maxon compact drive Technology – short and to the point

Properties of the brushless **maxon EC-max motors** with integrated electronics:
- Operated directly with DC voltage
- Integrated commutation electronics
- Ironless winding for good synchronization without cogging torque

Properties of the brushless **maxon EC-i motors** with integrated electronics:
- Can be operated directly with DC voltage
- Integrated commutation electronics with 4-Q speed control
- Separate set value input. Optionally with Enable or Direction input
- Speed monitor output
- Flat design with high torque

Properties of the brushless **maxon EC flat motors** with integrated electronics:
- Can be operated directly with DC voltage
- Integrated commutation electronics with 1-Q or 4-Q speed control (Hall sensor feedback)
- 2-wire version: Set value proportional to supply voltage
- 5-wire version: Separate set value input. Optionally with Enable or Direction input, speed monitor output
- Short design with high torque

Properties of the brushless maxon **ECX flat motors** with integrated electronics
- Can be operated directly with DC voltage
- Integrated commutation electronics with 4Q speed control (Hall sensor feedback)
- Configurable speed range
- Configurable set value: analog voltage, fixed set value
- Configurable digital inputs and outputs: Enable, Direction, Monitor outputs for speed or current
- Short design with high torque

Properties of the **maxon IDX drives:**
- Compact drive with integrated EPOS4 positioning/speed controller
- Field-oriented control
- Command via CANopen, EtherCAT or I/Os
- Integrated absolute encoder
- High power density
- IP65-protected design
- Optional holding brake and gearhead

Program

- **EC-max with integrated electronics**
- **EC-i with integrated electronics**
- **EC flat with integrated electronics**
- **ECX FLAT with integrated electronics**
- **IDX drives**

Integrated electronics

On motors with integrated electronics, the electronic commutation (usually block commutation with Hall sensors) is built in. Usually speed control and other functionalities (activation, reversal of direction of rotation, speed monitor) are also implemented.

Properties
- Easy operation with DC voltage
- Fewer connections than EC motor
- No additional electronics required for commutation
- Possible power loss due to space constraints and the thermal coupling in the motor

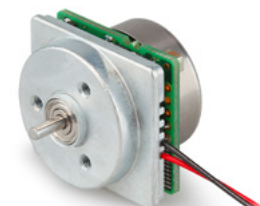|	
1	Gearhead (optional)
2	Motor
3	Holding brake (optional)
4	Encoder
5	Housing with connections
6	Electronics (EPOS4)

EC-max 16

EC 20 flat

EC-i 30 iE

1   2   3   4   5   6

IDX drives

The maxon IDX drives consist of a motor based on EC-i technology, a magnetic absolute encoder and an EPOS4 positioning controller with integrated field-oriented control (FOC).
– IP65 protection; only the output shaft needs to be sealed by the customer.
– Integrated temperature sensors on the winding and in the controller are evaluated directly in the drive and enable optimal utilization of the operating range.

EPOS4 positioning controller
The integrated EPOS4 enables different operating modes: Positioning, speed or current control. The drive can be commanded via EtherCAT or CANopen. The IDX drive is equipped with configurable digital and analog inputs and outputs. These are matched optimally to the various functions and operating modes of the CiA-402 device profile.
– Easy commissioning due to preconfigured motor, encoder and brake parameters, as well as auto-tuning function
– EPOS Studio: Intuitive software for commissioning
– Libraries for lean integration into a wide variety of master systems
– All documentation and software is available free of charge

Alternative version without fieldbus
(I/O version)
Commands are given via the inputs and outputs. In this case, only current and speed control are supported (no position control).

Optional brake
The holding brake blocks the motor when disconnected from power. The brake is controlled by the integrated controller.
– Minimally longer drive
– Holding brake, not suitable for deceleration.
– The brake influences the temperature range and the minimum permissible supply voltage The electrical properties, performance data, dimensional drawings and CAD data of the brake with drive are available online.

Cables
Only minimal work is needed for cabling the IDX drive, as only the power supply, command cabling and, if necessary, the I/Os have to be connected. In the online shop, maxon offers a selection of suitable cables.

Drive selection
maxon IDX drives are integrated systems that cannot be viewed and specified like separate motor-controller combinations. The supply current and supply voltage are not the currents and voltages that are present at the motor. For this reason, the data sheet does not specify motor characteristics, such as torque constant or speed constant.

For specification in an application, the nominal torque, the maximum torque (short-term), the nominal speed, as well as the maximum drive speed have to be referenced for the given supply voltage. The operating range diagrams can be useful for this.

At www.maxongroup.com, detailed documentation can be downloaded.

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