

**NEW**

# Industrial Actuator

with multi-turn Absolute Encoder

3 Nm

## Serie 6091

	6091 Q	024 DC01	
Nominal voltage	U <sub>N</sub>	24	Volt
Terminal resistance, phase-phase	R	4,1	Ω
Output power, max.	P <sub>2 max.</sub>	32,6	W
No-load speed	n <sub>0</sub>	10 400	rpm
No-load current	I <sub>0</sub>	0,093	A
Stall torque	M <sub>H</sub>	120,1	mNm
Friction torque	M <sub>R</sub>	1,99	mNm
Speed constant	k <sub>n</sub>	448	rpm/V
Back-EMF constant	k <sub>E</sub>	2,23	mV/rpm
Torque constant	k <sub>M</sub>	21,3	mNm/A
Current constant	k <sub>i</sub>	0,05	A/mNm
Slope of n-M curve	Δn/ΔM	86,3	rpm/mNm
Terminal inductance, phase-phase	L	180	μH

Shaft bearings		sintered bearings (standard)	ball bearings (optional)	
Shaft load max.:				
– radial (15 mm from mounting flange)	≤	200	400	N
– axial at standstill	≤	150	150	N
Shaft play:				
– radial	≤	0,1	0,1	mm
– axial	≤	0,4	0,4	mm
Protection classification		IP65		
Housing material		zinc		
Geartrain material		plastic		
Weight		678		g
Operating temperature range		0 ... +60		°C

### Specifications

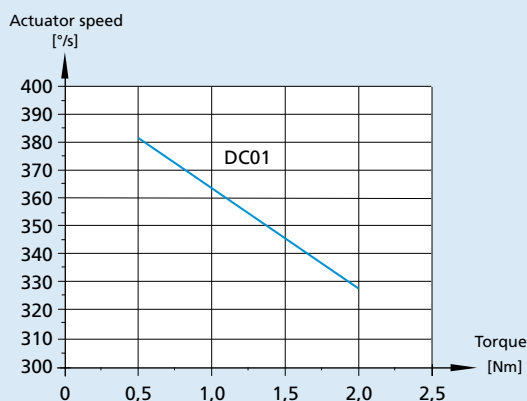
Reduction ratio <sup>1)</sup> (rounded)	output torque		direction of rotation <sup>1)</sup>
	continuous operation	intermittent operation	
156 : 1	M <sub>max</sub> Nm 1,5	M <sub>max</sub> Nm 2,0	CCW
302 : 1	3,0	4,5	CCW

<sup>1)</sup> The reduction ratios are rounded, the exact values are available on request or at [www.faulhaber.com](http://www.faulhaber.com).

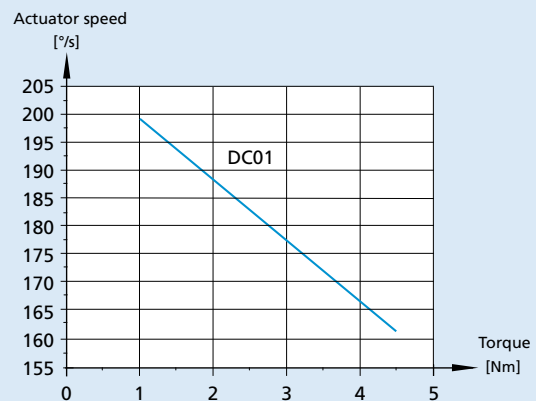
<sup>2)</sup> CCW = Counter clockwise when viewed from the front of the drive.

**Note:** The gearhead specifications are given independently from the motor specifications.

Actuator with Gearhead 156:1



Actuator with Gearhead 302:1



The diagram indicates the recommended actuator speed in relation to the available torque at the output shaft for a given ambient temperature of 22°C.

### Features

The encoder is based on a magnetic hall sensor principle and is maintenance free.

The encoder saves and recognizes the actual position after a power supply switch-off or a twisted output shaft in idle condition.


Option **MA** (Multiturn analog): An analog ratiometric output signal is provided over more revolutions depending of the position of the output shaft.

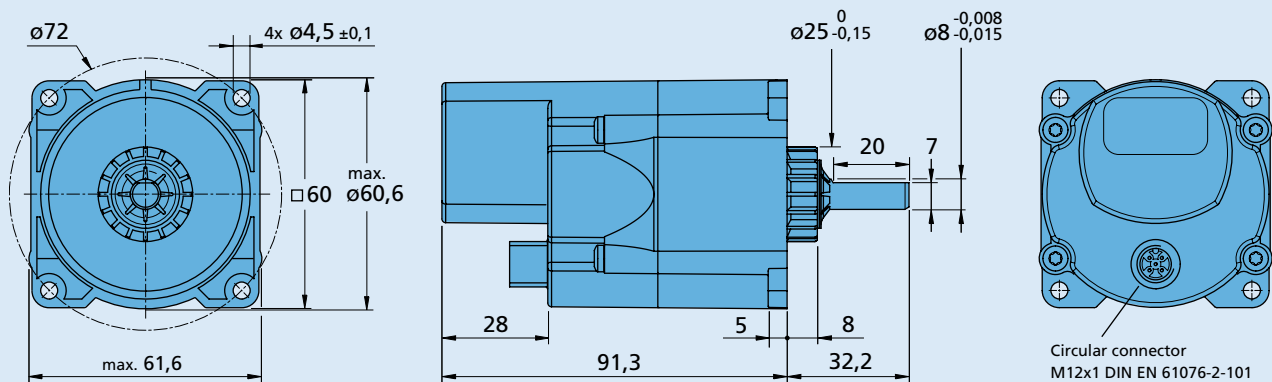
Option **MD** (Multiturn digital): The position of the output shaft can be detected over more revolutions via a RS485 interface. There is only the alternative of a point-to-point connection, no Network availability.

The electrical connection of the Industrial Actuator is carried out by a circular plug-in connector.

Further product modifications, differing to the standard, are available by request. For more information please contact your local sales representative.

### Dimensional drawing

scale reduced 



6091Q024DC01 ...

Integrated Absolute Encoder analog		MA-47/75	MA-40/75	
Number of turns	N	46,8	39,6	
Output signal		analog, ratiometric		
Operating voltage	V <sub>CC</sub>	4,5 ... 5,5		V DC
Current consumption	I <sub>CC</sub>	typ. 14, max. 17,5		mA
Output resistance	R <sub>OUT</sub>	100		Ω
Electrical angle	Φ <sub>el</sub>	16 848	14 256	°
Total number of increments	N <sub>inc</sub>	3 523	2 981	Inc.
Angular resolution	Φ <sub>res</sub>	4,8		°
Linearity deviation, max.		± 0,25		%
Lower limit of the linear range	V <sub>lin, min</sub>	0,05 · V <sub>CC</sub>		V DC
Upper limit of the linear range	V <sub>lin, max</sub>	0,95 · V <sub>CC</sub>		V DC

### Features / Connector information

#### Options

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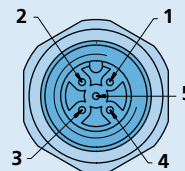
#### Full product description

Examples:

6091Q024DC01 MA47/75 K302:1

6091Q024DC01 MA40/75 S156:1

#### Connector



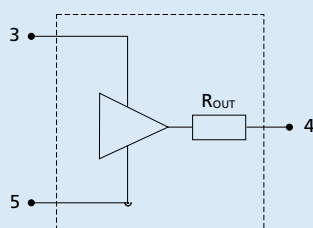
#### Connection

No.	Function
1	Motor +
2	Motor -
3	Encoder V <sub>CC</sub> 5V
4	Encoder V <sub>OUT</sub>
5	Encoder GND

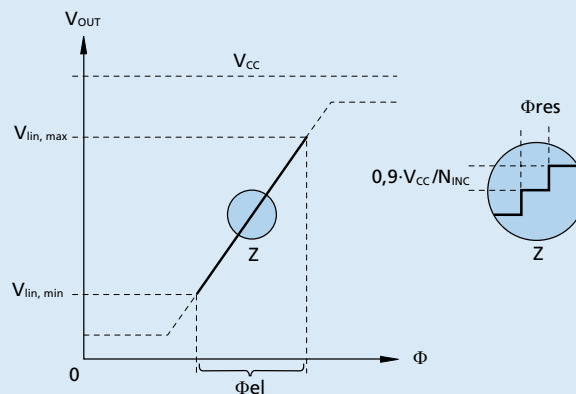
**Caution:**  
Incorrect lead connection will damage the motor electronics!

### Output signals / Circuit diagram

#### Circuit diagram of the output stage



#### Output signals



Integrated Absolute Encoder digital		MD-81/1053	
Number of turns	N	81	
Supply voltage ( $\pm 10\%$ )	V <sub>CC</sub>	24	V DC
Current consumption at 24V, max.	I <sub>CC</sub>	80	mA
Electrical angle	$\Phi_{el}$	29 160	°
Total number of increments	N <sub>inc</sub>	85 313	Inc.
Angular resolution	$\Phi_{res}$	0,35	°
Linearity deviation, max.		$\pm 0,25$	%

Connection interface			
Physical interface	RS485, half-duplex		
Topology	Point to point connection		
Termination resistor, integrated	120		$\Omega$
Transfer speed rate	115 200		baud
Scanning rate, max.	2		ms

### Features / Connector information

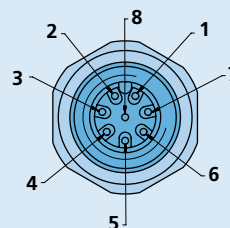
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#### Full product description

- Example:  
6091Q024DC01 MD81/1053 K302:1

#### Connector



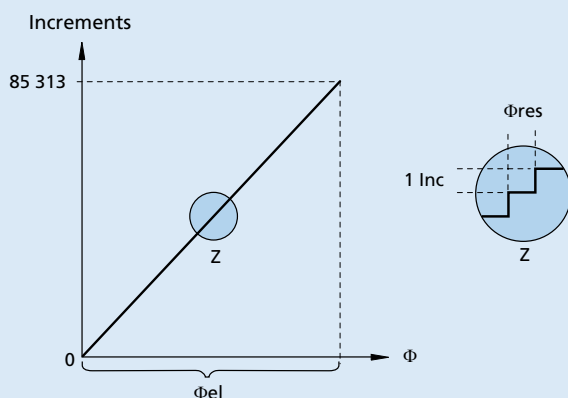
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6	RS485 B
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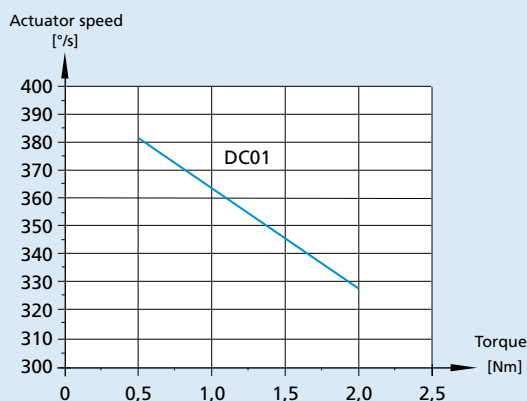
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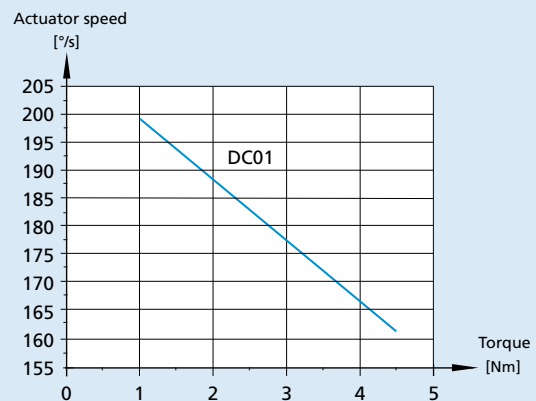
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
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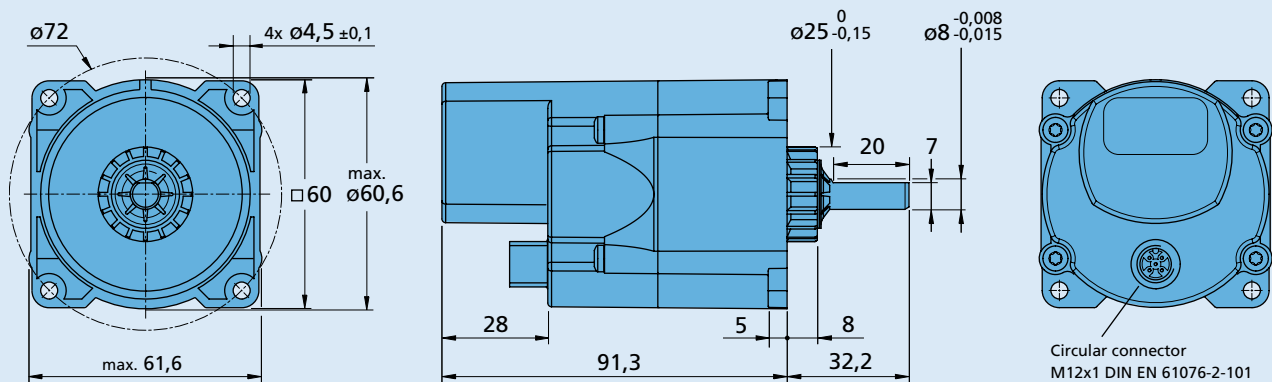
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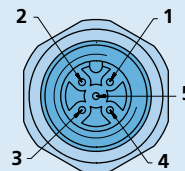
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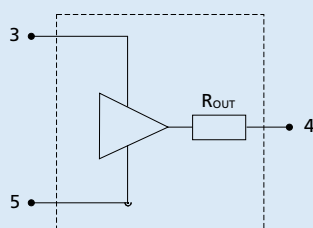
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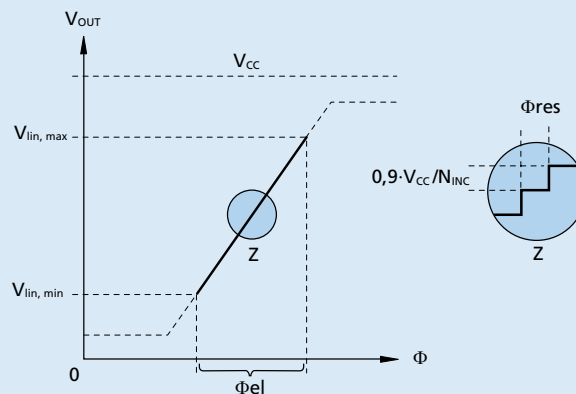
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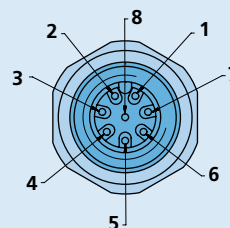
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