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	$\cdot 10^3$rad/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

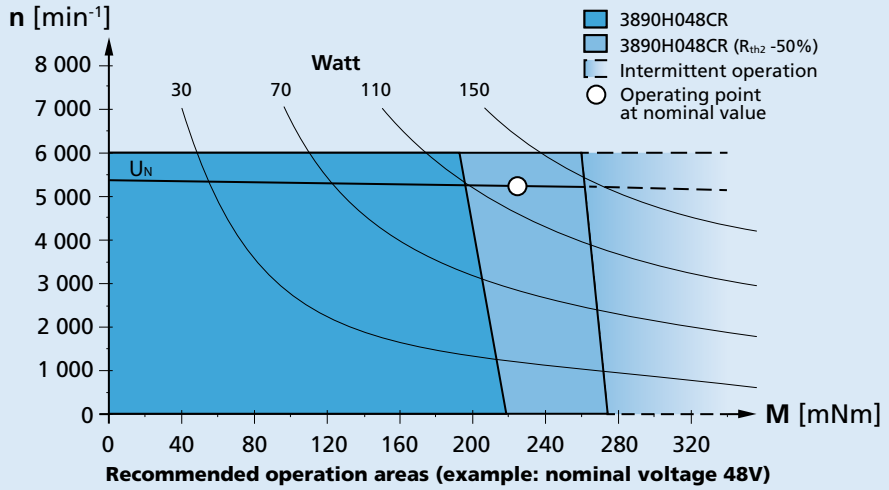
Note: Rated values are calculated with nominal voltage and at a 22°C ambient temperature. The R_{th2} value has been reduced by 25%.

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".

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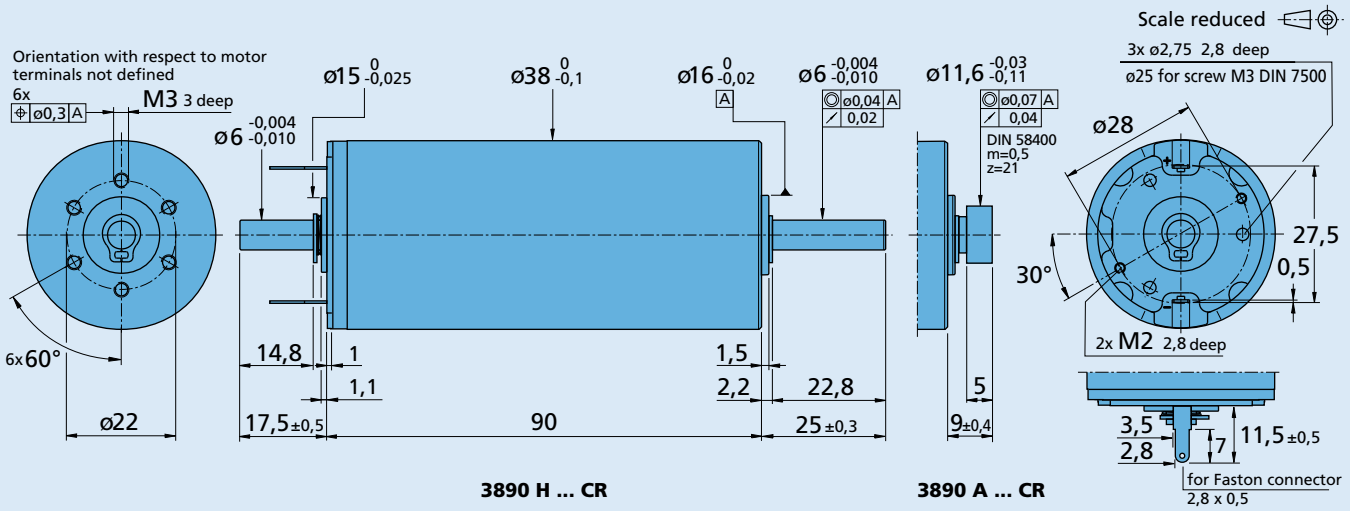
Dimensional drawing



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
1387	Brakes combination	For combination with Brakes MBZ

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	
42GPT	IER3-10000 L		
44/1			