

**NEW**

**DC-Micromotors**  
Graphite Commutation

**224 mNm**

**For combination with**  
Gearheads:  
38/1, 38/1 S, 38/2, 38/2 S, 38A, 44/1  
Encoders:  
HEDL 5540, HEDM 5500, HEDS 5500, HEDS 5540,  
IE3-1024, IE3-1024 L

**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	$\Omega$
3 Output power	$P_{2nom.}$	362	381	401	406	W
4 Efficiency, max.	$\eta_{max.}$	86	87	87	88	%
5 No-load speed	$n_0$	5 400	5 400	5 400	5 500	rpm
6 No-load current, typ. (with shaft $\varnothing$ 6 mm)	$I_0$	0,323	0,242	0,161	0,121	A
7 Stall torque	$M_H$	2 642	2 760	2 887	2 911	mNm
8 Friction torque	$M_R$	10	10	10	10	mNm
9 Speed constant	$k_n$	300	225	150	112	rpm/V
10 Back-EMF constant	$k_E$	3,332	4,443	6,665	8,887	mV/rpm
11 Torque constant	$k_M$	31,82	42,43	63,65	84,86	mNm/A
12 Current constant	$k_I$	0,031	0,024	0,016	0,012	A/mNm
13 Slope of n-M curve	$\Delta n / \Delta M$	2	1,9	1,8	1,8	rpm/mNm
14 Rotor inductance	L	60	110	240	430	$\mu H$
15 Mechanical time constant	$\tau_m$	3,4	3,3	3,3	3,3	ms
16 Rotor inertia	J	164	164	171	171	gcm <sup>2</sup>
17 Angular acceleration	$\alpha_{max.}$	161	168	169	170	$\cdot 10^3 \text{rad/s}^2$
18 Thermal resistance	$R_{th1} / R_{th2}$	1,9 / 4,2				K/W
19 Thermal time constant	$\tau_{w1} / \tau_{w2}$	58 / 910				s
20 Operating temperature range:						
– motor		-30 ... +125				°C
– winding, max. permissible		+155				°C
21 Shaft bearings		ball bearings, preloaded				
22 Shaft load max.:						
– with shaft diameter		6				mm
– radial at 3 000 rpm (3 mm from bearing)		60				N
– axial at 3 000 rpm		6				N
– axial at standstill		50				N
23 Shaft play						
– radial	$\leq$	0,015				mm
– axial	$=$	0				mm
24 Housing material		steel, black coated				
25 Mass		550				g
26 Direction of rotation		clockwise, viewed from the front face				
27 Speed up to	$n_{max.}$	6 000				rpm
28 Number of pole pairs		1				
29 Magnet material		NdFeB				
<b>Rated values for continuous operation</b>						
30 Rated torque	$M_N$	139	182	222	224	mNm
31 Rated current (thermal limit)	$I_N$	5	5	4,3	3,2	A
32 Rated speed	$n_N$	5 190	5 240	5 350	5 360	rpm

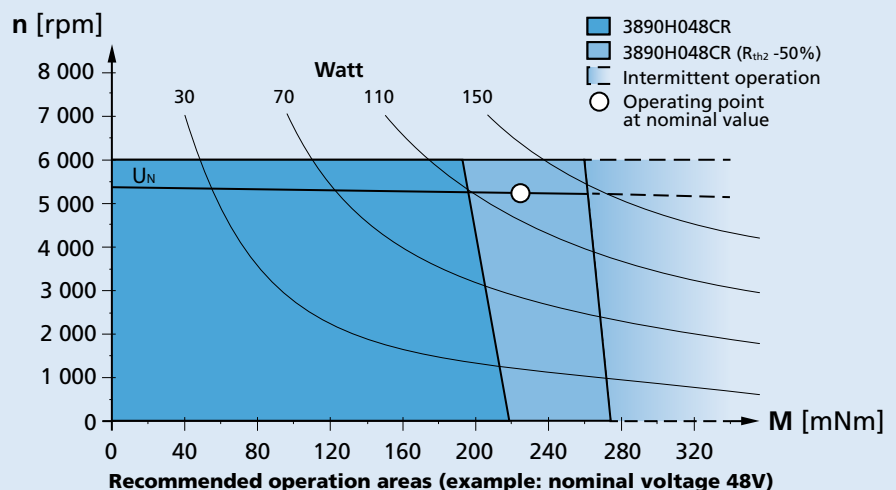
**Note:** Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The  $R_{th2}$  value has been reduced by 25%.

**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.



**Dimensional drawing**

