



Smart
connections.

Order catalogue
Line of drive controllers

INVEOR M, INVEOR P, accessories

KOSTAL competence – Using energy smartly

**KOSTAL competence –
Smart connections**

4



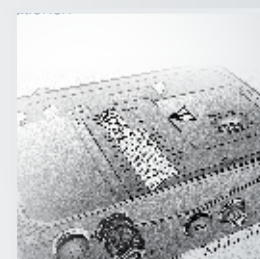
**INVEOR –
Smart connections
on five levels**

8



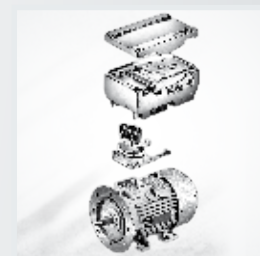
**INVEOR
Equipment features and standard
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**INVEOR
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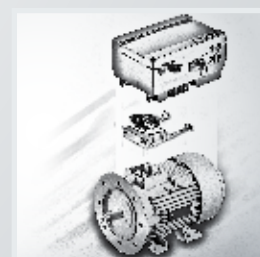
**INVEOR
Technical data**

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**INVEOR
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46



KOSTAL competence – Smart connections

partnership

future

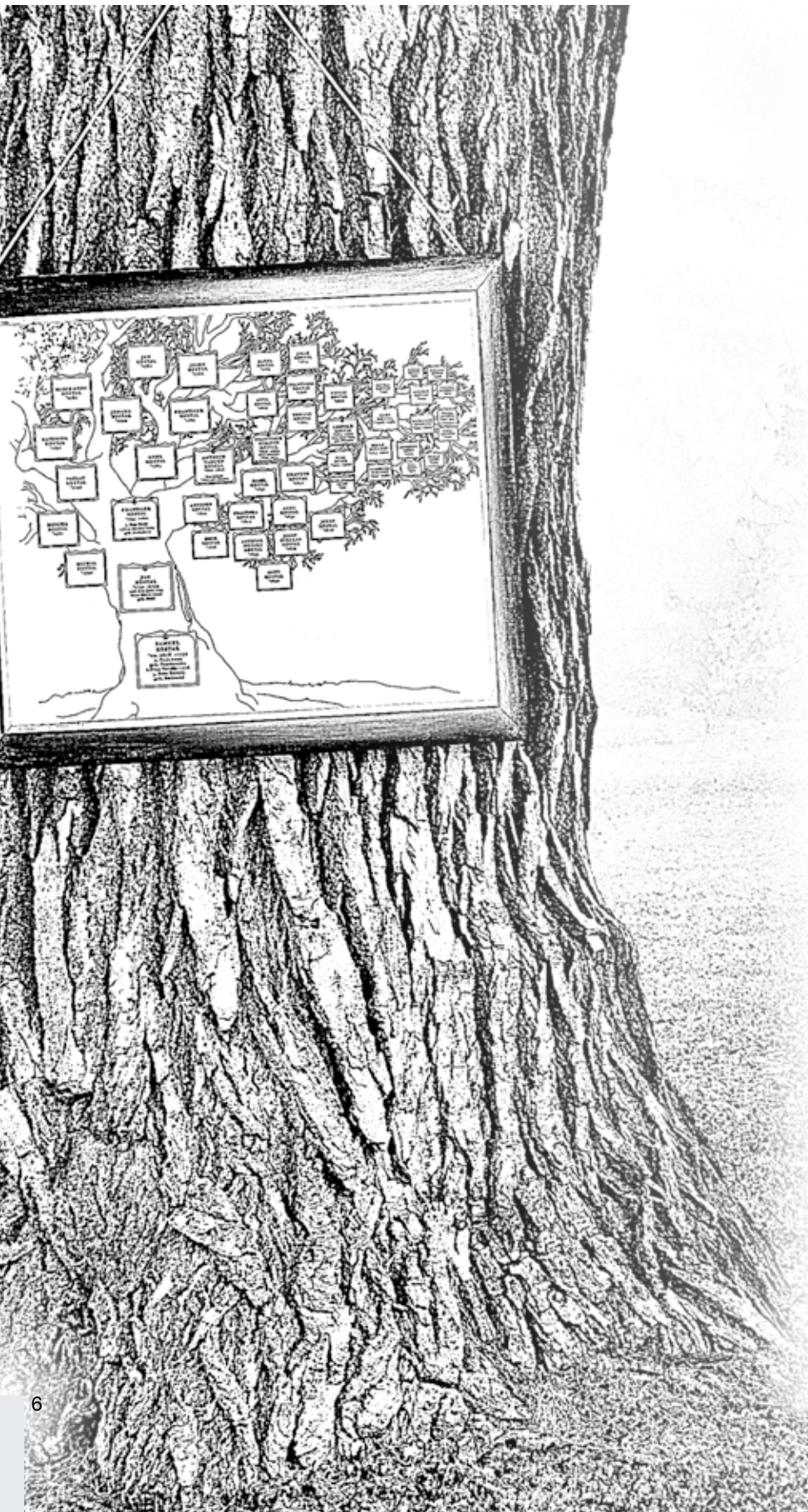




family

quality

KOSTAL competence – Smart connections



For over 100 years, KOSTAL has focused on values such as family, partnership, reliability, customer satisfaction, a zero-error approach and awareness of responsibility.

KOSTAL Group

- As an independent, family-owned company, the KOSTAL Group specialises in the development of high-quality electronic, electromechanical and mechatronic solutions for a wide range of automotive and industrial applications.
- The company was founded in 1912 by Leopold Kostal in Lüdenscheid, Germany, and today employs about 16,300 people at 39 locations in 18 countries.
- The KOSTAL Group has four divisions: Automotive Electrical Systems, Connectors, SOMA Test Technology and Industrial Electronics with its international sales company KOSTAL Solar Electric for photovoltaic inverters.
- The KOSTAL Group's partners include the world's leading automotive manufacturers and numerous major industrial companies.

KOSTAL Industrie Elektrik

- With the founding of KOSTAL Industrie Elektrik in 1995 under the umbrella of the KOSTAL Group, the stage was set for providing broad expertise from the automotive sector to additional markets, such as drive technology.
- Based in Hagen, Germany, the leading power electronics firm employs 300 members of staff in development, administration and production.
- Its core competences are drive technology (INVEOR drive controllers) and photovoltaics (PIKO inverters).

Smart connections

- The "Smart Connections." philosophy is the KOSTAL brand promise and is based on the KOSTAL Group's vast experience.

“Smart connections.” – the four pillars of the KOSTAL philosophy

For KOSTAL customers, "Smart Connections." means a partnership with a down-to-earth and sound company, guaranteeing long-term trusting business relationships at all levels.

KOSTAL family

In dealings with all partners, KOSTAL sees itself as a KOSTAL family, in which each member can rely on the others. This understanding and long-standing relations with our customers guarantee a code of conduct built on human values and tradition.

Partnership based on symbiosis

Using the idea of symbiosis as its guiding principle, by working closely with customers from project planning, qualification and system integration to market launch, KOSTAL is able to deliver optimum support and by treating customers as equals is able to take full account of individual requirements.

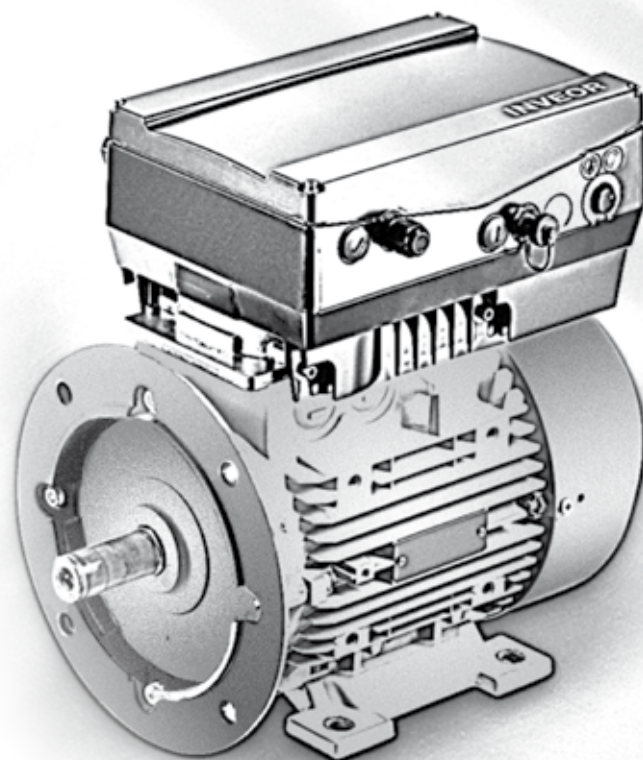
Quality-offensive thinking

The professional error management system – adopted from the automotive industry – guarantees a zero-error strategy. Highly automated volume production includes defined test loops through which every product passes. KOSTAL offers this partnership-based quality-offensive thinking with the INVEOR, a genuine, German-made quality product. Errors exist to be eliminated and to give us the opportunity to improve day after day, especially for the benefit of KOSTAL customers.

Envisioning the future

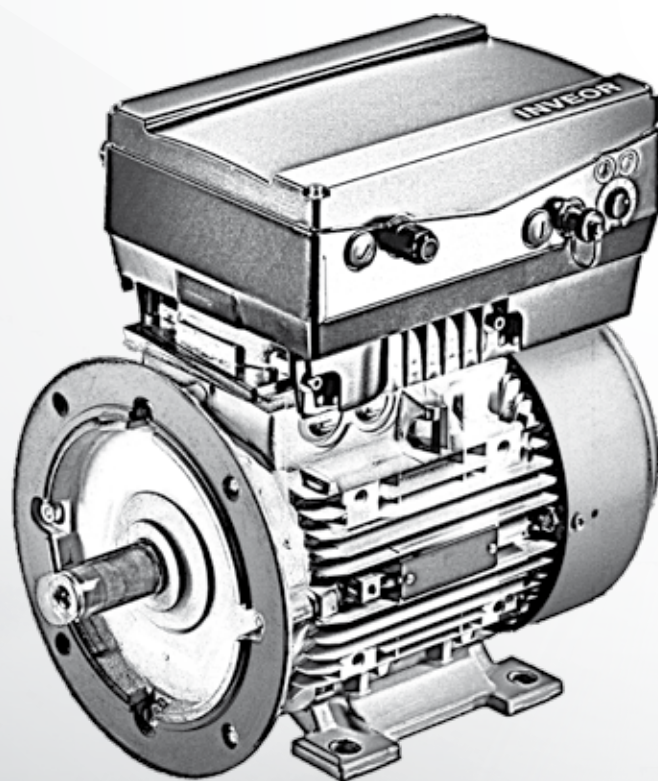
KOSTAL works tirelessly towards active knowledge transfer and intensive dialogue with its partners. Together the challenges presented by constant change can be overcome. The topic of energy efficiency (EN50598) in particular is gaining ever greater significance in this field. In close dialogue with partners, KOSTAL creates new product developments for future requirements. In other words, envisioning the future together.

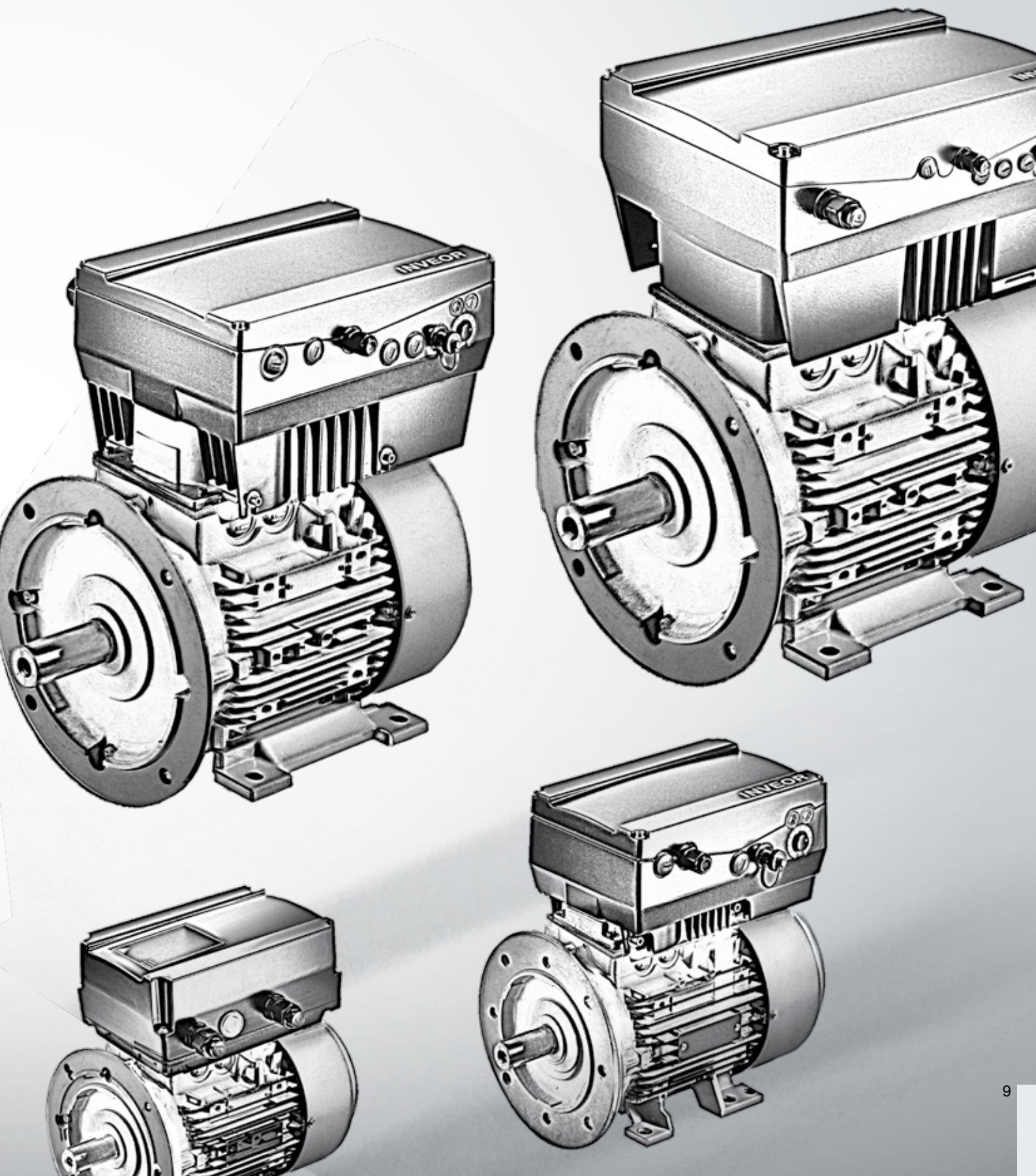
KOSTAL applies its brand promise and competitive advantages to all aspects of business, which of course includes development of the INVEOR line of drive controllers.



INVEOR –

Smart connections on five levels





INVEOR – “Smart connections.” ...

The “Smart connections.” claim is not only the brand claim of KOSTAL Industrie Elektrik. It also stands for the philosophy behind the development of the INVEOR line of drive controllers. The goal for the INVEOR was to develop a product that is ideally oriented to the requirements of customers and their respective applications without sacrificing the advantages

of volume production. This has resulted in a product with a modular configuration, which customers can put together to suit their needs. On the basis of INVEOR, the key interfaces to the customer application were therefore defined and analysed in order to offer ideal solutions. These solutions, or smart connections, exist at five levels – as is shown below.



... on five levels

- 1** The INVEOR: Five sizes covering motor ratings from 0.25 to 22 kW, each available in the motor-mounted, wall-mounted and cold plate variants. The INVEOR drive controllers can also be fitted with the Safe Torque Off function (STO = functional safety)
- 2** Communication: Through CANopen, EtherCAT, Modbus, PROFIBUS, PROFINET and Sercos, the INVEOR is compatible with almost all common control environments. Customers can select the bus system relevant to their needs and thereby ideally integrate the INVEOR into the control environment of their application
- 3** Operation and observation: For operation, a foil keypad, an external and an integrated MMI handheld controller, operation via an external touch operating terminal and PC software are available depending on requirements
- 4** Motor adaptations: Thanks to its innovative adaptation concept with a wide range of standard and motor-specific adapter plates, the INVEOR can be used with virtually any motor on the market
- 5** Control process: The regulating concept of the INVEOR is conceived of in such a way that all motors, from asynchronous to synchronous machines, can be operated

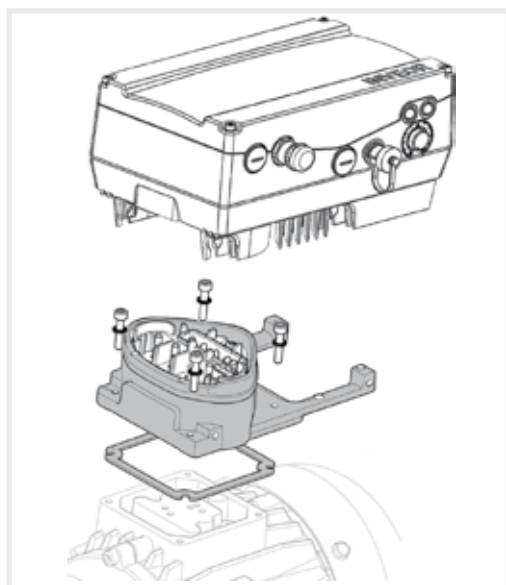
Once you consider all these interfaces and the various configuration options of the INVEOR, you could say that the KOSTAL line of drive controllers adapts in various ways to the customer's needs and the application situation. – "Smart connections." on five levels.

The following pages will give you more detailed insight into the five levels of the INVEOR's smart connections.

Five levels at a glance

1

The INVEOR



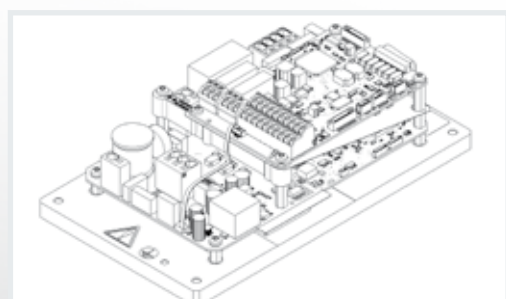
Decentralised drive controller concept

Being installed directly on the motor minimises wiring and installation work and therefore also project planning and installation costs for systems covering large areas. The application section can be extended with ease as no additional space is needed for control cabinets. The individual units can be fully pre-wired, pre-tested and standardised. This makes project planning and commissioning faster than with comparable projects where several drive controllers are fitted in the control cabinet. Shielded motor cables are very short if they are needed at all.



INVEOR M

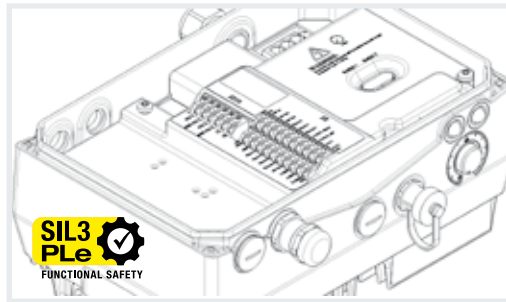
The motor-mounted INVEOR M product family comes in five sizes and covers the power range between 0.25 kW and 22 kW in 1- and 3-phase variants, motor-mounted or wall-mounted. You select the size to suit your motor rating in the configuration.



INVEOR P

Based on the same platform, the INVEOR P includes the electronics hardware from the INVEOR M family on a standardised cold plate. Specific and therefore variable integration in the customer system is thereby made possible. The electronics are cooled via the cold plate's attachment to the customer's cooling surfaces such as installation plates, cast parts or ribbed housing parts. The extensive configuration options, derived from the INVEOR M platform, are still available here. You select the INVEOR type in the configuration.

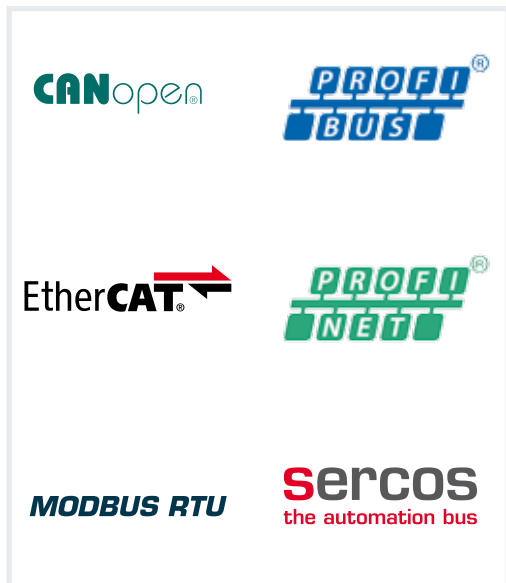




Input/output configuration

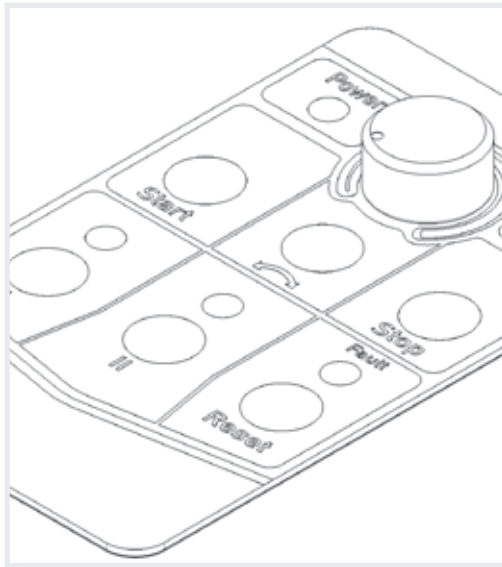
The number of inputs/outputs and the model with and without functional safety (STO) can be configured through the choice of integrated application unit.

2 Communication



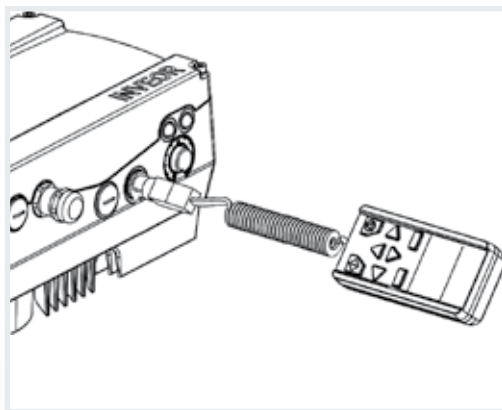
Comprehensive communication interfaces

The choice of the preferred field bus usually depends on the controller manufacturer used in the system, the geographic region, the functional requirements in terms of speed and network spread and availability of suitable field devices. The INVEOR product family offers a large number of communication options, allowing it to be easily integrated in existing automation processes without having to depart from the fieldbus systems used previously in the application. The fieldbus systems can be selected as options.



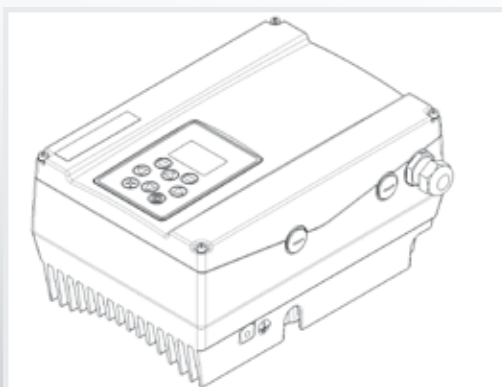
Integrated foil keypad

Decentralised drive controllers are easy to access in the field and can also be operated locally thanks to the integrated foil keypad. Changes in direction of rotation, parameter changes, changes in the target value and start and stop commands are therefore possible. What's more, the integrated potentiometer allows target values to be specified with ease. The foil keypad can be selected as an option in the INVEOR configuration.



MMI* handheld controller

For commissioning, parameter adaptations and service purposes, our flexible MMI handheld controller is available as an alternative to the PC software. You can edit and save parameters and copy parameter sets from one device to another (clone devices). You can also specify target values and display actual values. The MMI handheld controller is available as an accessory to the INVEOR.



Integrated MMI*

The full functionality of the handheld controller, combined with 5 freely selectable status screens, enables parameterization and operation on the drive controller itself. Everything complies with the IP device protection class. The MMI functionality can be selected as an option in the INVEOR configuration.

*Man-Machine-Interface



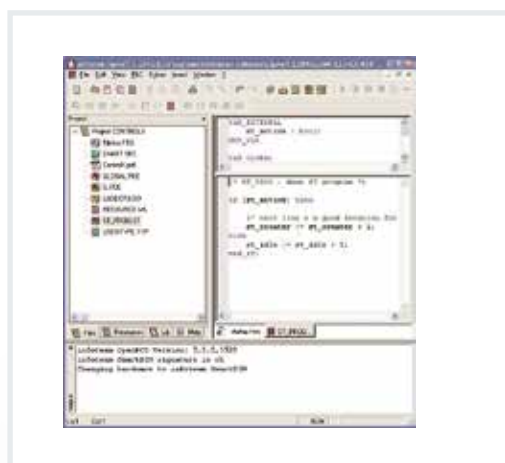
Touch operating terminal

You can conveniently automate several INVEOR drive controllers without a fieldbus using the touch operating terminal. Two variants of this touch operating terminal are available as accessories to the INVEOR.



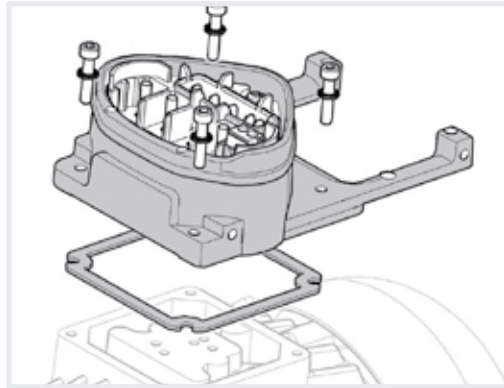
INVEOR PC software

The user will get to grips with intuitive PC software interface with virtually no assistance. Commissioning can be easily undertaken by oscilloscope, parameter adaptation and the cloning of drive axes. Automatic motor identification, parameter presettings and customer-specific actual value displays automate and speed up application commissioning. The INVEOR PC software is available to download for free from the following website: www.kostal-industrie-elektrik.com



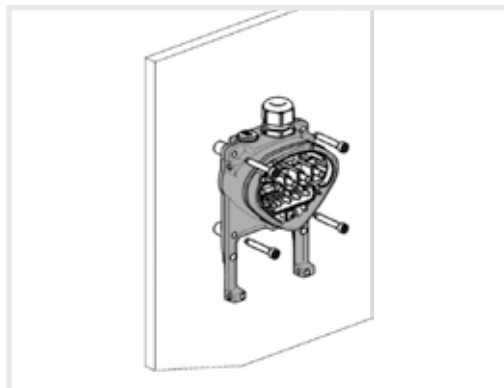
Soft PLC, IEC 61131-3

The INVEOR provides a freely programmable soft PLC solution with complete access to the device parameters and status data. Programming and depiction can take place in a function block diagram (FBD), structured text (ST) and a list of instructions (AWL). There are 20 technology parameters, which you can use for your specific functions in your application. Each INVEOR is equipped with the soft PLC solution as standard.



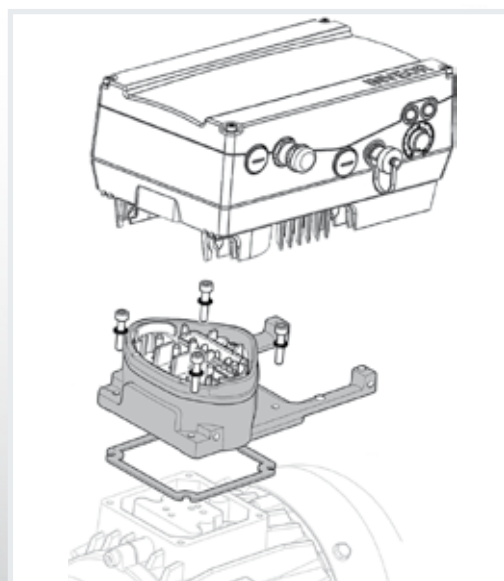
Motor adapter plate

In order to mechanically install the drive controller on the motor, the INVEOR adapter plate (ADP) is used in place of the terminal box. The INVEOR can then be attached directly to this (plug-and-play). Thanks to the large number of adapter plates available, virtually any motor can be adapted. You will find suitable adapter plates in the accessories area.



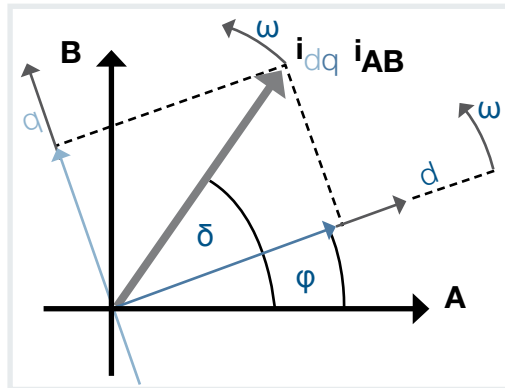
Mounting adapter plate on wall

If the application does not permit installation on the motor, installation close to the motor is possible. As an alternative to the motor adapter plate, KOSTAL provides an adapter plate for wall mounting. You will find wall mounting plates in the accessories area.



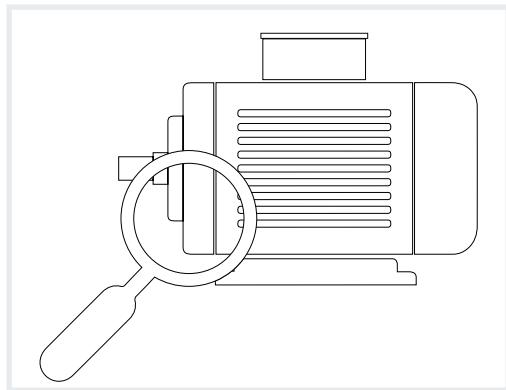
Extensive range of adapter plates

The range includes a large number of adapter plates and intermediate adapters for many common motor types. Specific adapter plates are also available for special motors and can be set up to match requirements and quantities. Please get in touch with your KOSTAL contact for more details.



Field-oriented sensorless control for asynchronous and synchronous motors

Compared with controlled processes such as voltage/frequency control, the INVEOR attains improved start-up torques, better efficiency and optimised control quality. Expensive rotary encoder feedback can be dispensed with.



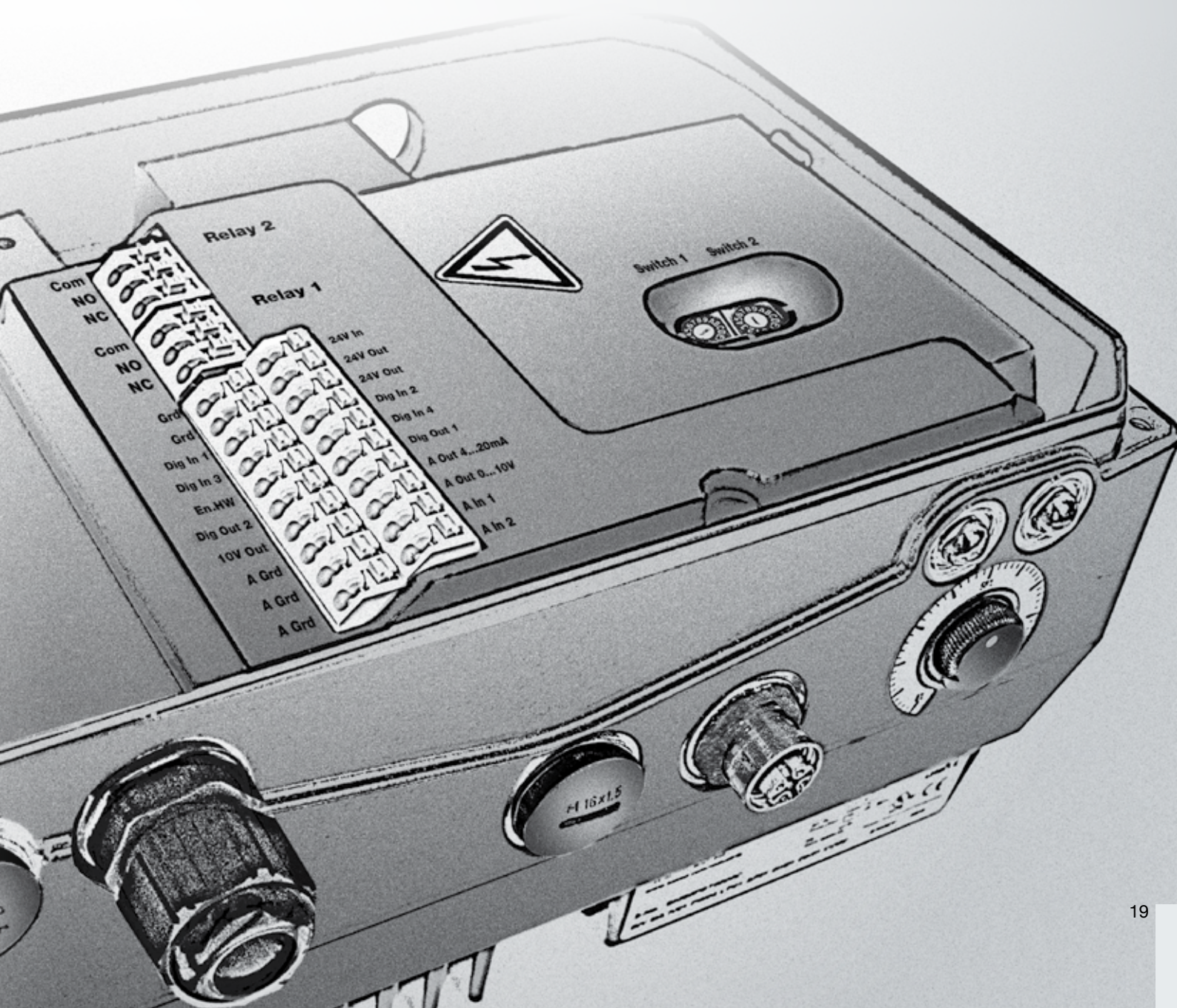
Automatic motor identification

To speed up the process of commissioning the drive controller in combination with external motors, the INVEOR family provides automatic motor identification. Only the type plate data has to be entered to start the identification process.

INVEOR

Equipment features and standard configurations





Equipment features at a glance

By selecting the application unit as part of the INVEOR configuration, you define the main functionalities and features, in particular the interfaces and fieldbus options, of your drive controller. The following overviews provide a summary of the equipment features of the individual application unit.

Application units available per INVEOR size

Depending on size (A, B, C, D), there are up to three application units: basic, standard and functional safety. There is only a standard application unit for the α size. You can see the application units available per size below.

Size	α	A, B, C	A, B, C, D	
Application unit type	Standard	Basic	Standard	Functional safety
Size α , 1Ph (0.25 kW – 0.75 kW)	■ ■			
Size A, 1Ph (0.37 kW – 1.1 kW)		■	■	
Size A, 3Ph (0.55 kW – 1.5 kW)		■	■	■
Size B, 3Ph (2.2 kW – 4.0 kW)		■	■	■
Size C, 3Ph (5.5 kW – 7.5 kW)		■	■	■
Size D, 3Ph (11.0 kW – 22.0 kW)			■	■

Operation and observation

Depending on the choice of application unit, various operation and observation options exist.

Size	α	A, B, C	A, B, C, D	
Application unit type	Standard	Basic	Standard	Functional safety
Soft PLC. IEC 61131-3	■ ■	■ ■	■ ■	■ ■
INVEOR PC software	■ ■	■ ■	■ ■	■ ■
Potentiometer on device	Accessories	■	■	■
Integrated foil keypad	■			
Integrated foil keypad with potentiometer		■	■ Cannot be combined with fieldbus option	■
Integrated MMI		■	■	■
MMI handheld controller	Accessories	Accessories	Accessories	Accessories
Touch operating terminal	Accessories	Accessories	Accessories	Accessories

■ ■ available as standard ■ option

Fieldbus options

Depending on the choice of application unit, various fieldbus options can be added as options.

Size	α	A, B, C	A, B, C, D	
Application unit type	Standard	Basic	Standard	Functional safety
Modbus RTU	■ ■	■ ■	■ ■	■ ■
CANopen	■		■	■
PROFIBUS			■	■
PROFINET			■	■
EtherCAT			■	■
Sercos III			■	■
Fieldbus address coding switch			■ ■ CANopen, PROFIBUS DP, Sercos III	

Housing versions and attachments

Size	α	A, B, C	A, B, C, D	
Application unit type	Standard	Basic	Standard	Functional safety
M12 plug for RS485	Accessories	■ ■	■ ■	■ ■

■ ■ available as standard ■ option

Functions and characteristics

Size	α	A, B, C	A, B, C, D	
Application unit type	Standard	Basic	Standard	Functional safety
PID control	■ ■	■ ■	■ ■	■ ■
Digital inputs	2	2	4	4
Digital outputs	1	1	2	2
Analogue inputs*	1	1	2	2
Analogue outputs			1	1
Hardware enable, digital	■ ■	■ ■	■ ■	
STO inputs				2
Digital input 5, quick stop SS1				■ ■
STO diagnosis relay				■ ■
24 V supply voltage	■ ■	■ ■	■ ■	■ ■
24 V feed-in for the control part card			■ ■	■ ■
10 V voltage supply	■ ■	■ ■	■ ■	■ ■
Relay	1		2	
Motor temperature evaluation	■ ■	■ ■	■ ■	■ ■

*can be configured as digital inputs

Power unit card options

	INVEOR sizes				
	α	A	B	C	D
Brake chopper		■	■	■	■
IT network	■				

■ ■ available as standard ■ option

Device sizes and standard configurations

The standard variants of the INVEOR M and INVEOR P drive controllers provide the basis for each device configuration and are shown in the following overviews. The complete device configuration comprises 9 items, which produce the complete order code.

Standard variants of INVEOR M

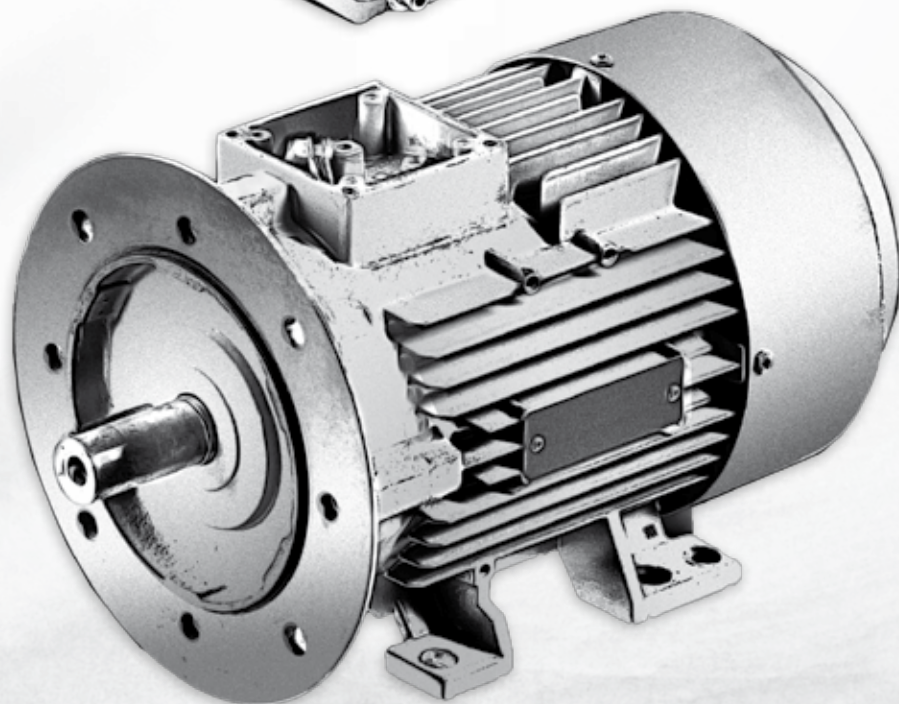
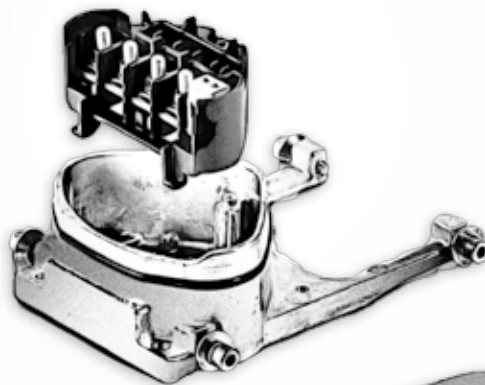
1.	2.	3.	4.	5.	6.	7.	8.	9.
INVEOR type	Size	Supply voltage	Recommended motor rating	Power unit card configuration	Selection of application unit and fieldbus option	Housing configuration: Type of cooling / cable glands	Cover variant and operating option	Model
INV M motor-mounted	α	IV02 230 V	PW04 0.75 kW	LP01 without brake chopper	AP12 standard version	GH01 passive cooling type	DK01 cover without foil keypad	CO00 KOSTAL standard
INV M motor-mounted	A	IV01 400 V	PW06 1.5 kW	LP01 without brake chopper	AP01 standard version	GH01 passive cooling type, potentiometer, standard cable glands	DK01 cover without foil keypad	CO00 KOSTAL standard
INV M motor-mounted	B	IV01 400 V	PW09 4.0 kW	LP01 without brake chopper	AP01 standard version	GH01 passive cooling type, potentiometer, standard cable glands	DK01 cover without foil keypad	CO00 KOSTAL standard
INV M motor-mounted	C	IV01 400 V	PW11 7.5 kW	LP01 without brake chopper	AP01 standard version	GH01 passive cooling type, potentiometer, standard cable glands	DK01 cover without foil keypad	CO00 KOSTAL standard
INV M motor-mounted	D	IV01 400 V	PW15 22.0 kW	LP03 without brake chopper	AP01 standard version	GH06 active cooling type, potentiometer, standard cable glands	DK01 cover without foil keypad	CO00 KOSTAL standard

Standard variants for INVEOR P

1.	2.	3.	4.	5.	6.	7.	8.	9.
INVEOR type	Size	Supply voltage	Recommended motor rating	Power unit card configuration	Selection of application unit and fieldbus option	Housing configuration: Type of cooling / cable glands	Cover variant and operating option	Model
INV P Cold-Plate	α	IV02 230 V	PW04 0.75 kW	LP01 without brake chopper	AP12 standard version	GH03 cold plate cooling type	DK03 without cover	CO00 KOSTAL standard
INV P Cold-Plate	A	IV01 400 V	PW06 1.5 kW	LP01 without brake chopper	AP01 standard version	GH03 cold plate cooling type	DK03 without cover	CO00 KOSTAL standard
INV P Cold-Plate	B	IV01 400 V	PW09 4.0 kW	LP01 without brake chopper	AP01 standard version	GH03 cold plate cooling type	DK03 without cover	CO00 KOSTAL standard
INV P Cold-Plate	C	IV01 400 V	PW11 7.5 kW	LP01 without brake chopper	AP01 standard version	GH03 cold plate cooling type	DK03 without cover	CO00 KOSTAL standard
INV P Cold-Plate	D	IV01 400 V	PW15 22.0 kW	LP03 without brake chopper	AP01 standard version	GH03 cold plate cooling type	DK03 without cover	CO00 KOSTAL standard

INVEOR

Order code



Configuration of INVEOR α

30



Configuration of INVEOR A

32



Configuration of INVEOR B

34



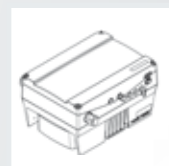
Configuration of INVEOR C

36



Configuration of INVEOR D

38



INVEOR

Order code

The INVEOR order code comprises a total of nine individual items. Each item determines one stage of the INVEOR configuration relating to the various device characteristics.

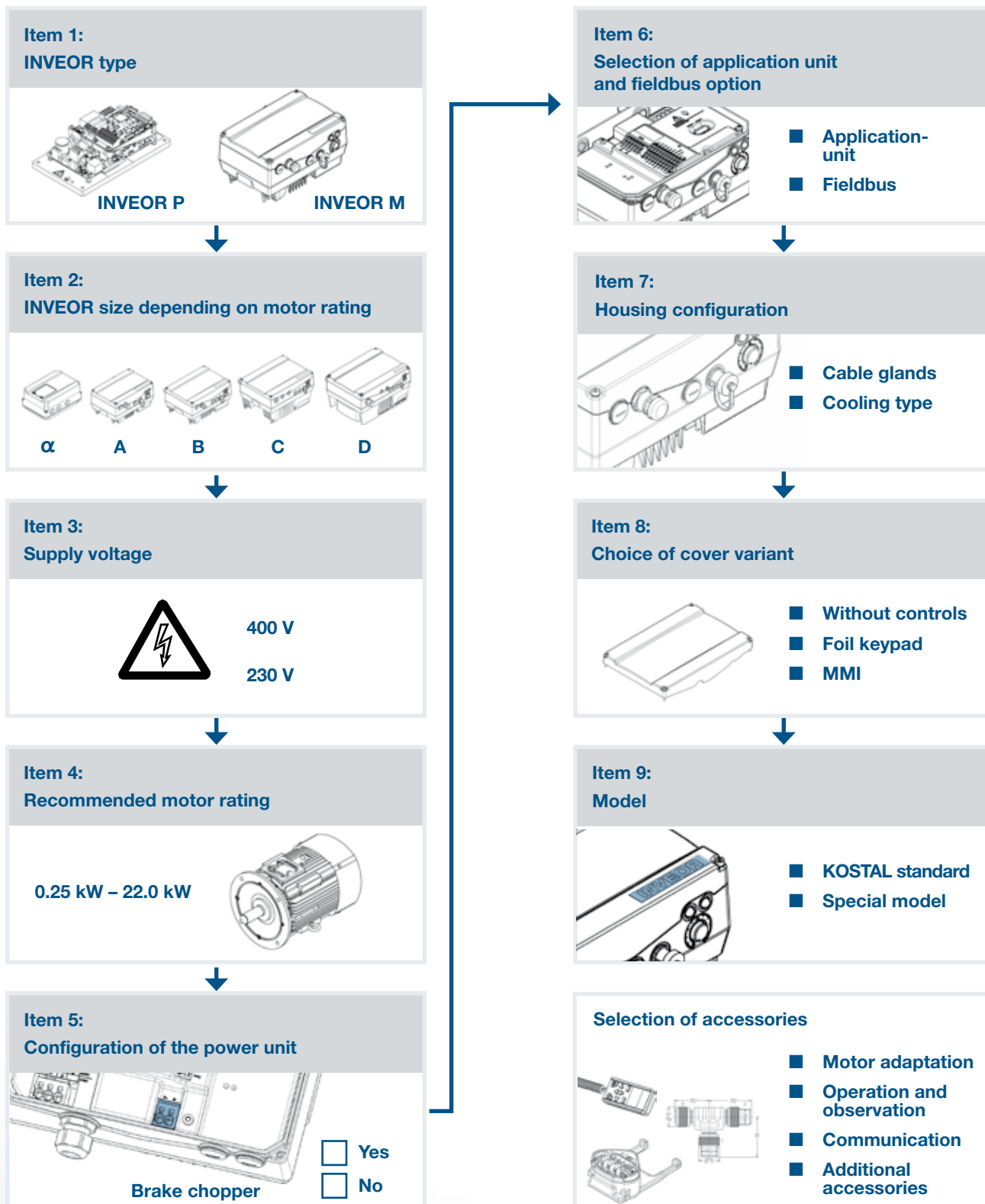
Item	Code	
1	INV x	INVEOR type motor-mounted or as Cold-Plate
2	x	Size α, A, B, C, D
3	IVxx	Supply voltage 230 V or 400 V
4	PWxx	Recommended motor rating 0.25 kW to 22 kW
5	LPxx	Configuration of power unit with and without brake chopper
6	APxx	Configuration of the application unit Input/output configuration, fieldbus or safety technology
7	GHxx	Housing configuration Cooling type, cable glands, potentiometer and attachments
8	DKxx	Cover variant and controls
9	COxx	Model Standard or special model

Here you can configure the INVEOR and enter the order code:

Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9

The route to your INVEOR

The route to your INVEOR configuration is illustrated below. For each of the 9 items, you make a configuration decision, producing one part of the order code. Together all 9 sub-codes produce your total order code, clearly defining your INVEOR.



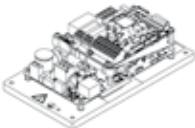
Configuration

INVEOR

Item 1: INVEOR type

INV x

Here a distinction is made between motor- and wall-mounted in IP65/55 and Cold-Plate with IP00.

INV M		INVEOR motor- and wall-mounted	INV M
INV P		INVEOR Cold-Plate*	INV P






*INVEOR Cold-Plate only offers limited configuration options. Please note the colour coding on the following pages: **INV M** ■ **INV P** ■

Item 2: INVEOR size depending on motor rating

x

The motor rating is key to the choice of size.
Please select the power range into which your motor rating falls.

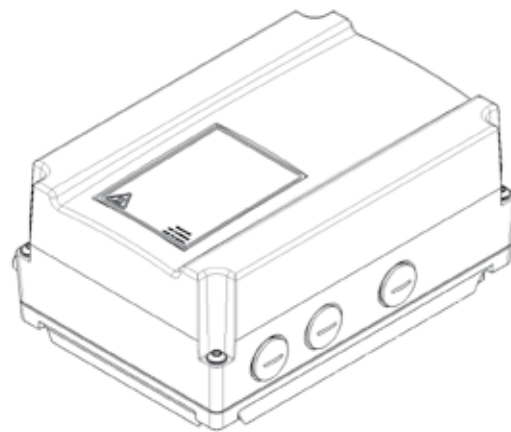
Size selection

	Motor rating	Size	Go to page
	0.25 kW – 0.75 kW →	α	30
	0.37 kW – 1.5 kW →	A	32
	2.2 kW – 4.0 kW →	B	34
	5.5 kW – 7.5 kW →	C	36
	11.0 kW – 22.0 kW →	D	38

Other configuration points depend on the size and are listed on the following pages.

Configuration

INVEOR α



Item 3: Supply voltage

IVxx

Selection of supply voltage

INV M	INV P	1 x 100 VAC -15%...230 VAC +10%	IV02
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Item 4: Recommended motor rating

PWxx

Selection of power class depending on INVEOR type

INV M		0.25 kW	PW01
		0.37 kW	PW02
		0.55 kW	PW03
	INV P	0.75 kW	PW04

⚠ Recommended motor rating (4-pole asynchr. motor) is given based on the 230 VAC supply voltage.

Item 5: Configuration of the power unit

LPxx

Selection of power stack

INV M	INV P	Standard	LP01
		IT network	LP07

⚠ INVEOR α without brake chopper option

Item 6: Configuration of the application unit

APxx

Selection of the application unit

INV M	INV P	Standard 2 DI 1 DO 1 AI 1 relay	AP12
		Standard + CANopen 2 DI 1 DO 1 AI 1 relay	AP13

Details on [page 21](#) and [page 22](#)

Item 7: Housing configuration

GHxx

Selection of housing type depending on INVEOR type

INV M		Passive cooling type for power of between 0.25 and 0.37 kW	GH11
		Passive cooling type (ribbed) for power of between 0.55 and 0.75 kW	GH10
	INV P	Cold plate in IP00 cooling type	GH03

⚠ Please remember that an adapter plate is needed for each device.
Details on **page 48 / 49**

Item 8: Cover variant

DKxx

Selection of cover model depending on INVEOR type

INV M		Cover without foil keypad	DK01
		Cover with foil keypad	DK04
	INV P	Without cover (only for INV P)	DK03

Details on **page 20**

Item 9: Model

COxx

Selection of standard or special model

INV M	INV P	KOSTAL standard	CO00
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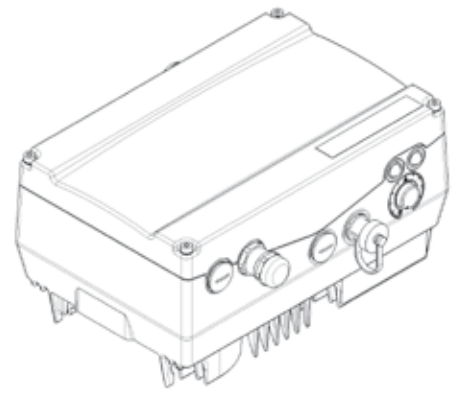
⚠ For models with a customer label, please get in touch with your KOSTAL contact.

Accessoires for α size can be found on page 55

Configuration

INVEOR A

(0.37 – 1.5 kW)



Item 3: Supply voltage

IVxx

Selection of supply voltage

INV M	INV P	3 x 200 VAC -10%...480 VAC +10%	IV01
		1 x 100 VAC -15%...230 VAC +10%	IV02

Item 4: Recommended motor rating

PWxx

Selection of power class depending on INVEOR type and supply voltage

INV M		1 x 230 VAC	0.37 kW	PW02
		1 x 230 VAC	0.55 kW	PW03
		3 x 400 VAC		
		1 x 230 VAC	0.75 kW	PW04
	P	3 x 400 VAC		
		1 x 230 VAC	1.10 kW	PW05
	INV P	3 x 400 VAC		
		3 x 400 VAC	1.50 kW	PW06

⚠ Recommended motor rating (4-pole asynchr. motor) is given based on the 230 VAC or 400 VAC supply voltage.

Item 5: Configuration of the power unit

LPxx

Selection of power stack and brake chopper

INV M	INV P	Without brake chopper	LP01
		With brake chopper	LP02

Item 6: Configuration of the application unit

APxx

Selection of application unit depending on INVEOR type

INV M	INV P	Standard 4 DI 2 DO 2 AI 1 AO 2 relays	AP01
		Basic 2 DI 1 DO 1 AI	AP03
		Standard + PROFIBUS 4 DI 2 DO 2 AI 1 AO 2 relays	AP16
		Standard + CANopen 4 DI 2 DO 2 AI 1 AO 2 relays	AP05

INV M	INV P	Standard + EtherCAT 4 DI 2 DO 2 AI 1 AO 2 relays	AP06
		Standard + PROFINET 4 DI 2 DO 2 AI 1 AO 2 relays	AP09
		Standard + Sercos III 4 DI 2 DO 2 AI 1 AO 2 relays	AP14
		Functional safety (only with IV01) 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP10
		Functional safety + PROFIBUS (only with IV01) 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP25
		Functional safety + CANopen (only with IV01) 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP21
		Functional safety + EtherCAT (only with IV01) 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP22
		Functional safety + PROFINET (only with IV01) 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP23
		Functional safety + Sercos III (only with IV01) 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP24

Details on **page 21** and **page 22**

Item 7: Housing configuration

GHxx

Selection of housing type depending on INVEOR type

INV M		Passive cooling type, potentiometer, standard cable glands	GH01
		Passive cooling type, standard cable glands	GH02
	INV P	Cold plate in IP00 cooling type	GH03

⚠ Please remember that an adapter plate is needed for each device.
Details on **page 48 / 49**

Item 8: Cover variant

DKxx

Selection of cover model depending on INVEOR type

INV M		Cover without controls	DK01
		Cover with foil keypad and potentiometer (only with GH02)	DK02
		Cover with integrated MMI	DK05
	INV P	Without cover	DK03

Details on **page 20**

Item 9: Model

COxx

Selection of standard or special model

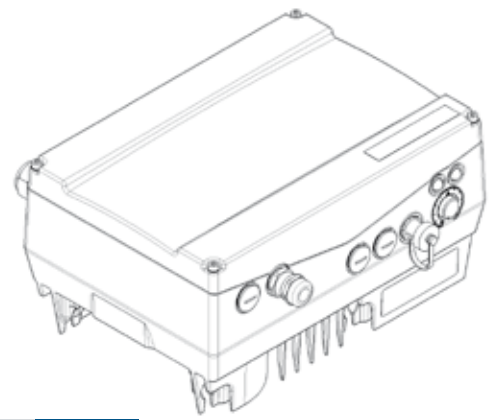
INV M	INV P	KOSTAL standard	CO00
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⚠ For models with a customer label, please get in touch with your KOSTAL contact.

Configuration

INVEOR B

(2.2 – 4.0 kW)



Item 3: Supply voltage

IVxx

Selection of supply voltage

INV M	INV P	3 x 200 VAC -10%...480 VAC +10%	IV01
-------	-------	---------------------------------	------

Item 4: Recommended motor rating

PWxx

Selection of power class depending on INVEOR type

INV M		2.20 kW	PW07
		3.00 kW	PW08
	INV P	4.00 kW	PW09

⚠ Recommended motor rating (4-pole asynchr. motor) is given based on the 400 VAC supply voltage.

Item 5: Configuration of the power unit

LPxx

Selection of power stack and brake chopper

INV M	INV P	Without brake chopper	LP01
		With brake chopper	LP02

Item 6: Configuration of the application unit

APxx

Selection of application unit depending on INVEOR type

INV M	INV P	Standard 4 DI 2 DO 2 AI 1 AO 2 relays	AP01
		Basic 2 DI 1 DO 1 AI	AP03
		Standard + PROFIBUS 4 DI 2 DO 2 AI 1 AO 2 relays	AP16
		Standard + CANopen 4 DI 2 DO 2 AI 1 AO 2 relays	AP05
		Standard + EtherCAT 4 DI 2 DO 2 AI 1 AO 2 relays	AP06
		Standard + PROFINET 4 DI 2 DO 2 AI 1 AO 2 relays	AP09

INV M	INV P	Standard + Sercos III 4 DI 2 DO 2 AI 1 AO 2 relays	AP14
		Functional safety 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP10
		Functional safety + PROFIBUS 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP25
		Functional safety + CANopen 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP21
		Functional safety + EtherCAT 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP22
		Functional safety + PROFINET 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP23
		Functional safety + Sercos III 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP24

Details on [page 21](#) and [page 22](#)

Item 7: Housing configuration

GHxx

Selection of housing type depending on INVEOR type

INV M		Passive cooling type, potentiometer, standard cable glands	GH01
		Passive cooling type, standard cable glands	GH02
	INV P	Cold plate in IP00 cooling type	GH03

⚠ Please remember that an adapter plate is needed for each device.
Details on [page 48 / 49](#)

Item 8: Cover variant

DKxx

Selection of cover model depending on INVEOR type

INV M		Cover without controls	DK01
		Cover with foil keypad and potentiometer (only with GH02)	DK02
		Cover with integrated MMI	DK05
	INV P	Without cover	DK03

Details on [page 20](#)

Item 9: Model

COxx

Selection of standard or special model

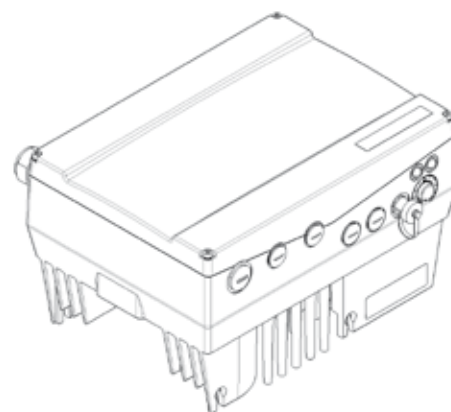
INV M	INV P	KOSTAL standard	CO00
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⚠ For models with a customer label, please get in touch with your KOSTAL contact.

Configuration

INVEOR C

(5.5 – 7.5 kW)



Item 3: Supply voltage

IVxx

Selection of supply voltage

INV M	INV P	3 x 200 VAC -10%...480 VAC +10%	IV01
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Item 4: Recommended motor rating

PWxx

Selection of power class depending on INVEOR type

INV M		5.50 kW	PW10
	INV P	7.50 kW	PW11

⚠ Recommended motor rating (4-pole asynchr. motor) is given based on the 400 VAC supply voltage.

Item 5: Configuration of the power unit

LPxx

Selection of power stack and brake chopper

INV M	INV P	Without brake chopper	LP01
		With brake chopper	LP04

Item 6: Configuration of the application unit

APxx

Selection of application unit depending on INVEOR type

INV M	INV P	Standard 4 DI 2 DO 2 AI 1 AO 2 relays	AP01
		Basic 2 DI 1 DO 1 AI	AP03
		Standard + PROFIBUS 4 DI 2 DO 2 AI 1 AO 2 relays	AP16
		Standard + CANopen 4 DI 2 DO 2 AI 1 AO 2 relays	AP05
		Standard + EtherCAT 4 DI 2 DO 2 AI 1 AO 2 relays	AP06
		Standard + PROFINET 4 DI 2 DO 2 AI 1 AO 2 relays	AP09

INV M	INV P	Standard + Sercos III 4 DI 2 DO 2 AI 1 AO 2 relays	AP14
		Functional safety 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP10
		Functional safety + PROFIBUS 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP25
		Functional safety + CANopen 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP21
		Functional safety + EtherCAT 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP22
		Functional safety + PROFINET 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP23
		Functional safety + Sercos III 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP24

Details on [page 21](#) and [page 22](#)

Item 7: Housing configuration

GHxx

Selection of housing type depending on INVEOR type

INV M		Passive cooling type, potentiometer, standard cable glands	GH01
		Passive cooling type, standard cable glands	GH02
	INV P	Cold plate in IP00 cooling type	GH03

⚠ Please remember that an adapter plate is needed for each device.
Details on [page 48 / 49](#)

Item 8: Cover variant

DKxx

Selection of cover model depending on INVEOR type

INV M		Cover without controls	DK01
		Cover with foil keypad and potentiometer (only with GH02)	DK02
		Cover with integrated MMI	DK05
	INV P	Without cover	DK03

Details on [page 20](#)

Item 9: Model

COxx

Selection of standard or special model

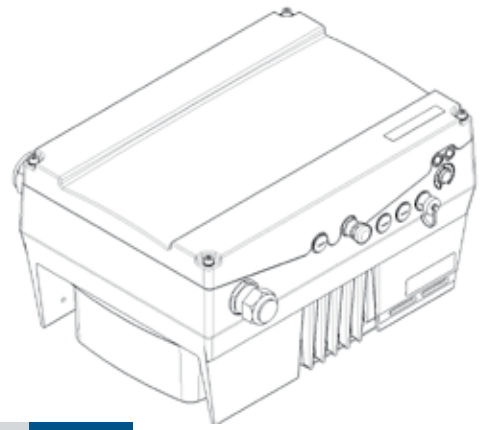
INV M	INV P	KOSTAL standard	CO00
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⚠ For models with a customer label, please get in touch with your KOSTAL contact.

Configuration

INVEOR D

(11 – 22 kW)



Item 3: Supply voltage

IVxx

Selection of supply voltage

INV M	INV P	3 x 200 VAC -10%...480 VAC +10%	IV01
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Item 4: Recommended motor rating

PWxx

Selection of power class depending on INVEOR type

INV M		11.00 kW	PW12
	INV P	15.00 kW	PW13
		18.50 kW	PW14
	INV P	22.00 kW	PW15

⚠ Recommended motor rating (4-pole asynchr. motor) is given based on the 400 VAC supply voltage.

Item 5: Configuration of the power unit

LPxx

Selection of power stack and brake chopper

INV M	INV P	Without brake chopper	LP03
		With brake chopper	LP04

Item 6: Configuration of the application unit

APxx

Selection of application unit depending on INVEOR type

INV M	INV P	Standard 4 DI 2 DO 2 AI 1 AO 2 relays	AP01
		Standard + PROFIBUS 4 DI 2 DO 2 AI 1 AO 2 relays	AP16
		Standard + CANopen 4 DI 2 DO 2 AI 1 AO 2 relays	AP05
		Standard + EtherCAT 4 DI 2 DO 2 AI 1 AO 2 relays	AP06
		Standard + PROFINET 4 DI 2 DO 2 AI 1 AO 2 relays	AP09
		Standard + Sercos III 4 DI 2 DO 2 AI 1 AO 2 relays	AP14

INV M		Functional safety 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP10
		Functional safety + PROFIBUS 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP25
		Functional safety + CANopen 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP21
		Functional safety + EtherCAT 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP22
		Functional safety + PROFINET 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP23
		Functional safety + Sercos III 2 STO inputs 4 DI 2 DO 2 AI 1 AO	AP24

Details on [page 21](#) and [page 22](#)

Item 7: Housing configuration

GHxx

Selection of housing type depending on INVEOR type

INV M		Active cooling type, potentiometer, standard cable glands	GH06
		Active cooling type, standard cable glands	GH09
	INV P	Cold plate in IP00 cooling type	GH03

⚠ Please remember that an adapter plate is needed for each device.
Details on [page 48 / 49](#)

Item 8: Cover variant

DKxx

Selection of cover model depending on INVEOR type

INV M		Cover without controls	DK01
		Cover with foil keypad and potentiometer (only with GH09)	DK02
		Cover with integrated MMI	DK05
	INV P	Without cover	DK03

Details on [page 20](#)

Item 9: Model

COxx

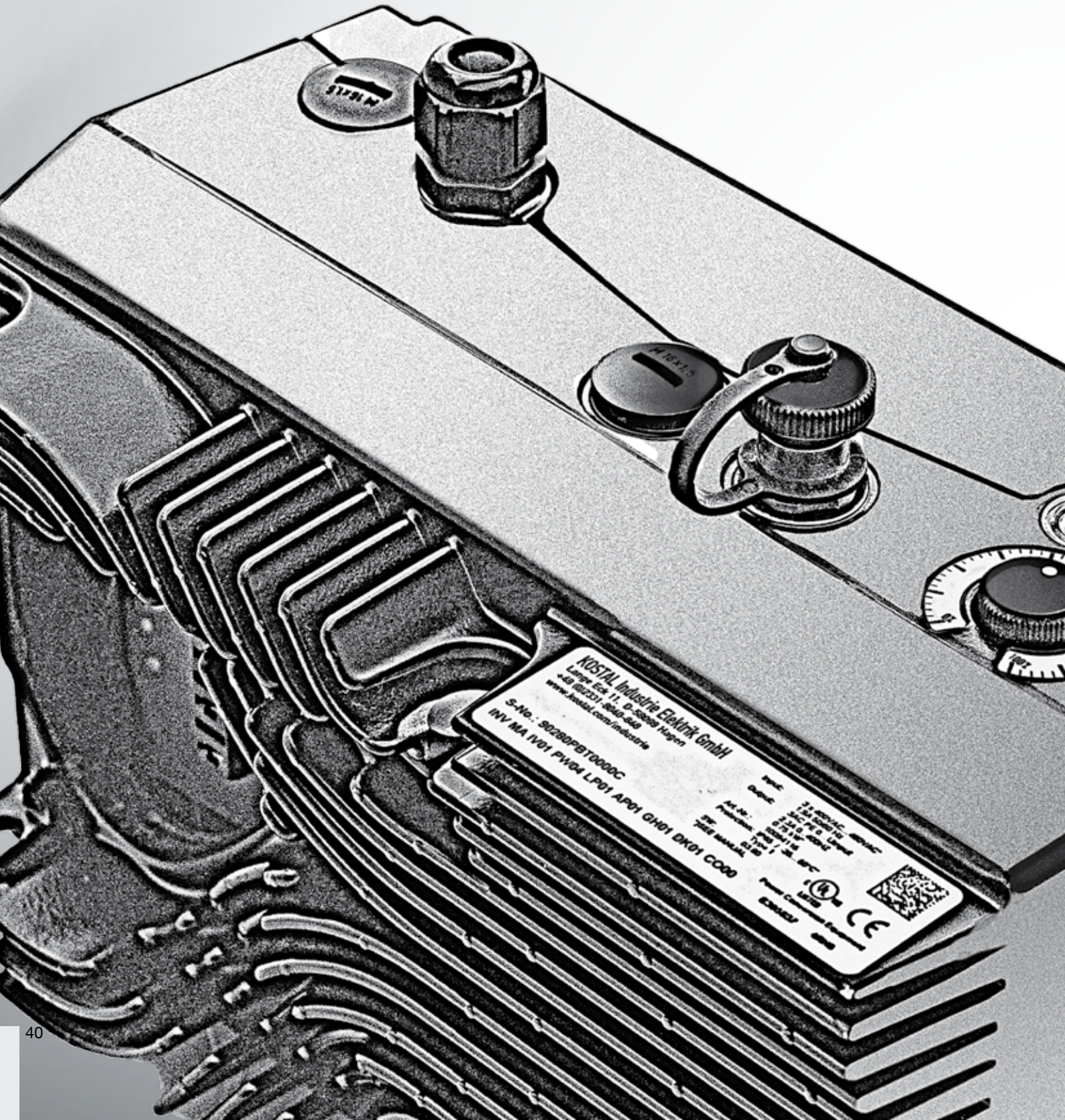
Selection of standard or special model

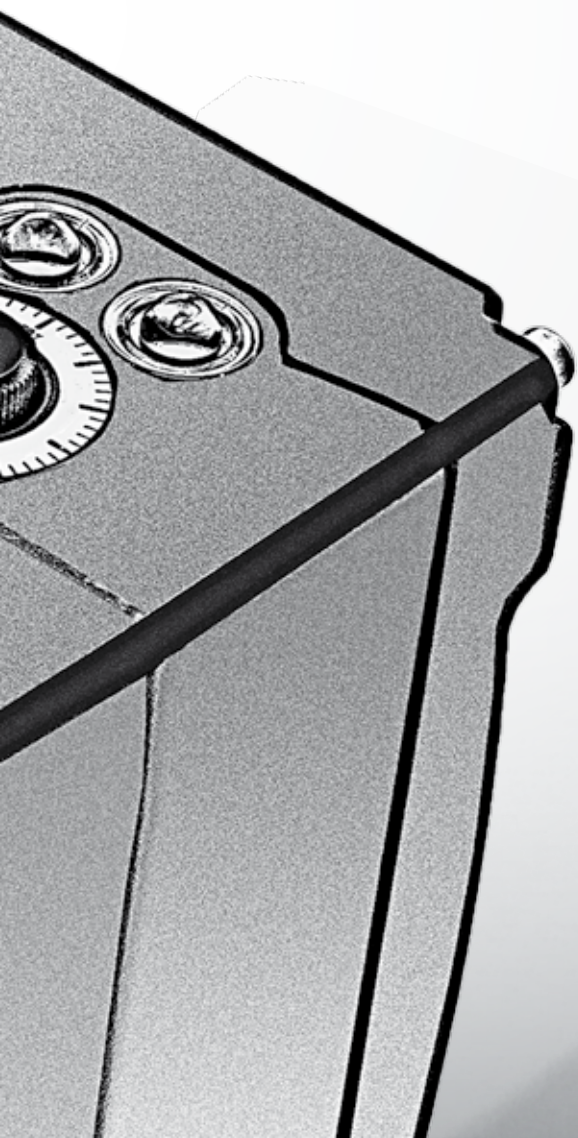
INV M	INV P	KOSTAL standard	CO00
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⚠ For models with a customer label, please get in touch with your KOSTAL contact.




INVEOR

Technical data





230 V devices, technical data for INVEOR M

Size	α				A			
Recommended motor rating ¹⁾ [kW]	0.25	0.37	0.55	0.75	0.37	0.55	0.75	1.1
Grid voltage	1 x 100 VAC -15 %...230 VAC +10 % 140 VDC -15 %...320 VDC +10 %							
Grid frequency	50/60 Hz ± 6%							
Mains configurations	TN / TT / IT (option)				TN / TT			
Line current [A]	4.5	4.5	5.8	7.3	4.5	5.6	6.9	9.2
Rated current output eff. [IN at 8 kHz]	1.4	2.2	2.7	3.3	2.3	3.2	3.9	5.2
Min. brake resistance [Ω]	-				50			
Overload for 60 sec.	150 %							
Switching frequency	4 kHz, 8 kHz, 16 kHz, (factory setting 8 kHz)							
Output frequency	0 Hz – 400 Hz							
Mains cycles of operation / restart	Every 2 min.							
DIN EN 61800-5 touch current	< 10 mA ²⁾							
Protective function	Overvoltage and undervoltage, I ² t restriction, short-circuit, ground leak, motor and drive controller temperature, stall prevention, blocking detection, PID dry run protection							
Software functions	Process control (PID controller), fixed frequencies, data record changeover, flying restart, motor current limit							
Soft PLC	IEC61131-3, FBD, ST, AWL							
Housing	Plastic adapter plate / aluminium die-cast casing				Two-part aluminium die-cast casing			
Dimensions [L x W x H] mm	187 x 126 x 70		187 x 126 x 80		233 x 153 x 120			
Weight including adapter plate	1.5 kg				3.9 kg			
Protection class [IPxy]	IP 65							
Cooling	Passive cooling							
Ambient temperature	-10 °C (non-condensing) to +40 °C (50 °C with derating)							
Storage temperature	-25 °C...+85 °C							
Altitude of the installation location	Up to 1000 m above sea level / over 1000 m with reduced performance (1 % per 100 m) / above 2000 m see operating manual							
Relative air humidity	≤ 96 %, condensation not permitted.							
Vibration resistance (DIN EN 60068-2-6)	50 m/s ² ; 5...200 Hz ³⁾							
Shock resistance (DIN EN 60068-2-27)	300 m/s ²							
EMC (DIN-EN-61800-3)	C2				C1			
Certificates and conformity	  							




Technical data for 230 V devices INVEOR M (subject to technical changes)

¹⁾ Recommended motor rating (4-pole asynchr. motor) is given based on the 230 VAC supply voltage.

²⁾ With 1LA7 asynchronous motor, motor-mounted

³⁾ Combined vibration test, part 4, severity 2 in accordance with FN942017

400 V devices, technical data for INVEOR M

Sizes	A				B			C		D			
Recommended motor rating ¹⁾ [kW]	0.55	0.75	1.1	1.5	2.2	3.0	4.0	5.5	7.5	11.0	15.0	18.5	22.0
Grid voltage	3 x 200 VAC -10 %...480 VAC +10 % 280 VDC -10 %...680 VDC +10 %												
Grid frequency	50/60 Hz ± 6 %												
Mains configurations	TN / TT												
Line current [A]	1.4	1.9	2.6	3.3	4.6	6.2	7.9	10.8	14.8	23.2	28.2	33.2	39.8
Rated current output eff. [IN at 8 kHz]	1.7	2.3	3.1	4.0	5.6	7.5	9.5	13.0	17.8	28.0	34.0	40.0	48.0
Min. brake resistance [Ω]	100				50			50		30			
Overload for 60 sec. in %	150												130
Switching frequency	4 kHz, 8 kHz, 16 kHz, (factory setting 8 kHz)												
Output frequency	0 Hz – 400 Hz												
Mains cycles of operation / restart	Unlimited									2 min.			
DIN EN 61800-5 touch current	< 3.5 mA ²⁾												
Protective function	Overvoltage and undervoltage, I ² t restriction, short circuit, ground leak, motor and drive controller temperature, stall prevention, blocking detection, PID dry run protection												
Software functions	Process control (PID controller), fixed frequencies, data record changeover, flying restart, motor current limit												
Soft PLC	IEC61131-3, FBD, ST, AWL												
Housing	Two-part aluminium die-cast casing												
Dimensions [L x W x H] mm	233 x 153 x 120				270 x 189 x 140			307 x 223 x 181		414 x 294 x 232			
Weight including adapter plate	3.9 kg				5.0 kg			8.7 kg		21.0 kg			
Protection class	IP 65									IP 55			
Cooling	Passive cooling									Active cooling			
Ambient temperature	-25 °C (non-condensing) to + 50 °C (without derating)												
Storage temperature	-25 °C...+85 °C												
Altitude of the installation location	Up to 1000 m above sea level / over 1000 m with reduced performance (1 % per 100 m) / above 2000 m see operating manual												
Relative air humidity	≤ 96 %, condensation not permitted.												
Vibration resistance (DIN EN 60068-2-6)	50 m/s ² ; 5...200 Hz ³⁾												
Shock resistance (DIN EN 60068-2-27)	300 m/s ²												
EMC (DIN-EN-61800-3)	C2												
Certificates and conformity													



Technical data for 400 V devices INVEOR M (subject to technical changes)

¹⁾ Recommended motor rating (4-pole asynchr. motor) is given based on the 400 VAC supply voltage.

²⁾ With 1LA7 asynchronous motor, motor-mounted

³⁾ Combined vibration test, part 4, severity 2 in accordance with FN942017

400 V and 230 V devices, technical data for INVEOR P

	230 V		400 V				
	α	A	A	B	C	D	D
Size							
Recommended motor rating ¹⁾ [KW]	0.75	1.1	1.5	4.0	7.5	15.0	22.0
Supply voltage [V]	1 x 100 VAC -15 % ... 230 VAC +10 % 140 VDC -15 % ... 220 VDC +10 %		3 x 200 VAC -10 %...480 VAC +10 % 280 VDC -10 %...680 VDC +10 %				
Grid frequency [Hz]	50 Hz / 60 Hz \pm 6 %						
Mains configurations	TN / TT, IT (option)		TN / TT				
Line current [A]	7.3	9.2	3.3	7.9	14.8	28.2	39.8
Rated current output eff. [IN at 8 kHz]	3.3	5.2	4.0	9.5	17.8	34.0	48.0
Min. brake resistance [Ω]	-	50	100	50	50	30	
Overload for 60 sec	150 %						130 %
Switching frequency	4 kHz, 8 kHz, 16 kHz, (factory setting 8 kHz)						
Output frequency	0 Hz – 400 Hz						
Mains cycles of operation / restart	Every 2 min.		Unlimited			Every 2 min.	
DIN EN 61800-5 touch current	< 10 mA ²⁾		< 3.5 mA ²⁾				
Protective function	Overvoltage and undervoltage, I ² t restriction, short-circuit, ground leak, motor and drive controller temperature, stall prevention, blocking detection, PID dry run protection						
Software functions	Process control (PID controller), fixed frequencies, data record changeover, flying restart, motor current limit						
Soft PLC	IEC61131-3, FBD, ST, AWL						
Dimensions [L x W x H] mm	210x120x71	261.5x150x 82.9	261.5x150x 82.9	300x185x 83.3	330x220x91	343x270x113	
Weight including cooling plate [kg]	1.6	2.2	2.2	2.9	4.2	6.5	
Protection class [IPxy]	IP 00 (type of protection is determined by the final application)						
Ambient temperature [°C]	-10 °C (non-condensing) to +40 °C (50 °C with derating)		-25 °C (non-condensing) to +50 °C (without derating)			-25 °C (non-condensing) to +40 °C (without derating)	
Storage temperature	-25 °C...+85 °C						
Altitude of the installation location	Up to 1000 m above sea level / over 1000 m with reduced performance (1 % per 100 m) / above 2000 m see operating manual						
Relative air humidity	\leq 96 %, condensation not permitted.						
Vibration resistance (DIN EN 60068-2-6)	10 m/s ² ; 5...200 Hz ³⁾						
Shock resistance (DIN EN 60068-2-27)	300 m/s ²						
EMC (DIN-EN-61800-3) prepared for	C2	C1	C2				
Certificates and conformity	 						

Technical data for 230 V and 400 V devices INVEOR P (subject to technical changes)

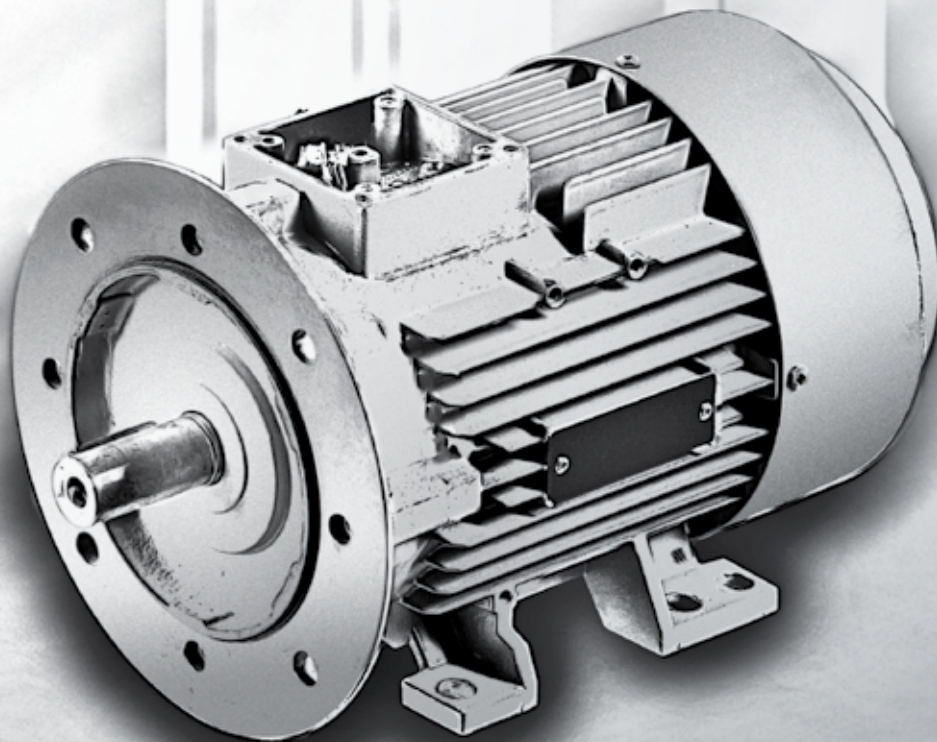
¹⁾ Recommended motor rating (4-pole asynchr. motor) for single-phase and three-phase devices is given based on the 230 VAC and 400 VAC supply voltage.

²⁾ With 1LA7 asynchronous motor, motor-mounted

³⁾ Combined vibration test, part 4, severity 2 in accordance with FN942017

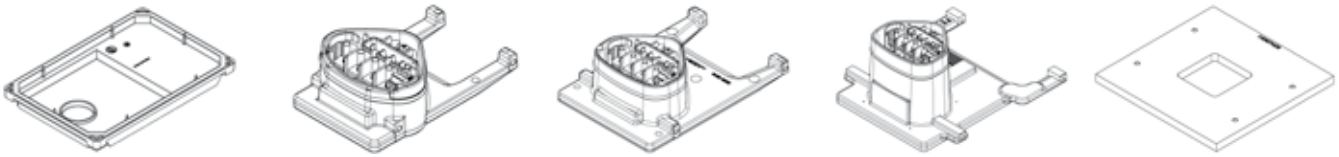
Accessories

Motor adaptation	48	
Operation and observation	50	
Communication – fieldbus components	51	
Brake resistors	54	
Specific accessories for INVEOR M α and INVEOR P	55	
Small parts and attachments	56	
Documentation	56	



Motor adaptations

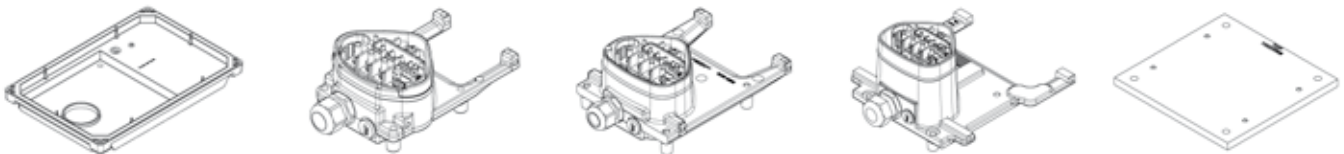
Thanks to the innovative adapter plate concept, the INVEOR drive controller is compatible with virtually all motors. With the standard adapter plates without holes, customers can flexibly produce hole patterns to suit their needs themselves. There are also pre-drilled adapter plates for many motor models. Wall mounting plates are available for mounting close to the motor.



Standard adapter plates (ADP)

Motor size											
63	71	80	90	100	112	132	160	180	INVEOR size	Hole pattern	Art. no.
dependent on motor									α	freely selectable*	10117052
									A	freely selectable*	10108906
									B	freely selectable*	10026184
									C	freely selectable*	10025632
									D	freely selectable*	10098202

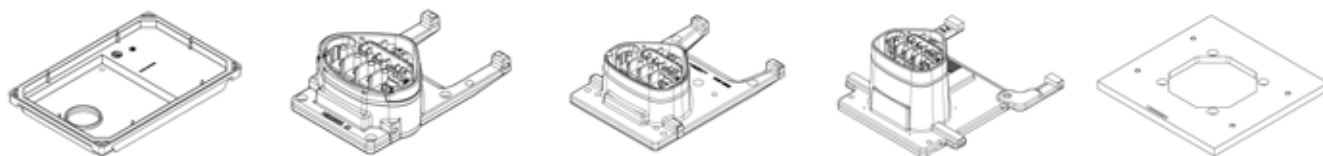
*The hole pattern is produced by the customer and can therefore be flexibly adapted to the motor



Adapter plates for wall mounting

Motor size											
63	71	80	90	100	112	132	160	180	INVEOR size	Art. no.	
not dependent on motor									α	10117051	
									A	10023107	
									B	10026185	
									C	10025932	
									D	10098170	

⚠ Please refer to your KOSTAL contact partner regarding precise lot sizes of individual accompanying items. The illustration may deviate from the original.



Adapter plate for motors 1LA7 / 1LA9

Motor size									INVEOR size	Hole pattern [mm] Terminal box holder	Thread	Art. no.
63	71	80	90	100	112	132	160	180				
■	■	■	■						α	51x51	M4	10117056
■	■	■	■						A	64x64	M4	10023843
■	■	■	■						B	64x64	M4	10114861
				■	■				B	105x105	M5	10091120
				■	■				C	105x105	M5	10106344
						■			C	125x125	M5	10025933
						■			D	125x125	M5	10107137
							■		D	150x150	M5	10101828

Adapter plate for motors 1LE1...1

Motor size									INVEOR size	Hole pattern [mm] Terminal box holder	Thread	Art. no.
63	71	80	90	100	112	132	160	180				
		■	■						α	47x22	M4	10117054
		■	■						A	47x22	M4	10112586
				■	■				B	75x75	M4	10096094
				■	■				C	75x75	M4	10108013
						■			C	90x90	M4	10096099
						■			D	90x90	M4	10098193
							■		D	100x100	M5	10101827

Adapter plate for motors FCA

Motor size									INVEOR size	Hole pattern [mm] Terminal box holder	Thread	Art. no. ADP
63	71	80	90	100	112	132	160	180				
■	■	■							A	54x54	M5	10112914
			■	■					A	60x60	M5	10112915
			■	■					B	60x60	M5	10112916
					■	■			B	68x68	M5	10112918
					■	■			C	68x68	M5	10112921
							■	■	D	102x102	M6	10130526

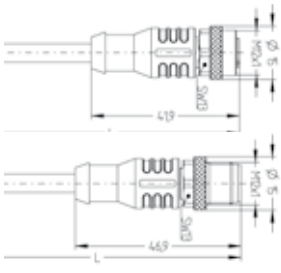
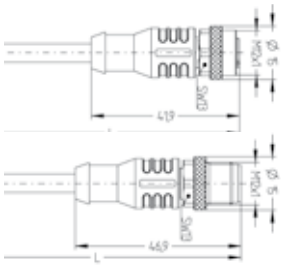
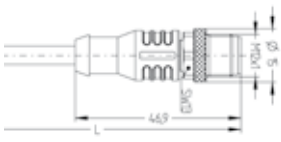
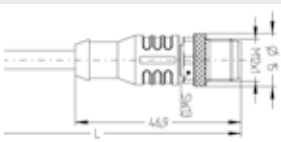
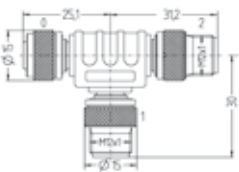
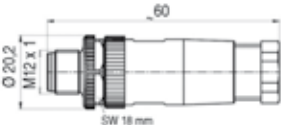
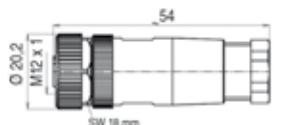

⚠ Please refer to your KOSTAL contact partner regarding precise lot sizes of individual accompanying items. The illustration may deviate from the original.

Operation and observation

	Description	Article number
	INVEOR cover size A without label, including cover screws, ZUB MA DECKEL .- 0 1	10116057
	INVEOR cover size B without label, including cover screws, ZUB MB DECKEL .- 0 1	10116058
	INVEOR cover size C without label, including cover screws, ZUB MC DECKEL .- 0 1	10116059
	INVEOR cover size D without label, including cover screws, ZUB MD DECKEL .- 0 1	10116060
	INVEOR cover size A with foil keypad + potentiometer without label, neutral foil keypad, including cover screws ZUB MA COVER FOIL .- 0 1	10116583
	INVEOR cover size B with foil keypad + potentiometer without label, neutral foil keypad, including cover screws ZUB MB COVER FOIL .- 0 1	10116584
	INVEOR cover size C with foil keypad + potentiometer without label, neutral foil keypad, including cover screws ZUB MC COVER FOIL .- 0 1	10116585
	INVEOR cover size D with foil keypad + potentiometer without label, neutral foil keypad, including cover screws ZUB MD COVER FOIL .- 0 1	10116586
	INVEOR cover size A with integrated MMI without label, including cover screws INVZUB A RP/COV/MMI/-	10174751
	INVEOR cover size B with integrated MMI without label, including cover screws INVZUB B RP/COV/MMI/-	10174752
	INVEOR cover size C with integrated MMI without label, including cover screws INVZUB C RP/COV/MMI/-	10174753
	INVEOR cover size D with integrated MMI without label, including cover screws INVZUB D RP/COV/MMI/-	10174754
	MMI handheld controller including 3 m connection cable RJ9 on M12 plug ZUB M- MMI .S00 000 1	10004768
	Programming and diagnosis cable 2 m for PC, USB on M12 plug, RS485 with integrated converter ZUB M- LEITUNG PC .- 000 1	10023950
	INVEOR PC software	www.kostal-industrie-elektrik.com
	Touch operating terminal SC103 3.5", colour, incl. RTC and RS485 SAS interface P SC1030101, 3.5"	10266305
	Touch operating terminal SC107 7", colour, incl. RTC and RS485 SAS interface P SC107A 0111, 7"	10266309

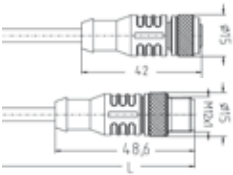
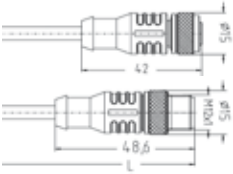
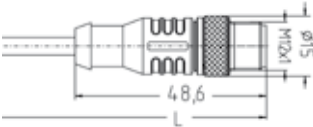
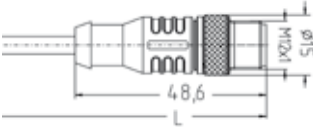
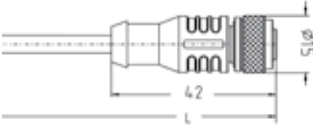
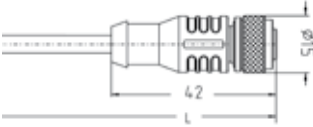
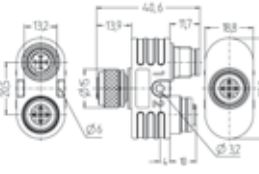
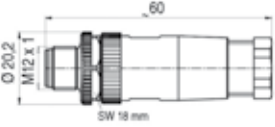
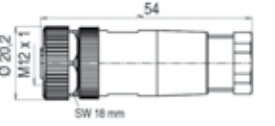
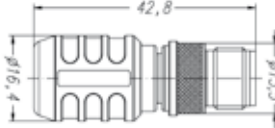
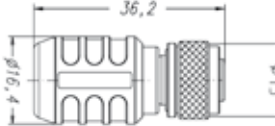
Communication – fieldbus components


RS485 fieldbus components

	Description	Article number
	<p>M12 connecting cable 2 m M12 plug on M12 coupling / RS485 / 4-pin / 2 m / A-coded P AL-WAK4-m-AL_8044041</p>	<p>10272382</p>
	<p>M12 connecting cable 5 m M12 plug on M12 coupling / RS485 / 4-pin / 5 m / A-coded P AL-WAK4-m-AL-WAS4/S37080</p>	<p>10272793</p>
	<p>M12 connection cable open 2 m M12 plug / open / RS485 / 4-pin / 2 m / A-coded P AL-WAS4-m/S370 8043817</p>	<p>10272795</p>
	<p>M12 connection cable open 10 m M12 plug / open / RS485 / 4-pin / 10 m / A-coded P AL-WAS4-m/S370 8043819</p>	<p>10272794</p>
	<p>M12 T splitter M12 plug on plug and socket / RS485 / 4-pin / A-coded J FKM4-FSM4-FSM4, 8008139</p>	<p>10272829</p>
	<p>M12 plug can be self-assembled M12 plug / RS485 / 4-pin / A-coded INVZUB - L/CF/RS/M12M/ - / - /A/</p>	<p>10137294</p>
	<p>M12 coupling can be self-assembled M12 coupling / RS485 / 4-pin / A-coded P WAKC4K 8004811</p>	<p>10272796</p>
	<p>D-SUB bus plug D-SUB bus plug with screw connection, RS485, 9-pin J SUBCON 9/M-SH, 2761509</p>	<p>10272797</p>

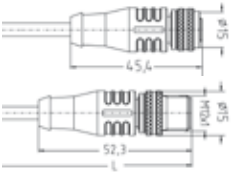
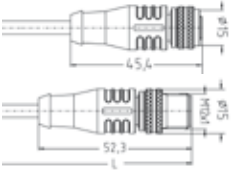
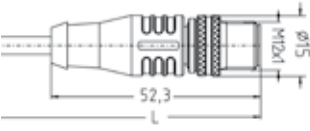
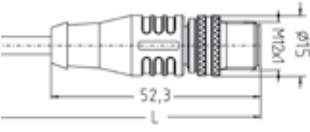
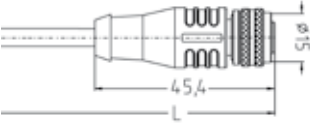
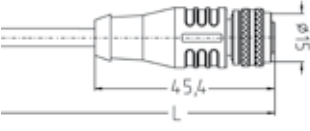
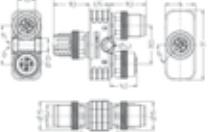
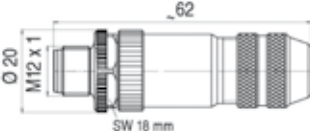
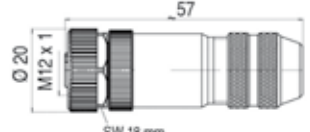
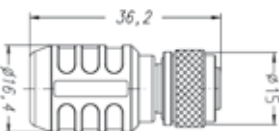
⚠ Please refer to your KOSTAL contact partner regarding precise lot sizes of individual accompanying items. The illustration may deviate from the original.

CANopen fieldbus components

	Description	Article number
	<p>M12 connecting cable 2 m M12 plug on M12 coupling / CANopen / 5-pin / 2 m / A-coded INVZUB - L/CL/CO/M12M/M12F/2m /A/-</p>	<p>10138812</p>
	<p>M12 connecting cable 5 m M12 plug on M12 coupling / CANopen / 5-pin / 5 m / A-coded INVZUB - L/CL/CO/M12M/M12F/5m /A/-</p>	<p>10138813</p>
	<p>M12 connection cable open 2 m M12 plug / open / CANopen / 5-pin / 2 m / A-coded INVZUB - L/CL/CO/M12M/OPEN/2m /A/-</p>	<p>10138804</p>
	<p>M12 connection cable open 10 m M12 plug / open / CANopen / 5-pin / 10 m / A-coded INVZUB - L/CL/CO/M12M/OPEN/10m /A/-</p>	<p>10138806</p>
	<p>M12 connection cable open 2 m M12 coupling / open / CANopen / 5-pin / 2 m / A-coded INVZUB - L/CL/CO/M12F/OPEN/2m /A/-</p>	<p>10138807</p>
	<p>M12 connection cable open 10 m M12 coupling / open / CANopen / 5-pin / 10 m / A-coded INVZUB - L/CL/CO/M12F/OPEN/10m /A/-</p>	<p>10138809</p>
	<p>M12 Y splitter M12 coupling on plug and coupling / CANopen / 5-pin / A-coded INVZUB - L/YD/CO/M12M/M12F/- /A/-</p>	<p>10138791</p>
	<p>M12 plug can be self-assembled M12 plug / CANopen / 5-pin / A-coded INVZUB - L/CF/CO/M12M/- /- /A/-</p>	<p>10138799</p>
	<p>Coupling can be self-assembled M12 coupling / CANopen / 5-pin / A-coded INVZUB - L/CF/CO/M12F/- /- /A/-</p>	<p>10138801</p>
	<p>M12 terminating resistor M12 plug / CANopen / 5-pin / A-coded INVZUB - L/TE/CO/M12M/- /- /A/-</p>	<p>10138792</p>
	<p>M12 terminating resistor M12 coupling / CANopen / 5-pin / A-coded INVZUB - L/TE/CO/M12F/- /- /A/-</p>	<p>10138793</p>

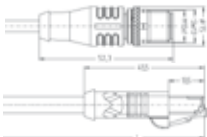
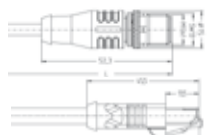


 Please refer to your KOSTAL contact partner regarding precise lot sizes of individual accompanying items. The illustration may deviate from the original.

PROFIBUS fieldbus components

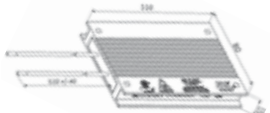
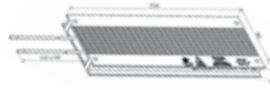
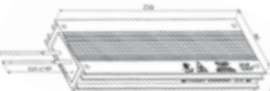
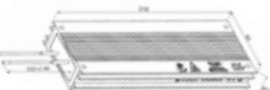
	Description	Article number
	<p>M12 connecting cable 2 m M12 plug on M12 coupling / PROFIBUS / 5-pin / 2 m / B-coded / colour: purple P PB-WASSW2.012/S180080438</p>	10272791
	<p>M12 connecting cable 5 m M12 plug on M12 coupling / PROFIBUS / 5-pin / 5 m / B-coded / colour: purple P PB-WASSW2.012/S1800 8043</p>	10272792
	<p>M12 connection cable open 2 m M12 plug / open / PROFIBUS / 5-pin / 2 m / B-coded / colour: purple P PB-WASSW2.012-m/S1800 80</p>	10272786
	<p>M12 connection cable open 10 m M12 plug / open / PROFIBUS / 5-pin / 10 m / B-coded / colour: purple PB-WASSW2.012-m/S1800 80</p>	10272789
	<p>M12 connection cable open 2 m M12 coupling / open / PROFIBUS / 5-pin / 2 m / B-coded / colour: purple P PB-WAKSW2.012-m/S1800804</p>	10272790
	<p>M12 connection cable open 10 m M12 coupling / open / PROFIBUS / 5-pin / 10 m / B-coded / colour: purple P PB-WAKSW2.012-m/S18000</p>	10272385
	<p>M12 Y splitter M12 plug on coupling and plug / PROFIBUS / 5-pin / B-coded P Profibus Y-piece 0798540</p>	10272780
	<p>M12 plug can be self-assembled M12 plug / PROFIBUS / 5-pin / A-coded P PB-WASCWSW4.5K 8031375</p>	10272785
	<p>M12 coupling can be self-assembled M12 coupling / PROFIBUS / 5-pin / B-coded P PB-WAKCSW4.5K 8031376</p>	10272387
	<p>M12 terminating resistor M12 plug / PROFIBUS / 5-pin / A-coded P PB-WASSW4.5-AS 8043520</p>	10272784

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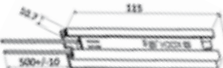
EtherCAT, PROFINET, Sercos III fieldbus components

	Description	Article number
	M12 connecting cable 2 m M12 plug / RJ45 plug / 4-pin / 2 m / D-coded / colour: green INVZUB - L/CL/IE/M12M/RJ45/2m /D/-	10138814
	M12 connecting cable 5 m M12 plug / RJ45 plug / 4-pin / 5 m / D-coded / colour: green INVZUB - L/CL/IE/M12M/RJ45/5m /D/-	10138847
	M12 connecting cable 2 m M12 plug / M12 plug / 4-pin / 2 m / D-coded / colour: green INVZUB - L/CL/IE/M12M/M12M/2m /D/-	10138848
	M12 connecting cable 10 m M12 plug / M12 plug / 4-pin / 10 m / D-coded / colour: green INVZUB - L/CL/IE/M12M/M12M/10m /D/-	10138849











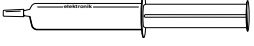
Brake resistors

	Description	Output [W]	ED [%]	Article number
	INVEOR M/P brake resistor Size A 100 W, 100 Ω, IP65, connection cable 510 mm, L=110 mm W=80 mm H=15 mm INVZUB/-/R/001/100R/10W/IP65/50/-/-	550	13.60	10138851
		750	10.00	
		1100	6.80	
		1500	5.00	
	INVEOR M/P brake resistor Size B 200 W, 50 Ω, IP65, connection cable 510 mm, L=216 mm W=80 mm H=15 mm INVZUB/-/R/002/50R/20W/IP65/50/-/-	2200	9.00	10138852
		3000	6.66	
		4000	5.00	
	INVEOR M/P brake resistor Size C 240 W or 400 W*, 7 Ω, IP65, connection cable 510 mm, L=216 mm W=80 mm H=30 mm INVZUB/-/R/003/72R/40W/IP65/50/-/-	5500	4.3 / 7.3*	10138853
		7500	3.2 / 5.3*	
	INVEOR M/P brake resistor Size D 2 x 240 W or 2 x 400 W*, 2 x 72 Ω, IP65, connection cable 510 mm, 2 x L=216 mm W=80 mm H=30 mm INVZUB/-/R/003/72R/40W/IP65/50/-/-	11 000	4.4 / 7.2*	2 x 10138853
		15 000	3.2 / 5.3*	
		18 500	2.6 / 4.3*	
		22 000	2.2 / 3.6*	

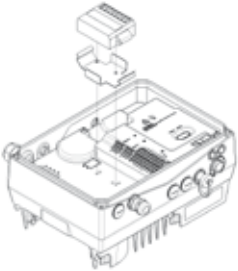

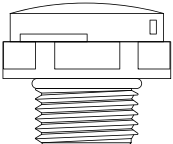
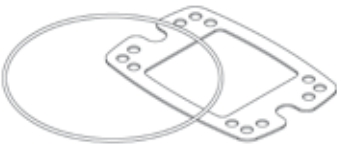
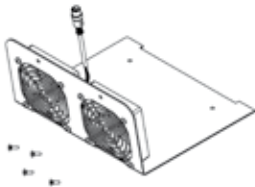

(*) without UL

	Description	Article number
	Brake resistors with mounting frame Assembly kit for INVEOR M size C including 2 x 100 Ω brake resistor, mounting frame, screws ZUB MC BREMSWIDERST. 1	10121035
	PTC brake resistor Self-protecting, 70 W, 175 Ω, IP20, Connection cable 500 mm, L=115 mm W=34 mm H=10.5 mm T PTC800643 brake resistor	10268264


Specific accessories for INVEOR M α and INVEOR P


	Description	Type / size	Article number
	Cable glands Cable glands (2x M16) and blind plugs (2x M16 black, 1x M16 transparent) ZUB M α VERSCHRAUBUN.- 0 1	INVEOR M Size α	10118230
	Screws 4x cooling element screws + 1x ground screw ZUB M α SCHRAUBEN .- 0 1	INVEOR M Size α	10118227
	Terminals Plug terminals for connecting mains cable and motor supply cable/PTC including jumper ZUB M α E BAUTEILE .- 0 1	INVEOR M/P Size α	10118222
	Cable set Cable set for extending the motor connection (including crimp material) ZUB M α KABELSATZ .- 0 1	INVEOR M/P Size α	10118226
	Adapter for jack plug to M12 Adapter for jack plug to M12 for MMI/PC cable connection ZUB M α LEITUNG MMI .- 0 1	INVEOR M/P Size α	10118219
	M12 receptacle MMI/ PC M12 female receptacle to JST 4-pin, A-coded, cable length 240 mm, M16 x 1.5, including captive protective cap ZUB M- LEITUNG MMI .- 0 1	INVEOR M Size α INVEOR P Sizes α to D	10118216
	Potentiometer Potentiometer on JST 3-pin for screwing in, cable length 180 mm, including reducer M16 x 1.5 and scale ZUB M α POTI .- 0 1	INVEOR M Size α INVEOR P Sizes α to D	10118232
	M12 receptacle CANopen M12 female receptacle to JST 3-pin, for CANopen connection, A-coded, cable length 110 mm, M16 x 1.5, including captive protective cap ZUB M α CANOPEN OB .- 0 1	INVEOR M Size α INVEOR P Sizes α to D	10118224
	M12 receptacle PROFIBUS M12 female receptacle to JST 9-pin, for PROFIBUS connection, B-coded, cable length 100 mm, M16 x 1.5 Line set. Inveor 4-pin Profibus cpl.	INVEOR P Sizes A to D	10056418
	M12 receptacle EtherCAT / PROFINET / Sercos III M12 female receptacle to RJ45 for EtherCAT / PROFINET / Sercos III connection, D-coded, cable length 170 mm, M16 x 1.5 Line set. Inveor EtherCAT 4-pin cpl.	INVEOR P Sizes A to D	10085888
	Heat transfer paste Heat transfer paste for connecting INVEOR P cooling plate to thermal sink, contents 5 ml INVZUB - OP HTP/- / -	INVEOR P Sizes α to D	10139778

Small parts and attachments

	Description	Article number
	<p>Brake module to control a mechanical brake on the motor end, including retaining plate, screws, varistor</p> <p> not in combination with α size or basic application unit</p> <p>ZUB M- GLEICHRICHTE.-</p>	10136409
	<p>M16 ventilation element M16x1.6, material: PA 6 housing, ventilation element Acrylic Co-Polymer on Nylon Support, Chloroprene seal ZUB M- VERSCHRAUBUN.- 0</p>	10142939
	<p>Sealing set for cup INVEOR M size D O-ring, flat seal, 2x fixing screws with spring washer ZUB MD BECHER.- 0 -</p>	10253835
	<p>Fan unit with fixing screws for size D INVZUB D RP HSG/FAN/-</p>	10142453
	<p>Screws for adapter plates for INVEOR M size A / B / C 4x fixing screws for adapter plate, 1x ground screw with spring washer Zubehör. Inveor MABC Bef. BGR</p>	10072211

Documentation

	Description	Article number
	<p>Documentation for INVEOR M DE Operating manual for INVEOR M sizes A to D BA. INVEOR M PAP</p> <p style="text-align: right;">DE</p>	10075087

 Please refer to your KOSTAL contact partner regarding precise lot sizes of individual accompanying items. The illustration may deviate from the original.

Your smart connection to us

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