm]	2.0	2.0	1.0	2.5	2.5
Connection at 50 Hz [VA]	15.0	15.0	60	70.0	70.0
Peak force at nominal air gap [N]	4.0	4.0	60.0	15.0	15.0
Connection via one-way rectifier [VA]	14.0	14.0	42.0	68.0	68.0
Peak force at nominal air gap at rectifier [N]	5.0	5.0	38.0	24.0	24.0
Armature weight [kg]	0.03	0.03	0.09	0.11	0.11
Magnet weight [kg]	0.18	0.14	0.50	0.64	0.65

Designation	OAC007001	OAC007002	OAC009001	OAC009002	WSB010001
Nominal air gap [mm]	3.0	3.0	3.0	3.0	3.5
Connection at 50 Hz [VA]	136.0	136.0	282.0	282.0	480.0
Peak force at nominal air gap [N]	40.0	40.0	110.0	110.0	160.0
Connection via one-way rectifier [VA]	125.0	125.0	315.0	315.0	525.0
Peak force at nominal air gap at rectifier [N]	45.0	45.0	159.0	159.0	200.0
Armature weight [kg]	0.15	0.15	0.33	0.33	0.68
Magnet weight [kg]	0.96	1.06	1.93	2.13	3.85

Designation	WSB011001	WSB012002	WSB013002	WSB014002
Nominal air gap [mm]	3.5	4.0	5.0	6.0
Connection at 50 Hz [VA]	650.0	1000.0	1826.0	3280.0
Peak force at nominal air gap [N]	320.0	360.0	400.0	550.0
Connection via one-way rectifier [VA]	730.0	1155.0	2200.0	3520.0
Peak force at nominal air gap at rectifier [N]	360.0	460.0	480.0	900.0
Armature weight [kg]	1.00	1.80	3.10	6.20
Magnet weight [kg]	6.43	9.20	19.00	26.30

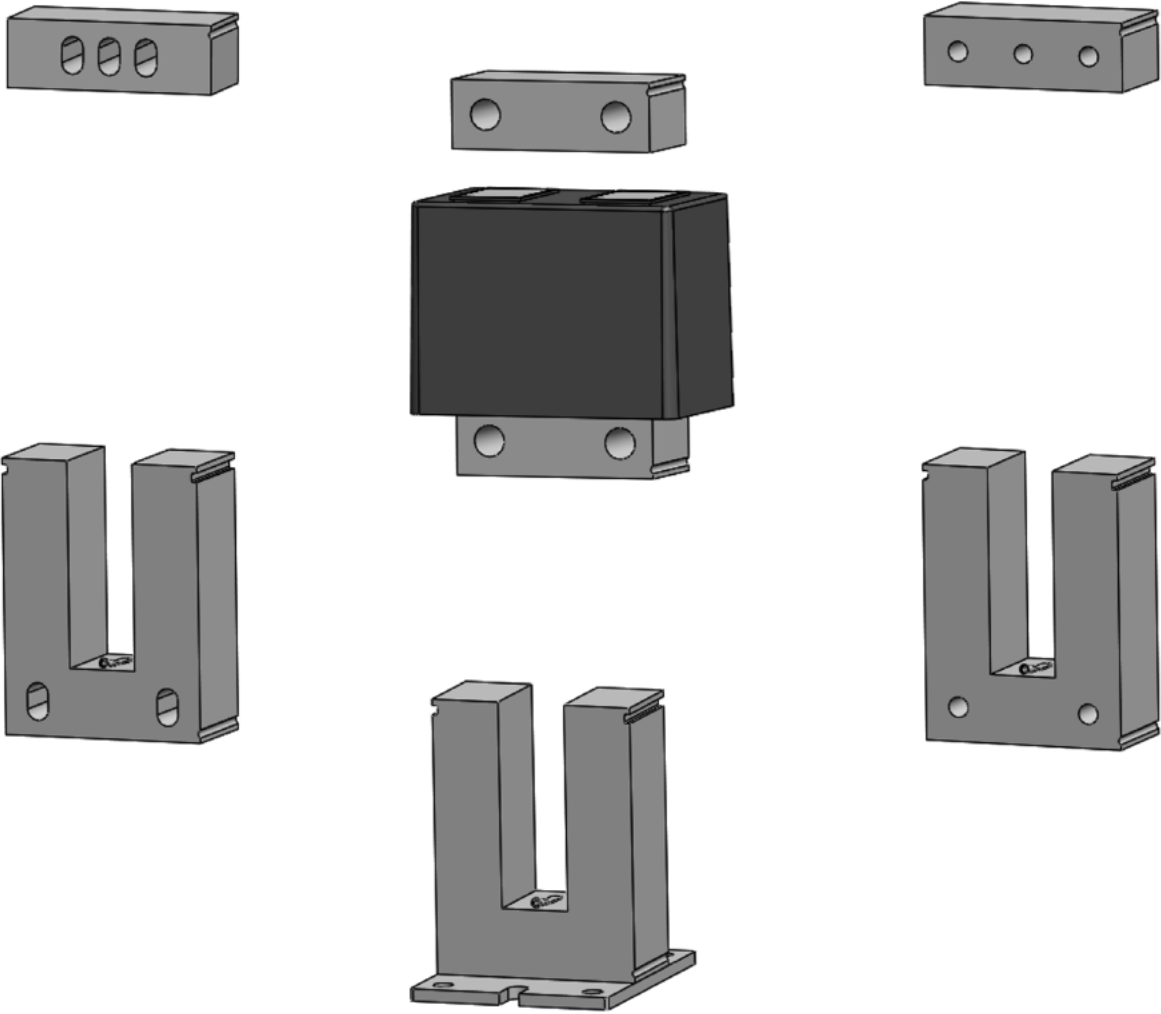


Please ask for other voltage, performance or frequency variants
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Customer-Specific Adaptations

We adapt to your mounting requirements. The vibratory solenoids manufactured from a UI-core offer a variety of different mounting options and cable outlets with shielded and unshielded UL-approved connecting cables.

Mounting Options



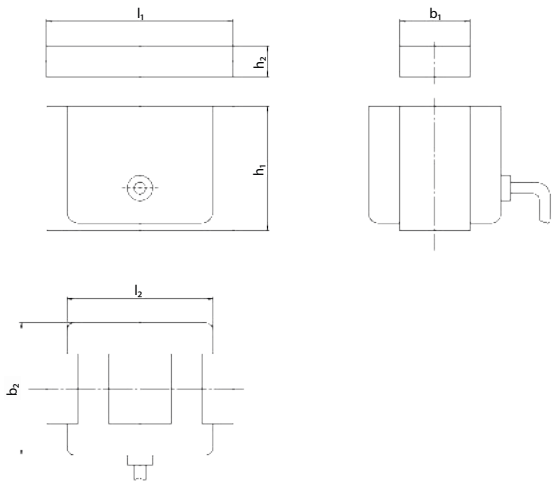
Cable outlet to the side

Cable outlet to the bottom



Dimension Drawing

WEXXXX002



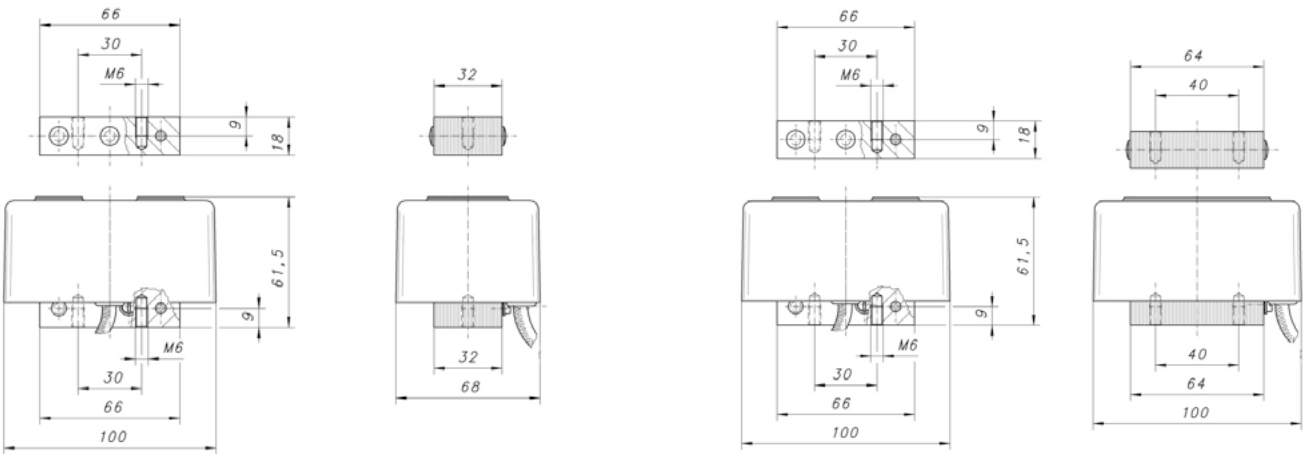
Dimension Table

Type	l_1	l_2	b_1	b_2	h_1	h_2
WEG019002	54	44	19	42	36	9
WEL027002	78	64	27.5	53	52	13
WEO036002	96	74.5	36	68	64	15.5

Dimension Drawing

WSN007002

WSN008002



Technical Data

Designation	WSN007002	WSN008002	WEG019002	WEL027002	WEO036002
Nominal air gap [mm]	2.5	3.0	0.6	1	1.2
Connection at 50 Hz [VA]	250.0	410.0	42	140	276
Peak force at nominal air gap [N]	300	495	120	250	430
Connection via one-way rectifier [VA]	250.0	605.0	-	110	240
Peak force at nominal air gap at rectifier [N]	380	600	-	340	570
Armature weight [kg]	0.29	0.56	0.13	0.18	0.42
Magnet weight [kg]	1.85	2.80	0.34	0.96	1.9

Inline Vibrator OMW

The magnetic body of the inline vibrator with the excitation winding is fixed to a base. Mounted above is the armature plate, with pole faces separated by an air gap and parallel with those of the magnetic body.

The armature plate and the base are connected by leaf springs mounted at an angle. If an alternating current is applied to the excitation coil an alternating magnetic field is generated the force of which attracts the armature plate. In the case of type OMW 516004 this electromagnetic force interferes with the force of the permanent magnets used.

The frequency of the resulting force corresponds to the frequency of the AC-voltage applied which moves the armature in the same rhythm. Due to the leaf springs mounted at an angle the armature plate performs an arc-shaped vibratory movement.

Fields of Application

- Shaking**
e.g. shaking of punching and stamping waste
- Feeding**
e.g. container filling in the packaging and pharmaceutical industry
- Dosing**
Particle feeding for measuring devices and analysis



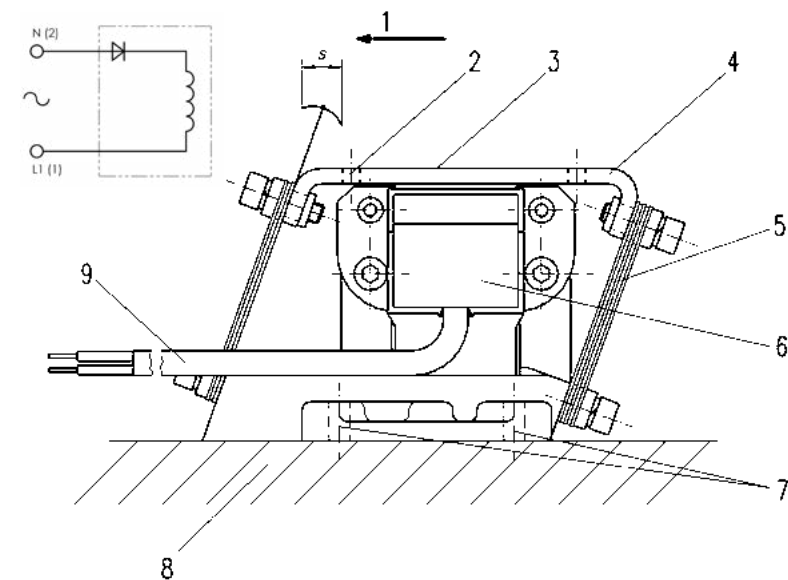
Accessories

- Phase Angle Control
33 43303B00 / 33 43304B00
- Bellow (serves to cover and protect the OMW)
- Leaf springs available as spare parts for all variants

Advantages

- Infinitely adjustable
- Pre-finished system
- Sturdy, compact design

Cross Section



- 1 = Conveying direction
- 2 = Mounting thread for conveyor channel
- 3 = Useful side
- 4 = Armature plate
- 5 = Leaf spring
- 6 = Excitation system
- 7 = Fixing hole
- 8 = Fixing side (free side)
- 9 = Connecting cable or flat plug

Technical Data*

Designation	OMW516001	OMW516002	OMW516003	OMW516004
Loading weigh to be achieved [kg]	0.52	1.2	6.2	13.5
Cycle stroke [mm]	1.3	1.5	1.5	1.5
Max. cycle stroke [mm]	1.6	1.6	1.6	1.6
Apparent power [VA]	14	60	93	200
Magnet weight [kg]	0.2	1.1	3.25	8.6
Protection class	IP54	IP54	IP54	IP00
Spring placement	2x0.4	1x0.8 und 2x0.9	5x1.2 und 1x1.0	7x1.2 und 1x0.8
Thermal class	F			
Standard rated voltage	230 V AC, 50 Hz			

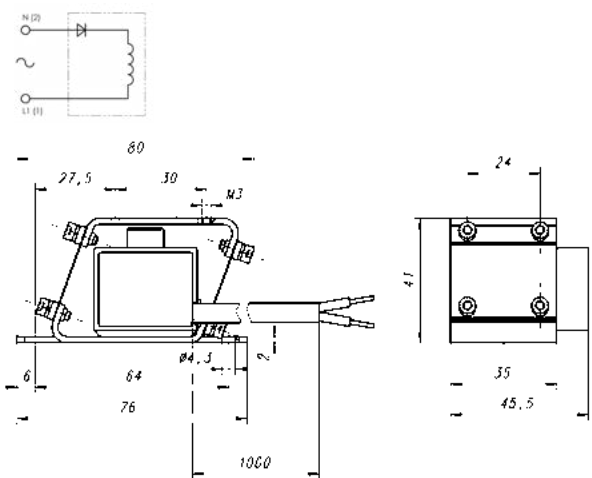
* All data apply to an operating frequency of 50 Hz
For higher loading weights several devices can be operated parallel or in line



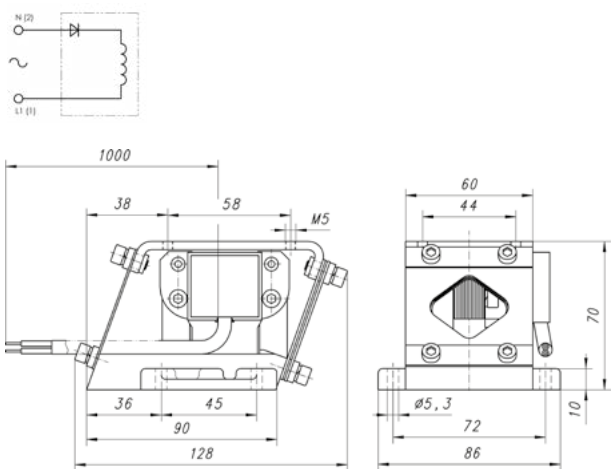
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Dimension Drawing

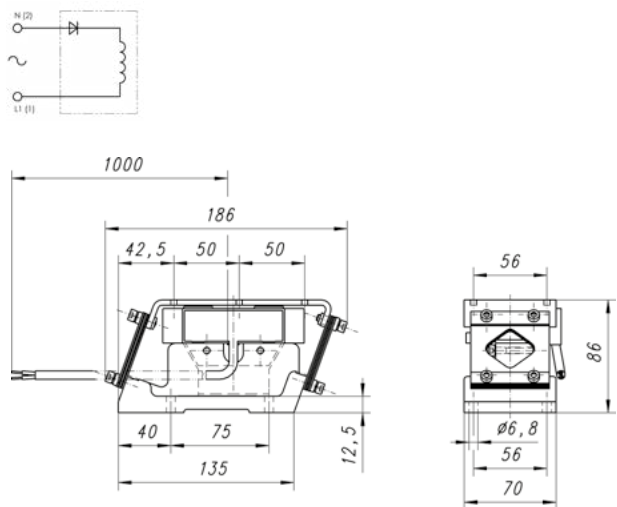
OMW516001



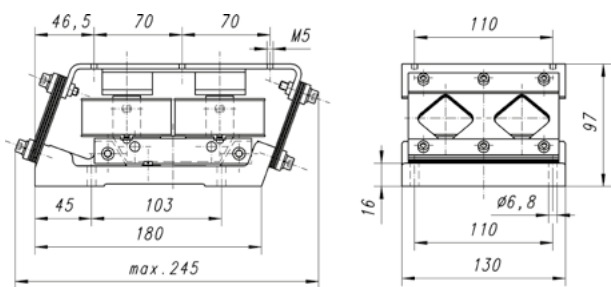
OMW516002



OMW516003

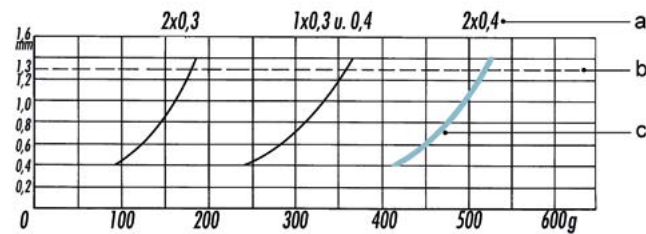


OMW516004

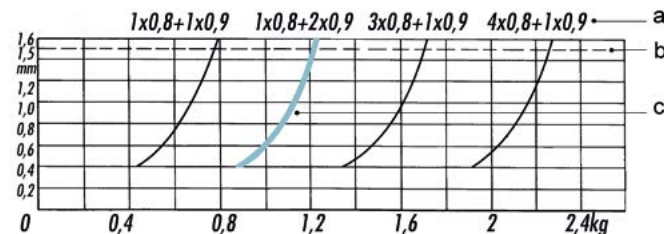


Spring Placement Diagram / Load Diagram

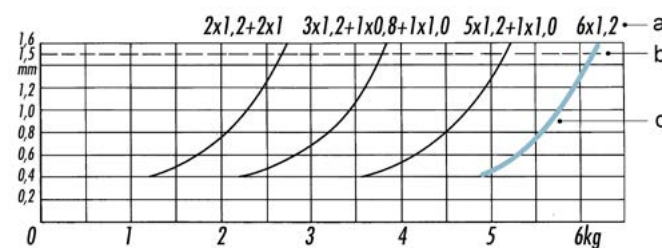
OMW516001



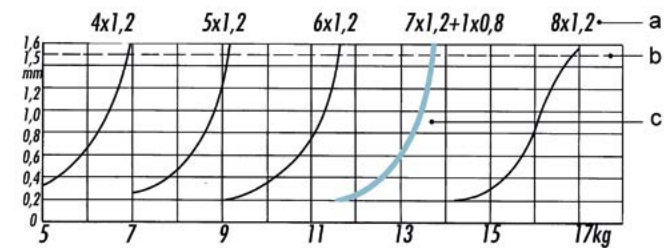
OMW516002



OMW516003



OMW516004



a=Spring mounting
b=Normal stroke[s]
c=Standard spring package

Shaker Solenoid OSR

The magnetic system of the vibrating solenoid is cast in a plastic housing. It consists of two excitation windings and the two halves of the magnetic body which are connected at the bottom by a permanent magnet. The magnetic circle is closed via the air gap by the body to be vibrated which represents the armature.

The system is biased by the permanent magnet integrated into the magnetic body, generating a constant pulling force between magnetic body and armature. When an AC-voltage is applied to the excitation winding the force effect of the electromagnetic alternating field is superimposed on the force effect of the permanent magnet.

In order to achieve the vibrating movement desired the useful load (the body to be vibrated) must be mounted to a base plate or a base in a manner capable of vibrating by means of vibrating metals, pressure springs or leaf springs.

Fields of Application

Shaking

e.g. vibration of injection needles

Compacting

e.g. of granulate

Bunker and Container Vibration

to avoid bridges and gaps



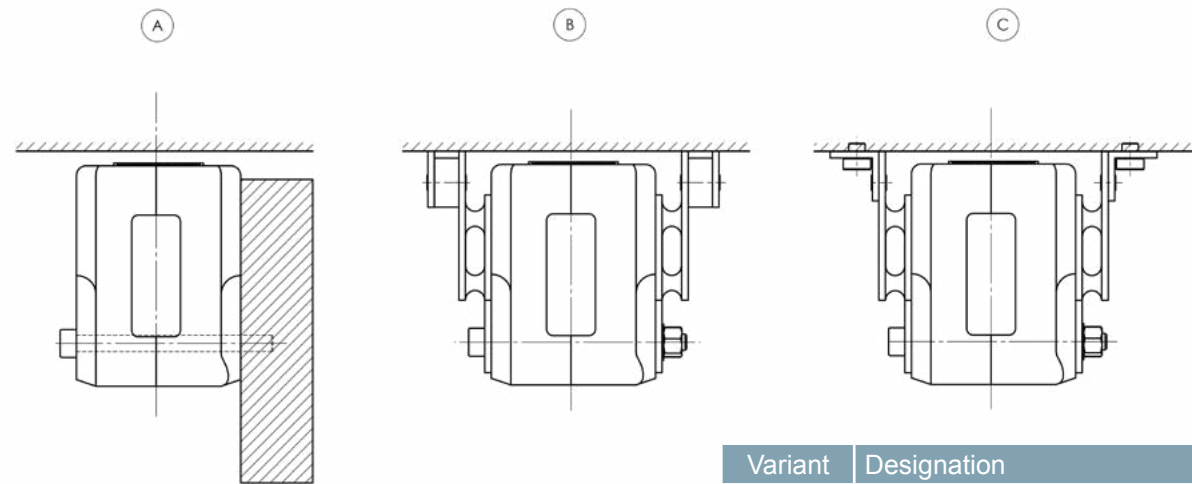
Accessories

- Permanentmagnetic adhesive attachment OSR127.500001.600
- Angle mounting OSR127.500131.600
- Phase Angle Control 33 43303B00 / 33 43304B00

Advantages

- Sturdy and compact design
- High insensitivity to moisture and dust
- Easy mounting by magnetic adhesive attachment

Mounting Options



Variant	Designation
A	Lateral screw mounting
B	Permanent magnetic adhesive attachment
C	Angle mounting

Technical Data*

	Through Bore		Holding		Angle Mounting	
Designation		OSR101002	OSR501001	OSR501002	OSR601001	OSR601002
Apparent power [VA]	36	48	36	48	36	48
Max. air gap [mm]	3					
Force [F] with air gap 1 mm	10	30	10	30	10	30
Force [F] with air gap 2 mm	5	17	5	17	5	17
Force [F] with air gap 3 mm	3.5	13	3.5	13	3.5	13
Magnet weight [kg]	0.36	0.56	0.56	0.76	0.48	0.68
Dimension width X	36.5	50.5	36.5	50.5	36.5	50.5
Protection class	IP60, depends on installation situation					
Thermal class	E					
Standard rated voltage	230 V AC, 50 Hz					

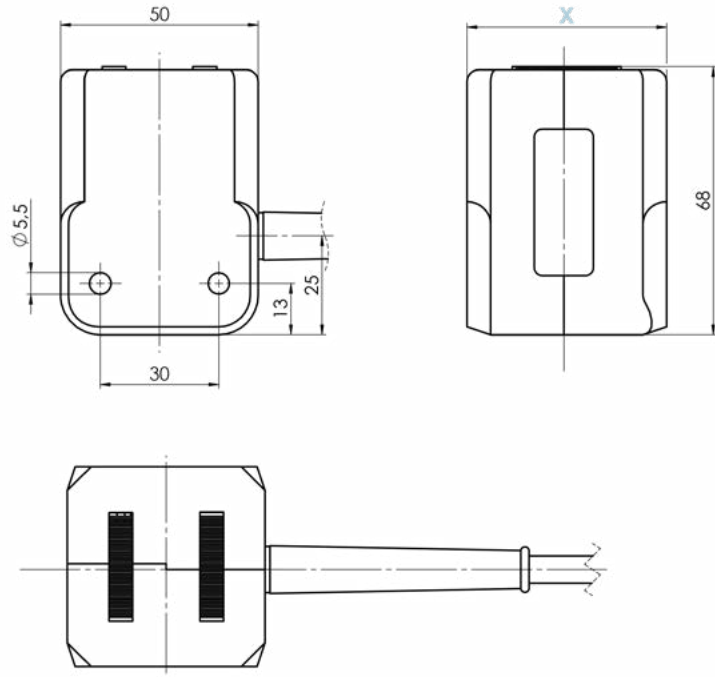
* All data apply to an operating frequency of 50 Hz. The magnetic force values are statically measured peak values for the air gap specified at 90 % of the nominal voltage and at operating temperature. The cable length is 2 m.



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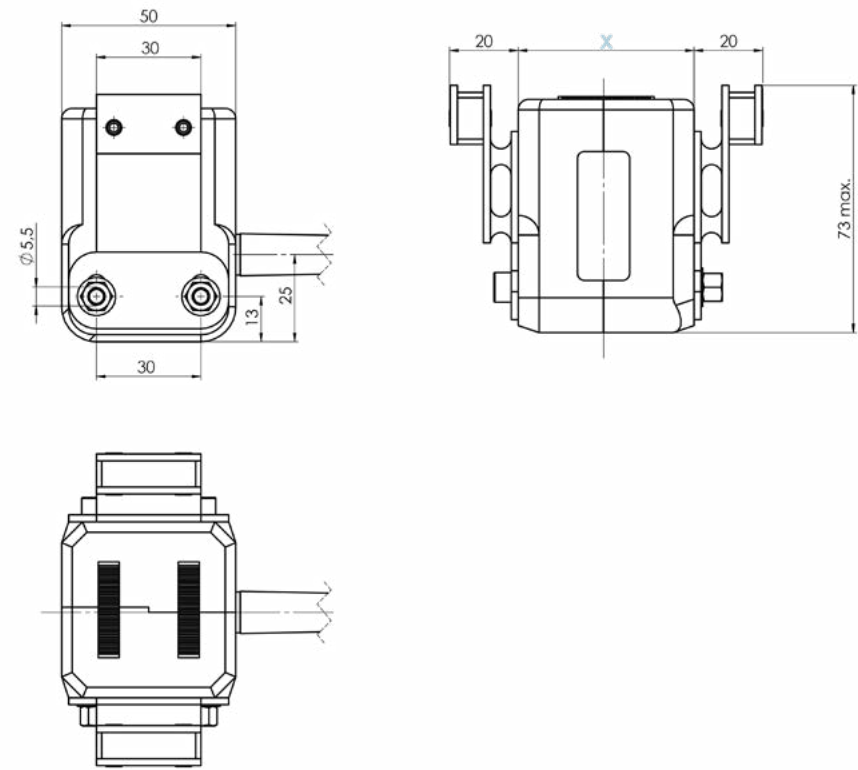
Dimension Drawing

OSR101001 und OSR101002

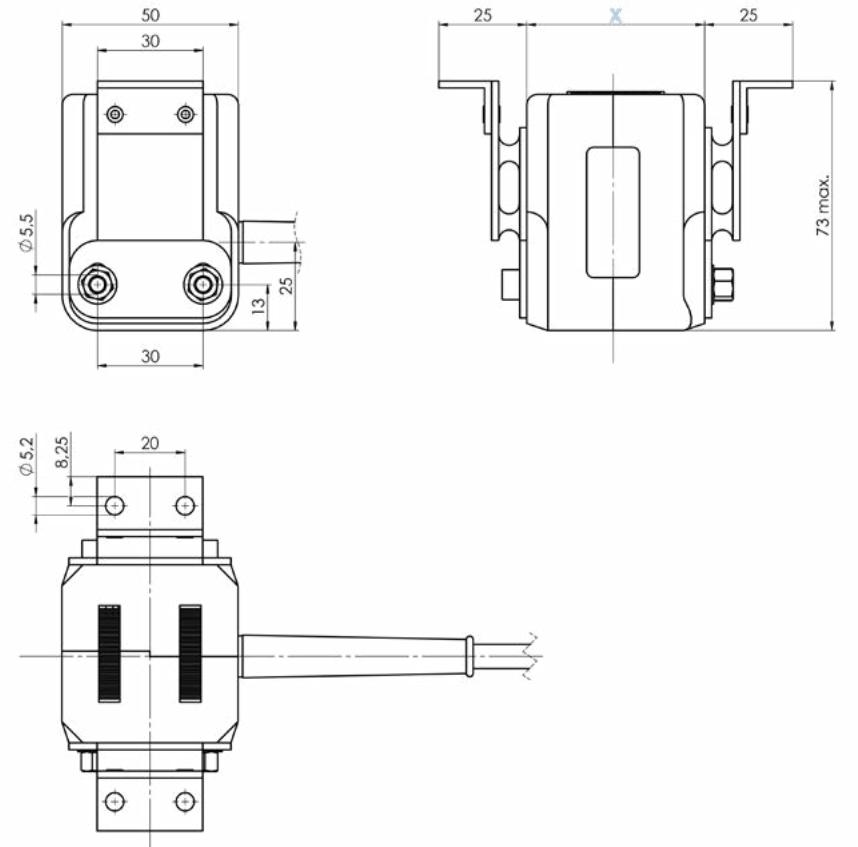


Dimension Drawing

OSR501001 und OSR501002



OSR601001 und OSR601002



Linear Vibrator OLV

The magnetic body of the linear vibrator consists of a round steel housing. Inside the magnetic body there is the excitation winding and the armature which is guided centrally via a non-magnetic shaft and held in central position by two springs. The system is biased and kept in a stable and neutral initial position by a permanent magnet with guiding poles which is located between the two coils of the excitation winding.

When an AC-voltage is applied to the excitation winding the force effect of the electromagnetic alternating field is superimposed on the force effect of the permanent magnet.

The frequency of the resulting force matches the frequency of the AC-voltage applied which causes a linear movement of the armature and the shaft in the same rhythm. The linear vibrator can be used as a vibratory drive and, fitted with an additional weight on the armature shaft, as a compactor.

Fields of Application

Shaking

e.g. correct paper positioning in printing technology

Compacting

e.g. can filling in packaging industry

Bunker and Container Vibration

to avoid bridges and gaps



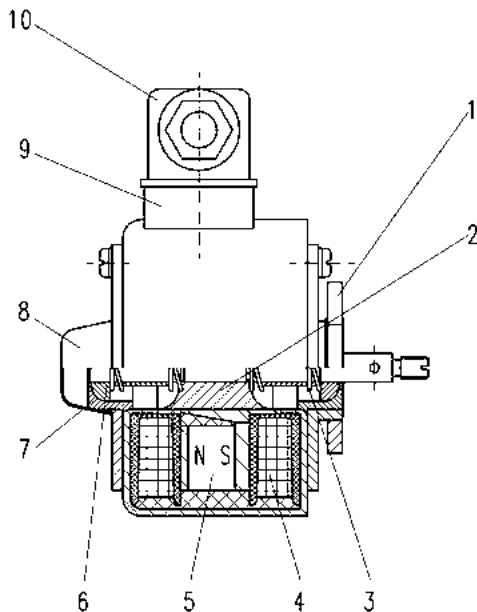
Accessories

- Phase Angle Control 33 43303B00 / 33 43304B00
- Plug-in Connectors Typ 430006
- Additional Weight 21 50108A2 904
- Mounting Flange 21 50108A1 002

Advantages

- Compact vibratory drive with connector system
- With additional weight usable as shaker solenoid
- Closed design

Cross Section



- 1 = Mounting flange
- 2 = Armature
- 3 = Spring
- 4 = Coil
- 5 = Permanent magnet
- 6 = Spherical bearing
- 7 = Spherical bearing shell
- 8 = End cap
- 9 = Device plug
- 10 = Device socket

Technical Data*

Designation	OLV504001	OLV514001	OLV544001	OLV554001
Cycle stroke [mm]	5.5	5.5	4-6	4-6
Max. cycle stroke [mm]	7	7	6	6
Additional weight [g]	-	-	0 - max. 250	0 - max. 250
Apparent power [VA]	54	54	54	54
Armature weight [kg]	0.08	0.08	0.08	0.08
Magnet weight [kg]	1.5	1.5	1.75	1.75
Protection class	device IP40, connection IP65			
Thermal class	B			
Standard rated voltage	230V AC, 50Hz			

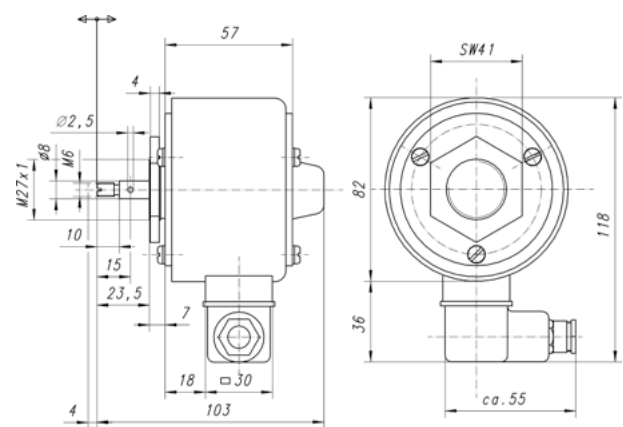
* All data apply to an operating frequency of 50 Hz



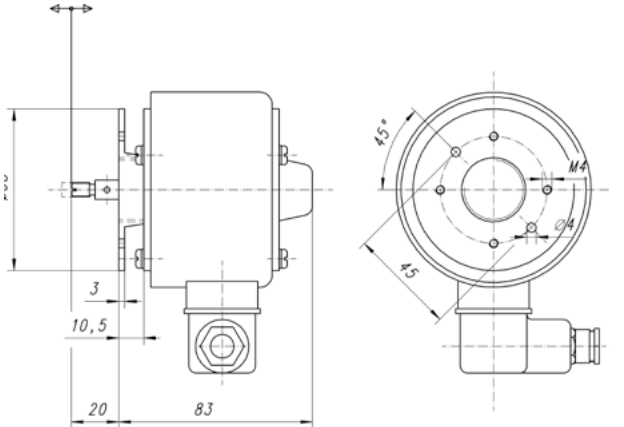
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Dimension Drawing

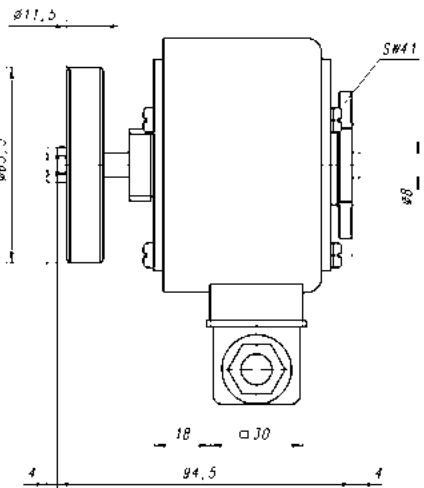
OLV504001



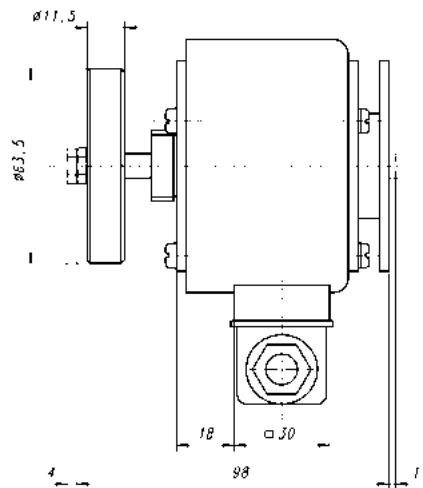
OLV514001



OLV544001



OLV554001



Arc Vibrator OAB

The magnetic body of the arc vibrator of Kendrion consists of two ring shells which enclose the excitation winding. It is permanently connected to the device base. The armature consists of two annular permanent magnets with opposite poles arranged axially. These are enclosed by pole discs and by means of leaf springs fixed on opposite sides of the device base.

The system is biased by the two permanent magnets. In stationary condition the armature is located between two annular poles of the magnetic body. When an AC-voltage is applied to the excitation winding the unlike poles of armature and magnetic body attract each other. The frequency of the arc-shaped armature movement corresponds to the frequency of the AC-voltage applied.

The arc vibrator can be used as a vibratory drive and, fitted with an additional weight on the armature shaft, as a vibrator. The integrated permanent magnets have a braking effect when switched off, thereby preventing reverberation.

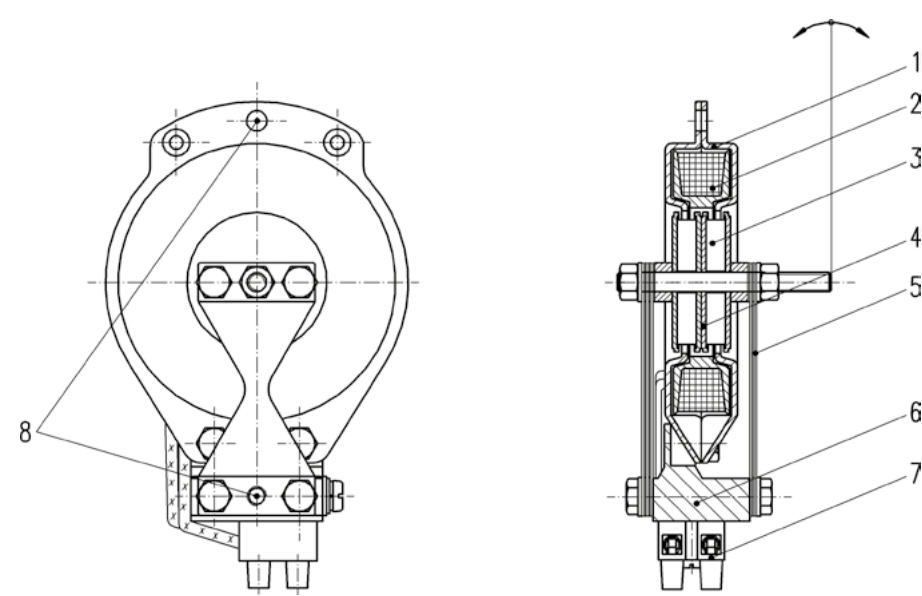
Accessories

- Phase Angle Control
33 43303B00 / 33 43304B00
- Plug-in Connectors Typ 430007
- Additional Weight 25 51307A1 904

Advantages

- Extremely flat design
- Wear-free, maintenance-free
- Low energy consumption

Cross Section



- 1 = Magnetic body
- 2 = Excitation winding
- 3 = Permanent magnet
- 4 = Armature complete
- 5 = Spring
- 6 = Device base
- 7 = Terminal clamp
- 8 = Fixing

Fields of Application

Shaking
e.g. sheet powdering in printing industry

Dosing
e.g. exact dosing of powders and granulates

Electromagnetic Pump Drive



Technical Data*

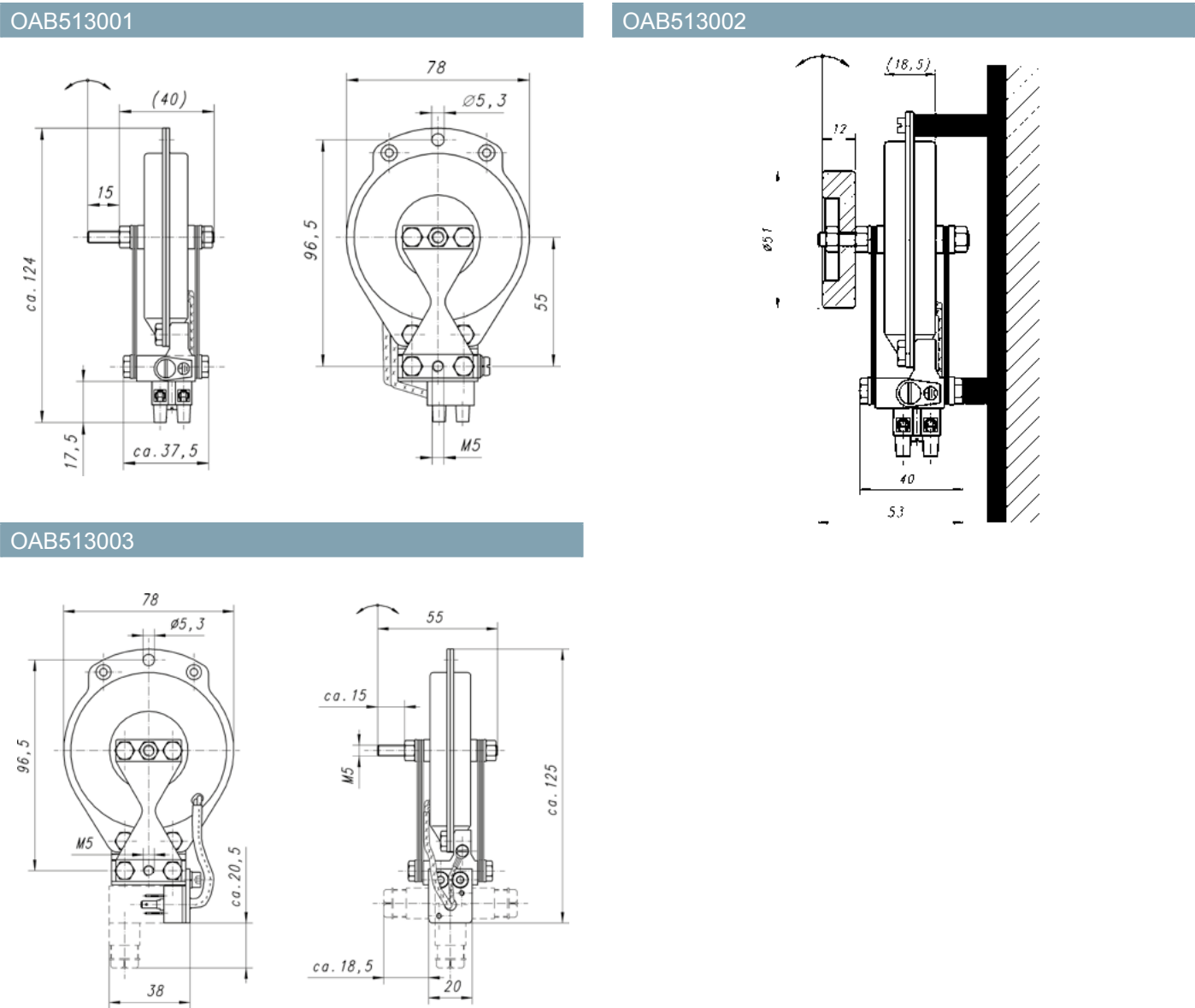
Designation	OAB513001	OAB513002	OAB513003
Cycle stroke [mm]	1.5	2	1.5
Max. cycle stroke [mm]	4.5	4.5	4.5
Cycle stroke with additional weight 150 g [mm]	-	4-4.5	-
Apparent power [VA]	21	21	21
Armature weight [kg]	0.13	0.13	0.13
Magnet weight [kg]	0.52	0.67	0.55
Protection class	device IP20, connection IP00 (with plug IP54)		
Thermal class	E		
Standard rated voltage	230 V AC, 50 Hz		
Additional weight	0 - max. 150 g (maximum permitted cycle stroke)		

* All data apply to an operating frequency of 50 Hz



Please ask for other voltage, performance or frequency variants
+49 7575 208 0 or sales-ims@kendrion.com

Dimension Drawing



Bellow for Inline Vibrators OMW

The bellow serves to cover the inline vibrator types OMW516002 and OMW516003 providing protection from pollution and environmental influence.

It is mounted between useful and free side (bottom side of conveyor channel and mounting side of inline vibrator).

For the connecting cable a feed-through hole is provided.

The protection class of the devices is therefore IP54.



Technical Data

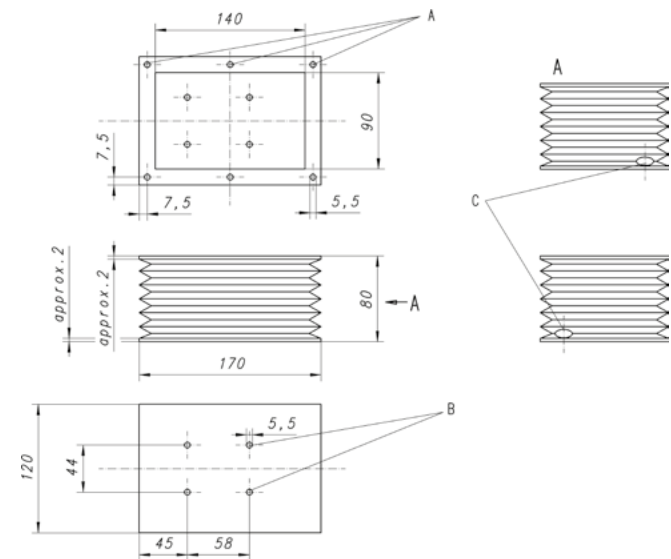
- 24 51606D0005 (140x120x80 mm)
- 24 51607D0007 (220x120x100 mm)

Model

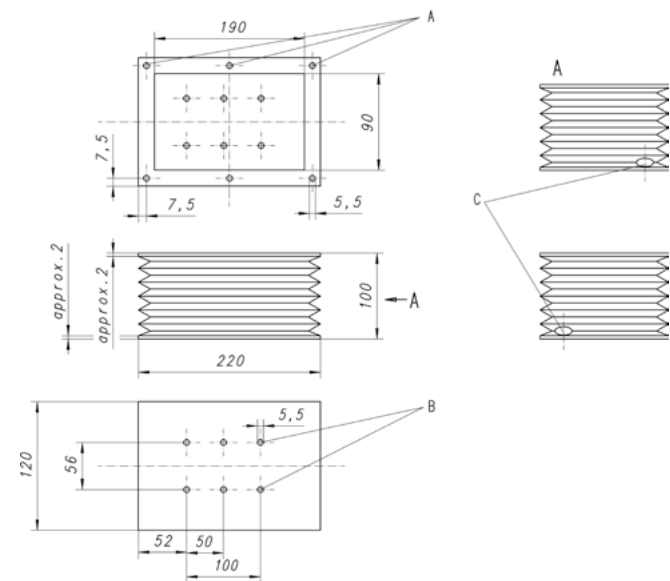
- 24 51606D00005 (OMW516002)
- 24 51607D00005 (OMW516003)

Dimensional Drawing

Bellow OMW516002



Bellow OMW516003



A=Mounting holes/free side
B=Mounting holes/useful side
C=Hole for connecting cable

Plug-in Connectors

The two variants of the 2-pole plug-in connectors with protective lead are detachable connections

The cable outlet can be rotated 4 x 90° by inserting the contact carrier accordingly.

The contact elements are suitable for connecting-wire cross sections up to 1.5 mm².

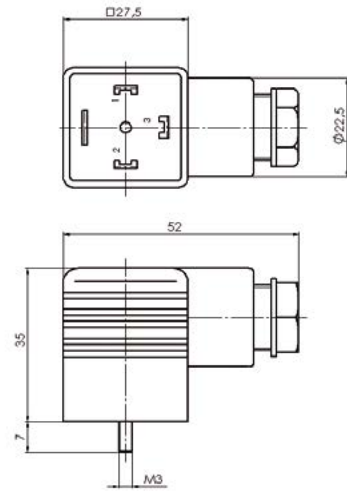
Technical Data

Protection class IP 65
(plugged in and secured)

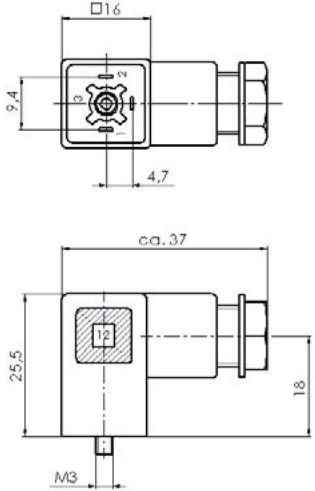


Dimension Drawing

Plug-in connector type 430006



Plug-in connector type 430007



Phase Angle Control 33 43303B00

Phase Angle Control 33 43304B00

The control units are suitable for the individual control of vibrating solenoids by variable alternating current as well as direct current (via integrated one-way rectification).

They are used for fine adjustment of the oscillation amplitude and adaptation of devices with low operating voltage.

Inside their plastic housing they can be mounted on top hat rails in cabinets with minimum space requirements.

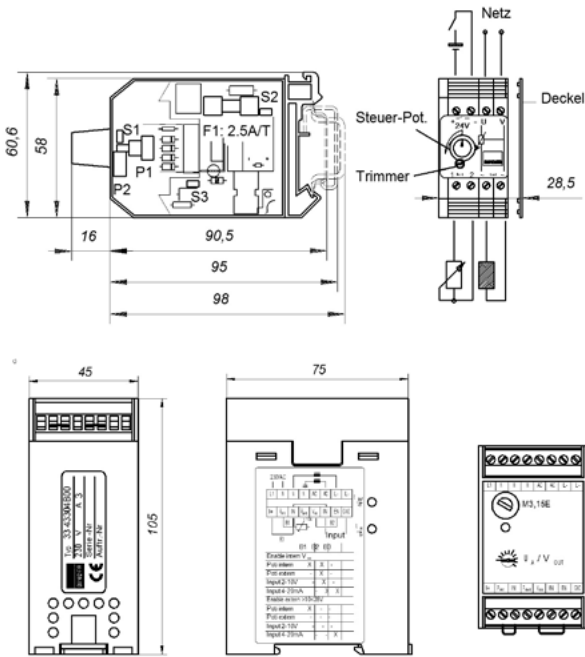
Characteristics

These devices are in accordance with EMC guideline 89/336/EWG, the low voltage guideline 73/23/EWG and the machine guideline 98/37/EWG.



Dimension Drawing

33 43303B00 / 33 43304B00



Technical Data

Designation	33 43303B00 / 33 43304B00
Operating voltage [V AC]	230
Operating frequency [Hz]	50/60
Oscillating frequency [Hz]	50
Output voltage [V AC]	0-0.95
Output current [A]	2/3
Protection class	IP00
Fuse [A]	micro-fuse 2.5 T, 250 V
Ambient temperature [°C]	0-50
Housing	plastic
Connection	3343303B00: 2x4 poles 1.5 mm 3343304B00: 2x8 poles 1.5 mm
Control voltage [V DC]	24 V +/- 10%

Additional Weight 21 50108A2 904

Mounting Flange 21 51108A1 001

With the additional weight the linear conveyor can be used as an electro-magnetic knocker for shaking bunkers and containers.

The mounting flange serves to attach the linear conveyor to a container or bunker surface.

Characteristics

- Additional weight: diameter 63x11.7 mm
- Weight: 0,25 kg
- Mounting flange: diameter 68x10 mm

Model

- Typ 21 50108A2 904
- Typ 21 51108A1 001



Permanentmagnetic Adhesive Attachment OSR127.500001.600

The permanentmagnetic adhesive attachment serves to mount the OSR shaker solenoid freely and in a detachable way at a container wall. Placement in the lower third of the container height.



Angle Mounting OSR127.500131.600

The angle mounting serves to permanently fixate the OSR shaker.



Characteristics

- Permanentmagnetic adhesive attachment: 67x45x20 mm
- Angle mounting 67x45x25 mm

Model

- Permanentmagnetic adhesive attachment suitable for all OSR solenoids
- Angle mounting suitable for all OSR solenoids

1. General

The devices are built, tested and designed according to generally acknowledged rules of technology, in particular according to the regulations for electromagnetic devices (DIN VDE 0580/07.2000).

The devices may only be connected to the type of voltage (alternating current) and voltage value indicated on the type plate. Before each maintenance precautions must be taken that the devices are not energised. The conducting parts, e.g. the plug or the excitation winding of the device, must not come in contact with water. The free wire or cable ends or the plug-in connector must not be subject to mechanical stress (tear, squeezing).

Devices must not be put into operation if:

- electric leads are damaged
- the magnet housing or the coating show damages
- there is a suspected defect (after a fall or similar)

In these cases repairs may only be carried out by specialists. Inappropriate repairs may expose users to significant hazards. If the devices are misused or wrongly connected no liability for potential damages will be assumed.

The user assumes liability for proper and safe use. For this reason the installation situation, ambient conditions and the like must be coordinated with the manufacturer.

The life-cycle largely depends on external conditions (installation situation, kind of medium, intensity of load). Statements in this respect require a special agreement. The magnetic forces indicated are average values and may deviate from the list values due to natural scattering. Depending on the use the respective accident prevention regulations have to be observed.

2. Environmental Requirements

In the case of deviations from the fixed operating and ambient conditions respective measures have to be taken, e.g. higher protection class and/or a special surface protection or in the case of higher temperature a special coil and special cable.

3. Connection

In the data sheets different types of connection for the respective devices are indicated. The devices may only be connected according to the data on the rating plate. Especially the voltage and the frequency have to be observed.

A parallel operation of devices is common. Before connecting them it must be checked if the devices operate in phase (e.g. several inline vibrators under one shaking trough) or phase-shifted by 180° (vibration-free operation with low free load). All devices with plug connections always operate in phase if either the left or right connection is connected to the phase. In the case of all other devices ends with the same colour resp. identically marked clamps have to be connected. During operation the amplitudes of all devices can be electrically controlled (e.g. by a transformer or KENDRION control units).

4. Installation Requirements

Unauthorised interference or changes of any kind, e.g. boring into the magnet housing, must be avoided as they may cause functional disorders, e.g. a disconnection of the coil winding. Higher supply voltages, different rated modes, lower frequencies contrary to the specifications on the type plates or a blocked armature with AC-solenoids may cause serious malfunctions, e.g. thermal destruction of the excitation winding.

The devices must be supplied with the required rated voltage and frequency. The voltage drop must be kept within narrow limits (normally 4 %) by proper wiring, i.e. by adequate dimensioning of the diameter.

If present the grounding screw must be connected or the grounding of the magnet must be otherwise ensured. With devices of protection class I the protective conductor connection acc. VDE 0100 must be provided by the user.

With devices of protection class II there is no protective conductor connection required.

The protection class acc. IEC 60529 is only guaranteed in the case of proper mounting to the machine and in association with plug connection via plug-in connector acc. DIN EN 175301-803 (DIN 43650).

Vibrating solenoids for direct mains connection carry the voltage information 230 V/50 Hz.

In the case of direct connection to the mains the mechanical vibration generated is twice as high as the mains frequency because each half-wave causes a magnetic pull impulse. Shortly after the zero-crossing of the electrical current the polarity of the force field is reversed, the magnetic force being zero.

Vibrating solenoids to be connected via one-way rectifiers carry the voltage information $G\ 230\ V\ (50\ Hz)$. An upstream one-way rectifier blocks either the positive or the negative half-wave of the alternating current. By means of a one-way rectifier we achieve a mechanical vibration in the altitude of the mains frequency. The current flowing through the vibrating solenoid is pulsating direct current. The power decrease of the smaller frequency is balanced by a higher oscillation amplitude. Harmonic oscillations in the excitation frequency prevent the sticking of humid bulk material in conveyor channels and the blocking resp. clogging of the meshes in close meshed vibrating screens.

When adjusting the static air gap may be selected smaller, but the nominal air gap must not be selected wider as an improper increase of the power consumption may result in a burning of the coil. An increase of the air gap requires an adaptation of the winding and results in a loss of force.

The peak force F is the force measured by an equivalent direct current which equals the peak value of the alternating current with nominal air gap (DIN VDE 0580, 5.4.3.2). The amplitude force is half the peak force.

Overview of Catalogue

Linear Solenoids 							
Classic Line - single-stroke solenoids - compact design - individual fixing - mono- and bistable version	High Performance Line - square single-stroke solenoids - high force with small installation space - modular system - short pull-in times	High Power Line - round single-stroke solenoids - high forces and stroke travels - short switching times - also reversible solenoids	Control Power Line - control solenoids - extremely fast switching - short strokes - precise switching	Elevator Line - spreader solenoids - especially designed for elevator brakes - extremely high forces - any mounting position	ATEX Line - explosion-proof solenoids - prevent the occurrence of sparks and light arcs - dynamic and reliable switching	Locking Line - locking solenoids - high transverse forces - integrated feedback of locking function - compact design	System Line - operated by AC - extremely short activation times - very high pull-in forces
Electro Holding Magnets 		Oscillating Solenoids 		Custom Solutions Rotary solenoids Assemblies Customer-specific solutions Please contact us for special or customer-specific solutions. Kendrion Donaueschingen/Engelswies GmbH Industrial Magnetic Systems Sales Team Donaueschingen and Engelswies Tel.: +49 771 8009 3770 Mail: sales-ims@kendrion.com			
Hahn CQ^{Line} - door holding magnet - design and functionality - VdS, CE, EN 1155, - EN 14637 tested - great variety	Industrial Line - industrial holding magnets - high holding force with low power consumption - compact design - variable connections	Oscillating Line - vibratory solenoids - wide product range for transportation of bulk material - low wear - compact design					

If you do not find what you are looking for, please feel free to contact us!
We will find the best solution for you.

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