

**Operating Manual**  
(Translation of the original operating manual)  
**Small-parts Conveyor Drives**

**Series KF...**

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## Intended Use

AVITEQ small-parts conveyor drives are designed and intended for removing, transporting, conveying, measuring out, and distributing small-grained bulk materials and small parts.

Do not operate the small-parts conveyor drives of the standard series KF... as described in this operating manual, in areas with explosive gas atmospheres or in the presence of combustible dust. The small-parts conveyor drives aren't designed and approved for this case.

While completing the small-parts conveyor drive with a working unit (trough, tube or rail) it has to be made certain that the small-parts conveyor unit (unit of small-parts conveyor drive and working unit) is able to oscillate freely, without effecting neighboring components.

Please also observe the additional remarks about the intended use that are specified in chapter 1.3!

According to Article 2 Point g) of the Machines Directive 2006/42/EC, the drives are partly completed machinery. Installation instructions according to Appendix VI must be produced for and supplied with this partly completed machinery. Due to the requirements arising from other also applicable EC Directives, a complete operating manual has been produced. This is an integral part of the product. A separate installation manual therefore does not exist. Instead, the description of the installation is part of the operating manual and must be observed accordingly.

## For your Safety

You will find three different types of symbols in this operating manual which are intended to point out important information:



**DANGER!**

*The danger warning describes procedures or conditions which could lead to dangerous and even life-threatening consequences for the person installing or using the equipment.*



**ATTENTION!**

*You will find this information with procedures in which a danger of damage to equipment exists. This damage could also result in injury to personnel (e.g., from a fire or an explosion!).*



**NOTE!**

*Notes provide information regarding individual tasks. Notes explain circumstances, clarify terminology or provide tips for simplifying processes or procedures.*

Even though the AViTEQ small-parts conveyor drives were developed with all safety measures for your protection, handling errors may occur. In the interest of your safety and that of your colleagues, observe the following information:



**DANGER!**

*When the unit is connected to the mains, a lethal voltage is present inside the controller and possibly existing junction boxes. Touching electrically live components can be lethal! Before switching on mains power, ensure that no live parts can be touched!*



**DANGER!**

*Inadequate installation may cause the small-parts conveyor drive to fall down possibly causing injuries. Ensure that the rubber pads on the lower part are bolted on tight and take appropriate steps to ensure that the small-parts conveyor drive cannot fall down!*

*Remaining under the small-parts conveyor drive and/or unit is **not** allowed!*



**DANGER!**

*Non-sterile small-parts conveyor drives in applications of the pharmaceutical and food processing industries represent a significant health risk through the spreading of germs. For this reason, only small-parts conveyor drives in special surface coating with sterilisable surface may be used in such applications.*



**DANGER!**

*Explosions can lead to perilous injuries and cause great damage to property! Small-parts conveyor drives in standard version without an ATEX-type examination certification **must not** be operated in areas with potentially explosive atmospheres consisting of a gas-, a vapour-, a mist- or a dust-air-mixture!*



**ATTENTION!**

*Unsuitable controller, operation without controller and/or operation with an incorrect mains voltage/frequency normally result in damage to the small-parts conveyor drive and is not allowed. Ensure that the connected loads are correct and compare them with the device type labels!*

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**ATTENTION!**

*Changes of the air gap, the spring rate, the tightening torque of the spring mounting screws, installation without rubber pads and deviations from the intended working weight (see type label) are not allowed, because this may lead to excessive heating of the drive, to short circuits between electromagnet windings, and eventually to destroying the drive. If you have any questions, you should give us a call! We can help to adapt the small-parts conveyor drive to your special requirements on request.*

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**ATTENTION!**

*In the case of applications in the food industry a special lacquering might be required that is permitted for the food industry. Please observe this to avoid health risks of others.*

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**NOTE!**

*Depending on the construction of the working unit and the acoustic properties of the material transported, the sound pressure level of the operational small-parts conveyor unit may exceed 70 dB(A). It is the operator's responsibility to ensure adherence to the sound pressure level permitted by means of suitable noise protection measures!*

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**NOTE!**

*The item „nominal current“, that is used in this manual corresponds with the rated current and the limit current, as defined in the national standard VDE 0580.*

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This operating manual supports the intended use and appropriate deployment of AViTEQ small-parts conveyor drives. For this purpose, the operating manual describes details that are significant for the product's operation.

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The *General Conditions of Delivery Domestic and Abroad* of AViTEQ Vibrationstechnik GmbH apply in their current version.

Do you have questions? Did you have problems with the installation and/or commissioning?  
Give us a call! We'll be glad to help you!

AViTEQ Vibrationstechnik GmbH  
Im Gotthelf 16  
65795 Hattersheim-Eddersheim  
Germany

Telephone ..... +49 (0) 6145 / 503 - 0  
Fax ..... +49 (0) 6145 / 503 - 200  
Telefax Service-Hotline ..... +49 (0) 6145 / 503 - 112  
E-Mail ..... service@aviteq.de

Hattersheim-Eddersheim, 14<sup>th</sup> of April 2011

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# 1 We are Partners

## 1.1 About this Operating Manual

### For whom?

This operating manual is intended for

- Installation technicians installing and commissioning the small-parts conveyor drive or the unit.
- Engineers installing the controller, the electrical connexion to the a.c. mains network and the connexion to the small-parts conveyor drive.

All work on the electrical installation must be carried out by qualified personnel (electricians or persons trained in electrical engineering according to EN 60204-1).

### Additional publications

Supplements to this operating manual

- Connexion diagram for the controller
- Operating manual for the controller
- Brief description of storage container and vibrator (special accessories)
- Dimension sheet (drawing) of the small-parts conveyor drive and/or the unit



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*Some versions of the small-parts conveyor drives are available as a PHARMA version for the pharmaceutical industry. For the use in the food industry, AViTEQ offers version with special sterilisable surface coating, or the PHARMA version "CR".*

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### Definitions

- **Small-parts conveyor drive:** electromagnetic-mechanical unit (vibration system) as it is shown on the frontpage
- **Working unit:** the conveyor unit (trough, tube or rail)
- **Small-parts conveyor unit:** small-parts conveyor drive with the assembled working unit
- **Controller:** the separately shipped controller unit assigned to the small-parts conveyor drive for connecting to the a.c. mains network

### Special symbols in this operating manual

Earlier in this manual, you should have learned how we indicate safety notices. If you have any questions about safe work practices regarding small-parts conveyor drives, you should give us a call.

For your convenience and orientation, we use the following special indicators in this operating manual:

- A round bullet indicates a listing of characteristics and conditions.
- ☝ The upward showing thumb tells you to check something, or read a summary.
- ☞ The pointing finger indicates steps that you have to carry out.

### Revision date

On the bottom on the right hand side page of this operating manual, the version number tells you the date when the page was last updated.

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## 1.2 Product Liability and Warranty

The drives correspond to the current State of Engineering and have been tested for each of its guaranteed functions prior to delivery. AViTEQ Vibrationstechnik GmbH carries out product and market research to aid further development and continuous improvement. Should malfunctions or failures occur despite these preventative measures, please contact our service department! We guarantee that appropriate measures for the repair of the defect will be taken immediately.

### Conditions of Warranty

We guarantee that the product is free of defects within the scope of the technical product specifications published by AViTEQ Vibrationstechnik GmbH as well as technical specifications provided in this operating manual. No declarations of other product features or claims regarding additional characteristics are provided. AViTEQ Vibrationstechnik GmbH is not liable for the economic efficiency of the product or proper functionality when used for applications other than the purpose defined for the product as specified on the first, left-hand inner page in the front of this operating manual.

The "General Conditions of Delivery Domestic and Abroad" of AViTEQ Vibrationstechnik GmbH apply in their current version.

### Warranty Exclusions

Customers and third parties must not undertake work inside or otherwise interfere with the product, except the works that are described in this operating manual. Otherwise, liability for devices, persons and other consequential damages of any type to the product specified in the contract and other legal assets is precluded, provided AViTEQ Vibrationstechnik GmbH is not co-responsible. Entering into or interfering with the equipment also renders any warranty null and void.

AViTEQ Vibrationstechnik GmbH does not accept liability beyond the warranty entitlements stated in our terms of business on which the contract is based. This applies in particular to claims arising from loss of profit or other damage to purchaser/customer assets. This liability limitation does not apply unless the damage was intentional or caused through gross negligence and unless liability for loss of life or limb or loss of health is mandatory. This also does not apply when the purchaser/customer makes a claim for damages based on an incorrect claim of a characteristic or an agreed-upon characteristic. In the event of culpable violation of principle contractual obligations, AViTEQ Vibrationstechnik GmbH is also liable for criminal intent and gross negligence on the part of non-managing employees and for mild negligence. In the latter case, this is limited to the contract-typical, judicious, predictable damages.

Warranty is excluded in particular when the units are used in environments, for purposes, or connected to power supplies or to control systems that are not suitable for the drives or that do not represent the common state of technology. In particular, no warranty is provided for damages caused by unsuitable or incorrect use, incorrect mounting or commissioning by the purchaser/customer or third parties, natural wear, faulty or careless handling or unsuitable operating materials. The same applies for replacement parts, chemical, electrochemical or electrical influences provided they cannot be attributed to AViTEQ Vibrationstechnik GmbH and its employees. Claims made for damages to objects other than that which is specified in the contract, so-called deficiency losses, are limited. In this case, AViTEQ Vibrationstechnik GmbH is liable, regardless of the legal basis, only in the cases of intent, gross negligence on



the part of the owner/of its management or managing employee in the event of culpable loss of life or limb or health, in the event of deficiencies which are fraudulently concealed or the absence of which AViTEQ guaranteed, in the event of deficiencies of the delivered object, provided liability is provided in accordance with the product liability law for injury to persons and damages to materials or other special legal requirements.

Likewise, no warranty is provided for damages to conveyance and automation systems which are the result of a malfunction of the product or a textual error in the operating manual. The warranty excludes damages which are the result of accessories not supplied or certified by AViTEQ Vibrationstechnik GmbH. AViTEQ Vibrationstechnik GmbH is not responsible for the violation of patent rights and other titles of third parties outside of the Federal Republic of Germany.

We would like to point out that we are not liable for damage to the product subject to the contract, or for consequential damage to other property, if the damage is caused by non-observation of safety regulations and/or warning notices.

When entering the contract, the purchaser/customer is obliged to point out explicitly if the product is intended for private use and will be used by the purchaser/customer predominantly for this purpose.

The drives described in this operating manual must not be operated without consultation and corresponding release by AViTEQ Vibrationstechnik GmbH in the United States of America and other countries where US American laws are applicable.

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## 1.3 Operative Range

AViTEQ small-parts conveyor drives are designed and intended for removing, transporting, conveying, measuring out, and distributing small-grained bulk materials and small parts.

Small-parts conveyor drives are used as components of conveyor and automation plants. Sample applications are...

- general industry use for the transport of, e.g., metal-, plastic- or paint-powder, chips, parts made out of plastic or metal, etc.
- pharmaceutical industry for the transport of, e.g., pills, cachets, ampullae, granulated materials, etc. (...in this case the „CR“-version)
- food industry for the transport of, e.g., sugar, tea, baking ingredients, cereals, milk powder, spices, muesli, etc.



**NOTE!**

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*We carry out experiments for products whose transportation properties are unknown. Give us a call!*

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Never use in the following cases:

- Do not use with liquids, powder with particle diameters of less than 50  $\mu\text{m}$ , sticky items, items that may jam, bulky items, soft items and fragile items (thin glass)!
- Do not use if product temperatures exceed +100°C, or in environmental temperatures below - 20°C and above + 40°C, or in tropical climate! The units are designed for operation in moderate climate environments.
- Do not use at elevations above 1,000 m above sea level without first consulting AViTEQ Vibrationstechnik GmbH.
- Do not use in the food industry with standard lacquering. In the case of applications in the food industry normally the pharmaceutical version or the standard version with a special lacquering is required that is permitted for the food industry.
- Do not use in pharmaceutical industries that must be sterilisable, except the pharmaceutical version.
- Do not use, if potentially explosive atmospheres are consisting of a gas-, a vapour-, a mist- or a dust-air-mixture.

### Connexion with the controller

The small-parts conveyor drives should only be operated with the appropriate AViTEQ-controller. A suitable controller exists for every small-parts conveyor drive.

Other control and connexion options are not included.



**ATTENTION!**

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*If a small-parts conveyor drive is connected directly to the AC mains or to an unsuitable controller, it may be destroyed. Only use the appropriate controller.*

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## 1.4 Installation and Operating Personnel

Prior to installation and/or commissioning, you must be familiar with all details and connexion configurations of the small-parts conveyor drive.



**NOTE!**

Persons involved with installation, commissioning, assembly, disassembly, adjustment or maintenance must have read and understood this operating manual in its entirety; in particular the safety notes. If you have any questions, we would be glad to help you!

All work on the electrical installation must be carried out by qualified personnel (electricians or persons trained in electrical engineering according to EN 60204-1).

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*The small-parts conveyor drives for standard areas are only allowed to be repaired by AViTEQ Vibrationstechnik GmbH or by special staff that has been trained and authorised by AViTEQ. AViTEQ Vibrationstechnik GmbH is not liable for damage to property and/or person in the case of neglect!*

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## 1.5 Safety Precautions and Responsibilities of the Operator

This operating manual is part of the small-parts conveyor drive and must be available to qualified personnel at any time. The following has to be observed:

- Supports and buildings must be designed to withstand the static load and dynamic stresses of the small-parts conveyor unit and the bulk material.
- The small-parts conveyor drive and the working unit have to be located in such a way that an adequate safety distance of 120 mm is present on all sides. Working stroke and safety distance must be kept free. Please also observe EN 349.
- For adjustment, inspection, and maintenance purposes, the small-parts conveyor drive must be accessible at all times.
- Qualified personnel must have appropriate tools and test equipment at their disposal.
- Qualified personnel must be trained in safe work practices and must be familiar with the safety notes.
- The operator must obtain a local operating permit and observe any conditions relating to it.
- The applicable conditions in their respective latest version must be complied with. Particularly observe EN 60204-1 which applies for the electrical equipment of machines and which must be applied mandatorily in its area of applicability.
- The operator must only use the small-parts conveyor drive if it is in perfect condition and in a proper state.

Please observe the following

- All works on the small-parts conveyor drive require that you observe the safety notes as they are shown in this operating manual.
- Avoid any work practice that compromises safety in relation to the small-parts conveyor drive. **You must not disable any safety mechanisms!**
- Any changes relating to the small-parts conveyor drive that could compromise safety must be reported to the operator immediately.

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## 1.6 EC-Directives

According to the EC Directive 2006/42/EC for Machines, Article 2 Point g), the drives are **partly completed machinery**. It is not permitted to start using this unit, until it has been established that the completely functional machine in which a drive is installed complies with the provisions of the Machinery Directive. The drives have been built in accordance with this Directive. An associated declaration of incorporation is included on page 37.

Further the drive complies with the regulations of the EC Directive 2006/95/EC relating to electrical equipment designed for use within certain voltage limits. The associated Declaration of Conformity can be found on page 36.

## 2 Transport, Storage

The small-parts conveyor drive and possible equipment are delivered by AViTEQ in appropriate packaging to ensure that they reach their destination undamaged.



**NOTE!**

*If the packing is visibly damaged in a way that indicates damage to the contents, contact the forwarding agent! In further proceedings, take notice of the General Conditions of Business of the forwarding agent in order not to risk your claim for damages by improperly filled out forms!*

- ☞ **Storage:** Unless special agreements concerning packing and storage have been made, the units, packed or unpacked, must be stored and transported under „normal“ conditions. This means in enclosed rooms with temperatures between  $-25^{\circ}\text{C}$  and  $+50^{\circ}\text{C}$ , relative humidity not exceed 80%.

When transporting the unpacked small-parts conveyor drive or unit, it is easy to avoid damage by observing the following points:



**ATTENTION!**

*If the weight of the small-parts conveyor drive or the complete unit is greater than 20 kg, please use appropriate hoisting devices and lift the unit by the suspension points for transporting the device. If the weight of the small-parts conveyor drive or the complete unit is less than 20 kg, grab the small-parts conveyor drive from the underside if you wish to carry it. Never lift it by the working unit!*

The dimensions, the weight and the position of the centre of gravity can be found on the separate drawing that exists for every small-parts conveyor drive.

- ☞ Avoid contact with pointed or sharp (metallic) objects that could damage the lacquer coating!
- ☞ Always place the unit onto a secure support base and position, such that the unit cannot tip or fall down!



**ATTENTION!**

*Transporting and storing the units under inappropriate conditions may cause permanent damage. Such damage may not be detectable from the outside. AViTEQ does not cover this case in its warranty and is not liable for any consequential damage.*

### 2.1 Extent of Delivery

After unpacking, check the delivery note and accompanying documentation to ensure that all the parts have been supplied and are undamaged.

Compare the information on the type label of the small-parts conveyor drive and the controller with the delivery note and order documentation!



**ATTENTION!**

*Destruction of the small-parts conveyor drive and/or the controller possible, if the units don't match! Please observe the table 4-6 on page 26 and check, if the units match. Only operate units that belong together!*

In the case of applications in the food industry, please check, if the small-parts conveyor drive has been delivered with a special lacquering or in the case of applications in the pharmaceutical industry in version "CR", if required.

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## 2.2 Disposal

### 2.2.1 Packing Materials

The following materials are used by AViTEQ for delivering the small-parts conveyor drives, depending on the type of transport:

- Polyethylene foil (PE) for device protection
- Corrugated cardboard for outer and inner packing
- Wooden cases for outer packing
- Paper shavings as filler material
- Styrofoam (Flo-Pack) as filler and cushioning material

All packing materials should be disposed of in accordance with local regulations of the delivery destination.



Cardboard containers and paper packing tapes can be recycled within the RESY Disposal and Re-utilisation System. Where used, packaging foil, packing tapes, and foam foils are made from polyethylene (PE), the CFC-free cushions are usually made from polystyrene foam (PS). These packing materials consist of pure hydrocarbons and can thus be recycled.

In special cases, we use steel packing bands and wooden cases free of chemical treatment.

### 2.2.2 Returning the Device

AViTEQ Vibrationstechnik GmbH will accept without charge small-parts conveyor drives, type: KF... that have been delivered in 1998 or later when delivered shipping paid to AViTEQ Vibrationstechnik GmbH, 65795 Hattersheim-Eddersheim, Germany.

AViTEQ guarantees for a professional disposal. Therefore the small-parts conveyor drives have to be free of product arrears and pollutants. Otherwise AViTEQ is justified to refuse the acceptance of the drive.

### 2.2.3 Materials Used in the Units

In case of disposal by the customer, and when exchanging components, the current local waste and disposal regulations that apply have to be observed. We accept no responsibility for improperly disposed of parts and components.

- The regulations for the disposal of electronic parts and components apply to the disposal of the controller.
- The power semiconductors used (triacs and diode modules) do not contain beryllium.



**NOTE!**

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*More detailed information on the materials used is available from us on request. In case of doubt, please do make use of our recycling service!*

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## 3 Description

### 3.1 Construction and Principle of the Small-parts Conveyor Units

AViTEQ small-parts conveyor drives are used as drives for small-parts conveyor units. A small-parts conveyor unit consists of at least the following components:

- Small-parts conveyor drive
- Working unit (trough, tube or rail)
- Controller

Further a hopper may be part of the unit.

The construction concept of the small-parts conveyor drive is shown in the figure below.

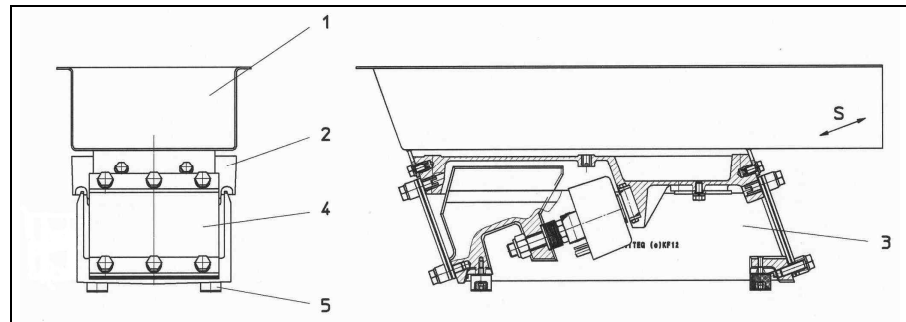


Figure 3-1 Construction principle of the small-parts conveyor unit

The small-parts conveyor drive is a two-mass oscillation system and is, among other things, made up of the main components: base plate (2), leaf springs (4), electromagnet (6) and lower part (3).

The electromagnet (6) generates a straight-path upwardly oscillation motion. The working unit (1) that is mounted to the base plate (2), transmits the oscillation motion to the transported material. Together the base plate and the working unit form one mass unit within the oscillation system. The lower part (3) represents the counter-mass. Both masses are connected by leaf springs (4). Rubber pads (5) support the oscillation system to its environment.

Each voltage cycle exerts a pulling force on the electromagnet (6). Depending on the type of the small-parts conveyor drive the unit oscillates with 3,000 or 6,000 oscillations per minute at a 50Hz-mains. By changing the voltage from the controller, the working stroke and hence the throughput may be adjusted during operation from close to 0 to 100 %.

### 3.2 Tuning of the Oscillation System

#### 3.2.1 Principles

Vibration drives are spring-mass oscillation systems that exploit the resonance of the oscillation system. If the system is stimulated, it continues to oscillate with its natural frequency, with a decaying amplitude depending on its attenuation properties.

If a sinusoidal force acts on this system with a frequency different from the natural frequency (vibration frequency or drive frequency), the entire system will no longer oscillate at its natural frequency (resonance frequency), but will follow the rhythm of the force exerted on it (forced oscillation).

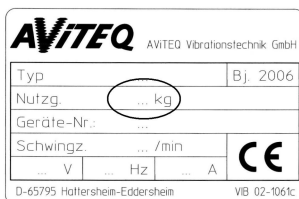
The closer the natural and the vibration frequency are, the larger the working stroke. However, for electromagnetic vibration drives, operation in the immediate vicinity of the natural frequency is critical, because retroactivities of the transported material like attenuation and coupling effects may have negative effects. For a stable operation of the oscillation system, a well-defined distance from the natural frequency is required. In this case, the natural frequency may be lower or higher than the vibration frequency.

AViTEQ small-parts conveyor drives, as described in this manual, always work in sub-critical operation. The natural frequency of the oscillation system is greater than the vibration frequency.

### 3.2.2 Tuning Data

Before delivery, small-parts conveyor drives without working units are factory-tuned for a specified working weight that is named „Nutzg.“ on the type label.

If the user installs a lower working weight, additional weights must be attached to the drives base plate until the combined mass reaches the given working weight. Else, if the user installs a higher working weight, the original distance from the natural frequency must be restored by changing the leaf spring arrangement. This is only allowed by AViTEQ or by special staff that has been trained and authorised by AViTEQ! After changing the original setting, the value of the natural frequency, the current, the working stroke, and the collision voltage must be check!



**NOTE!**

*Changes of the air gap, the spring rate, the tightening torque of the spring mounting screws, installation without rubber pads and deviations from the intended working weight (see type label) are not allowed, because this may lead to excessive heating of the drive, to short circuits between electromagnet windings, and eventually to destroying the drive. If you have any questions, you should give us a call! We can help to adapt the small-parts conveyor drive to your special requirements on request.*

*We always recommend our customers to send in the working unit, so that AViTEQ can carry out the exact tuning of the small-parts conveyor drive.*

When constructing your own working unit, you should ensure that sideway folding of the (trough) edges or other stiffening measures are used to achieve sufficient stiffness of the working unit if larger dimensions, thin metal sheets, or low side walls are used.



The technical data of the drives for a mains frequency of **50 Hz** are shown in the following tables:

Drive	KF 1-2	KF 6-2	KF 12-2	KF 24-3	Remarks
<b>Mains frequency: 50 Hz</b>					
Working weight (ideal)	1.5 kg	3.0 kg	6.0 kg	18.0 kg	Standard adjustment
Working weight (max.)	3.5 kg	7.0 kg	20.0 kg	45.0 kg	Maximum value, tuning only allowed to be carried out by AViTEQ!
Air gap	~ 1.0 mm	~ 2.5 mm	~ 3.5 mm	~ 3.0 mm	
Natural frequency (ideal)	103...108 Hz	55...60 Hz	55...60 Hz	54...59 Hz	
Tightening torque of the spring mounting screws	10 Nm	30 Nm	50 Nm	80 Nm	
Nominal current (max.) with...					
400 V nominal voltage	-	-	1.27 A	2.20 A	
240 V nominal voltage	0.20 A	0.85 A	2.20 A	3.75 A	
230 V nominal voltage	0.20 A	0.85 A	2.20 A	3.75 A	
110 V nominal voltage	0.40 A	1.70 A	4.40 A	-	
Vibrator voltage with...					Only use a true RMS meter for the measurement because of the non-sinusoidal voltage signal!
400 V nominal voltage	-	-	380 V	380 V	
240 V nominal voltage	210 V	210 V	210 V	210 V	
230 V nominal voltage	210 V	210 V	210 V	210 V	
110 V nominal voltage	100 V	100 V	100 V	-	
Collision voltage with...					Only use a true RMS meter for the measurement because of the non-sinusoidal voltage signal!
400 V nominal voltage	-	-	390 V	390 V	
240 V nominal voltage	216 V	216 V	216 V	216 V	
230 V nominal voltage	216 V	216 V	216 V	216 V	
110 V nominal voltage	105 V	105 V	105 V	-	
Working stroke with associated controller	0.5...0.6 mm	1.4...1.5 mm	1.4...1.5 mm	1.1...1.7 mm	
Oscillation rate	6,000 min <sup>-1</sup>	3,000 min <sup>-1</sup>	3,000 min <sup>-1</sup>	3,000 min <sup>-1</sup>	

Table 3-2 Operating data, **50 Hz-net** (Part 1)

Drive	KF 0.3-1	KF 0.5-1	KF 0.7-1	KF 0.9-1	Remarks
<b>Mains frequency: 50 Hz</b>					
Working weight (ideal)	0.3 kg	0.5 kg	1.5 kg	3.0 kg	Standard adjustment
Working weight (max.)	0.5 kg	0.8 kg	2.7 kg	5.5 kg	Maximum value, tuning only allowed to be carried out by AViTEQ!
Air gap	~ 0.8 mm	~ 0.8 mm	~ 0.9 mm	~ 3.3 mm	
Natural frequency (ideal)	108...110 Hz	108...109 Hz	108...109 Hz	57...60 Hz	
Tightening torque of the spring mounting screws	5 Nm	7 Nm	12 Nm	12 Nm	
Nominal current (max.) with...					
400 V nominal voltage	-	-	-	-	
240 V nominal voltage	0.06 A	0.07 A	0.32 A	1.20 A	
230 V nominal voltage	0.06 A	0.07 A	0.32 A	1.20 A	
110 V nominal voltage	0.12 A	0.15 A	0.65 A	2.50 A	
Vibrator voltage with...					Only use a true RMS meter for the measurement because of the non-sinusoidal voltage signal!
400 V nominal voltage	-	-	-	-	
240 V nominal voltage	240 V	240 V	210 V	210 V	
230 V nominal voltage	230 V	230 V	210 V	210 V	
110 V nominal voltage	110 V	110 V	105 V	105 V	
Collision voltage with...					Only use a true RMS meter for the measurement because of the non-sinusoidal voltage signal!
400 V nominal voltage	-	-	-	-	
240 V nominal voltage	248 V	248 V	216 V	216 V	
230 V nominal voltage	240 V	240 V	216 V	216 V	
110 V nominal voltage	118 V	118 V	109 V	109 V	
Working stroke with associated controller	0.4...0.5 mm	0.4...0.5 mm	0.6...0.7 mm	1.4...1.6 mm	
Oscillation rate	6,000 min <sup>-1</sup>	6,000 min <sup>-1</sup>	6,000 min <sup>-1</sup>	3,000 min <sup>-1</sup>	

Table 3-3 Operating data, **50 Hz-net** (Part 2)

The technical data of the drives for a mains frequency of **60 Hz** are shown in the following tables:

Drive <b>Mains frequency: 60 Hz</b>	KF 1-2	KF 6-2	KF 12-2	KF 24-3	Remarks
Working weight (ideal)	1.5 kg	3.0 kg	6.0 kg	18.0 kg	Standard adjustment
Working weight (max.)	3.5 kg	7.0 kg	20.0 kg	45.0 kg	Maximum value, tuning only allowed to be carried out by AVITEQ!
Air gap	~ 0.9 mm	~ 2.4 mm	~ 2.9 mm	~ 2.9 mm	
Natural frequency (ideal)	123...126 Hz	63...68 Hz	63...68 Hz	63...67 Hz	
Tightening torque of the spring mounting screws	10 Nm	30 Nm	50 Nm	80 Nm	
Nominal current (max.) with...					
480 V nominal voltage	-	-	-	2.20 A	
440 V nominal voltage	-	-	-	2.20 A	
380 V nominal voltage	-	-	1.27 A	-	
220 V nominal voltage	0.20 A	0.85 A	2.20 A	3.75 A	
110 V nominal voltage	0.40 A	1.70 A	4.40 A	-	
Vibrator voltage with...					Only use a true RMS meter for the measurement because of the non-sinusoidal voltage signal!
480 V nominal voltage	-	-	-	441 V	
440 V nominal voltage	-	-	-	420 V	
380 V nominal voltage	-	-	365 V	-	
220 V nominal voltage	210 V	210 V	210 V	210 V	
110 V nominal voltage	100 V	100 V	100 V	-	
Collision voltage with...					Only use a true RMS meter for the measurement because of the non-sinusoidal voltage signal!
480 V nominal voltage	-	-	-	456 V	
440 V nominal voltage	-	-	-	432 V	
380 V nominal voltage	-	-	375 V	-	
220 V nominal voltage	216 V	216 V	216 V	216 V	
110 V nominal voltage	105 V	105 V	105 V	-	
Working stroke with associated controller	0.4...0.5 mm	1.2...1.4 mm	1.2...1.4 mm	0.9...1.5 mm	
Oscillation rate	7,200 min <sup>-1</sup>	3,600 min <sup>-1</sup>	3,600 min <sup>-1</sup>	3,600 min <sup>-1</sup>	

Table 3-4 Operating data, **60 Hz-net** (Part 1)

Drive <b>Mains frequency: 60 Hz</b>	KF 0.3-1	KF 0.5-1	KF 0.7-1	KF 0.9-1	Remarks
Working weight (ideal)	0.3 kg	0.5 kg	1.5 kg	3.0 kg	Standard adjustment
Working weight (max.)	0.5 kg	0.8 kg	2.7 kg	5.5 kg	Maximum value, tuning only allowed to be carried out by AVITEQ!
Air gap	~ 0.7 mm	~ 0.7 mm	~ 0.8 mm	~ 3.2 mm	
Natural frequency (ideal)	123...124 Hz	123...124 Hz	123...124 Hz	63...65 Hz	
Tightening torque of the spring mounting screws	5 Nm	7 Nm	12 Nm	12 Nm	
Nominal current (max.) with...					
380 V nominal voltage	-	-	-	-	
220 V nominal voltage	0.06 A	0.07 A	0.32 A	1.20 A	
110 V nominal voltage	0.12 A	0.15 A	0.65 A	2.50 A	
Vibrator voltage with...					Only use a true RMS meter for the measurement because of the non-sinusoidal voltage signal!
380 V nominal voltage	-	-	-	-	
220 V nominal voltage	210 V	210 V	210 V	210 V	
110 V nominal voltage	105 V	105 V	105 V	105 V	
Collision voltage with...					Only use a true RMS meter for the measurement because of the non-sinusoidal voltage signal!
380 V nominal voltage	-	-	-	-	
220 V nominal voltage	216 V	216 V	216 V	216 V	
110 V nominal voltage	109 V	109 V	109 V	109 V	
Working stroke with associated controller	0.3...0.4 mm	0.4...0.5 mm	0.5...0.6 mm	1.2...1.4 mm	
Oscillation rate	7,200 min <sup>-1</sup>	7,200 min <sup>-1</sup>	7,200 min <sup>-1</sup>	3,600 min <sup>-1</sup>	

Table 3-5 Operating data, **60 Hz-net** (Part 2)



**NOTE!**

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*All voltage values apply to AViTEQ-controllers with voltage regulation of the series: SRA(E)...-1 (...also observe table 4-6 on page 26) or SC(E)...-2. AViTEQ-controllers of the series SC(E)...-2 have to be used, if the mains voltage exceeds 240V (50Hz) or 220V (60Hz).*

*As a further exception and **only**, if the mains frequency is **50Hz** the small-parts conveyor drives, type KF 03-1 and KF 05-1 can be operated with the controller type SW... !*

---

### **3.3 Sound Pressure Level**

The small-parts conveyor drive generates a sound pressure level of less than 70 dB(A) without considering the working unit or the transported material. Depending on the construction of the working unit and the acoustic properties of the material transported, the sound pressure level of the operational small-parts conveyor unit may exceed 70 dB(A). It is the operator's responsibility to ensure adherence to the sound pressure level permitted by means of suitable noise protection measures!

---

## 4 Installation

Unless the small-parts conveyor unit has been delivered with a working unit attached, the working unit (trough, tube or rail) must first be bolted onto the small-parts conveyor drive. Afterwards, the entire small-parts conveyor unit has to be positioned and bolted firmly onto the basement or the support structure.

### 4.1 Installation of the Working Unit



**NOTE!**

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*If the small-parts conveyor unit has been delivered by AViTEQ complete with the working unit (trough, tube or rail) assembled, you may skip ahead to Chapter 4.2 „Installation of the Small-parts Conveyor Unit“ on page 23 now.*

---

#### 4.1.1 Working Unit

If you want to build your own working unit, please observe the following advices:

- ☞ The trough has to be stiff to avoid bending. In the case of large lengths/widths and low side walls, sideways folding of the edges or other stiffening measures may be required to achieve this. If required, ribs or rails have to be attached. However, this must not interfere with the attachment of the trough.
- ☞ Operating noise: the small-parts conveyor drive generates a sound pressure level of less than 70 dB(A) without considering the working unit or the transported material.



**NOTE!**

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*Depending on the construction of the working unit and the acoustic properties of the material transported, the sound pressure level of the operational small-parts conveyor unit may exceed 70 dB(A). It is the operator's responsibility to ensure adherence to the sound pressure level permitted by means of suitable noise protection measures!*

---

- ☞ The centre of gravity of the working unit (trough, tube rail) should be within the front section (outlet side) of the small-parts conveyor drive.
- ☞ When placing the mounting holes, use the information in the AViTEQ leaflet „small-parts conveyor units“. Do not drill any additional holes into the small-parts conveyor drive! Only use the threaded holes on the small-parts conveyor drive!
- ☞ For correct alignment of the oscillation system, it is best to inform AViTEQ about the actual working weight (not including transported material) when ordering the small-parts conveyor drive!



**NOTE!**

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*It is possible to run longer transport systems (trough, tube or rail) with several successive small-parts conveyor drives. Please contact AViTEQ in such a case!*

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### 4.1.2 Location and Data of the Fixing Screws

The working unit is attached to the small-parts conveyor drive by screws. According to the type of the small-parts conveyor drive the attachment is from above, sidewise or frontal.

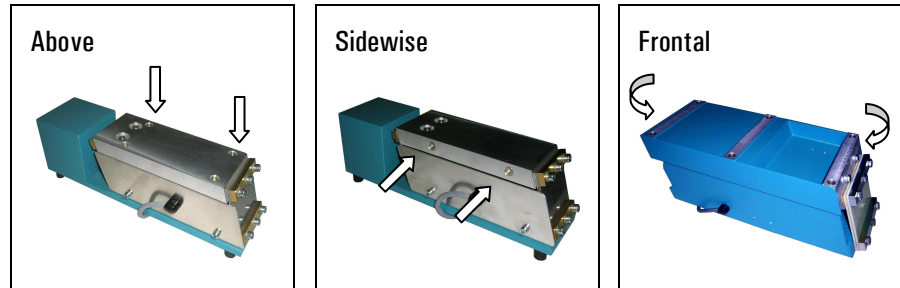


Figure 4-1 Kind of fixings

The following table 4-2 shows the technical specifications for the fixing screws. The values in brackets are the minimal and maximal allowed depth for turning the fixing screws into the base plate of the small-parts conveyor drive.

Drive	Attachment from <b>above</b>	Attachment <b>frontal</b>	Attachment <b>sidewise</b> (special version)
KF 0.3-...	M4 (4...10 mm)	-	M4 (4... 8 mm)
KF 0.5-...	M5 (5...10 mm)	-	M5 (5...10 mm)
KF 0.7-...	M6 (6...14 mm)	-	M6 (6...12 mm)
KF 0.9-...	M8 (8...16 mm)	-	M6 (6...14 mm)
KF 1-...	M5 (5...10 mm)	M5 (5...10 mm)	-
KF 6-...	M8 (8...15 mm)	M6 (6...12 mm)	-
KF 12-...	M8 (8...15 mm)	M8 (8...15 mm)	-
KF 24-...	M10 (10...18 mm)	M12 (12...18 mm)	-

Table 4-2 Fixing screw data



*Ensure that the attachment screws have the correct size are not too long! If they are too long, the working unit may not be able to be attached, or the end of the screws pointing to the inside restricts the movement of the upper part of the small-parts conveyor drive.*

*Do not drill holes into the bottom of the trough! Protruding bolt heads obstruct the product flow. Rather, you should use joints on the side or underside of the working unit for the attachment to the small-parts conveyor drive.*

### 4.1.3 Assembly Preparation

- ☞ Put the small-parts conveyor drive onto a solid and flat surface.



*Inadequate installation may cause the small-parts conveyor drive to fall down possibly causing injuries. Take appropriate steps to ensure that the small-parts conveyor drive cannot fall down!*

- ☞ Keep the mounting screws ready for the working unit. Choose screws with a bolt quality of 8.8 and ensure that the screws have the correct length!
- ☞ The controller must be separated from the mains if it has already been connected to the small-parts conveyor drive.

### 4.1.4 Installation



- ☞ Weigh the working unit (trough, tube or rail) without the transported material.
- ☞ Compare the weight measured with the weight „Nutzg. ... kg“ shown on the type label on the small-parts conveyor drive (see figure left).
- ☞ If the weight of the working unit is smaller, you will need to add additional weight (e.g., spacer plates) to reach the specified working weight. Such additional weight can be ordered from AVITEQ. If the weight of the working unit exceeds the specified working weight, the small-parts conveyor drive **must** be re-tuned by AVITEQ.

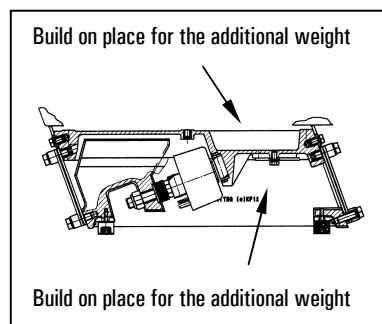


*Collision mode due to excessive working weight! Therefore deviations from the specified working weight are not allowed, because this may lead to excessive heating of the drive, to short circuits between electromagnet windings, and eventually to the destruction of the drive.*



*Low working weight results in low throughput! Do not commission the unit until the working weight (without transported material) corresponds to the specification on the type label!*

- ☞ Mount the working unit and if required, the additional weights (see figure 4-4) by screw joint onto the small-parts conveyor drive. Depending on the construction of the working unit, the fixing is carried out from above, from the side, or frontal. The appropriate tightening torque for the screws is shown in table 4-3 below.



Screw size	Tightening torque for screws (quality 8.8)
M4	2.4 Nm
M5	5.0 Nm
M6	8.0 Nm
M8	20.0 Nm
M10	40.0 Nm

Table 4-3  
Screw tightening torques

Figure 4-4 Build on place for the additional weight (KF 1..., 6..., 12... and 24...)

## 4.2 Installation of the Small-parts Conveyor Unit



**ATTENTION!**

*Resonances of the basement or the support structure might lead to malfunctions and damages. Please observe that the basement and the support structure have to be stiff. Resonances must not exist!*



**ATTENTION!**

*Damaging of the small-parts conveyor units or low capacity resulting from incorrect installation! AViTEQ small-parts conveyor drives are designed for a horizontal installation. The allowed angular misalignment towards the horizontal platform is limited to 8 degrees! All support elements (rubber pads) must lie in the same level, steps are not allowed.*



**NOTE!**

*AViTEQ also delivers completed units, consisting of the small-parts conveyor drive, working unit, hopper and an appropriate base plate. In this case only the fixing of the base plate with the support structure is required. No additional rubber pads are required.*

*Further AViTEQ offers special constructions for suspended applications.*

### 4.2.1 Assembly Preparation

- ☞ Put the small-parts conveyor drive onto a solid and flat surface.



**DANGER!**

*Inadequate installation may cause the small-parts conveyor drive to fall down possibly causing injuries. Take appropriate steps to ensure that the small-parts conveyor drive cannot fall down!*

- ☞ Keep the mounting screws ready for the small-parts conveyor drive. Choose screws with a bolt quality of 8.8 and ensure that the screws have the correct length (see table 4-3 on page 24)!
- ☞ The controller must be separated from the mains if it has already been connected to the small-parts conveyor drive.

### 4.2.2 Installation

- ☞ Position the small-parts conveyor drive at the intended assembly place. Before you mark the drilling holes, check that the working unit can vibrate freely without striking against neighboring conveyor components. The distance depends on the working stroke, which will be adjusted later.



**NOTE!**

*In the case of working units with input and output nozzle, the bellow used must not impede free vibration of the unit. Observe appropriate bellow length and flexibility.*

- ☞ Drill holes and make sure, that you do not damage the rubber pads if you leave the unit on the support structure during drilling.

- ☞ Fix the rubber pads to the support structure. The appropriate tightening torques for the screws are shown in table 4-5 below. Do not exceed the permissible tightening torques as this may result in damage to the rubber pad concerned.

Drive	Screw size	Tightening torque for screws	Minimum and maximum screw length inside rubber pad
KF 0.3-...	M4	2.4 Nm	3...5 mm
KF 0.5-...	M4	2.4 Nm	3...5 mm
KF 0.7-...	M4	2.4 Nm	3...5 mm
KF 0.9-...	M6	8.0 Nm	4...6 mm
KF 1-...	M4	2.4 Nm	3...5 mm
KF 6-...	M6	8.0 Nm	4...6 mm
KF 12-...	M6	8.0 Nm	4...6 mm
KF 24-...	M8	20.0 Nm	5...8 mm

Table 4-5 Tightening torques for screws and screw length inside the rubber pads



**ATTENTION!**

*Insufficient attachment of the small-parts conveyor unit! Ensure that the attachment screws have the correct length! The screws must not reach the bottom of the mould in the feet, as this prevents safe attachment of the small-parts conveyor drive.*

*Insufficient attachment leads to a relative motion between the lower part and the support construction and can result in the destruction of the rubber pads.*

- ☞ If the conveyed material leads to an electro-static charge of parts of the device, please provide a potential equalisation between the small-parts conveyor drive, the working unit and/or the support structure by an appropriate grounding.



## 4.3 Selection and Installation of the Controller

The small-parts conveyor units must be operated and connected via an appropriate controller to an AC mains with 50 or 60 Hz. The controllers are either included in the shipment from AViTEQ, or may be obtained from third party manufacturers under certain circumstances.

Further information can be found in the operating manual that exists for every AViTEQ-controller.

### 4.3.1 Controller

The VIBTRONIC controllers recommended by and available from AViTEQ permit an adjustment of the vibration width and thus of the conveyance rate from almost 0 to 100 %.

Four type series of AViTEQ controllers with different characteristics are applicable and can be designated:

- **SW...**, controller for small-sized drives for nominal currents up to 0.1 A.
- **SFA...**, frequency controller (converter) with a level scanning system for nominal currents up to 8.0 A. The output-frequency can be set within a fixed range. Fluctuations of the mains voltage and frequency are compensated and haven't got any influence on the working stroke. Optionally a working stroke regulation with a pick-up sensor is deliverable.
- **SRA(E)...**, series with voltage regulation for nominal currents up to 6.0 A with soft start. Mains voltage fluctuations are compensated and are almost without an effect on the conveyor capability. Optional the controller can be delivered with a level scanning system / part overflow controller. Controllers with a level scanning system / part overflow controller are specially designed for linking several small-parts conveyor units and/or bowl feeders.



#### ATTENTION!

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*For using the level scanning system or the part overflow controller an appropriate sensor is needed. Unless the sensor isn't part of the AViTEQ supply, AViTEQ isn't responsible for the sensor selected and therefore further isn't liable for damages that result out of incorrect selection and an incorrect case of operation of a sensor that isn't permitted for the case of operation.*

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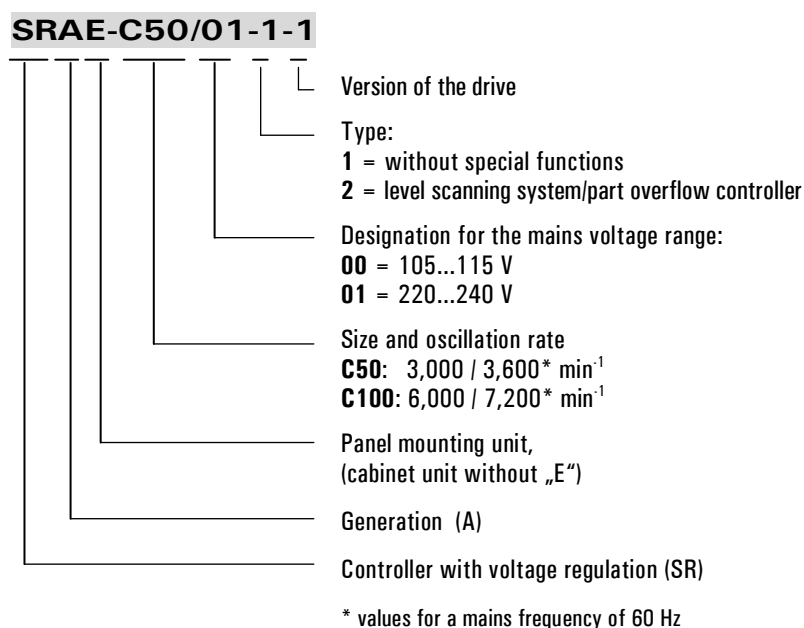
- **SC(E)...**, series with voltage regulation for nominal currents up to 15.0 A with soft start.

The controllers can optionally be delivered in the following versions:

- **Cabinet unit (IP54)**, controller in a closed housing. Depending on the type of controller, the terminals are designed pluggable and a potentiometer and a switch (On/Off) are integrated on the front plate. Delivered with an appropriate operating manual.
- **Panel mounting unit (IP00 or IP20)**, controller for installation in switching cabinets or control cases. Depending on the type, the fixing of the controller results from mounting onto a top hat rail or bolting together with a subplate. Delivered with an appropriate potentiometer (delivered loose) and operating manual.

### 4.3.2 Type Designation

Small-parts conveyor drives are normally operated with VIBTRONIC controllers of the series SRA(E)... . The type designation contains the following information:



### 4.3.3 Combination of Small-parts Conveyor Drive and Controller

Always use the following table (controllers series SW... and SRA...) to check prior to installation whether your controller is suitable for the existing small-parts conveyor drive(s)! Also check the mains specifications as stated on the type label!

Type	Nominal current	Degree of protection EN 60529	Weight	Oscillation rate	Matching small-parts conveyor drives	Remark(s)
SW-A100-1	0.1 A	IP55	0.6 kg	6,000 min <sup>-1</sup>	KF 0.3 / 0.5	Without soft-start and voltage regulation
SRA - C50/01-.-1	6.0 A	IP54	1.3 kg	3,000 min <sup>-1</sup>	KF 0.9 / 6 / 12 / 24	0(4)...20 mA, 0...10 V DC
SRAE-C50/01-.-1	6.0 A	IP00	0.6 kg	3,000 min <sup>-1</sup>	KF 0.9 / 6 / 12 / 24	0(4)...20 mA, 0...10 V DC top hat rail mounting
SRA - C100/01-.-1	6.0 A	IP54	1.3 kg	6,000 min <sup>-1</sup>	KF 0.5 / 0.7 / 1	0(4)...20 mA, 0...10 V DC
SRAE-C100/01-.-1	6.0 A	IP00	0.6 kg	6,000 min <sup>-1</sup>	KF 0.5 / 0.7 / 1	0(4)...20 mA, 0...10 V DC top hat rail mounting

Table 4-6 VIBTRONIC-controllers (mains voltage and frequency 220...240V, 50 Hz)



*Unsuitable controller, operation without controller and/or operation with an incorrect mains voltage/frequency normally result in damage to the small-parts conveyor drive and is not allowed. Ensure that the connected loads are correct and compare them with the device type labels!*

#### 4.3.4 Controllers from Third-party Manufacturers

Observe the following hints if you do not want to use an AViTEQ controller. Amongst other information, you can find the following specifications on the type label of an AViTEQ small-parts conveyor drive:

- Type
- Oscillation rate (oscillations per minute)
- Mains voltage
- Mains frequency
- Nominal current

When selecting a suitable controller, the mains voltage, mains frequency, mains current, and oscillation rate stated on the type label must be observed under any circumstances!



**ATTENTION!**

*Unsuitable controller, operation without controller and/or operation with an incorrect mains voltage/frequency normally result in damage to the small-parts conveyor drive and is not allowed. Ensure that the connected loads are correct and compare them with the device type labels! AViTEQ assumes no responsibility if controllers from third-party manufacturers are used! The valid nominal values for the current, voltage, and frequency must not be exceeded. Otherwise collision mode and as a result of this damage to the small-parts conveyor drive is possible.*

*If you use a controller from a third-party manufacturer, the distance between the nominal and the collision voltage has to be checked. The appropriate distance can be calculated by studying the values shown in the tables 3-2 up to 3-5. For example, if the nominal voltage is 220...240V, the distance is 6V. This distance (value) must not be fallen below. Otherwise collision mode and as a result of this damage to the small-parts conveyor drive is possible.*

*Only use meters which display the root mean square value for measuring the voltage and the current (moving iron instrument or „true RMS“). Other measuring devices would not produce relevant measurements when measuring the non-sinusoidal voltage or current curve!*

*Operation of the small-parts conveyor drive with square wave voltages is not permissible and may lead to destroying the drive!*

#### 4.3.5 Line Lengths

When you install the cable between the small-parts conveyor drive and the controller, please observe the following:

- ☞ The cable length must not exceed **40 m**,
- ☞ Only use cables with an insulation that suits the environmental requirements. For pharmaceutical and food processing applications, you must further choose sterilisable insulations, if required.
- ☞ In the proximity of the small-parts conveyor drive, run the cable in such a way that contact with vibrating parts is impossible.



**DANGER!**

*Short circuits and electric shock may result if insulation is damaged by rubbing! Connecting cables must **never** come in contact with vibrating parts – otherwise, the insulation may get damaged. Run the cables in a way that excludes this danger!*

- ☞ Avoid cable loops! Shorten cables if required.

### 4.3.6 Connexion Diagrams

Depending on the application a single small-parts conveyor drive (s. figure 4-7) or up to 4 small-parts conveyor drives (s. figure 4-8) can be operated with a single controller. Also the connexion of a sensor with an AViTEQ controller of the type SRA... in special version with level scanning system or part overflow controller is possible.



**ATTENTION!**

*Unless the sensor isn't part of the AViTEQ supply, AViTEQ isn't responsible for the sensor selected and therefore further isn't liable for damages that result out of incorrect selection and an incorrect case of operation of a sensor that isn't permitted for the case of operation.*

For single drives the wiring has to be carried out as shown in figure 4-7 below.

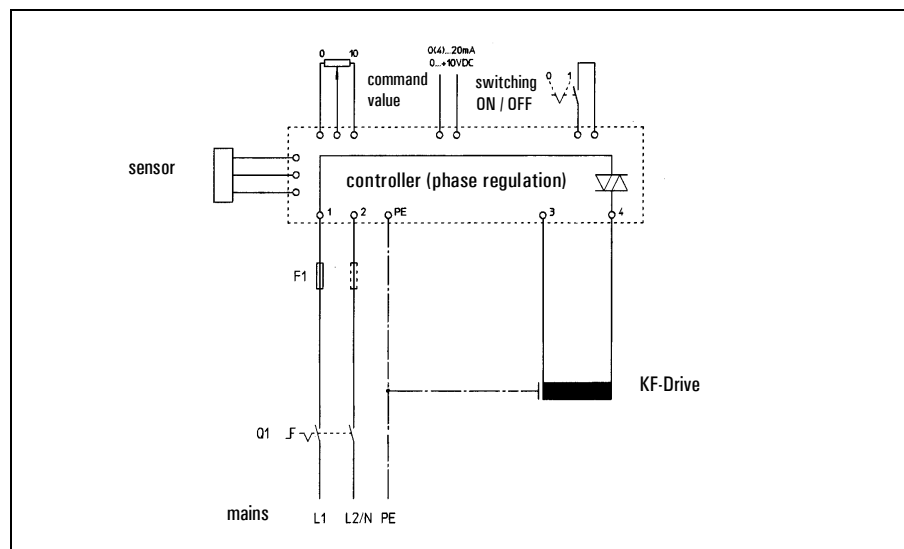


Figure 4-7 Connexion diagram, single drive



**ATTENTION!**

*Unsuitable controller, operation without controller and/or operation with an incorrect mains voltage/frequency normally result in damage to the small-parts conveyor drive and is not allowed. Ensure that the connected loads are correct and compare them with the device type labels!*

*It is totally prohibited that the current consumption of the small-parts conveyor drive exceeds the value of the nominal current specified on the type label. Exceeding the allowed current leads to un-allowed excessive temperatures of the electromagnet that may lead to destroying the small-parts conveyor drive. Protect the drive(s) against over-current!*

If several small-parts conveyor drives (multiple drives) are operated with a common controller the wiring has to be carried out as shown in figure 4-8 below.

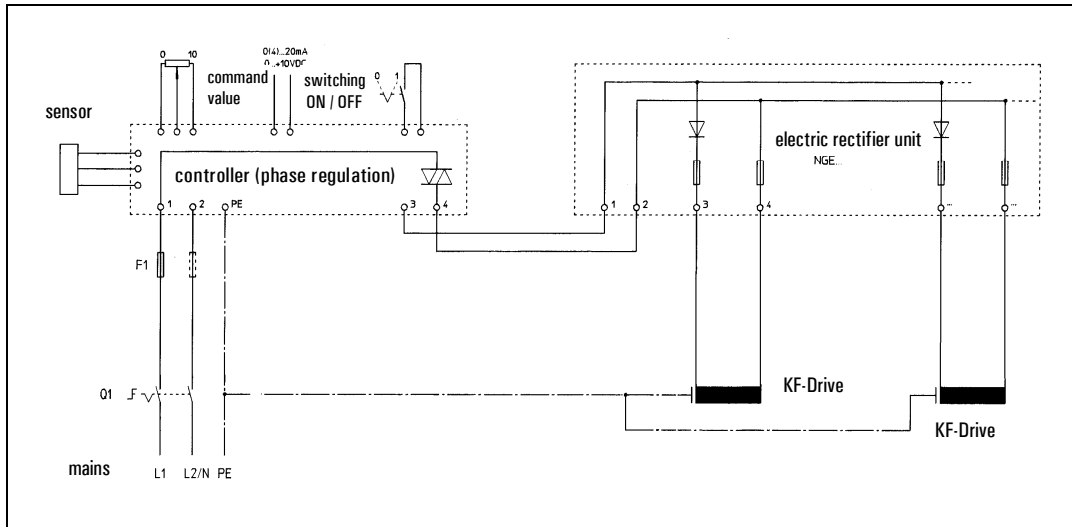


Figure 4-8 Connexion diagram, multiple drives

#### 4.3.7 Mains Connexion



*When the unit is connected to the mains, a lethal voltage is present inside the controller and possibly existing junction boxes. Touching electrically live components can be lethal! Before switching on mains power, ensure that no live parts can be touched!*

Every small-parts conveyor drive is delivered with a fitted connexion cable. For connecting the drive with the controller normally a separate terminal box is needed. Please observe that there is a relative movement between the small-parts conveyor drive and the support structure during operation.

Further details about the mains connexion can be found in the operating manual of the appropriate AViTEQ-controller.

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## 5 Commissioning



**NOTE!**

*Before first commissioning make sure that the working unit can oscillate without colliding with other parts and that all screws are tightened correctly.*

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Prior to the first commissioning all assembly works have to be carried out, as they are described in the previous chapter.

AViTEQ delivers small-parts conveyor drives including the appropriate controllers. Before commissioning, please check that the small-parts conveyor drive is only operated with the appropriate controller!

---



**ATTENTION!**

*Unsuitable controller, operation without controller and/or operation with an incorrect mains voltage/frequency normally result in damage to the small-parts conveyor drive and is not allowed. Ensure that the connected loads are correct and compare them with the device type labels!*

---



**NOTE!**

*It is impossible to predict the behavior of the small-parts conveyor unit in this operating manual if working units or controllers from third party manufacturers are used that were not manufactured by AViTEQ. If necessary, contact the manufacturer.*

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The commissioning procedure must be carried out using the lowest working stroke: Turn the vibration-width adjuster (potentiometer) on the controller counter clockwise till you reach the end stop (scale value of 0) or, if you use an external command value, set the lowest command value. Now switch on the controller.

---



**NOTE!**

*The commissioning process is carried out at a low working stroke in order to be able to detect any damage caused by assembly errors or the vibration behavior of the entire vibration conveyor device which is undetected at this point. Example: The working unit collides with neighboring conveyor components or works in collision mode.*

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Listen for any *hammering* noises that indicate the *collision mode*.

Slowly increase the working stroke by gradually turning the vibration-width adjuster (potentiometer) or by increasing the external command value, until the maximum value has been reached.

If hammering noises or resonances of the working unit or the support structure occur, switch off the unit and check the cause. By measuring the current and the voltage on the terminals of the controller, you can check the appropriate values. The maximum allowed vibrator voltage that is shown in the tables 3-2; 3-3; 3-4; and 3-5 on page 17 and 18 for the respective nominal voltage and mains frequency, **must not be exceeded!**



**DANGER!**

*Short circuit or danger of electrocution during the following measurements! Observe the safety regulations when measuring voltage-carrying components! Take appropriate measures to prevent contact with voltage-carrying components.*

---



**NOTE!**

*Only use meters which display the root mean square value for measuring the voltage and the current (moving iron instrument or „true RMS“). Other measuring devices would not produce relevant measurements when measuring the non-sinusoidal voltage or current curve. For digital measuring devices, select a measuring range of  $\geq 750\text{ V}$ !*

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The current that is shown on the type label must not be exceeded!

If no problems appeared, please check the function of the small-parts conveyor unit with the appropriate transported material for completing the commissioning: Is the material transported uniformly? Measure whether the required throughput is achieved.

Did problems appear while commissioning or do you have any questions, give us a call. We'll be glad to help you.

# 6 Maintenance



**DANGER!**

*Before carrying out any inspection works, the small-parts conveyor drive must be disconnected from mains and protected against reconnecting. Check that no voltage is present!*

*Further check, if the surface temperature is less than +50°C, otherwise the surface temperature may lead to burns of the skin!*

## 6.1 Regular Checks

Normally AViTEQ small-parts conveyor drives and controllers are maintenance-free.

We recommend the following checks in regular intervals as shown below:

Test intervals	Checks
2 operating hours after the first commissioning	<ul style="list-style-type: none"> <li>- Check screw connexions (working unit/drive)</li> <li>- Check, if connexion cable doesn't swing</li> <li>- Check, if connexion cable shows visible damages</li> <li>- Check noise development</li> <li>- Check that no deposits are existing (working unit/hopper)</li> </ul>
24 operating hours after the first commissioning	<ul style="list-style-type: none"> <li>- Check screw connexions (working unit/drive)</li> <li>- Check, if connexion cable doesn't swing</li> <li>- Check, if connexion cable shows visible damages</li> <li>- Check noise development</li> <li>- Check that no deposits are existing (working unit/hopper)</li> <li>- Check the condition of the support elements (rubber pads)</li> <li>- Check the condition of the working unit</li> </ul>
weekly	<ul style="list-style-type: none"> <li>- Check, if connexion cable doesn't swing</li> <li>- Check, if connexion cable shows visible damages</li> <li>- Check noise development</li> <li>- Check that no deposits are existing (working unit/hopper)</li> </ul>
monthly	<ul style="list-style-type: none"> <li>- Check screw connexions (working unit/drive)</li> </ul>
half-yearly	<ul style="list-style-type: none"> <li>- Check the condition of the support elements (rubber pads)</li> <li>- Check the condition of the working unit</li> </ul>

Table 6-1 Regular checks

While checking the screw connexions it is not allowed to alter the screw tightening torque of the spring mounting screws.

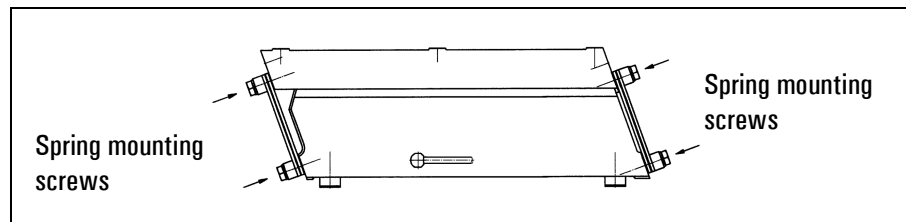


Image 6-2 Spring mounting screws



**NOTE!**

*It is not allowed to loosen the spring mounting screws (see figure 6-2) or to alter their tightening torque! Please observe this to avoid any damage to the small-parts conveyor drive!*



## 6.2 Cleaning

Depending on the environmental conditions and the properties of the material transported, the components of the small-parts conveyor unit, in particular the working unit will be subject to varying degrees of contamination.

Check the contamination level on regular basis. Initially, check on a weekly basis, thereafter check in intervals that you determine based on the requirements.



**NOTE!**

---

*If the working unit has a lining made out of plastic (e.g. Teflon, polyurethane, etc.) or a blanket with a brushing effect, special cleaning methods might be required to avoid any damage to the lining. Please clear this before you start cleaning the working unit.*

---

If the contamination is significant enough to impair the throughput, or there is a layer of dirt on the small-parts conveyor drive, it must be cleaned. As cleaning methods, alongside mechanical methods (hand brush e.g.), pressurised air and water with and without chemical cleansing agents are permitted.

Proceed thereby as follows:

- ☞ Switch off the power to the drive before any cleaning operation!
- ☞ Select the appropriate method! If applicable, follow the guidelines for the use of pressurised air, water and cleaning solvents that apply to the installation site! Also observe the degree of protection.
- ☞ Only use cleaning solvents with a pH value of 7 or greater!
- ☞ Do not use cleaning solvents containing chlorine!
- ☞ When cleaning with compressed air, observe any in-house regulations regarding dust.



**ATTENTION!**

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*Detachment of paintwork and contamination of the transported material! Do not use aggressive agents that could damage the paintwork! In the food processing industry, only permitted cleaning agents and solvents may be used. Do not use cleaning agents that may attack the plastic insulation of cables and cable glands!*

---

- ☞ Remove all residues of transported material and cleaning agent after cleaning!

## 6.3 Repairs

There are no components inside of the small-parts conveyor drive and the controller which could be repaired or serviced by the user. Do not attempt any repairs! In the event of damage, please send the small-parts conveyor drive back to AViTEQ Vibrationstechnik GmbH, 65795 Hattersheim-Eddersheim, Germany for being repaired.

# 7 Troubleshooting

In the following table you will find information regarding possible faults which could occur during installation or during operation.

	Fault	Cause(s)	Remedy
①	Small-parts conveyor drive does not function	No mains voltage	Check fuse(s) and the supply line(s)
		Units (controller, small-parts conveyor drive) defect	Please send the units to AViTEQ Vibrationstechnik GmbH, we will check and if possible repair the units
②	Release of the motor-protective circuit breaker (optinal)	Motor-protective circuit breaker has the wrong adjustment	Observe the current shown on the type label on the small-parts conveyor drive and alter the adjustment on the motor-protective circuit breaker.
		Power input of the small-parts conveyor drive inadmissibly highly	See point ③.
③	Power input of the small-parts conveyor drive inadmissibly highly	Electromagnet (winding) defect	Please send the drive to AViTEQ Vibrationstechnik GmbH, if possible we will repair the drive
		Air gap is set to wide	Only AViTEQ Vibrationstechnik GmbH is allowed to alter the air gap, please send in the unit or ask for our service
		Working weight to low and/or natural frequency to high	If possible and allowed, mount additional weight. Otherwise please send in the unit or ask for our service
④	Drive is running in collision mode (hammering noise)	Operating the small-parts conveyor drive without a controller	Only operate the small-parts conveyor drive with the appropriate controller
		Screws are loose	Tighten screws with the appropriate torque
		Excessive working weight and/or natural frequency to low	Only AViTEQ Vibrationstechnik GmbH is allowed to alter the natural frequency, please send in the unit or ask for our service
		Air gab is set to narrow	Only AViTEQ Vibrationstechnik GmbH is allowed to alter the air gap, please send in the unit or ask for our service
		Unsuitable controller	Please check, if the controller and the small-parts conveyor drive match, therefore check the AViTEQ delivery information.
		Leaf spring(s) or spring mounting screw(s) broken	Please send the drive to AViTEQ Vibrationstechnik GmbH, if possible we will repair the drive
		Loose parts collide with the small-parts conveyor drive or unit	Remove or tighten loose parts
⑤	Small-parts conveyor unit output to low	Unsuitable controller	Please check, if the controller and the small-parts conveyor drive match, therefore check the AViTEQ delivery information.
		Working weight to low and/or natural frequency too high	Only AViTEQ Vibrationstechnik GmbH is allowed to alter the natural frequency, please send in the unit or ask for our service
		Working unit cannot vibrate freely	Operate the small-parts conveyor unit only when it rests on rubber pads, the working unit must oscillate freely without touching any components
		Resonances at the working unit or the support construction	Eliminate resonances
		Deposits of the transported material, also ③ and ④ possible	Eliminate deposits and take further steps to avoid deposits
		Screws for tightening the working unit are too long, also ③ and ④ possible	Shorten the screws
		Check, if used, if the height of the hopper outlet is too low	Increase height of the hopper outlet, if necessary. Observe that the maximum height of the outlet is the height of the working unit.
		Temperatures below 0°C, transported material freezes or sticks	Warm up the transported material if possible or take other steps to avoid that the material freezes or sticks.

Table 7-1 Fault, Causes and Remedies



**NOTE!**

*Consult us, however, prior to performing error rectification measures to avoid possible damages or accidents.*

*The faults listed in the table 7-1 refer to the small-parts conveyor drive. Further faults, caused by the controller, can be found in the appropriate operating manual.*

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# Declaration of Conformity

*according to Appendix III Point B of the EC Directive 2006/95/EC for electrical equipment designed for use within certain voltage limits*

The Manufacturer...

**AVITEQ Vibrationstechnik GmbH  
Im Gotthelf 16  
65795 Hattersheim-Eddersheim  
Germany**

declares that the small-parts conveyor drives of the series... **KF...**

are in conformance with the following European Directive...

**2006/95/EC      Directive relating to electrical equipment  
designed for use within certain voltage limits**

The conformance of the products with the European Directive is demonstrated through full observation of the following harmonised standards and national standards:

**EN 60204-1**

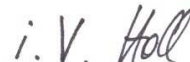
**DIN IEC 60038  
DIN VDE 0580**

Full technical documentation is available. The operating manual for the devices has to be observed. The CE symbol has been placed on the type label of the small-parts conveyor drive.

The safety notes in the operating manual and the intended use must be observed! This declaration certifies conformance with the specified standards and directive.

Hattersheim-Eddersheim, 18<sup>th</sup> of August 2008

Legally binding signature:



i.V. Holl (Product manager for small-parts conveyor drives)

# Declaration of Incorporation

(Translation of the original Declaration of Incorporation)

according to Appendix II, Part 1, Section B of the EC Directive 2006/42/EC for Machines

The manufacturer...

**AViTEQ Vibrationstechnik GmbH**  
**Im Gotthelf 16**  
**65795 Hattersheim-Eddersheim**  
**Germany**

declares that the drives (small-parts conveyor drives) of the series...

**KF...**

comply with the requirements of the following European Directive:

**2006/42/EC**

**Directive for Machines**

and according to Article 2 Point g), these are partly completed machinery which are exclusively intended for the installation in or for the assembly with another machine or equipment.

The special technical documents according to Appendix VII Part B have been produced. Mr. **Thomas Holl** is authorised to compile these special technical documents according to Appendix VII Part B and to transmit these on request in electronic form to the responsible national authorities. The associated address is: **AViTEQ Vibrationstechnik GmbH, Mr. Thomas Holl, Nürtinger Straße 80, 72644 Oberboihingen, Germany.**

The following general health and safety requirements according to Appendix I of this Directive are applicable and have been complied with:

**1.1.1; 1.1.2; 1.1.3; 1.1.5;**  
**1.3.1; 1.3.2; 1.3.3; 1.3.4; 1.3.6; 1.3.7;**  
**1.4.1;**  
**1.5.1; 1.5.6;**  
**1.7.3; 1.7.4; 1.7.4.1; 1.7.4.2 and 1.7.4.3.**

The conformity of the products with the European Directive is also proven by compliance with the following harmonised and (inter)national standards and requirements:

**EN ISO 12100-1 / ...-2**  
**EN 60034-1**  
**EN 60529**  
**DIN VDE 0580**

According to Article 2 Point g) of the Machines Directive 2006/42/EC, the drives are partly completed machinery. Installation instructions according to Appendix VI must be produced for and supplied with this partly completed machinery. Due to the requirements arising from other also applicable EC Directives, a complete operating manual has been produced. This is an integral part of the product. A separate installation manual therefore does not exist. Instead, the description of the installation is part of the operating manual and must be observed accordingly.

**It is not permitted to start using the drive until it has been ensured that the machine in which the drive is installed complies with the provisions of the Machines Directive 2006/42/EC.**

Strictly observe the safety instructions and the information about proper use in the supplied operating manual.

Hattersheim-Eddersheim, 29<sup>th</sup> of December 2009

Legally binding signature:




i.V. Holl (Product manager for small-parts conveyor drives)

AVITEQ Vibrationstechnik GmbH  
Im Gotthelf 16  
65795 Hattersheim-Eddersheim  
Germany

Phone ..... +49 / (0) 61 45 / 5 03 - 0  
Fax ..... +49 / (0) 61 45 / 5 03 - 2 00  
Fax ..... +49 / (0) 61 45 / 5 03 - 112 (Service-Hotline)  
E-Mail ..... [service@aviteq.de](mailto:service@aviteq.de)

[www.aviteq.de](http://www.aviteq.de)

 VIB 12.51 / 01-2010 EN (BE) - 58135