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Rexroth motors

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General information

ctrlX DRIVE devices and Rexroth motors are a perfectly adjusted system and provide the user with high operational safety. Rexroth motors are available as housing motors and kit motors.

Relevance for the user

Use case

Using Rexroth housing motors and kit motors

Application-related information (for project planning)

The information on supported motors and encoders is contained in the system overview, ↘ “Supported motors and motor encoders”.

For the sizing software of all Rexroth drives, please see https://www.boschrexroth.com/de/de/produkte/produktsupport/konfiguratoren-und-tools/electric-drives-and-controls/indrasize/indrasize-6 (https://www.boschrexroth.com/de/de/produkte/produktsupport/konfiguratoren-und-tools/electric-drives-and-controls/indrasize/indrasize-6) or https://www.boschrexroth.com/ctrlx-configurator (https://www.boschrexroth.com/ctrlx-configurator).

Motor series

As a standard, Rexroth housing motors come with a motor encoder and are equipped with an encoder data memory (e.g., MS2N with Acuro®link), see ↘ “Supported motors and motor encoders”.

The motor series have different motor encoder options for optimizing the costs depending on the application.

Rexroth kit motors consist of individual components that are mounted to a moving and a static part of the machine's mechanical system and are functionally put together to form a motor.

A kit motor consists of the following components:

- Electrically active part with a temperature sensor
- Electrically passive part
- Position encoder (motor encoder)
- Bearing

The electrical parts of the kit motor are supplied by Rexroth, the position encoder and the bearing are provided on the machine side.

Rexroth kit motors, synchronous motor

The following Rexroth kit motors are manufactured according to the functional principle of a "synchronous motor":

- Linear motor, e.g. MLF
- Rotary motors, e.g. MBS or MBT

As the motor is assembled in the machine, the stator, rotor (that is to say primary part and secondary part) and the position encoder can only be put together on site. The electric-magnetic-mechanical allocation of the synchronous motor is therefore only to be made on site. This is done by determining and setting the commutation offset.

See also ↘ “Commutation setting”.

The motor and position encoder should be implemented with high resolution and as a motor encoder to be evaluated in absolute form (see also " "). If it is necessary to use an incremental encoder, using encoders with square-wave signals should be avoided!

Rexroth kit motors, asynchronous motor

The following Rexroth kit motors are manufactured according to the functional principle associated with "asynchronous motors":

- Rotary motors, e.g. 1 MB

As the motor is assembled in the machine, the stator, rotor and the position encoder can only be put together on site. After loading the specific parameter values for the motor and for entering the encoder motor parameters, the assembled motor can be put into operation independent of rotor position and allocation of the motor encoder.

The motor encoder should be implemented with a high resolution. Avoid using encoders with square-wave signals!

Commissioning

For commissioning Rexroth motors, the following dialogs are available in ctrlX DRIVE Engineering:

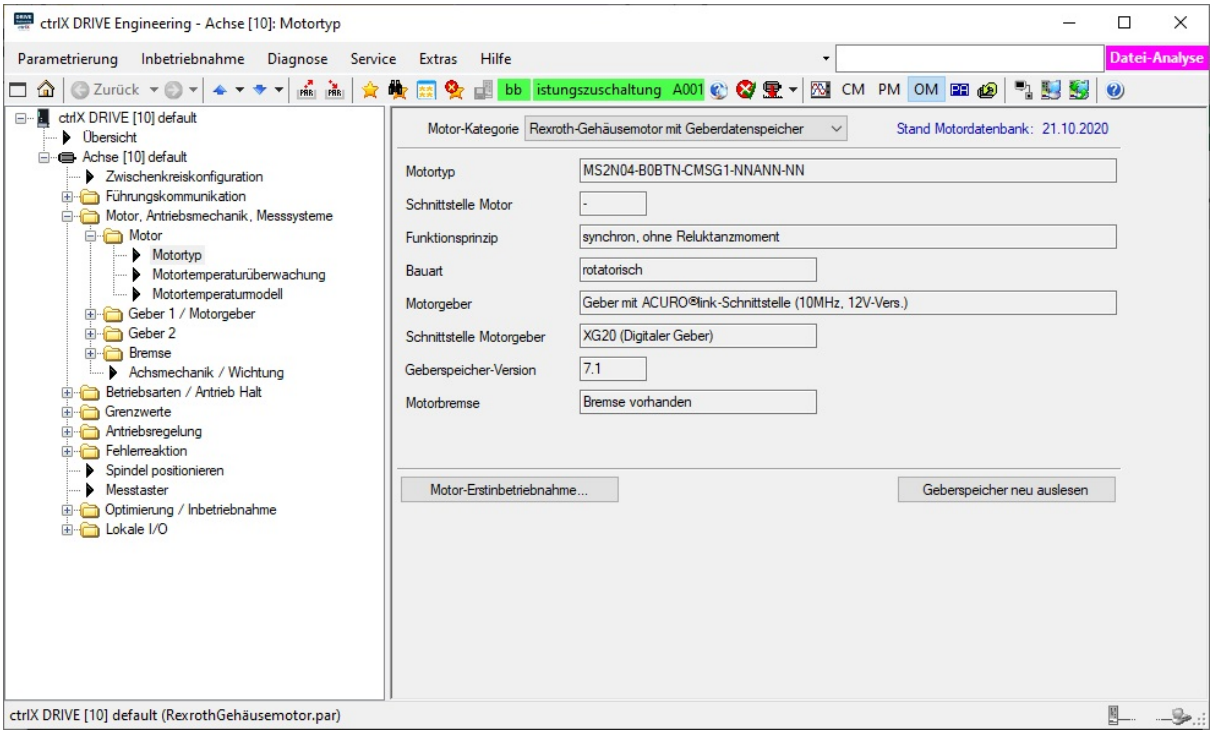

Fig. 150: Commissioning Rexroth motors

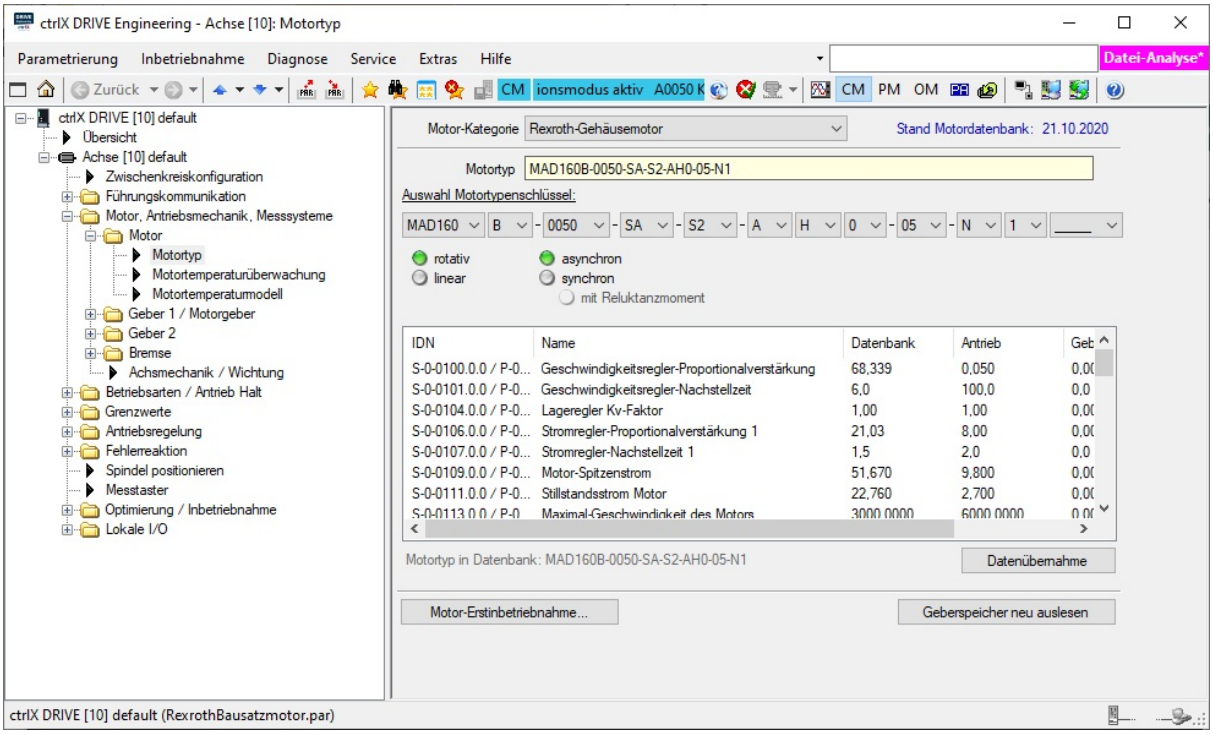

Fig. 151: Commissioning Rexroth motors without encoder data memory

For additional information on how to commission Rexroth motors, please see the following link:

https://www.ctrlx-automation.com/community (https://www.ctrlx-automation.com/community)

Setting the premagnetization factor

The following table contains the recommended setting for the parameter "P-0-0532 (/redirect/patternMatch?code=P-0-0532&redirectOrigin=ID1765271_510599369), Premagnetization factor ", depending on the application.

Recommended setting for parameter P-0-0532

Recommended setting for parameter P-0-0532

Application	Value of P-0-0532 (/redirect/patternMatch?code=P-0-0532&redirectOrigin=ID1765271_510599369) in %	Effect
Servo drive	100	Torque generation free of delay in the case of acceleration or sudden

		load variation
Main drive	50	Less power dissipation in no-load operation, noise level reduced

With values between 50% and 100%, it is possible to obtain a compromise between the mentioned effects.

It is therefore necessary to make sure you obtain the desired results for processing or acceleration/deceleration procedures after the premagnetization factor has been reduced.

The selection lists for motor/controller combinations with asynchronous Rexroth motors published by Rexroth refer to a premagnetization of 100%.

With lower values, you have to expect deviation from these data.

Influence of the premagnetization factor on the torque

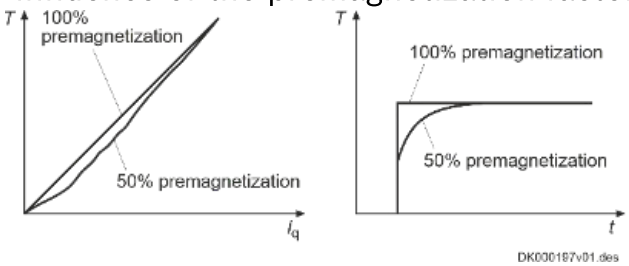

Fig. 152: Influence of the premagnetization factor on the torque of asynchronous motors

T Torque at the motor shaft

Iq Torque-generating component of the motor current

Additional information and details

The motor parameter values determined by the manufacturer guarantee that the motor can be loaded in accordance with its operating characteristic, if the required current and the corresponding power are provided by controller and supply unit.

The current motor ranges have different encoder data memory structure versions that support extended functions, where applicable:

Encoder memory versions and properties installed in motors

Encoder memory versions and properties installed in motors

Motor	Encoder memory vers.	P-0-3100 (/redirect/patternMatch?code=P-0-3100&redirectOrigin=ID1765271_510599369)	Comment
MSK	4.1	0x0401	Standard
	4.2	0x0402	4.1 + diagnostic data of motor operation
	4.3	0x0403	
	4.4	0x0404	
	4.5	0x0405	
	4.6	0x0406	4.3 + field weakening
			4.4 + correction of torque constant
			4.5 + reluctance utilization MSK133
MS2N with encoder performance of encoder types A and B	4.1-4.6 and 7.1	0x0406 0x0701	4.5 + reluctance utilization MSK133 Standard
MS2N with encoder performance C	7.1 and 8.1	0x0701 0x0801	Standard
MSD with HIPERFACE encoder or EnDat encoder	8.2 and higher	0x080x	Motors with customer-specific application data
MS2N with EnDat2.2	7.1 and 8.1		

MS2S with ctrlX SENSE^{motor}	7.1 and 8.1

Rexroth kit motors

Rexroth kit motors are manufactured according to the functional principles associated with "asynchronous motors" or "synchronous motors". With regard to control, the functional principles have different requirements:

- In the case of synchronous motors, the current in the windings of the stator must have a fixed allocation to the permanent magnetic field of the rotor so that the maximum torque or the maximum force is generated.
  See also ↘ “Commutation setting” under ↘ “Motor encoder, absolute vs. relative”.
- In the case of asynchronous motors there is no fixed allocation between stator and rotor required in order to generate the maximum torque or the maximum force.
  See also ↘ “Motor encoder, absolute vs. relative”.

Resetting the motor data

If a different Rexroth motor type is detected when the device is booted up (diagnostic "F2008 (/redirect/patternMatch?code=F2008&redirectOrigin=ID1765271_510599369) RL The motor type has changed"), the motor control loop parameters can be reset to the default values of the type plate by clearing the error. Use the command C0700 (/redirect/patternMatch?code=C0700&redirectOrigin=ID1765271_510599369) for resetting all motor parameters to factory default values.

Parameters involved

See also ↘ “Parameters involved” in "Basics on Rexroth motors".