



AMKASYN KE/KW servo drives.
Compact, powerful, modular.

AMK

BENEFITS

- Safety inside
- Motion control
- Up to 50% less control cabinet volume
- Energy saving
- Cold plate/heat recovery
- Control performance





Take advantage of saving potential! With the most compact servo drives.

Extremely compact but powerful.

Discover the added value of “power density”. With intelligent KE/KW servo drives you make efficient use of available space. AMK’s ingenious cooling technology ensures optimum heat removal and increases service life. You need up to 50% less volume. The ability to arrange the modules according to your requirements gives you the freedom you need for ergonomic machine design.

The drive system for highly dynamic positioning tasks.

The controller platform of the AMK KE/KW drive system, together with the latest processor technology, opens up entirely new possibilities for higher performance. Real-time Ethernet (RTE) via EtherCAT or VARAN offers you high-performance system communication for automation of your machines. By using only the modules with the desired functionality that you actually need, you achieve an extremely favorable price-performance ratio. You can operate all types of synchronous or asynchronous servo, high-torque, and linear motors with a wide range of encoder systems in a highly dynamic and precise manner.

Be on the safe side.

The devices have a maximum safety standard. The KW inverters are available with integrated OSE-Output stage enable safety function: TÜV-certified against restart for machines up to PLe according to ISO 13849-1 (analogous to STO). Functional Safety – also up to PLe according to ISO 13849-1 – can be realized with safe controller cards.

Sustainability through maximum energy efficiency.

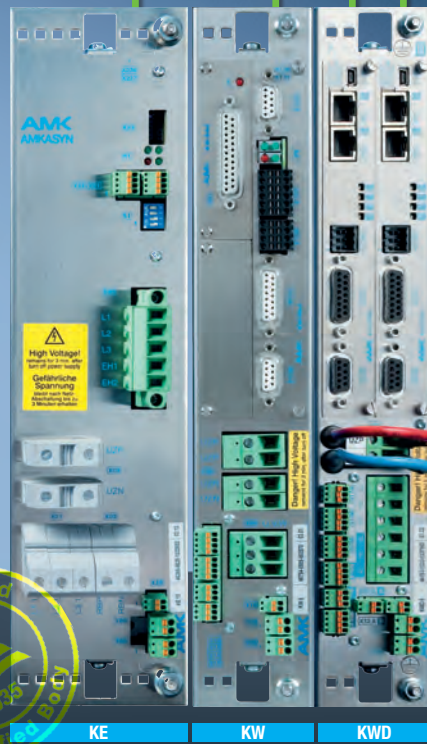
The incoming supply is regenerative and therefore extremely energy efficient. You save on energy costs as a result. The devices of the KES product line return the energy obtained from regenerative braking to your power network sinusoidally with the maximum possible efficiency. Higher speeds and powers are also available for your drives through a regulated DC link voltage. The line current peaks are thereby limited, and a power factor of nearly 1 is achieved. You can utilize the power loss inherent in the system effectively in your processes through the heat recovery function of the cold plate technology.

System overview



OPC
AIPEX PRO
Remote maintenance
Development environment

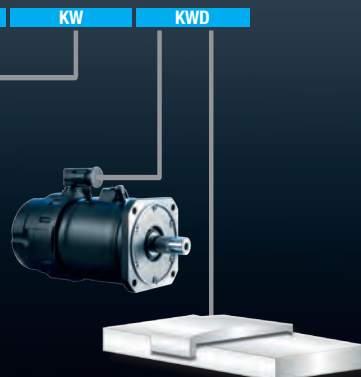
Fieldbus communication



EtherCAT
Technology Group

CANopen

SERCOS
interface



KE KE compact supply
KW KW inverter

Compact supply

Compact supply, available with or without regeneration. Devices with regeneration in a design with block-commutated regeneration or with sinusoidal incoming supply and regenerative feedback.

Compact inverters

Central inverters in scalable module widths depending on performance class for devices as single or double inverter with plug-in controller cards.

Controller cards

Controller cards are inserted in the slot of the compact inverter. There is an appropriate variant available depending on bus system and performance.

Trendsetting cooling technology

Through their efficient heat removal, AMK inverters have been front runners in compactness and power density for many years. The modules in cold plate design are easily mounted on a liquid- or air-cooled plate. The liquid-cooled cold plate provides significant benefits, particularly for high power ratings. The devices can be mounted very easily without having to interrupt the cooling circuit. The removal of heat via the liquid-cooled plate reduces the switch cabinet interior cooling significantly. For low power ratings, the modules with integrated air cooling offer a cost-effective alternative.

Communication

Fieldbuses:

- EtherCAT
- CANopen
- SERCOS III
- Profibus DP
- VARAN

Multifunctional I/O

- Digital Inputs and outputs
- Analog input
- Measuring input
- Pulse output

Standard functions

- Torque control
- Speed control
- Position control
- Positioning function
- Homing in many variants
- Synchronous control
- Electronic line shaft
- Brake control
- Protection functions

Functional Safety

KW devices with integrated OSE-Output stage enable safety function: TÜV-certified against restart for machines up to PLe ISO 13849-1 (analogous to STO).

Design

Ultracompact dimensions. The system can be optimally adapted to any machine ergonomics with space savings of up to 50%. Elimination of busbar connections for cabling of modules enables flexible installation in the control cabinet.

Sustainable energy management

High efficiency and regeneration capability reduce energy consumption and costs.

BENEFITS

- Functional Safety
- Reduction of control cabinet space up to 50%
- Cost savings through possible integration of the control cabinet into the machine
- Cost-optimized solutions through modular system structure
- Assembly of complex, networked machines through precise synchronization in real time
- Application-related cooling technology



ACC bus connection

AMK
AMKASYN

X236
X237

X23

H1

X22 X21

S1

X20

L1

L2

L3

EH1

EH2

High Voltage!
remains for 5 min. after
turn off power supply

**Gefährliche
Spannung**
bleibt nach Netz-
Abschaltung bis zu
5 Minuten erhalten

JZP

X02

JZN

X01

X03

X25

DC link voltage –

Line supply connection
400...480 VAC –
Brake resistor connection –

L1.1

L2.1

L3.1

RBP

RBN

X09

X08

46267-1006-1/4/903 03.20

– LED

– Digital Inputs/outputs

– Fieldbus configuration

– Charging circuit of line 400...480 VAC – 50/60Hz

– Main contactor control

– PTC thermistor

– 24 VDC supply,
looping through of 24 VDC

KE compact supply.

Maximum power in minimum space.

The KE compact supplies produce the DC link voltage for the connected inverters and are available in the following variants:

KEN:

Incoming supply (no regenerative feedback)

KE:

Block-commuted incoming supply and regenerative feedback of energy. Communication interfaces ACC bus or EtherCAT with UPS of control voltage.

KES:

Sinusoidal incoming supply and regenerative feedback

The KES product line with sinusoidal incoming supply and regenerative feedback produces a regulated DC link voltage. This makes the device robust against line fluctuations and disturbances regardless of the respective line voltage.

The voltage boost in the DC link enables a higher speed and power of the drives. Communication interfaces ACC bus or EtherCat with UPS of control voltage

Features:

- Power range up to 180 kW
- Cold plate cooling technology
- Optional (block or sinusoidal) regenerative feedback to the line supply
- Integrated monitoring
 - Overtemperature
 - Line supply failure
 - Line current
 - Brake resistor short circuit
 - DC link overvoltage
 - Main contactor control

BENEFITS

- High power density
- High efficiency
- Sustainability through regeneration capability
- KES: Reduced line reaction
- KES: Limit value for harmonic currents according to EN 61000-3-12

Technical data

Type	KEN 5	KEN 10	KEN 20	KEN 120	KE 20	KE 40	KE 60	KE 120	KE 180	KES 20	KES 60	KES 120	KES 180	
Rated input voltage	VAC 3 x 400 ... 480 ± 10%													
Line frequency	Hz 47... 63													
Input current	A 13	15		180	30	60	90	180	270	30	90	180	270	
Rated output power	kW 5	10		120	20	40	60	120	180	20	60	120	180	
Maximum output power (for 60 s)	kW 10	20		200 ¹⁾	40	80	120	200	320	40 ²⁾	120 ²⁾	200 ²⁾	320 ²⁾	
Efficiency	approx. 99										approx. 98			
Power factor	0.55	> 0.9								> 0.98				
Cooling	Cold plate design													
Regenerative feedback into the supply	No				Yes					Yes, sinusoidal				
Ext. brake resistor (option) min. Ω	47	47		2x8	20	8	8	8	5.4	20	8	8	5.4	
Protective function	Line supply failure, overcurrent of device and brake resistor, overtemperature of device and brake resistor													
Line filter	Integrated		External	External	Integrated			External						
Weight	kg 3	3		16	4.2	8	8	16	20	4.2	8	16	20	
Device width	55	55	55	255	85	170	170	255	425	85	170	255	425	
AMK Part No. (ACC bus)	E793	E816	-	E781	E717	E718	E719	E856	-	E944	E833	E834	-	
AMK Part No. (EtherCAT with UPS)	-	-	-	-	E1037	E1038	E1039	E1040	E1060	E984	E986	E987	E1061	
AMK Part No. (no fieldbus)	E1054	-	-	-	-	-	-	-	-	-	-	-	-	

¹⁾ Incoming supply, max. 160 kW for 2.5 s via brake resistor ²⁾ For max. 10 s



Option card 1 –

Option card 2 –

– Controller card

– DC bus DC link voltage and looping through

– Motor connection

– Motor PTC thermistor

– 24 VDC supply, looping through

OSE-Output stage enable

KW compact inverters.

Dynamic response and precision. With safety.

The digital KW compact inverter modules control the drives in 4-quadrant operation precisely and with high dynamic response. A multifunctional interconnection with a higher-level controller via various field buses is possible.

Features:

- Power range up to 200 kVA
- Cold plate cooling technology
- Integrated OSE-Output stage enable safety function: TÜV-certified against restart for machines up to PLe ISO 13849-1 (analogous to STO).
- Accommodation of 1 controller card KW-Rxx (see pg. 14). Controller cards must be ordered separately.

BENEFITS

- Integrated OSE-Output stage enable safety function
- New dimensions of power density
- Efficient heat removal and long service life with use of cold plate technology
- High efficiency
- Compact machine design

Technical data

Type	KW 2	KW 3	KW 5	KW 8	KW 10	KW 20	KW 40	KW 60	KW 100	KW 150	KW 200
Input voltage	VDC 540 ... 650										
Shutdown threshold	VDC 850										
Input current	A 3.8	A 5.6	A 9.3	A 15	A 18.5	A 37	A 74	A 112	A 187	A 280	A 37
Rated output voltage	VAC 3 x 350 for sinusoidal currents										
Output frequency	Hz 0 ... 599 ¹⁾										
Rated output power	kVA 2	kVA 3	kVA 5	kVA 8	kVA 10	kVA 20	kVA 40	kVA 60	kVA 100	kVA 150	kVA 200
Maximum output power	kVA 4	kVA 6	kVA 10	kVA 16	kVA 20	kVA 40	kVA 80	kVA 120	kVA 165 ²⁾	kVA 300	kVA 340
Rated output current	A 3.3	A 5	A 8.2	A 13.2	A 16.5	A 33	A 66	A 99	A 165	A 247	A 330
Maximum output current (for 10 s)	A 6.6	A 10	A 16.5	A 26.4	A 33	A 66	A 132	A 198	A 247 ³⁾	A 495	A 561 ⁴⁾
Efficiency	% >98										
Cooling	Cold plate design										
Protective function	Motor overcurrent, short circuit, ground fault, overtemperature of device and motor, I ² T monitoring										
Switching frequency	kHz 8 (4)										
Weight	kg 3	kg 3	kg 3	kg 3	kg 4.2	kg 4.2	kg 8	kg 8	kg 16	kg 20	kg 25
Device width	mm 55	mm 55	mm 55	mm 55	mm 85	mm 85	mm 170	mm 170	mm 255	mm 425	mm 425
AMK Part No. with OSE-Output stage enable (no controller card)	E765	E815	E767	E813	E768	E769	E770	E771	E855	E988	E989

¹⁾ 0 ... 400 at 4 kHz PWM ²⁾ At 8 kHz PWM, 200 kVA at 4 kHz PWM ³⁾ At 8 kHz PWM, 330 A at 4 kHz PWM ⁴⁾ For max. 7 s



Controller card 1 –

– Controller card 2

– DC bus DC link voltage and looping through

– Motor A

OSE-Output stage enable –

– Motor B

– PTC thermistor for motor A/B

– 24 VDC supply,
looping through

KWD double inverters.

Two inverters in one housing.

The KWD compact inverter contains two independent KW inverters inside one housing. It represents a low-cost and extremely compact solution for servo drives with low power ratings.

Features:

- Power range up to 2 x 5 kVA
- Very compact dimensions
- Cold plate cooling technology
- Integrated OSE-Output stage enable safety function: TÜV-certified against restart for machines up to PLe ISO 13849-1 (analogous to STO).
- Accommodation of 2 controller cards KW-Rxx (see pg. 14), controller cards must be ordered separately

BENEFITS

- Low-cost and extremely compact solution for servo drives with low power ratings
- Integrated OSE-Output stage enable safety function
- High efficiency
- Even more compact machine design

Technical data

Type		KWD 1	KWD 2	KWD 5
Input voltage	VDC	540... 650		
Shutdown threshold	VDC	850		
Input current	A	3.8	7.6	19
Rated output voltage	VAC	3 x 350 for sinusoidal currents		
Output frequency	Hz	0...599 ¹⁾		
Rated output power	kVA	2 x 1	2 x 2	2 x 5
Maximum output power	kVA	2 x 2	2 x 4	2 x 10
Rated output current	A	2 x 1.65	2 x 3.3	2 x 8.3
Maximum output current (for 10 s)	A	2 x 3.3	2 x 6.6	2 x 16.5
Efficiency	%	approx. 98		
Cooling		Cold plate design		
Protective function		Motor overcurrent, short circuit, ground fault, overtemperature of device and motor, I ² T monitoring		
Switching frequency	kHz	8 (4)		
Weight	kg	3		
Device width	mm	55		
AMK Part No. with OSE-Output stage enable (no controller card)		E759	E760	E818

¹⁾ 0...400 at 4 kHz PWM

KE-F/KW-F with integrated air cooling.

The KE-F/KW-F device series is equipped with integrated air cooling.

The modules of this series differ from the devices in cold plate design only in the air heat sinks affixed directly on the back of the modules.

These devices are a cost-effective solution for applications with low power.

The inverters of the F-series also have the integrated OSE-Output stage enable safety function: TÜV-certified against restart for machines up to PLe ISO 13849-1 (analogous to STO).

KE-F with integrated air cooling

Type		KEN 5-F	KEN 10-F	KE 20-F
Rated input voltage	VAC	3 x 400 ... 480 ± 10%		
Line frequency	Hz	47... 63		
Input current	A	13	15	30
Rated output power	kW	5	10	20
Maximum output power (for 60 s) kW		10	20	40
Efficiency	%	approx. 99		
Power factor		0.55	> 0.9	
Cooling		Forced air cooling		
Regenerative feedback to the line supply		No	No	Yes
Ext. brake resistor (option) min. Ω		47	47	20
Protective function		Line supply failure, overcurrent of device and brake resistor, overtemperature of device and brake resistor		
Line filter		Integrated		
Weight	kg	3	3	4.2
Device width	mm	55	55	86
AMK Part No. (ACC)		E923	E924	E928
AMK Part No. (no fieldbus)		E1055	–	–



KW-F and KWD-F with integrated air cooling

Type		KW 2-F	KW 4-F	KW 6-F	KW 9-F	KWD 1-F	KWD 2-F	KWD 4-F
Input voltage	VDC	540...650						
Shutdown threshold	VDC	850						
Input current	A	3.8	7.6	11.4	16.8	3.8	7.6	15.2
Rated output voltage	VAC	3 x 350 for sinusoidal currents						
Output frequency	Hz	0...599 ¹⁾						
Rated output power	kVA	2	4	6	9	2 x 1	2 x 2	2 x 4
Maximum output power	kVA	4	8	12	18	2 x 2	2 x 4	2 x 8
Rated output current	A	3.3	6.6	9.9	14.9	2 x 1.65	2 x 3.3	2 x 6.6
Maximum output current (for 10 s)	A	6.6	13.2	19.8	29.7	2 x 3.3	2 x 6.6	2 x 13.2
Efficiency	%	Approx. 98						
Cooling		Forced air cooling						
Protective function		Motor overcurrent, short circuit, ground fault, overtemperature of device and motor, I ² T monitoring						
Switching frequency	kHz	8 (4)						
Weight	kg	3			4.2	3		
Device width	mm	55			86	55		
AMK Part No. with OSE-Output stage enable (no controller card)		E910	E942	E943	E925	E914	E915	E916

¹⁾ 0...400 with 4 kHz PWM

Controller cards.

Functionality as a measure.

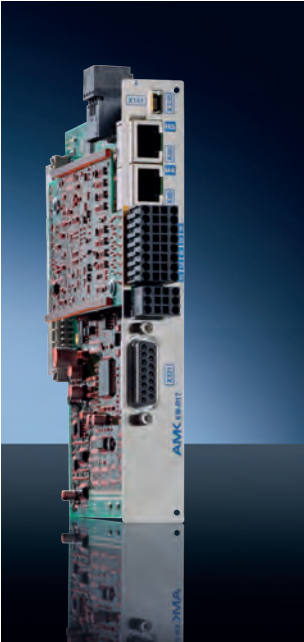
With the controller cards for the AMKASYN KE/KW inverter system, you can select a cost- and function-optimized card that meets your individual requirements.

We therefore offer you a diverse selection with numerous functionalities.



Functions	KW-R06	KW-R16	KW-R07
Drive control			
Minimum fieldbus cycle time	250 µs	250 µs	250 µs
Resolver	✓	–	✓
Sine-wave encoder	✓	✓	✓
EnDat 2.1 / 2.2 light	✓	✓	✓
Hiperface	✓	✓	✓
Hiperface DSL*	–	–	–
Hall-effect encoder (via resolver input)	✓	–	✓
Rectangular signals (input/retransmission)	✓	–	✓
2nd encoder connection, e.g., load encoder	✓	–	✓
Encoderless U/F operation	✓	✓	✓
I/O interfaces			
Analog inputs ±10 V (resolution)	2 (12 bits)	2 (12 bits)	2 (12 bits)
Local digital inputs	3	3	3
Local digital outputs	3	3	3
Rectangular pulse output/SIWL, fmax	2 MHz	–	2 MHz
Fieldbus interfaces			
Real-time bus ACC (CANopen)	Master	–	Master
EtherCAT (SoE)			Slave
Service			
Service Port			USB 1.1
AIPEX PRO connection			USB/EtherCAT
Functional Safety	–	–	✓
AMK part no.	0835	0872	0807

* Single cable solution/hybrid cable



KW-R17	KW-R24	KW-R25	KW-R26
250 µs	250 µs	250 µs	250 µs
-	-	-	-
✓	-	✓	✓
✓	-	✓	✓
✓	-	✓	✓
-	-	-	✓
-	-	-	-
-	-	-	-
-	-	-	-
✓	✓	✓	✓
2 (12 bits)	-	-	-
3	3	3	3
3	3	3	3
-	-	-	-
-	-	-	-
-	✓	✓	✓
-	✓	✓	✓
-	✓	✓	✓
✓	-	-	-
0873	0901	0902	0903



AMK

Functional Safety in the drive.

Compliance with the Machinery Directory is mandatory for every machine manufacturer in the European Economic Area. In other words, machine builders are required by law to build safe machines.

The crucial question is how this safety is realized. Of course, the effort and costs involved play a major role.

Ideally, safety functions are integrated in the drive. This not only saves time and money but is also much easier. From AMK you receive drives with integrated Functional Safety TÜV-certified for machines up to PL_e (ISO 13849-1:2008) and up to SIL 3 (IEC 62061).

The safety functions can be commanded by local safety inputs or by the FSoE protocol, depending on the device.

BENEFITS

- Functional Safety at device level
- Easy and at optimal cost
- All from one source!
- Functional Safety can be commanded via local I/Os or the FSoE protocol
- Standard versions with OSE-Output stage enable (analogous to STO)
- TÜV-certified for machines up to PL_e (ISO 13849-1:2008) and up to SIL 3 (IEC 62061)

Products with Safety



Central inverters

- KW devices with integrated OSE-Output stage enable safety function: Certified against restart analogous to STO
- For machines up to PLe (ISO 13849-1)



KW-R07 and KW-R17 controller cards for central inverters

- Functional Safety
 - Safe normal operation
 - Safe operating modes
 - Safe stop functions
- TÜV-certified for machines up to PLe (ISO 13849-1) and up to SIL 3 (IEC 62061)
- Commanding via the FSoE protocol
- Commanding via safe I/Os
- Parameter assignment with Safety Editor

Safety functions

Safety in normal operation

- Safe Encoder Monitoring (SEM)
- Safe Maximum Speed (SMS)

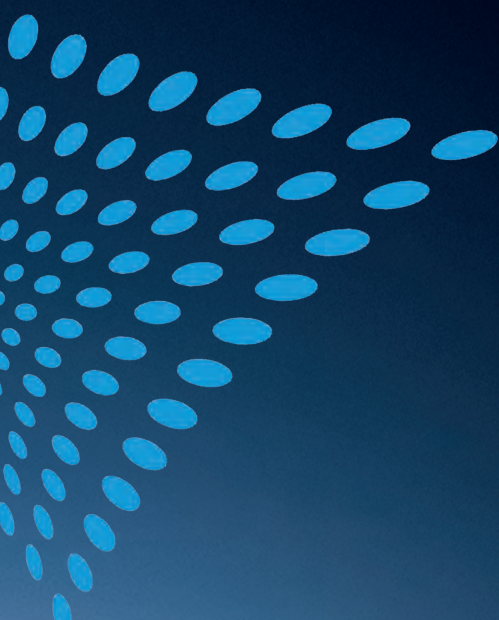
Safe operating modes:

- Safe Operating Stop (SOS)
- Safe Speed Range (SSR)
- Safely-Limited Speed (SLS)
- Safe Direction (SDI)
- Safely Limited Increment (SLI)

Safe stop functions

- Safe Torque Off (STO)
- Safe Stop 1 (SS1)
- Safe Stop 2 (SS2)





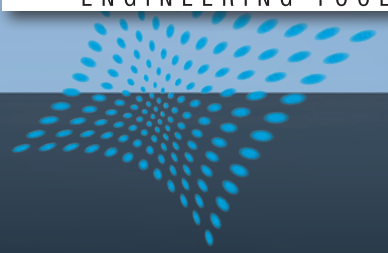
- PLC programming
- Visualization
- Motion control
- Technology functions
- Automatic fieldbus configuration
- Machine setup
- Diagnostics and remote maintenance
- Safety

New in V3:

- Object-oriented programming
- Editor for Functional Safety parameters
- Autotuning

AIPEXPRO v3

ENGINEERING TOOL



AMK

AIPEX PRO V3 integrates all engineering tools needed during the life cycle of a machine, e.g., programming, parameter assignment, commissioning, optimization, and diagnostics. This saves you time-consuming efforts to coordinate, for example, between your PLC program containing drive parameters and the configured user data exchange via the fieldbus.

AIPEX PRO V3 does this work for you automatically and frees you from all tasks not directly tied to your application. This leaves you free to concentrate on what is really important in your application.



BENEFITS

- All IEC 61131-3 programming languages
- Economical creation of your machine software
- Reduction of the time-to-market of your machine
- Implementation of innovative machine concepts using drag & drop
- Extensive pre-programmed AMK technology functions
- Integrated Web visualization you can access worldwide

Engineering and application with **AIPEXPRO V3**

Configuration

Hardware configuration involves taking all the components of your drive system from a database and arranging them (motor, converter, controller module, option cards, controllers, I/O modules).

- Automatic fieldbus configuration
- Parameter assignment
- Commissioning

Programming

AIPEX PRO V3 integrates the internationally proven CODESYS V2 programming platform and CODESYS V3 for object-oriented programming. All the IEC 61131-3 programming languages are supported and these can even be combined within the same project. You can use your preferred language when programming. Blocks from numerous libraries are available to the programmer.

The development environment contains the visualization and the basic library as a foundation for the automation solution. The basic library contains an extensive set of basic blocks, such as logic blocks (timers, counters, etc.) and those for implementing mathematical functions.

Visualization

You use the graphics functions of the integrated visualization editor to create your machine visualization, while taking advantage of the ready-to-use visualization blocks. You can access the web visualization in the AMK controllers from anywhere in the world.

Libraries

This tool provides an extensive set of pre-programmed motion control and technology functions.

Motion control libraries

These blocks contain the basic functions for your machine control system, such as the electronic cam controller and cam disc function.

Technology functions

You can make your engineering processes even easier by using the technology functions on offer, such as the form/fill/seal, print mark control, winder, and cross cutter functions.

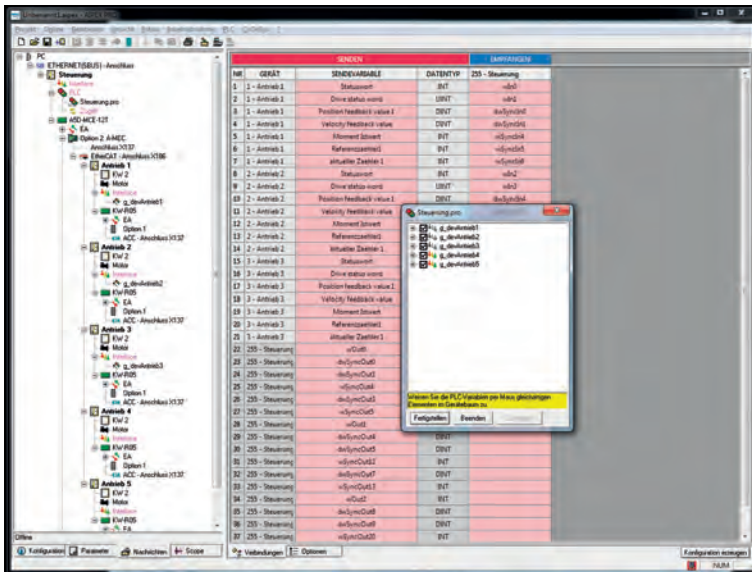
Remote maintenance and diagnostics

You can access the machine control and the drives from any location.

The Update tool in AIPEX PRO V3 allows you to update firmware quickly and easily.

Safety Editor

You use the certified Safety Editor to assign parameters for the safe drives of AMK. The selected safety functions are logged and output in PDF format. This allows the safety data to be printed out and attached to the machine.

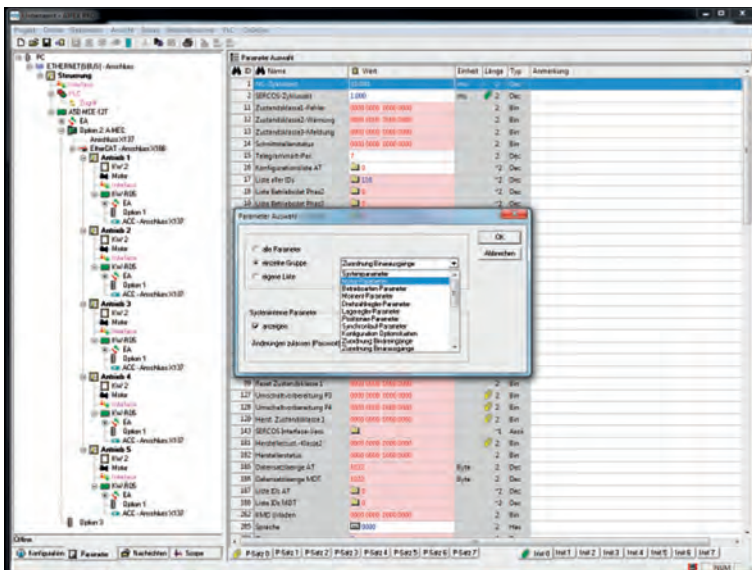


Automatic fieldbus configuration

The revolutionary coupling of component configuration and programming environment makes the fieldbus configuration child's play. AIPEX PRO recognizes all data to be transmitted and automatically creates the fieldbus configuration. In doing so, data are provided synchronously or asynchronously depending on their purpose in the PLC program. Fully automatic and reliable.

The programmer is freed up from tedious work and can devote full undivided attention to the important parts of the machine control system.

Both drive data and I/O data are configured fully automatically in the process.



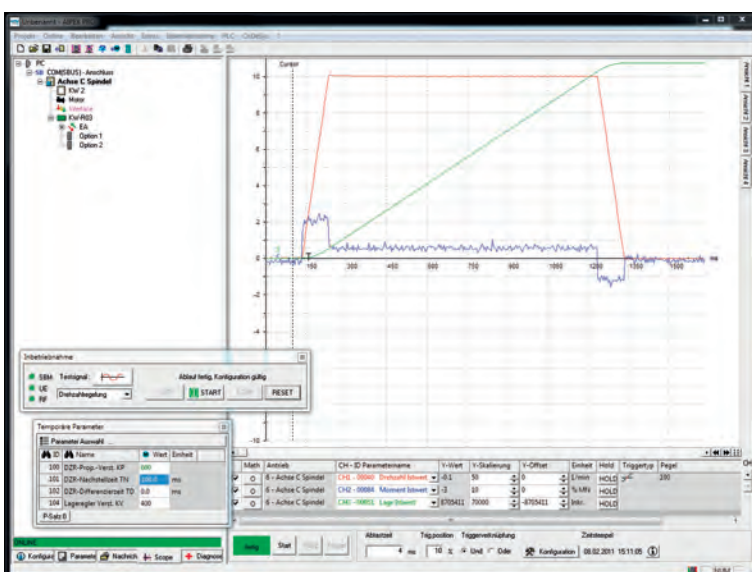
Easy parameter assignment of the drives

Servo drives and motors form the drive system that must optimally fulfill its purpose.

Parameter assignment wizards are available as an aid for standard drive functions. The Parameter Explorer gives you access to all parameters in the system. Adjustments and optimizations can be made even during active operation. The temporary changes are applied directly.

AIPEX PRO has access to all nodes in the fieldbus network for this. It is possible to read and write all parameters and configuration data from a central point.

Troubleshooting is facilitated by the central access with AIPEX PRO. As soon as a message is generated, it is displayed to you in plain text with additional information.



Start up

- Internal setpoint generator with sine, delta, trapezium and step function generators for torque, speed, and position setpoints
- Temporary parameter access for online tuning of all control parameters
- Integrated oscilloscope
 - Measurement of all internal data such as position values, speed values, currents, torques, digital I/O voltages etc.
 - Up to 8 variables can be recorded per device
 - Diverse trigger (edge, event, level)
 - Cursor measuring function (time, absolute values, difference)
 - Hold function for measured values
 - 4 different views possible for each device
 - Saving and export of measured values for evaluation

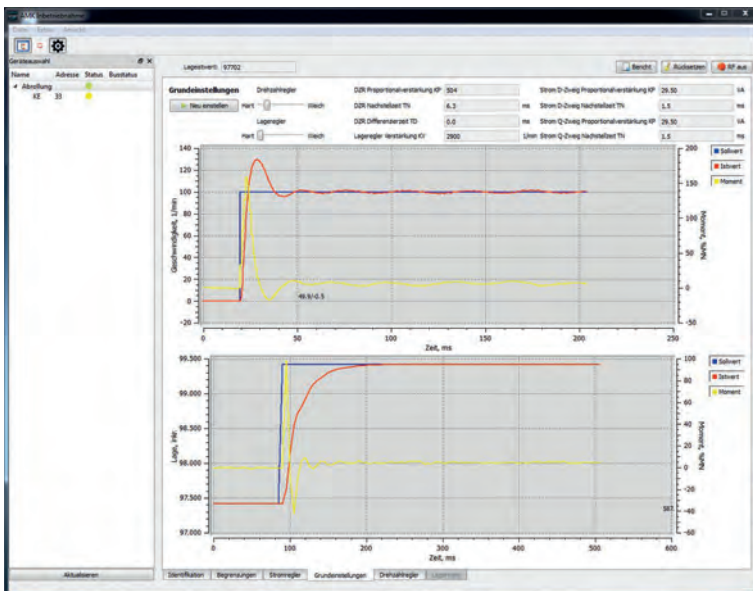
AMK PRO V3 - Parameter, Sicherheits-EA

Nr.	Parameter	Wert	Einheit	min.	max.	Beschreibung
15	Sicherheitsfunktion SE1_SF_SE1	SDg		0	18	Sicherheitsfunktion für den Eingang SE1
16	Sicherheitsfunktion SE2_SF_SE2	SDg		0	18	Sicherheitsfunktion für den Eingang SE2
17	Notfunktion SE1_SF_SE1	SDg		0	2	Notfunktion für den Eingang SE1
89	Dynamisierung SE1_SE1_DYN	Keine Dynamik		0	1	Dynamisierung des Eingangs SE1
90	Eingangsgel SE1_SE1_RIV	Nicht inverteilt		0	1	Eingangsgel SE1 nicht inverteilt / inverteilt
71	Dynamisierungsbereich SE1.1_SE1.1_Pub	1000	[µs]	250	6500	Dynamisierungsbereich des Eingangs SE1.1
72	Dynamisierungsbereich SE1.1_SE1.1_Sine	50	[ms]	50	6400	Dynamisierungsbereich des Eingangs SE1.1
73	Dynamisierungsbereich SE1.2_SE1.2_Pub	2000	[µs]	250	6500	Dynamisierungsbereich des Eingangs SE1.2
74	Dynamisierungsbereich SE1.2_SE1.2_Sine	100	[ms]	50	6400	Dynamisierungsbereich des Eingangs SE1.2
75	Dynamisierung SE2_SE2_DYN	Keine Dynamik		0	1	Dynamisierung des Eingangs SE2
76	Eingangsgel SE2_SE2_RIV	Nicht inverteilt		0	1	Eingangsgel SE2 nicht inverteilt / inverteilt
77	Dynamisierungsbereich SE2.1_SE2.1_Pub	1000	[µs]	250	6500	Dynamisierungsbereich des Eingangs SE2.1
78	Dynamisierungsbereich SE2.1_SE2.1_Sine	50	[ms]	50	6400	Dynamisierungsbereich des Eingangs SE2.1
79	Dynamisierungsbereich SE2.2_SE2.2_Pub	2000	[µs]	250	6500	Dynamisierungsbereich des Eingangs SE2.2
80	Dynamisierungsbereich SE2.2_SE2.2_Sine	100	[ms]	50	6400	Dynamisierungsbereich des Eingangs SE2.2
81	Dynamisierung SE3_SE3_DYN	Keine Dynamik		0	1	Dynamisierung des Eingangs SE3
82	Eingangsgel SE3_SE3_RIV	Nicht inverteilt		0	1	Eingangsgel SE3 nicht inverteilt / inverteilt
83	Dynamisierungsbereich SE3.1_SE3.1_Pub	1000	[µs]	250	6500	Dynamisierungsbereich des Eingangs SE3.1
84	Dynamisierungsbereich SE3.1_SE3.1_Sine	50	[ms]	50	6400	Dynamisierungsbereich des Eingangs SE3.1
85	Dynamisierungsbereich SE3.2_SE3.2_Pub	2000	[µs]	250	6500	Dynamisierungsbereich des Eingangs SE3.2
86	Dynamisierungsbereich SE3.2_SE3.2_Sine	100	[ms]	50	6400	Dynamisierungsbereich des Eingangs SE3.2
87	Dynamisierung SA1_SA1_DYN	Keine Dynamik		0	1	Dynamisierung des Ausganges SA1
88	Dynamisierungsbereich SA1.1_SA1.1_Pub	1000	[µs]	500	6500	Dynamisierungsbereich des Ausganges SA1.1
89	Dynamisierungsbereich SA1.1_SA1.1_Sine	50	[ms]	50	6500	Dynamisierungsbereich des Ausganges SA1.1
90	Dynamisierungsbereich SA1.2_SA1.2_Pub	2000	[µs]	500	6500	Dynamisierungsbereich des Ausganges SA1.2
91	Dynamisierungsbereich SA1.2_SA1.2_Sine	100	[ms]	50	6500	Dynamisierungsbereich des Ausganges SA1.2
92	Ausgangsgel SA1.2_SA1.2_RIV	Nicht inverteilt		0	1	Ausgangsgel SA1.2 nicht inverteilt / inverteilt
93	Dynamisierung SA2_SA2_DYN	Keine Dynamik		0	1	Dynamisierung des Ausganges SA2
94	Dynamisierungsbereich SA2.1_SA2.1_Pub	1000	[µs]	500	6500	Dynamisierungsbereich des Ausganges SA2.1
95	Dynamisierungsbereich SA2.1_SA2.1_Sine	50	[ms]	50	6500	Dynamisierungsbereich des Ausganges SA2.1
96	Dynamisierungsbereich SA2.2_SA2.2_Pub	2000	[µs]	500	6500	Dynamisierungsbereich des Ausganges SA2.2
97	Dynamisierungsbereich SA2.2_SA2.2_Sine	100	[ms]	50	6500	Dynamisierungsbereich des Ausganges SA2.2
98	Ausgangsgel SA2.2_SA2.2_RIV	Nicht inverteilt		0	1	Ausgangsgel SA2.2 nicht inverteilt / inverteilt
99	Dynamisierungsbereich Ausgang SDYN1_SDYN1_Pub	1000	[µs]	100	6500	Dynamisierungsbereich des Ausganges SDYN1
100	Dynamisierungsbereich Ausgang SDYN1_SDYN1_Sine	50	[ms]	50	6500	Dynamisierungsbereich des Ausganges SDYN1
101	Dynamisierungsbereich Ausgang SDYN2_SDYN2_Pub	2000	[µs]	100	6500	Dynamisierungsbereich des Ausganges SDYN2
102	Dynamisierungsbereich Ausgang SDYN2_SDYN2_Sine	100	[ms]	50	6500	Dynamisierungsbereich des Ausganges SDYN2
104	SA1.2_Ausgabe	Leit gegen GND		0	1	Auswert SA1.2 Lastbindung

Safety Editor

A new certified editor has been introduced in AIPEX PRO V3 that provides the functionality for creating and managing safety-relevant parameters.

- Parameter assignment of the safe drives of AMK
- Logging of the safety functions
- Automatic documentation in PDF format



Automatic controller optimization

- Connected AMK drive systems are automatically detected and identified. All relevant values for the motor, motor encoder, and electronic line shaft are displayed.
- Determination and setting of the parameter values for current, speed, and position controllers.
- Recording and graphic display of the measured response to a setpoint step change.
- Possibility of application-specific adaptation of the controller settings.

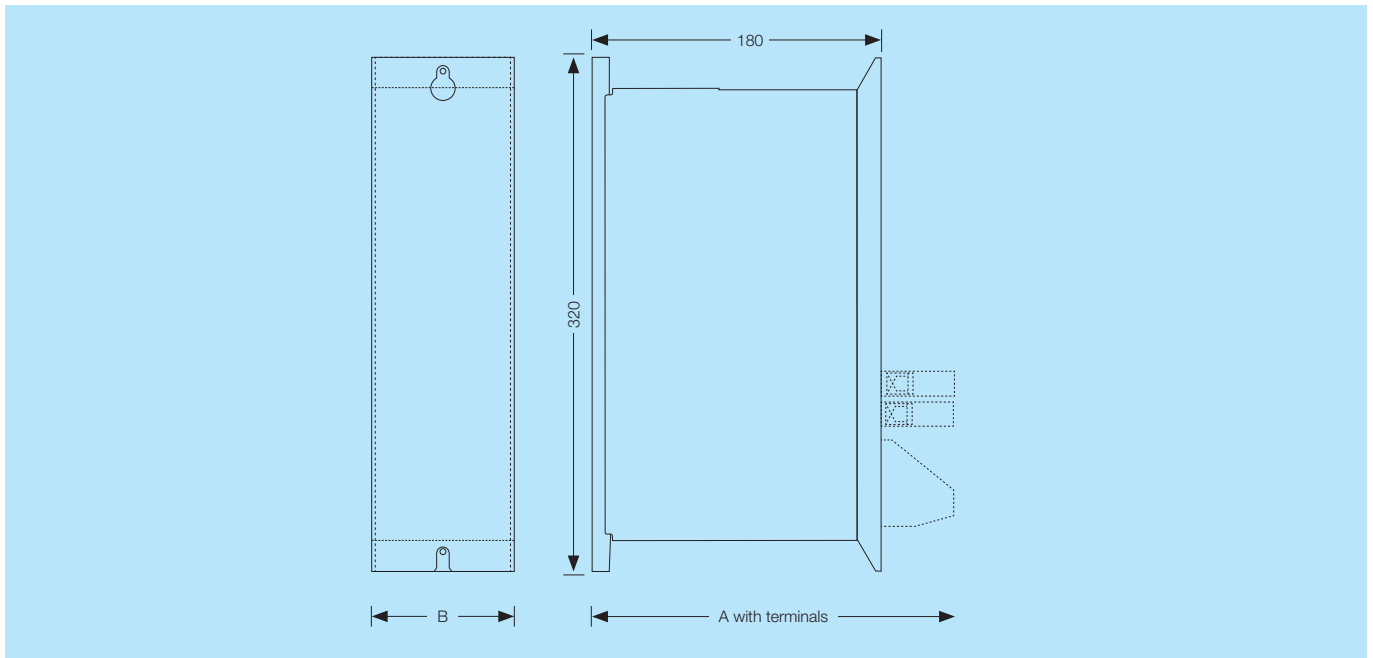
Accessories

Designation	Product information	AMK Part No.
KE/KW cold plate with cooling connection on the side for devices in cold plate design		
KW-CP340	L=340 mm	0704
KW-CP510	L=510 mm	0706
KW-CP680	L=680 mm	0708
KW-CP680-V	L=680 mm, stainless steel tubes	0782
KE/KW cold plate with cooling connection on the back for devices in cold plate design		
KW-CP340R	L=340 mm	0705
KW-CP420R	L=420 mm	0710
KW-CP510R	L=510 mm	0707
KW-CP680R	L=680 mm	0709
KW-CP680R-V	L=680 mm, stainless steel tubes	0783
KW-CP1035R	L=1035 mm	0734
KE/KW cold plate with fan for devices in cold plate design		
KW-LK110	110 x 418 x 46 (cooling surface)	0745
KW-LK250	250 x 465 x 84 (cooling surface)	0743
KW-LK400	400 x 465 x 84 (cooling surface)	0744
KW-LK500	500 x 465 x 84 (cooling surface)	0802
Fastening material		
Fastening material 20 sliding blocks and washers	For installation of cold plate devices on AMK cold plate	49994
Brake resistors		
AR 45	All incoming supplies	0536
AR 80-20-0	KE 20	29433
AR 140	KEN 5, KEN 10	0746
AR 1000-50-F	All incoming supplies	E586
AR 4000-8-F	KE 40, KE 60, KE (N/S) 120	E585
AR 4000-8-0	KE 40, KE 60	E584
AR 4000-20-F	KE 20	E593
AR 4000-20-0	KE 20	E591
AR 4000-40-F	KE 10	E601
Operator panel		
KU-BF1	For KW with KW-R03, KW-R03P, KW-R04	E628
Line contactors		
	For KE 20, KES 20, coil 24 V	200593
	For KE 40, coil 24 V	29297
	For KE 60, KES 60, coil 24 V	29298
	For KE 120, KES 120, coil 24 V	200446
		29300

Accessories

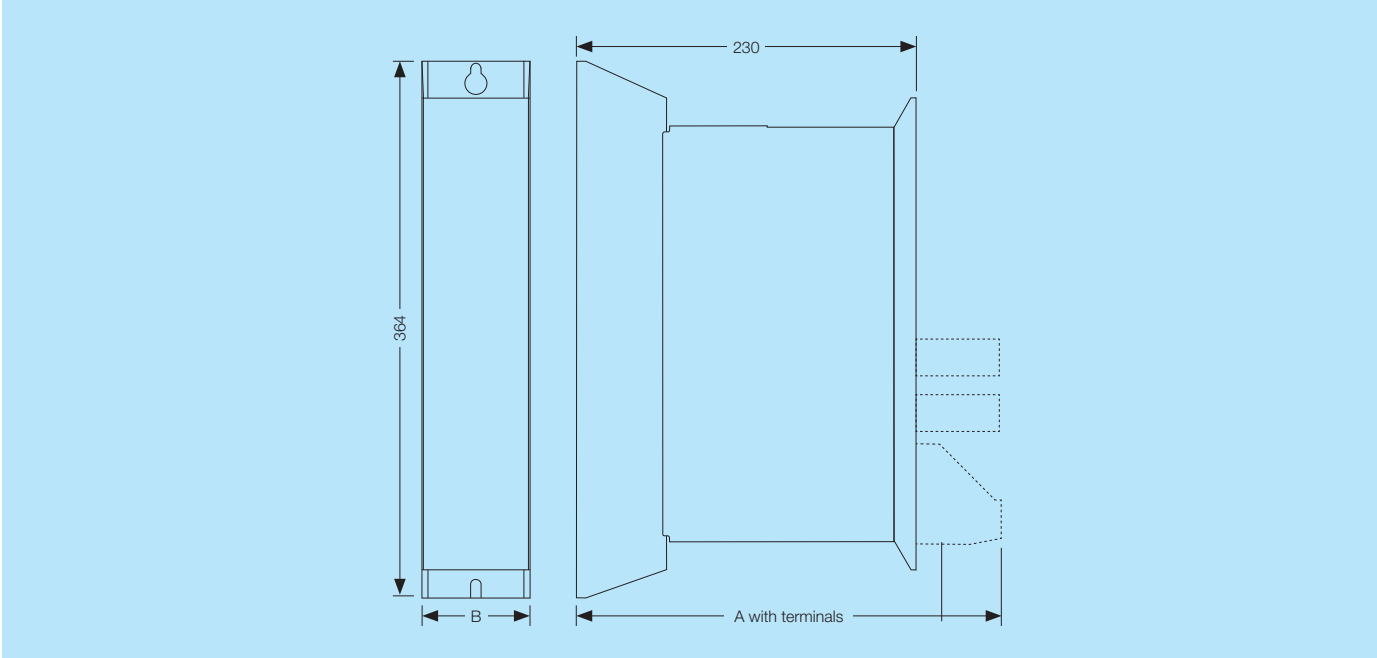
Designation	Product information	AMK Part No.
Line filter		
AF 90	KE 60, 3 x 480 VAC, 90 A	0820
AF 180	KE 120, KEN 120, 3 x 480 V, 180 A	0821
AF 90-S	KES 60, 3 x 480 V, 90 A	0825
AF 180-S	KES 120, 3 x 480 V, 180 A	0812
AF 300	KE 180, 3x480V, 300A	0886
AMKASYN line reactors		
ALN 12	For KEN 5-ON without fieldbus	
ALN 17	For KEN 10	0742
ALN 30-S	KES 20, 30A/continuous operation	0893
ALN 36/1000	For KE 20, 36 A	0727
ALN 63	For KE 40, 63 A	0728
ALN 85	For KE 60, 85 A	0729
ALN 180	For KE 120, KEN 120	0739
ALN 15-SI	For KES 20, 15 A/pulse loading	0829
ALN 45-SI	For KES 60, 45 A/pulse loading	0789
ALN 60-SI	For KES 120, 60 A/pulse loading	0790
ALN 90-S	For KES 60, 90 A/continuous operation	0770
ALN 150-I	KE 180, 150 A/pulse operation	0885
ALN 180-S	For KES 120, 180 A/continuous operation	0771
AMKASYN line series reactors		
ALNV 15-SI	For KES 20, 15/60 A	0841
ALNV 30-S	KES 20, 30A/continuous operation	0828
ALNV 90-S	For KES 60, 90/180 A	0826
ALNV 180-S	For KES 120, 180/300 A	0827
DC link cable sets blue/red		
KW-UZ55	L=180 mm, 10 mm ²	46621
KW-UZ85	L=45 mm, 10 mm ²	46620
KE-UZ170	L=117 mm, 10 mm ²	46376
KW-UZ170	L=114 mm, 25 mm ²	46622
KW-UZ255	L=380 mm, 50 mm ²	46908
KE-UZ255	L=350 mm, 25 mm ²	46975
ACC bus cable		
KW-ACC140	L=140 mm	29237
KW-ACC210	L=210 mm	29231
KW-ACC300	L=300 mm	200053
KW-ACC1000	L=1000 mm	29523
KW-ACC1800	L=1800 mm	29543
KW-ACC5000	L=5000 mm	200507
KW-ACC10000	L=10000 mm	29545
KW-ACCT	Terminating connector	29240
EC bus cable		
Cable RJ45 0.2 m	L=200 mm	202665
Cable RJ45 0.3 m	L=300 mm	202666
Cable RJ45 0.4 m	L=400 mm	202667
Cable RJ45 1.0 m	L=1000 mm	202668
Cable RJ45 2.0 m	L=2000 mm	202669
Cable RJ45 5.0 m	L=5000 mm	202670
Cable RJ45 10.0 m	L=10000 mm	202671
Supplementary accessories		
AP-CI3	Adapter ACC to Wago	0777
AP-CI4	Adapter ACC general CAN connection	0778
AP-CI6	Adapter ACC for general CAN connection	0780
AIPEX Lite	Diagnostics tool on request	
AIPEX PRO V3	Engineering tool	0907
AIPEX PRO Update	Engineering tool update	0811

Device dimensions in cold plate design.



Modules	B (module width in mm)	A (module depth in mm with terminals)
KEN 5, KEN 10, KEN 20, KW 2, KW 3, KW 5, KW 8, KWD 1, KWD 2, KWD 5	55	205
KE 20, KES 20, KW 10, KW 20	85	212
KE 40, KE 60, KES 60, KW 40, KW 60	170	235
KE 120, KEN 120, KES 120, KW 100	255	259
KE 180, KES 180, KW 150, KW 200	425	228

Device dimensions with integrated air cooling.



Modules	B (module width in mm)	A (module depth in mm with terminals)
KEN5-F, KEN10-F, KW2-F, KW4-F, KW6-F, KWD1-F, KWD2-F, KWD4-F	55	261
KE20-F / KW9-F	86	261

Industry sector solutions.

Economical, modular and absolutely efficient.

The innovative drive and control solutions from AMK provide just the right products for your production lines and machines:

- Printing industry
- Paper processing
- Machine tool manufacturing
- Textile industry
- Plastics industry
- Packaging industry
- Foodstuff industry

No matter your industry sector, our application engineers have extensive theoretical and practical knowledge and would be happy to work on a customized solution for you.



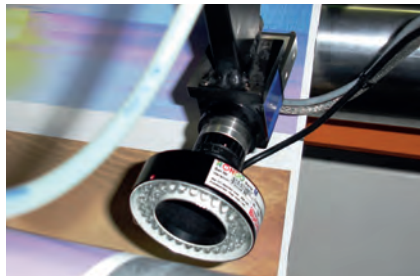
Printing industry

Maximum precision and dynamics. 1000 axes, 18 meters per second



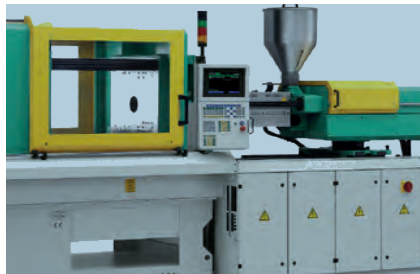
Paper unwinder

On-the-fly change at full production speed.



Paper processing.

At speeds of 10 m/s, 2x2 mm-sized print marks are detected with an accuracy of +/- 30 µm.



Plastics industry.

Cycle times of 1.6 second Maximum requirements for precision and repeat accuracy.



Foodstuff industry.

Rotary labeling machine for flexible use of different bottle formats.



Packaging industry.

Bag forming, filling, and sealing machines, inserters, blister machines, and film packaging machines or palletizers.

BENEFITS

- Complete drive and control solutions from one source
- Comprehensive industry sector know-how for innovative machine concepts
- AMK technology library with motion control function blocks, including for your application

Service, training, and consulting.

Our know-how working for you:

Service

It goes without saying that we offer comprehensive service. Whenever you need support, our "Technical Support" specialists are there for you – from planning, design, installation and startup, to programming and operating a system, and to replacing of system parts.

Consultation

We support you with customized, project-related consultation on all aspects of your drives and controllers. You receive exactly the information you require fully tailored to your individual needs.

Training

Our comprehensive training program covers all theoretical and practical aspects of drive and control technology and offers you different training options, either in our training center or at your site.

Our training offer ranges from basic training to expert workshops. On request, we also offer project-optimized, customized training.

General technical data

Directives and standards

- Low Voltage Directive 73/23/EEC and 93/68/EEC
- EN 50178 "Electronic equipment for use in power installations"
- EN 61800-2 "Adjustable speed electrical power drive systems, General requirements"
- EN 61800-3 "Adjustable speed electrical power drive systems, EMC product standard"
- UL 508C "Power Conversion Equipment"
- CSA C22.2 "Industrial Control Equipment"

Machine standards:

- Machinery Directive 89/392/EEC
- EMC Directive 89/336/EEC
- EN 60204 "Electrical equipment of machines"

Incoming line supply of KE:

3 x 400 V...480 V \pm 10%, 47... 63Hz
Line-powered operation conditions according to EN61800-2 Section 4.1.1 or EN60204-1 Section 4.3

- Symmetrical three-phase line, max. permissible voltage unsymmetry 3% TN or TT system, neutral point grounded
- Suitable for IT systems

Reference potential:

PE, circuit GND of the low voltage circuit is connected internally to the housing ground

Power pack supply voltage

24VDC \pm 15%, max. 5% ripple, with integrated inrush-current limiting

Limit values for radio interference voltage according to EN 61800-3: (2000) in accordance with Section 6.3.2 Tab. 11 and Tab.12 (external filter required from KE 60 onwards)

Ambient conditions

Degree of protection according to EN 60529: IP20, degree of pollution 2

Storage/transport temperature: -25°C to +75°C

Ambient temperature: +5°C to +40°C

Cold plate temperature with liquid cooling: max. 40°C

Relative humidity: 5% to 85%, without condensation

Installation altitude:

Up to 1000m above sea level. In the case of altitudes over 1000m up to max. 2000m, the ratings must be reduced by 1% per 100m.

Shock resistance:

15 g for 11 ms according to EN 60068-2-27

Vibration stress:

1 g at 10...150Hz according to EN 60068-2-6





- **AMKAMAC**
controllers
- **AMKASMART**
decentralized
drive technology
- **AMKASYN**
servo drives
- **DYNASYN**
servo motors
- **SPINDASYN**
hollow shaft motors

AMK

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The information in this brochure serves only as a product description for a series of products. Deviations are possible due to specific product features and ongoing development activities. Before using the data for calculation or design purpose, you should inquire about the current status and request product-specific dimension drawings and data sheets.