DC-Micromotors

Graphite Commutation

224 mNm

160 W

Series 3890 ... CR

Values at 22°C and nominal voltage		3890 H	018 CR	024 CR	036 CR	048 CR	
1	Nominal voltage	U_N	18	24	36	48	V
2	Terminal resistance	R	0,21	0,36	0,78	1,38	Ω
3	Efficiency, max.	$\eta_{max.}$	86	87	87	88	%
4	No-load speed	n_0	5 400	5 400	5 400	5 500	min⁻¹
5	No-load current, typ. (with shaft ø 6 mm)	I_0	0,323	0,242	0,161	0,121	A
6	Stall torque	M_H	2 642	2 760	2 887	2 911	mNm
7	Friction torque	M_R	10	10	10	10	mNm
8	Speed constant	k_n	300	225	150	112	min⁻¹/V
9	Back-EMF constant	k_E	3,332	4,443	6,665	8,887	mV/min⁻¹
10	Torque constant	k_M	31,82	42,43	63,65	84,86	mNm/A
11	Current constant	k_I	0,031	0,024	0,016	0,012	A/mNm
12	Slope of n-M curve	$\Delta n/\Delta M$	2	1,9	1,8	1,8	min⁻¹/mNm
13	Rotor inductance	L	60	110	240	430	µH
14	Mechanical time constant	τ_m	3,4	3,3	3,3	3,3	ms
15	Rotor inertia	J	164	164	171	171	gcm²
16	Angular acceleration	$\alpha_{max.}$	161	168	169	170	·10³rad/s²
17	Thermal resistance	R_{th1} / R_{th2}	1,9 / 4,2				K/W
18	Thermal time constant	τ_{w1} / τ_{w2}	58 / 910				s
19	Operating temperature range:						
	– motor		-30 ... +125				°C
	– winding, max. permissible		+155				°C
20	Shaft bearings		ball bearings, preloaded				
21	Shaft load max.:						
	– with shaft diameter		6				mm
	– radial at 3 000 min⁻¹ (3 mm from bearing)		60				N
	– axial at 3 000 min⁻¹		6				N
	– axial at standstill		50				N
22	Shaft play:						
	– radial	≤	0,015				mm
	– axial	=	0				mm
23	Housing material		steel, black coated				
24	Mass		550				g
25	Direction of rotation		clockwise, viewed from the front face				
26	Speed up to	$n_{max.}$	6 000				min⁻¹
27	Number of pole pairs		1				
28	Magnet material		NdFeB				
Rated values for continuous operation							
29	Rated torque	M_N	139	182	222	224	mNm
30	Rated current (thermal limit)	I_N	5	5	4,3	3,2	A
31	Rated speed	n_N	5 190	5 240	5 350	5 360	min⁻¹

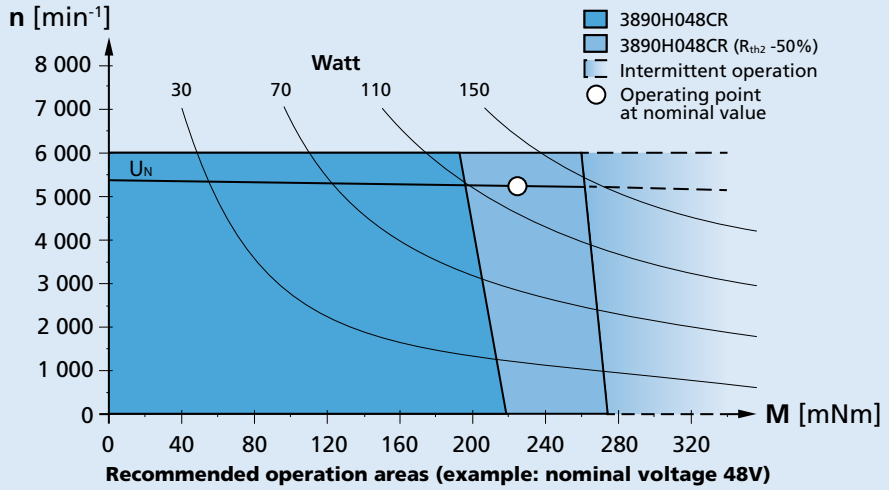
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 25%.

Note:

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

The diagram shows the motor in a completely insulated as well as thermally coupled condition (R_{th2} 50% reduced).

The nominal voltage (U_N) curve shows the operating point at nominal voltage in the insulated and thermally coupled condition. Any points of operation above the curve at nominal voltage will require a higher operating voltage. Any points below the nominal voltage curve will require less voltage.

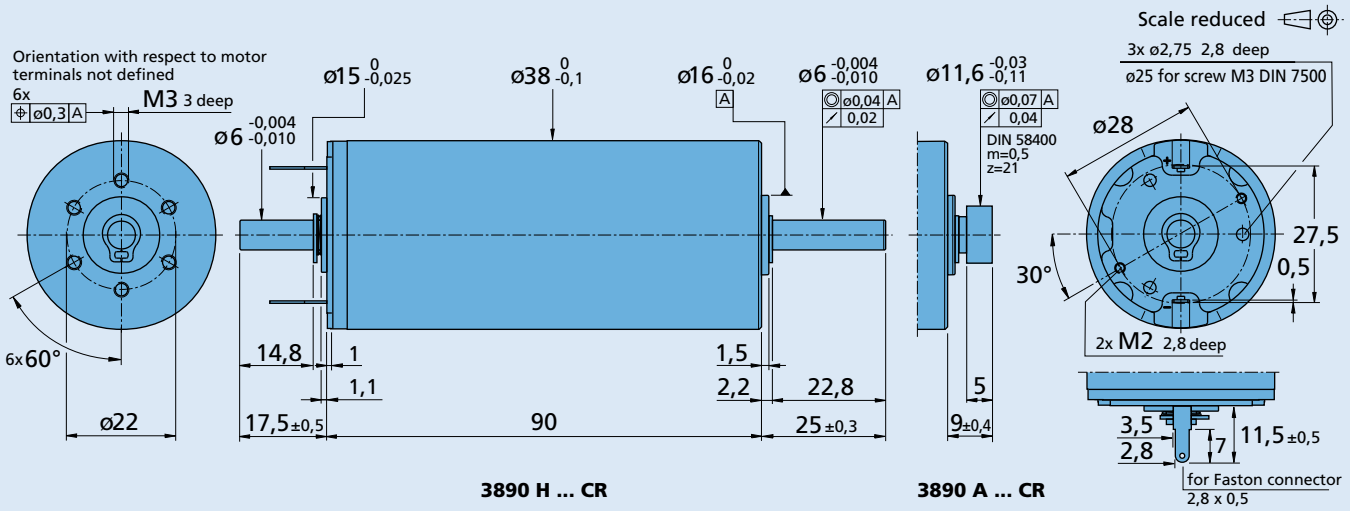


Recommended operation areas (example: nominal voltage 48V)

For notes on technical data and lifetime performance refer to "Technical Information".

Edition 2019

Dimensional drawing



Options

Example product designation: **3890H024CR-158**

Option	Type	Description
U	Single Leads	For motors with single leads (PTFE), length 160 mm, red (+) / black (-)
158	Shaft end	No second shaft end
2016	Encoder combination	Motor with rear end shaft for combination with Encoder IE3, IERS3 and IER3

Product combination

Precision Gearheads / Lead Screws	Encoders	Drive Electronics	Cables / Accessories
38A	IE3-1024	SC 2804 S	MBZ
38/1	IE3-1024 L	SC 5004 P	
38/1 S	IERS3-500	SC 5008 S	To view our large range of accessory parts, please refer to the “Accessories” chapter.
38/2	IERS3-500 L	MCDC 3006 S	
38/2 S	IER3-10000	MC 5010 S	
44/1	IER3-10000 L		

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