

# APOS MAGNETIC GLIDING 17-BIT

POSITIONING SYSTEM



## APOS MAGNETIC GLIDING – SYSTEM

The APOS Magnetic Gliding positioning system from VAHLE relies on a very robust system using a magnetic method. The absolute position is encoded on a magnetized code strip and is decoded safely and reliably using a sliding reading head. The system is very compact and is highly compatible with VAHLE conductor rails, so that a very reliable overall system can be offered.

APOS Magnetic Gliding guarantees absolute position determination even directly after switching on or after a power loss. In addition, the magnetic process is absolutely error-resistant even in damp, dusty or difficult lighting conditions. VAHLE is the market leader in the field of magnetic positioning and has many years of market experience in various application areas.

Our latest generation: The **17-bit system is now available** and can support system lengths of up to 524 meters. The system is also downward compatible and can be adjusted via software.

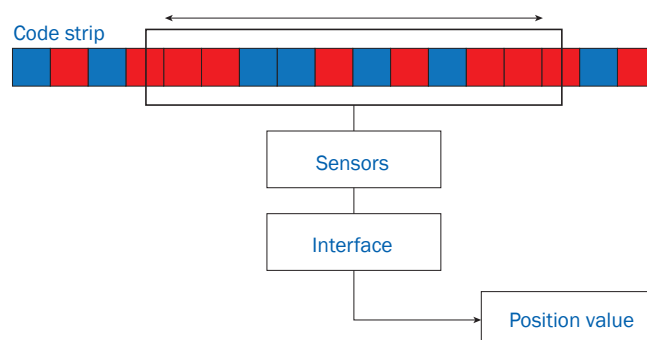
### BENEFITS

- Absolute position value with an accuracy of 1 mm
- Robust magnetic method
- High repeat accuracy
- Can also be used in harsh environments
- High tolerances combined with maximum reliability
- Easy installation and commissioning
- Plug & play (no configuration necessary)
- High compatibility with VAHLE conductor systems
- Can be combined with other VAHLE products as a system solution (energy, data & position)



### SYSTEM SKETCH

The electronics of the reading head scan the magnetized code strip and decode the absolute position safely and reliably. The absolute position is immediately available even after a power failure. The current position value is output via the appropriate communication interface (RS485/SSI) to the downstream control system for further processing. Various encodings are available for this purpose. The validity of the current position value is indicated by a status/error bit. In the event of an error, the last valid position is fixed and the status bit is set.



# ELECTRONICS COMPONENTS

## THE NEW GENERATION OF READING HEADS

The reading head is the heart of the system. It decodes the absolute position value along the magnetized code strip at all times with maximum reliability. The reading head is available with different tolerance values for the individual systems. VAHLE offers different interfaces and protocols.

The SSI version is also available as BINARY, GRAY PRE and GRAY PST version. In the GRAY PRE version the position value is coded together with the GRAY error bit. In the GRAY PST version, only the GRAY position value is encoded and then the error bit is appended in binary form.

A standardized reading head is now used for all conductor systems from VAHLE. Only the mounting options differ. We offer a short-arm and a long-arm version. The latter guarantees higher mechanical tolerances, as required, for example, in the crane market.

The new generation of our APOS Magnetic Gliding System now offers the possibility to configure and diagnose the reading head with a software tool. For this purpose, your reading heads can be connected to a computer via a USB interface using a diagnostic box. With the optional diagnostic kit from VAHLE, the reading heads can also be reconfigured at any time after delivery. This allows you to adapt the reading head to your requirements in terms of protocol, reading direction and many other parameters. We offer several options for mounting the reading head, depending on the rail system. The information on the following pages provides an overview.



## BENEFITS OF THE NEW GENERATION

- Configuration of the reading head via software tool (can also be done by the customer)
- Extensive diagnostics and status information (can also be done by the customer)
- Higher IP protection class thanks to new design with seal
- Faster travel speed (tested up to 6 m/s)
- Easier cap replacement without tools thanks to new mechanical design
- Visual inspection of wear through markings on the insulating housing
- Protection of the electronics when replacing the cap by means of hot-melt encapsulation
- Standardized reading head for all VAHLE conductor systems (U10, U20, VKS10 and FABA100)
- Maximum cable resistance thanks to new twisted-pair connection cable with molded plug
- Increased sturdiness thanks to double the number of Hall sensors on the same surface
- Error bit now also output in hardware on pin 7 (status query via PLC possible)
- Optimized mechanical guidance and increased running performance
- Various mounting brackets available (square, top-hat rail, baseplate, ...)

## READING HEAD

Read heads are available in short and long arm versions for the highest possible tolerance. The reading head is supplied pre-configured as required.

Short arm (Tolerance:  $\pm 15$  mm)



Long arm (Tolerance:  $\pm 30$  mm)

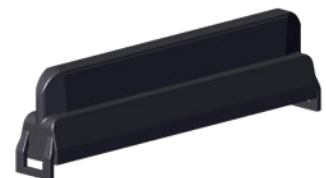


Type	Description	Order No.
VC – Reading head	Variant configurator for reading head – LK-2-...	0777071/00

### Pre-configuration possible

Below is an overview of the various reading heads that can be purchased preconfigured.

U10/VKS10 System	SSI - BINARY	SSI - GRAY PRE	SSI - GRAY PST
U10 – Short arm – Standard	LK-2-17K-F-C-SSI-BIN1500-54+V	LK-2-17K-F-C-SSI-PRE1500-54+V	LK-2-17K-F-C-SSI-PST1500-54+V
U10 – Short arm – Reverse	LK-2-17K-R-C-SSI-BIN1500-54+V	LK-2-17K-R-C-SSI-PRE1500-54+V	LK-2-17K-R-C-SSI-PST1500-54+V
U10 – Long arm – Standard	LK-2-17L-F-C-SSI-BIN1500-54+V	LK-2-17L-F-C-SSI-PRE1500-54+V	LK-2-17L-F-C-SSI-PST1500-54+V
U10 – Long arm – Reverse	LK-2-17L-R-C-SSI-BIN1500-54+V	LK-2-17L-R-C-SSI-PRE1500-54+V	LK-2-17L-R-C-SSI-PST1500-54+V
U20 System			
U20 – Short arm – Standard	LK-2-17K-F-U-SSI-BIN1500-54+V	LK-2-17K-F-U-SSI-PRE1500-54+V	LK-2-17K-F-U-SSI-PST1500-54+V
U20 – Short arm – Reverse	LK-2-17K-R-U-SSI-BIN1500-54+V	LK-2-17K-R-U-SSI-PRE1500-54+V	LK-2-17K-R-U-SSI-PST1500-54+V
U20 – Long arm – Standard	LK-2-17L-F-U-SSI-BIN1500-54+V	LK-2-17L-F-U-SSI-PRE1500-54+V	LK-2-17L-F-U-SSI-PST1500-54+V
U20 – Long arm – Reverse	LK-2-17L-R-U-SSI-BIN1500-54+V	LK-2-17L-R-U-SSI-PRE1500-54+V	LK-2-17L-R-U-SSI-PST1500-54+V
FABA100 System			
FABA100 – Short arm – Standard	LK-2-17K-F-F-SSI-BIN1500-54+V	LK-2-17K-F-F-SSI-PRE1500-54+V	LK-2-17K-F-F-SSI-PST1500-54+V
FABA100 – Short arm – Reverse	LK-2-17K-R-F-SSI-BIN1500-54+V	LK-2-17K-R-F-SSI-PRE1500-54+V	LK-2-17K-R-F-SSI-PST1500-54+V
FABA100 – Long arm – Standard	LK-2-17L-F-F-SSI-BIN1500-54+V	LK-2-17L-F-F-SSI-PRE1500-54+V	LK-2-17L-F-F-SSI-PST1500-54+V
FABA100 – Long arm – Reverse	LK-2-17L-R-F-SSI-BIN1500-54+V	LK-2-17L-R-F-SSI-PRE1500-54+V	LK-2-17L-R-F-SSI-PST1500-54+V



### Spare part

Type	Description	Order No.
APOSM-19-LK-Gehaeuse/Dicht+U	Insulated housing (Reading head)	10034185

## BRACKETS

VAHLE offers various mounting options for short and long arm reading heads. This enables seamless integration into the respective conductor system.

U20 12-square mount (Short arm)



Top hat rail (Short & Long arm)



U20 12-square mount (Long arm/Double long arm)



Bolt for base plate (Short & Long arm)



Type	Description	Order No.
APOSM-19-LKGU-Bef.-U+V	U20 12-square mount (Short arm)	10035694
APOSM-19-LLGU-Bef.-U+V	U20 12-square mount (Long arm/Doppel-Long arm)	10035678
APOSM-19-LK/LLGU-Bef.-F+V	Top hat rail (Short & Long arm)	10035687
APOSM-19-LK/LLGU-Bef.-A/C+V	Bolt for base plate (Short & Long arm)	10035688

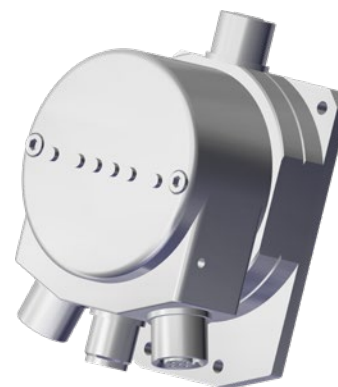
## GATEWAY

With the optional interface converter (so-called „gateway“), the SSI interface of the reading head can be extended to other industrial applications.

We currently offer the following interfaces:

- EtherNet/IP
- PROFINET
- EtherCAT

The gateway is only compatible with the SSI GRAY PST reading head. An adapter cable is also required for the connection.

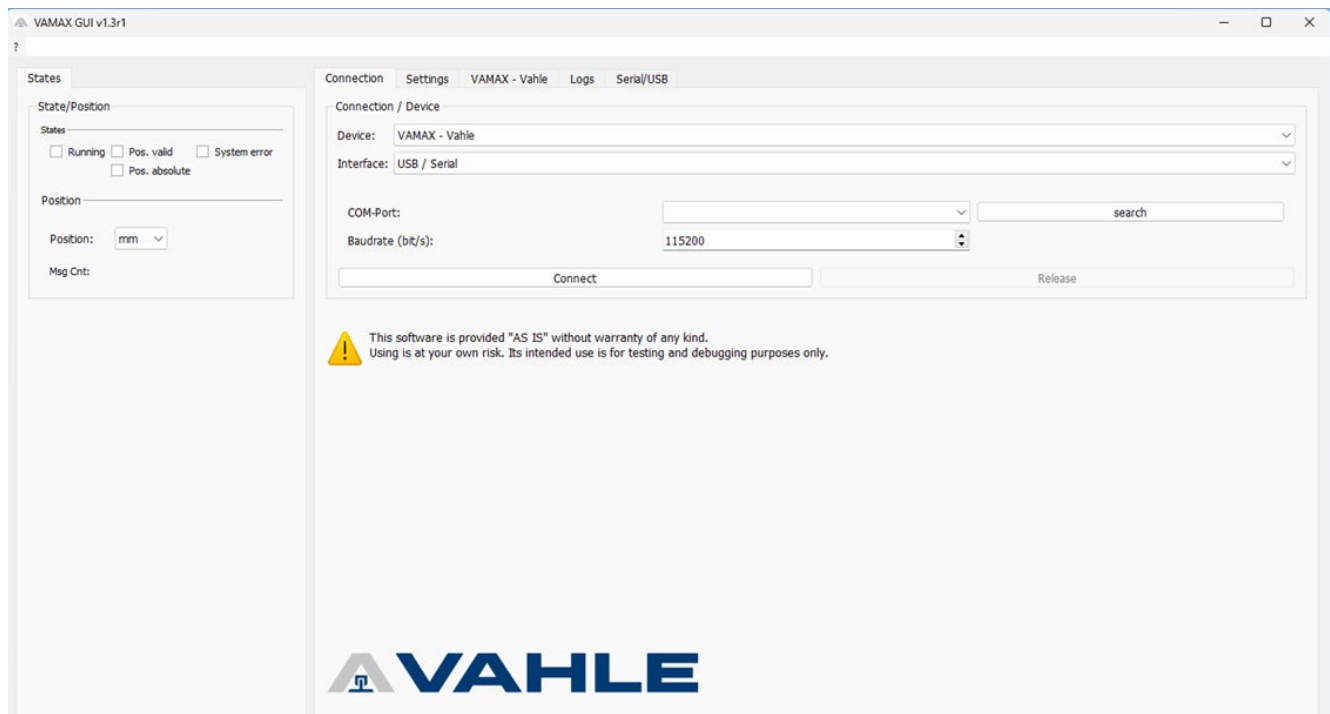


Type	Description	Order No.
APOSM-ZH-SU-AL-1500+V	Adapter cable – 1,5 m	10032630
APOSM-ZH-SU-PT-SSI-Profinet+V	PROFINET Version	10032596
APOSM-ZH-SU-ET-SSI-Ethernet/IP+V	EtherNet/IP Version	10032682
APOSM-ZH-SU-EC-SSI-Ethercat+V	EtherCAT Version	10032782

Other interfaces on request. Please do not hesitate to contact us!

## DIAGNOSTIC BOX AND SOFTWARE

We offer an optional diagnostic kit for our latest generation of reading heads. It consists of a connection box and software. This kit can be used to configure and diagnose the reading heads. The reading head is connected directly to the diagnostic box. A USB cable is then used to connect to the software on the computer. Here you can configure the reading head according to your requirements. This is a useful extra, especially during commissioning. In addition to the position value and system status, other status information (e.g. temperature, voltage level, etc.) can be read from the reading head.



Type	Description	Order No.
APOSM-ZH-DIAG-01+V	Diagnostic box	10036679

## MECHANICAL COMPONENTS

### CODE STRIP

The magnetic code strip contains the absolute position value, which is decoded by the electronics of the reading head. Another component to be used is the metal glide strip, which protects the code strip and over which the appropriate reading head glides. Insert strips are available for tight curves. This allows the reading heads to pass through these curves. However, positioning is not possible when only one reading head is used. An adhesive tape acts as an anchor point for the code strip, which is used to secure the code strip to the appropriate support profile.



Type	Description	Order No.
Code strip 17-bit	Code strip 17-bit by the meter	2823255/01
Glide strip	Glide tape by the meter	2823446/00
Adhesive tape	Double-sided adhesive tape 6 mm wide	2823028/00
Insert strips	Insert strips 8 x 1,5 x 2000 for APOS	2806618/00

### MOUNTING SYSTEMS

Our system also includes the right mounting system for your application, so that VAHLE offers a complete system solution for space-saving integration into your system. The magnetic code strip is securely and reliably integrated into the mounting system with an adhesive tape. This ensures perfect guidance of the reading head along the track and 100% compatibility with the respective VAHLE conductor rail.

Corresponding components are available for each mounting system. Some mounting systems can also be used individually, i.e. without a conductor rail system, for pure positioning (e.g. the APOSM U20 mounting system). Various universal brackets are available for separate installation.

#### Mounting system for U10 conductor rail



Support profile for U10



Transition section for U10

Type	Description	Order No.
TPA-U10-6000	Support profile – 6 m	2823258/00
TPA-U10-3000	Support profile – 3 m	2823613/00
VM-UV10A	Connectors	2823267/00
USK10A	Fixed point	2823268/01
MU-US10A	Transition section – short	2823270/00
MU-US10A-D	Transition section – Expansion	2823609/00
DV-UDV10A-30M	Expansion connector	2823269/00

## MOUNTING SYSTEM

### APOSM-Mounting system for U20 conductor rail

The new mounting system for the VAHLE U20 conductor rail features few components and easy installation. Our mounting system guarantees maximum suspension distances of up to 1.5 m in a straight line. With the new mounting system, bends can be made on site without tools.

New universal brackets (1 to 4 poles) offer a high degree of installation flexibility and can be combined with each other. For example, a 2-pole bracket can be combined with a 3-pole bracket when a 5-pole bracket is required. The new 1-pin universal bracket allows a quick and secure installation. The brackets are also 100 % compatible with the VAHLE U20 conductor rail. The support system can also be used individually, i.e. without the conductor rail system.



Transition section for U20

Support profile for U20

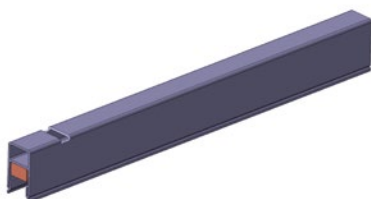
Type	Description	Order No.
APOSM-17-U20-TPC-01-6000-SW+V	Support profile – 6 m	10028732
APOSM-17-U20-PV-01+V	Connectors	10028733
APOSM-17-U20-US-01+V	Transition section	10028739
FP-USK20-APOSmag	Fixed point	2824074/00
AH-K-U-20/1-1	Universal bracket 1-pole	10028734
AH-K-U-20/2-2	Universal bracket 2-pole	10028735
AH-K-U-20/3-3	Universal bracket 3-pole	10028736
AH-K-U-20/4-4	Universal bracket 4-pole	10028737



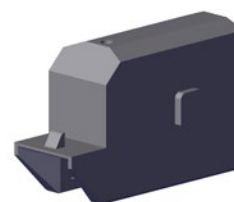
## MOUNTING SYSTEM

### APOSM-Mounting system for FABA100 conductor rail

Can also be used as a separate support system for positioning only.



Support profile for FABA100

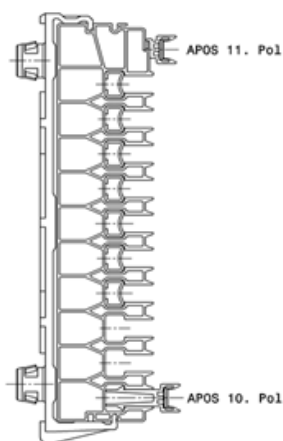


Transition cap for FABA100

Type	Description	Order No.
TPA-F100-4000-55	Support profile – 4 m	2823612/00
GS-80-3	Guide rail – 3 m	2823129/00
Meschwork band – curves	Meschwork band for curves	2809553/00
Insert band – curves	Filling rod for slide rails in curves	2809495/00
VM-FV100A	Connectors	2809535/00
SF-FPL100	Fixed point	2807042/00
Fixed point – Profil & Code strip	Fixed-point clip compl code strip APOS	2807040/00
MU-FUK100A	Transition section	2809528/00
DV-FDV100A-50M	Expansion connector	2809531/00

### APOSM-Mounting system for VKS10 conductor rail

For maximum flexibility, the system can be integrated into the 10th or 11th pole.



Type	Description	Order No.
TPA-VKS 10/10 -6	Support profile – 6 m (10th pole)	2823259/00
VEPS 10-CA	Code strip-Fixed point	2823283/00
TPA-VKS10/11-6000	Support profile – 6 m (11th pole)	2823265/00
VK-SV10/11-APOS	Connectors	2823444/00

## SPARE PARTS / ACCESSORIES / TOOLS

### General accessories for the mounting system

Type	Description	Order No.
APOSM-ZH-POL-SUCHER+V	Pole finder foil	10030410
MZ-KS10	Chop saw	0165276/01
HRF-150 LANG/HIEB 3	Half-round file	0165264/00

### APOSM-Mounting system for U10 conductor rail

Type	Description	Order No.
LZ 10A	Punch pliers	2823443/00
BS 10A for TPA- U10	Drilling template for U10	2823266/00
MZ-ADR10A	Pressure roller	2823467/00

### APOSM-Mounting system for U20 conductor rail

Type	Description	Order No.
LZ 20A	Punch pliers	10029635
MZ-ADR20A+V	Pressure roller	10030115

### APOSM-Mounting system for FABA100 conductor rail

Type	Description	Order No.
Assembly tool	Assembly tool for slide rail GS 80	2809346/00
Drilling template	FABA APOS Drilling template for CB-Fixed point	2823454/00

### APOSM-Mounting system for VKS10 conductor rail

Type	Description	Order No.
KOERATAC VC34	Adhesive	1010178/00
KOERACLEAN R-100 C	Cleaner	2517787/00

# FIELDS OF APPLICATION

## Automotive



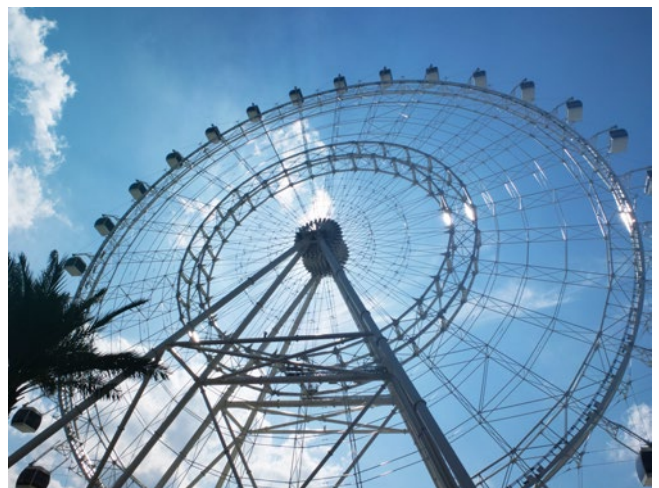
## Intralogistics



## Crane Technology



## Amusement Rides (Dark Rides)



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