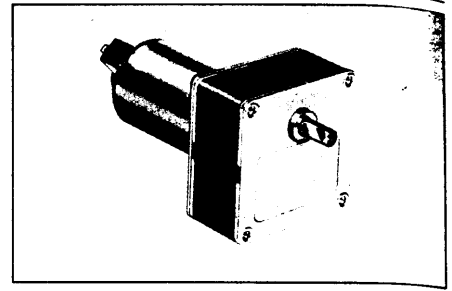# D.C. geared motors

308 9733,

- ■ Speed range : 1 to 208 rpm
- ■ Gearboxes with torque ratings from 5 to 6 Nm, solid metal gears 6 Nm, versions provide long life
- ■ Motors : maximum usable power 17 W

Applications

- Robot suction devices
- Opening/closing of windows in industrial buildings
- Diamond-cutting machines
- Portable electrical equipment
- Materials-handling machinery
- Etc.

Made to order products, available on request

Motor :
- other supply voltages
- motors with 1 ball bearing
- shaft lengths at front and/or rear
- specific interference suppression
- magnetic encoder 5 pulses per revolution
- other front fixing plates

Gearboxes :
- needle bearings for 81 032 6 see page 1/33
- special cover for 81 032 6 see page 1/33
- special lubrication
- special shaft
- other reduction ratios

Types

			80 807 0	80 807 0	80 807 0
Nominal voltage					
			12 V	24 V	48 V
Output speeds (rpm)		Ratios (i)	**Part numbers**		
208		12.5	80 807 012	80 807 018	●
156		50/3	●	●	●
104		25	80 807 013	80 807 019	●
62		125/3	80 807 014	80 807 020	●
42		62.5	80 807 015	80 807 021	●
21		125	80 807 016	80 807 001	●
12		650/3	—	—	—
10		250	●	●	●
8		338	—	—	—
5.20		500	80 807 017	80 807 022	●
4		650	—	—	—
1.04		2500	●	●	●

Standard gearbox shaft : see dimensions

General characteristics

Motor			82 800 0	82 800 0	82 800 0
Gearbox			81 037 0	81 037 0	81 037 0
Maximum permitted torque on gearbox for continuous rating	For 1 million revolutions	N.m	5	5	5
	For 10 million revolutions	N.m	—	—	—
Axial load (dynamic)		daN	2	2	2
Radial load (dynamic)		daN	3	3	3
Maximum usable power		W	16.3	17	16.7
Nominal usable power		W	15.7	15.6	15
Gearbox case temperature rise		°C	44	40	45
Weight		g	800	800	800

Options : for standard products non stocked

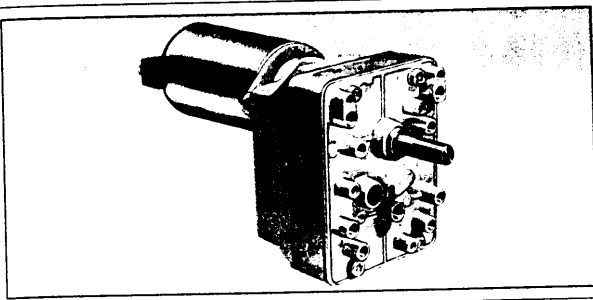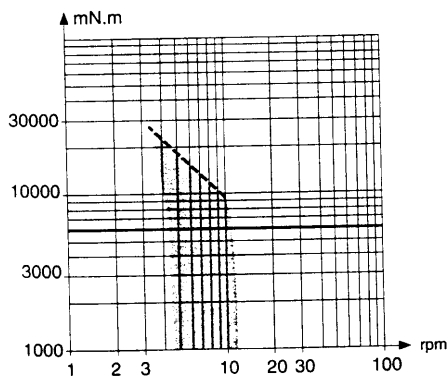|			
Gearbox shaft, Ø 8 mm round 79 206 478	●	●	●
Magnetic encoder 1 pulse per revolution to SP 1737.00	●	●	●

Nominal speed and torque curves

The shaded zone represents the operating range of the geared motor.

The horizontal line marks the maximum torque available in continuous duty cycle for a given life.

For higher torque ratings, service life will be reduced.

Other information

Basic principles : see page 1/6.
- Motor 82 800 0 : see page 1/8.
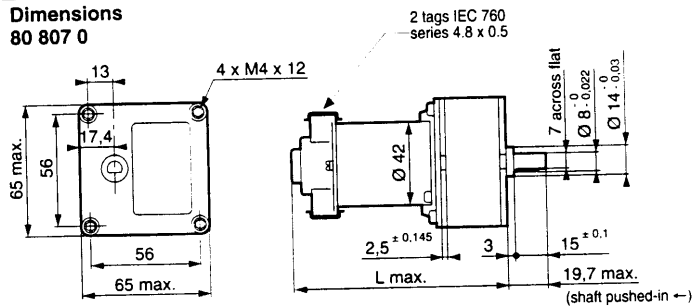- 82 800 0 version with encoder : see pages 1/8 - 1/41.

1

82 802 5	82 802 5	82 802 5

2

12 V	24 V	48 V

3

—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
●	●	●
●	●	●
●	●	●
—	—	—

82 800 0	82 800 0	82 800 0
81 032 6	81 032 6	81 032 6

—	—	—
6	6	6
3.5	3.5	3.5
5	5	5
16.3	17	16.7
15.7	15.6	15
44	40	45
880	880	880

4

—	—	—
●	●	●

Dimensions
80 807 0

2 tags IEC 760 — series 4.8 x 0.5
13
4 x M4 x 12
17,4
65 max.
56
56
65 max.
7 across flat
Ø 8 $_{-0,022}^{-0}$
Ø 14 $_{-0,03}^{-0}$
Ø 42
2,5 $^{±0,145}$
3
15 $^{±0,1}$
L max.
19,7 max.
(shaft pushed-in ←)

Geared motors	L max (mm)
80 807 0 standard	121
80 807 0 encoder	135.4

Non stocked products : gearbox shaft 79 206 478 on gearbox 80 807 0 only

19,7 max. (shaft pushed-in ←)
Ø 8
Ø 14

82 802 5

2 tags IEC 760 series 4.8 x 0.5
8 holes M4 depth 7.5
3 holes M5 at 120° depth 7.5
25,1 25,1
19,85 19,85
27,25 21,5
39,7 29,1 14,5
16
81,6 max.
85 max.
25,3 25,3
64,1 max.
L max.
19,8
3
18,5
11,5
59,7 max.
26,9 max.
15
(shaft pushed-in ←)
Ø 42
0,5
5,5
14,5
7 across flat
Ø 8 $_{-0,015}^{-0}$
Ø 12
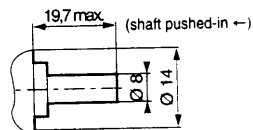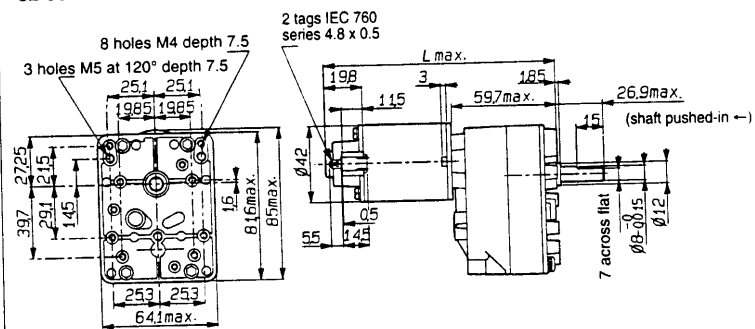
Geared motors	L max (mm)
82 802 5 standard	144.5
82 802 5 encoder	159.2

mN.m
30000
10000
3000
1000
1 2 3 10 20 30 100 rpm

To order, specify :

■ **Standard products**	**3** Part number
	Example : D. C. geared motor - 80 807 017
● **Standard products, non stocked**	**1** Type **2** Nominal voltage **3** Output speed **4** Option
	Example : D. C. geared motor 80 807 0 - 12 V - 156 rpm - magnetic encoder 1 pulse per revolution (SP 1737.00)
	Output shaft 79 206 478

Crouzet

1/33

Temperature rise

The temperature rise of a motor is due to the difference between the absorbed power and the output power of the motor. This difference is the power loss.
Temperature rise is also related to the fact that power loss, in the form of heat from the motor, is not rapidly absorbed by the ambient air (thermal resistance). The thermal resistance of the motor can be greatly reduced by ventilation.

Important

The nominal operating characteristics correspond to the voltage-torque-speed characteristics required for continuous operation at an ambient temperature of 20° C. Only intermittent duty is possible outside these operating conditions : without exception, all checks concerning extreme operating conditions must be performed in the actual customer application conditions in order to ensure safe operation.

5 - Motor and gearbox combinations

D.C. motors are constructed to operate continuously within a range of speeds near their no-load speed. This range of speeds is generally too high for most applications. In order to reduce this speed, a full range of geared motors is available, each with a series of gear ratios to suit most speed requirements.
The complete range is suitable for a wide variety of applications.

Gearbox characteristics

Our gearboxes have been designed for optimum performance and for maximum life under normal operating conditions.

Their main characteristic is the capacity to withstand **maximum design torque with continuous duty**.

The range of gearboxes shown in this catalogue can operate with maximum torque of **0.5 to 6 N.m** for long time periods. All values previously stated are for standard products in normal operating conditions, as specified.
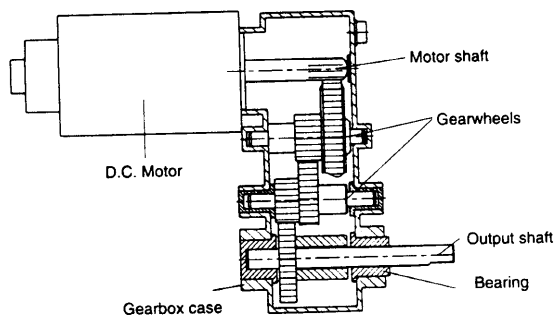
In certain cases, these values may be increased if a shorter life is required.

Please consult our Sales Office for further information.

Every gearbox has a torque limit, which is
the breaking torque
If this torque is applied to the gearbox, it will cause severe damage.

Gearbox construction

Selection of a geared motor

A geared motor is selected according to the required usable power output.

$$P_{usable} = \frac{2\pi}{60} . C . n$$

P usable			
W		Nm	rpm

A geared motor must have usable power equal to or greater than the power required to rotate the load. It is selected by checking that the point corresponding to the required operating conditions (torque and speed output) is higher than the nominal torque versus speed curve of the geared motor.
The required torque output of a geared motor must be within its maximum recommended torque for continuous duty.

Selecting the reduction gear ratio

Two selection criteria may be applied.

- The first criterion concerns the required speed output of the reduction gear only. It is adequate for most applications and is easy to apply. Given that :

$$R = \frac{N1}{Nb}$$

N1 = required speed of geared motor
Nb = basic nominal speed of motor

- The second criterion concerns the required usable power output of the motor. The rotational speed of the motor is given by :

$$N = 1/2 \left(No + \sqrt{No^2 - \frac{4P}{A}}\right) \text{ with } A = \frac{\pi Cd}{30No}$$

N = speed of motor (rpm)
No = no-load speed of motor (rpm)
P = required output power (W)
Cd = start-up torque of motor (Nm)

This gives the equation : $R = \frac{N1}{N}$

In order to avoid using numbers less than 1 where the reduction ratio is concerned, the value 1/R is employed.
Due to the fact that it is always a reduction gear and not a "multiplier" gear, there should be no ambiguity concerning the number used.

$$1/R = \frac{Nb}{N1} \text{ or } 1/R = \frac{N}{N1}$$

D.C. direct drive motors Ø 42 and 63 mm

- **For high-power drive applications**
- **Maximum usable power : from 14 to 67 W**
- **Ø 42 mm : Sintered bronze bearings lubricated for life**
  Supply connection by 4.75 mm tags
  Replaceable brushes
- **Ø 63 mm : With 2 ball bearings**
  Supply connection by 2 leads
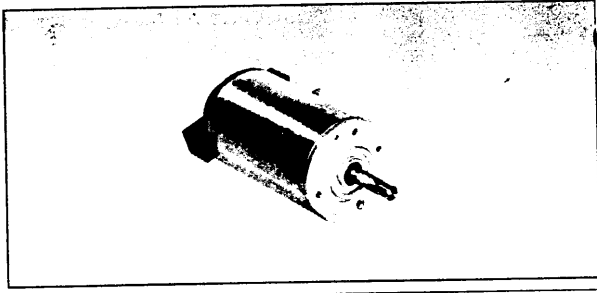
Applications

- Gas analysers
- Pumps/vacuum devices
- Cash registers
- Printers
- Mixers for automatic drink dispensers
- Compressors
- Spindle drives for engraving machines
- Document sorters
- Automatic swimming-pool cleaners
- Filtering systems
- Water circulators for whirlpool baths
- Paper drives for photocopiers
- Opening/closing of automatic doors
- Machines for making spectacle lenses

Made to order products, available on request

- integrated interference suppression (82 830 5)
- specific interference suppression (82 800 5 - 82 810 5)
- other supply voltages
- motor with 1 front ball bearing (82 800 5 or 82 810 5)
- shaft lengths at front and/or rear
- magnetic encoder 5 pulses per revolution
- magnetic encoder with 2 directions of rotation (1 or 5 pulses per revolution)
- other front and rear fixing plates
- short version possible on 82 830 5 (L = 90 mm)

Types

		82 810 5	82 810 5	82 800 5	82 800 5
Nominal voltage		12 V	24 V	12V	24 V
Part numbers		82 810 501	82 810 502	82 800 501	82 800 502
Standard characteristics					
Speed	rpm	3840	3860	3920	4010
Absorbed power	W	12	11.28	9.96	12.24
Absorbed current	A	1	0.47	0.83	0.51
Characteristics - nominal					
Speed	rpm	2580	2750	2670	3070
Torque	mN.m	45	45	70	70
Output power	W	12	13	20	22
Absorbed power	W	31	32	37	41
Absorbed current	A	2.6	1.32	3.05	1.71
Gearbox case temperature rise	°C	32	33	38	40
Efficiency	%	39	40.8	54	54
General characteristics					
Insulation class (conforming to IEC 85)		F (155 °C)	F (155 °C)	F (155 °C)	F (155 °C)
Degree of protection		IP20	IP20	IP20	IP20
Maximum usable power	W	14	16	22	31
Start torque	mN.m	138	156	219	298
Start current	A	6.2	3.4	9	6.16
Resistance	Ω	1.94	7.06	1.33	3.9
Resistance : inductive	mH	4.45	16.94	2.67	9.35
Torque constant	Nm/A	0.0265	0.0532	0.0268	0.0527
Electrical time constant	ms	2.3	2.4	2	2.4
Mechanical time constant	ms	26	23	20	15
Thermal time constant	min	8	8	12	12
Inertia	g.cm²	80	72	105	110
Weight	g	310	310	400	400
No of segments		8	8	8	8
Life	hr	2000	2000	2000	2000
Sintered bronze bearings		●	●	●	●
Ball bearings		—	—	—	—
Replaceable brushes	mm	●	●	●	●
Lead length (approx.)		—	—	—	—

Motors with encoder, non stocked

Magnetic encoder 1 pulse per revolution following SP 1737.00 (see dimensions)	82 810 504	82 810 505	82 800 504	82 800 505

A - Torque/Speed curves
B - Torque/Current curves

82 810 0

82 800 0

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