



HYDRAULICCOMPONENTS
HYDROSTATICTRANSMISSIONS
GEARBOXES -ACCESSORIES

HT 38 / A / 102 / 1004 / E

DC MOTORS WOUND FIELD MOTORS PERMANENT MAGNET MOTORS



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GENERAL INFORMATION**INTRODUCTION**

-This catalogue is published by

**HANSA-TMP srl
Via Martin Luther King, 6
I - 41100 MODENA Italy**

Issue number :

HT 38 / A / 102 / 1004 / E

Replace all previous edition

We design and manufacture :

- D.C. motors with winding :
 - series wound
 - compound wound
 - shunt wound
 - separately excited
- D.C. Permanent Magnet Motors
- Electro-hydraulic pumps for lifting
- Electro-hydraulic pumps for steering
- A.C. and D.C. geared motors
- A.C. and D.C. drive wheels

Our motors are manufactured with :

- High efficiency
- Protection from IP 20 up to IP 65
- Class H and F materials
- IEC and European Standards compliance
- Special models on request
- High efficiency armature core lamination
- they are available :
 - ventilated
 - not ventilated
 - with forced ventilation

All products are manufactured in compliance with IEC and European standards.

Permanent Magnet Motors

Simplicity in construction, high performances with optimum efficiency and long stable life are the most important features of our permanent magnet motors.

Wound Field Motors

During the wound field motor design and development we have taken into consideration all the technical and commercial aspects, which are required to meet every kind of applications.

For this reason all of the important components used on our motors have been specifically selected, are of a very high quality and they are used on every models.

This philosophy enable us to provide reliable motors even when they are used in the heaviest conditions.

Electro-hydraulic pumps for steering

The hydrostatic steering system is used in vehicles where the driver has to control large loads with minimum effort and where comfort and safety are essential.

We have designed and developed a range of electro-hydraulic pumps which are suitable for this kind of application. When the steering wheel is turned the steering unit measures an oil volume, which is proportional to the steering-wheel rotation. The oil is supplied by the electro-hydraulic pump to the steering unit and from steering unit into the chamber of the steering cylinder.

Electro-hydraulic pumps for lifting and traction applications

The electro-hydraulic pumps consist of a permanent magnet motor or wound field motor of an integrated gear pump. Sometime different kinds of pumps or multiple-stage pumps are utilised to meet specific inquiries.

The type of winding determines the electro-hydraulic performance, in particular the idling and full load speed variations.

We are able to supply compound, series and shunt wound motors and consequently can provide customers with the best combination to meet their specific requirement

GENERAL INFORMATION (continued)

DESIGN FEATURES

Type of winding	- The motor range includes :	<ul style="list-style-type: none"> - Wound field motors - Series wound - Compound wound - Shunt wound - Permanent Magnet motor
Enclosure	-	Enclosure from IP 20 up to IP 56 can be supplied.
Insulation Class F	-	Achieved by class H insulated wire, in conjunction by epoxy paints and resins. This guarantees high strength and reliability at up to 155°C winding temperature.
Bearings	-	Selected quality ball bearings with double shield and internal lubrication. On request high temperature grease or C3 tolerance bearings can be supplied.
Brushes	-	Made of carbon or graphite-metal depending on the motor characteristic. Easy to reach and maintain or, if necessary replace.
Accessories	-	Available on request : electromagnetic brakes, start contactors, thermal protection and detectable wear system, worm and planetary gearboxes, tachogenerator or encoder, forced ventilation, foot mounting adapter.

Motor

Characteristics - Speed and torque of a D.C. motor , and therefore also volumetric flow and pressure of the driven pumps, are interrelated as shown in the graphs.
The type of winding determines the curve shape.

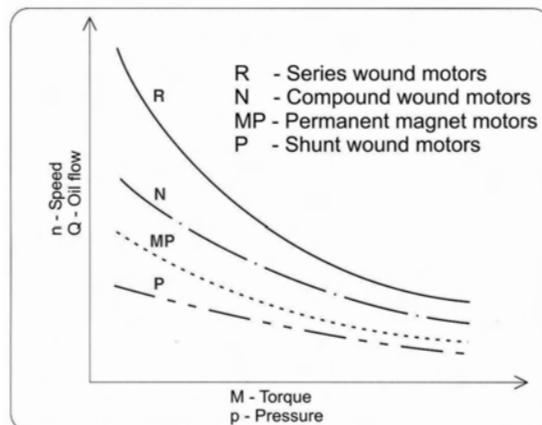
Series wound motors are characterized by excellent starting torque.

One should also note the high idle speed.

Shunt wound motors have the benefit of maintaining a practically constant speed irrespective of load variation; they have low starting torque and high starting current.

Permanent Magnet motors perform like shunt wound motors but in permanent magnet motors generally the variation in speed is greater as load changes.

As on see from the diagram, compound wound motors have intermediate features in comparison with series and shunt wound motors.



GENERAL INFORMATION (continued)

DUTY TYPES

The dimensioning of D.C. motors and electro-hydraulic pumps is based on the duty types. In particular the output power (Pr) depends on the temperature (T) reached by the motor.

The most important are :

Continuous running duty type S1

Operation at constant load, the duration of which is sufficient to achieve thermal equilibrium. This is the continuous duty condition equivalent to maximum performance of the motor.

Short time - duty type S2

Operation at constant load, of short duration, without thermal equilibrium being reached. A no load period follows, sufficient for the motor to return to ambient temperature.

Example : S2 – 60 min.

The motor runs continuously for 60 minutes, and stops a time sufficient to return to ambient temperature.

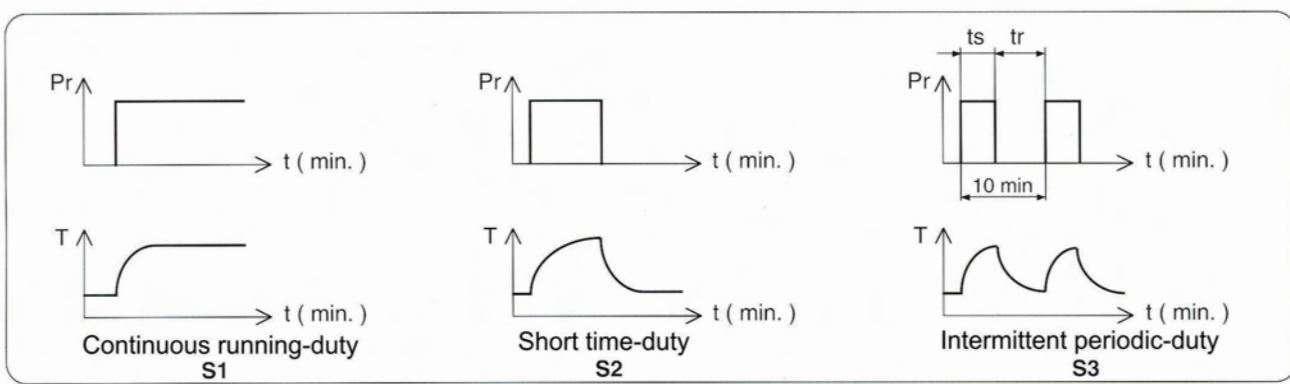
Intermittent periodic-duty type S3

Operations which consist of a sequence of uniform cycles (duty-cycle 10 min.) consisting of a period at constant load (ts) and a no load period (tr)

Example : S3 – 30%

The motor runs 3 minutes and stops 7 minutes.

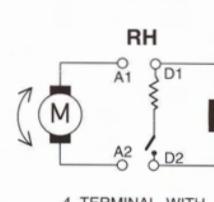
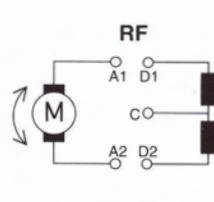
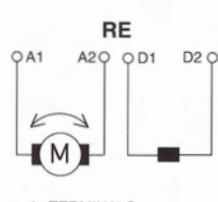
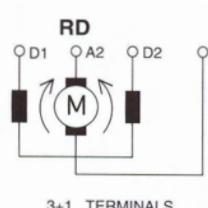
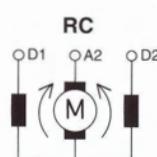
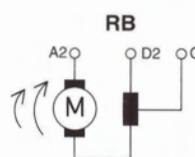
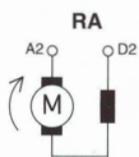
$$S3 (\%) = \frac{ts}{ts + tr} \times 100$$



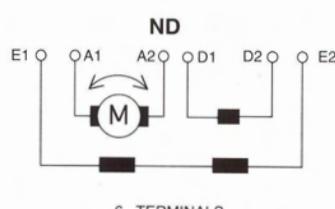
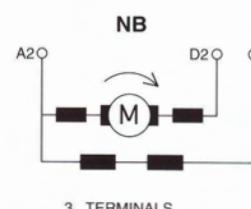
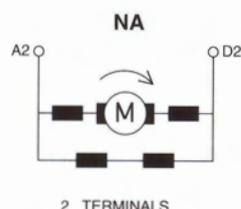
GENERAL INFORMATION (continued)

TIPICAL MOTOR CONNECTION

- Series wound motors

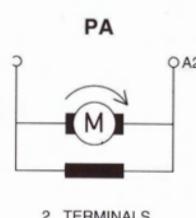


- Compound wound motors

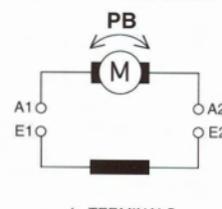


- Shunt wound motors

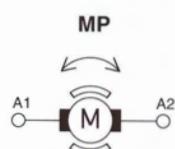
Shunt Wound



Separately excited
Shunt Wound motor



- Permanent magnet motors



GENERAL INFORMATION (continued)

ENCLOSURE

Table I

- 0 No protection
- 1 Protected against solid bodies of size over 50 mm.
- 2 Protected against solid bodies of size over 12 mm.
- 3 Protected against solid bodies of size over 2,5 mm.
- 4 Protected against solid bodies of size over 1 mm.
- 5 Protected against dust
- 6 Totally protected against dust

Table II

- 0 No protection
- 1 Protected against dripping vertical water.
- 2 Protected against spraying water up to 15°
- 3 Protected against rain.
- 4 Protected against sprays of water.
- 5 Protected against jets of water.
- 6 Protected against waves of water.
- 7 Protected against immersion.
- 8 Protected against submersion.

The degree of protection of electric motor cover is expressed by the two letter IP followed by two numbers. The first number (see table I) is the degree of protection against solid bodies as indicated. The second number (see table II) is the degree of protection against harmful penetration of water.

Example : Protection IP 44 = Protected against 1mm. solid parts and water spray.

USEFUL FORMULAS

Pa = Input Power (kW)

Pr = Output power (kW)

U = Voltage (Volt)

I = Current (Ampere)

Q = Pump delivery (lt / min.)

p = Pressure (bar)

M = Torque (Nm)

n = Speed (n / min.)

η = Efficiency (%)

Power

$$Pa = U \times I$$

$$Pr = 0,105 \times M \times n$$

$$Pr = \frac{Q \times p}{600}$$

Torque

$$M = 9,55 \times \frac{Pr}{n}$$

Efficiency

$$\eta = \frac{Pr}{Pa}$$

ELECTRIC D:C: MOTORS ORDER CODE

CA	2000	24	2000	151	RA	VA	Q
- TYPE							
- POWER (W)							
- VOLTAGE (V)	12, 24, 36, 40, 48, 60, 72, 80						
- MOTOR SPEED (n / min.)							
- MOTOR DIAMETER (mm.)							
- TYPE OF WINDING							
- TYPE OF FAN							
- NUMBER OF BRUSHES							

TYPE

- CA** Wound Field Motor
MP Permanent Magnet Motor

MOTOR DIAMETER

We built electric D.C. motors with following diameters:

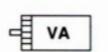
102, 113, 125, 151, 191, 244. (mm.)

TYPE OF WINDING

We can supply: series wound **RA** or **RB**, compound wound **NA**, shunt wound **PA** and permanent magnet **MP**.

TYPE OF FAN

Identifiable from external appearance



fan cooled motors

motor without fan

NUMBER OF BRUSHES

Z 2 brushes

Q 4 brushes

TB 8 brushes

TC 12 brushes

ACCESSORIES AVAILABLE ON REQUEST

- Start contactors
- Foot mounting
- Thermal protections and detectable wear systems

ELECTRIC - HYDRAULIC PUMP ORDER CODE

EP	3000	24	1580	151	RA	VA	Q	+	4 GR2 S V																																				
<p>- TYPE _____</p> <p>- POWER (W) _____</p> <p>- VOLTAGE (V) 12, 24, 36, 40, 48, 60, 72, 80</p> <p>- MOTOR SPEED (n / min.) _____</p> <p>- MOTOR DIAMETER (mm.) _____</p> <p>- TYPE OF WINDING _____</p> <p>- TYPE OF FAN _____</p> <p>- NUMBER OF BRUSHES _____</p> <p>- TYPE OF PUMP _____</p>																																													
TYPE <input type="checkbox"/> EP Electro-hydraulic pump for lifting application <input type="checkbox"/> SE Electro-hydraulic pump for steering system <input type="checkbox"/> E Electro - hydraulic pump special type																																													
MOTOR DIAMETER <p>We built electro-hydraulic pumps with following diameters:</p> <p>102, 113, 125, 151, 191, 244. (mm.)</p>																																													
TYPE OF WINDING <p>We can supply: series wound RA or RB, compound wound NA, shunt wound PA and permanent magnet MP.</p>																																													
TYPE OF FAN <p>Identifiable from external appearance</p>																																													
NUMBER OF BRUSHES <input type="checkbox"/> Z 2 brushes <input type="checkbox"/> Q 4 brushes <input type="checkbox"/> TB 8 brushes <input type="checkbox"/> TC 12 brushes																																													
TYPE OF PUMP: DISPLACEMENT, GROUP, ROTATION.																																													
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>1,1</td><td>1,4</td><td>1,7</td><td>2,1</td><td>2,5</td><td>3,2</td><td>3,7</td><td>4,3</td><td>4,8</td><td>5</td><td></td></tr> <tr><td>4</td><td>5,5</td><td>6,3</td><td>8</td><td>9,5</td><td>11,3</td><td>14</td><td>15,8</td><td>17</td><td>20,8</td><td>23,4</td></tr> <tr><td>22,5</td><td>26,4</td><td>33,7</td><td>39,4</td><td>42,7</td><td>51,4</td><td>60</td><td></td><td></td><td></td><td></td></tr> </table>	1,1	1,4	1,7	2,1	2,5	3,2	3,7	4,3	4,8	5		4	5,5	6,3	8	9,5	11,3	14	15,8	17	20,8	23,4	22,5	26,4	33,7	39,4	42,7	51,4	60					<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>GR1</td></tr> <tr><td>GR2</td></tr> <tr><td>GR3</td></tr> </table>	GR1	GR2	GR3	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>S</td></tr> <tr><td>S</td></tr> <tr><td>S</td></tr> </table>	S	S	S	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>V</td></tr> <tr><td>V</td></tr> <tr><td>V</td></tr> </table>	V	V	V
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<i>Displacements cm³/rev</i>																																													
<i>Group</i>																																													
<i>Rotation</i>																																													
D Clockwise S Anticlockwise DS Reversible																																													
V Gear pump with relief valve																																													
ACCESSORIES AVAILABLE ON REQUEST																																													
<input type="checkbox"/> Start contactors <input type="checkbox"/> Foot mounting <input type="checkbox"/> Thermal protections and detectable wear systems <input type="checkbox"/> Multiple gear pumps																																													

Company:

Contact person:

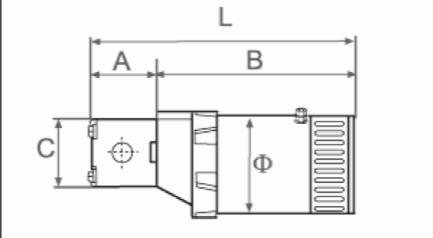
Tel.:

Fax:

E-mail:

ELECTRO HYDRAULIC PUMPS ENQUIRY FORM

Dimensions of existing pumps:

	A = <input type="text"/> mm. B = <input type="text"/> mm C = <input type="text"/> mm L = <input type="text"/> mm Diameter = <input type="text"/> mm
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Electro Hydraulic Pump data :

<input type="radio"/> FOR STEERING <input type="radio"/> FOR LIFTING
POWER: <input type="text"/> WATT VOLTAGE: <input type="text"/> VOLT SPEED: <input type="text"/> r.p.m.
Pump displacement: <input type="text"/> cm ³ /rev. <input type="checkbox"/> with relief valve Max Working Pressure: <input type="text"/> bar Max Oil Delivery: <input type="text"/> L/min
Type of winding: <input type="radio"/> series wound Number of terminals <input type="radio"/> 2 (1 speed) <input type="radio"/> compound wound <input type="radio"/> 3 (2 speed) <input type="radio"/> shunt wound <input type="radio"/> permanent magnet
Duty Cycle: <input type="checkbox"/> continuous S1 <input type="checkbox"/> Short time S2 <input type="text"/> min. <input type="checkbox"/> intermittent periodic S3 <input type="text"/> %
Enclosure: <input type="radio"/> IP 20 <input type="radio"/> IP <input type="text"/>

ACCESSORIES:

<input type="checkbox"/> Thermal protection <input type="checkbox"/> 90°C <input type="checkbox"/> 110°C <input type="checkbox"/> 130°C <input type="checkbox"/> Brush detectable wear system
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NOTES:

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Company: Contact person: Tel.: Fax: E-mail: **D.C.- MOTOR ENQUIRY FORM**

Many years of experience have indicated that for optimum cost, performance and reliability, a great many details are very important. Therefore before offering equipment we would ask you to complete the following details, and return the complete questionary to our Technical Dpt. at your earliest convenience.

POWER:	<input type="text"/> WATT
VOLTAGE:	<input type="text"/> VOLT
SPEED:	<input type="text"/> r.p.m.
Type of winding:	<input type="radio"/> series wound Number of terminals <input type="radio"/> 2 (1 speed) <input type="radio"/> compound wound <input type="radio"/> 3 (2 speed) <input type="radio"/> shunt wound <input type="radio"/> permanent magnet
Duty Cycle:	<input type="checkbox"/> continuous S1 <input type="checkbox"/> Short time S2 <input type="text"/> min. <input type="checkbox"/> intermittent periodic S3 <input type="text"/> %
Enclosure:	<input type="radio"/> IP 20 <input type="radio"/> IP <input type="text"/>

ACCESSORIES:

- | | | | |
|---|-------------------------------|--------------------------------|--------------------------------|
| <input type="checkbox"/> Thermal protection | <input type="checkbox"/> 90°C | <input type="checkbox"/> 110°C | <input type="checkbox"/> 130°C |
| <input type="checkbox"/> Brush detectable wear system | | | |

NOTES:

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HANSA · TMP srl CA - Wound Field Motors

CA 113 - Wound Field Motors 113 mm. diam.

100 - 700 W

12 - 80 V

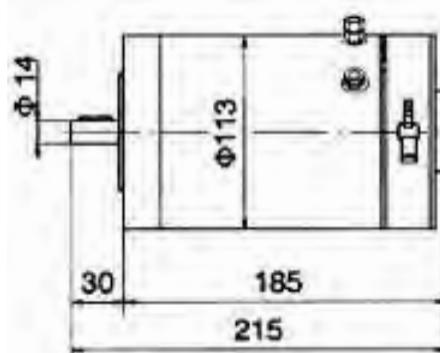
These shown below are only some example of diam. 113 Wound Field Motors that we manufacture.

Under request are available different lenghts , flanges , speed and power

350 W

12V	3000 n / min.
24V	2850 n / min.
36V	2800 n / min.
48V	2600 n / min.
72V	2700 n / min.
80V	2900 n / min.

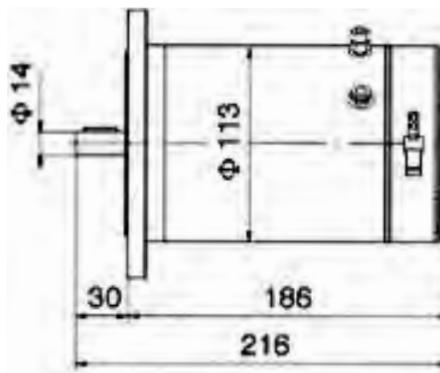
CA 113.1



500 W

12V	3000 n / min.
24V	2850 n / min.
36V	2820 n / min.
48V	2600 n / min.
72V	2700 n / min.
80V	2900 n / min.

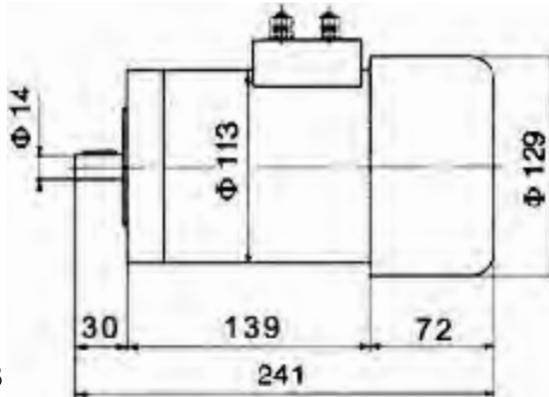
CA 113.2



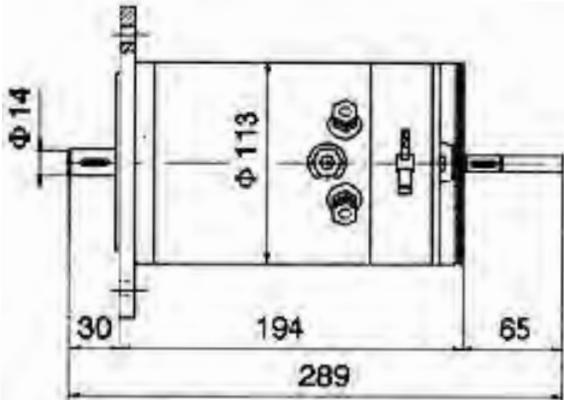
700 W

12V	2300 n / min.
24V	2200 n / min.
36V	2520 n / min.
48V	2600 n / min.
72V	2200 n / min.
80V	2330 n / min.

CA 113.3



CA 113.4



HANSA · TMP srl CA - Wound Field Motors

CA 125 - Wound Field Motors 125 mm. diam.

500 - 1.000 W

12 - 80 V

These shown below are only some example of diam. 125 Wound Field Motors that we manufacture.

Under request are available different lengths, flanges, speed and power

600 W

12V	3000 n / min.
24V	2950 n / min.
36V	3100 n / min.
48V	2850 n / min.
72V	2750 n / min.
80V	3300 n / min.

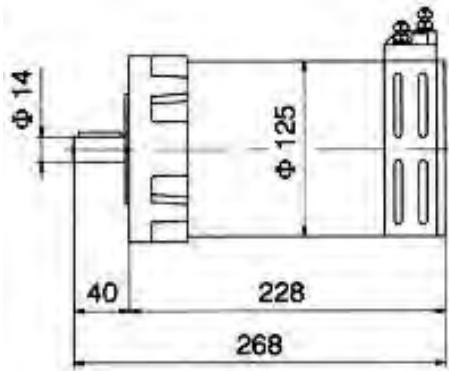
800 W

12V	1700 n / min.
24V	1950 n / min.
36V	2100 n / min.
48V	2230 n / min.
72V	2130 n / min.
80V	2200 n / min.

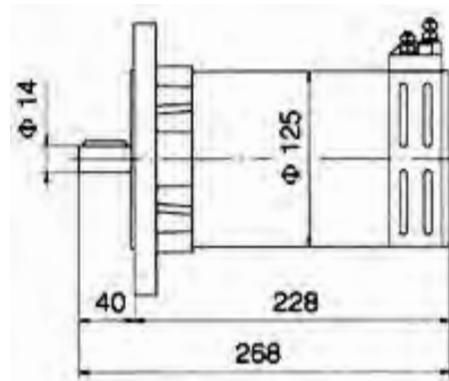
1000 W

12V	2300 n / min.
24V	2900 n / min.
36V	2620 n / min.
48V	2600 n / min.
72V	2200 n / min.
80V	2330 n / min.

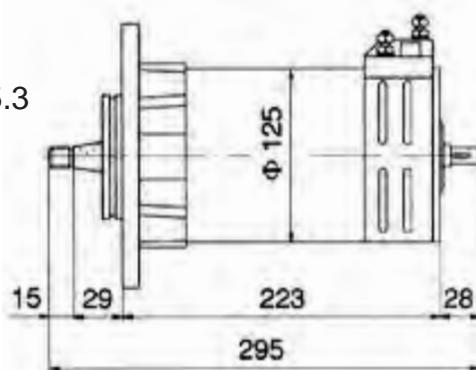
CA 125.1



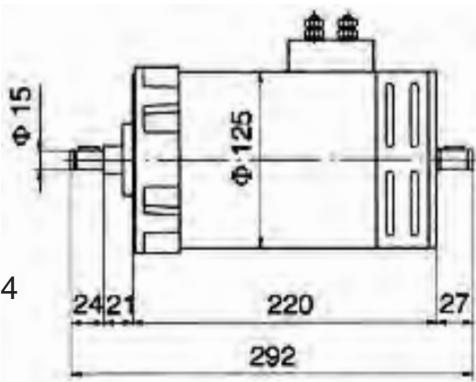
CA 125.2



CA 125.3



CA 125.4



HANSA · TMP srl CA - Wound Field Motors

CA 151 - Wound Field Motors 151 mm. diam.

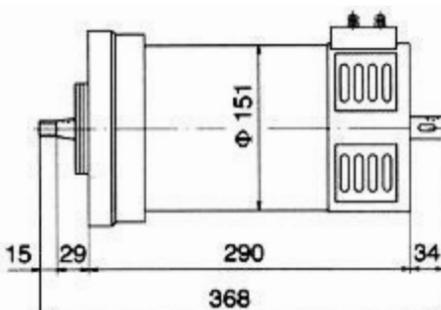
1.000 - 2.600 W

12 - 80 V

These shown below are only some example of diam. 151 Wound Field Motors that we manufacture.

Under request are available different lenghts , flanges , speed and power

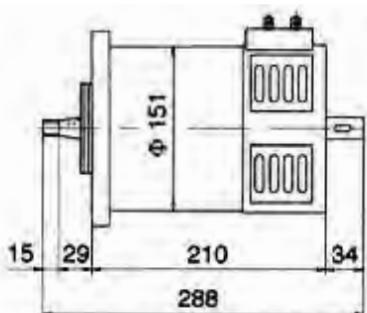
CA 151.1



1000 W

12V	2600 n / min.
24V	2850 n / min.
36V	2800 n / min.
48V	2630 n / min.
72V	2900 n / min.
80V	2710 n / min.

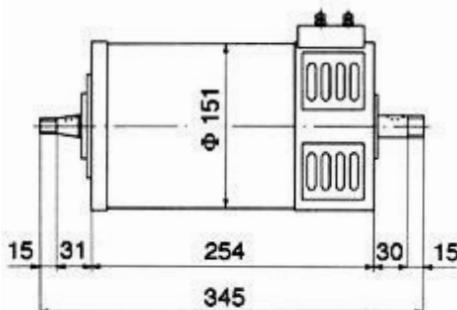
CA 151.2



1500 W

12V	1800 n / min.
24V	2100 n / min.
36V	2520 n / min.
48V	2600 n / min.
72V	2250 n / min.
80V	2000 n / min.

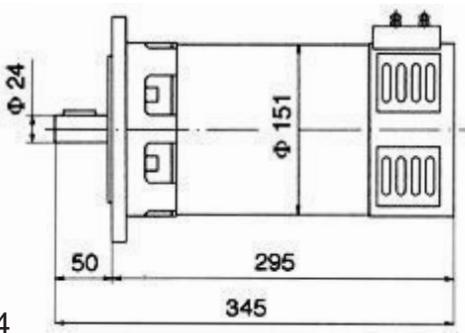
CA 151.3



2000 W

12V	1700 n / min.
24V	2000 n / min.
36V	2440 n / min.
48V	2600 n / min.
72V	2200 n / min.
80V	2330 n / min.

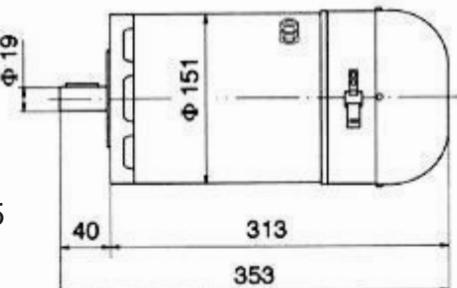
CA 151.4



4000 W

24V	2250 n / min.
36V	2520 n / min.
48V	2600 n / min.
72V	2280 n / min.
80V	2170 n / min.

CA 151.5



HANSA · TMP srl CA - Wound Field Motors

CA 191 - Wound Field Motors 191 mm. diam.

3.000 - 8.000 W

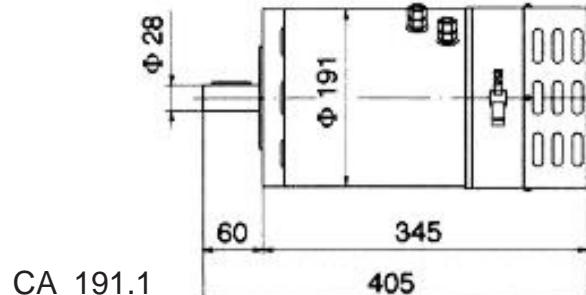
24 - 80 V

These shown below are only some example of diam. 191 Wound Field Motors that we manufacture.

Under request are available different lengths, flanges, speed and power

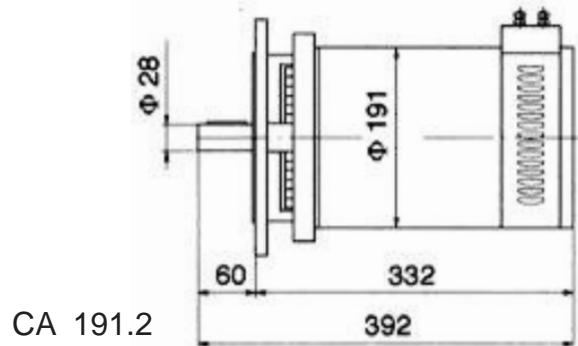
3000 W

24V	1500 n / min.
36V	1630 n / min.
48V	1800 n / min.
72V	2000 n / min.
80V	2200 n / min.



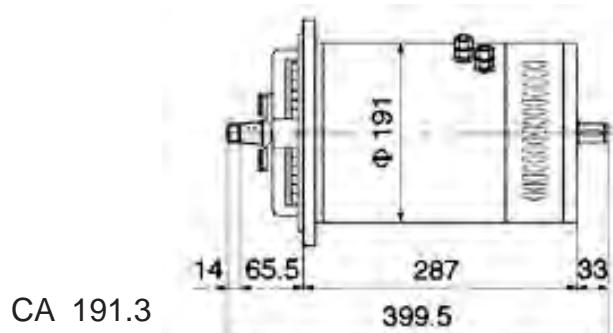
4000 W

24V	2150 n / min.
36V	2820 n / min.
48V	2600 n / min.
72V	2100 n / min.
80V	2300 n / min.



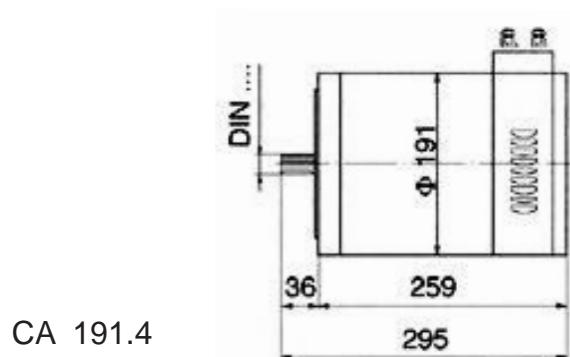
5000 W

48V	2800 n / min.
48V	2320 n / min.
48V	2600 n / min.
72V	2200 n / min.
80V	2330 n / min.



6000 W

48V	2200 n / min.
48V	1720 n / min.
48V	1800 n / min.
72V	2550 n / min.
80V	2650 n / min.



HANSA · TMP srl CA - Wound Field Motors

CA 244 - Wound Field Motors 244 mm. diam.

6.000 - 15.000 W

24 - 80 V

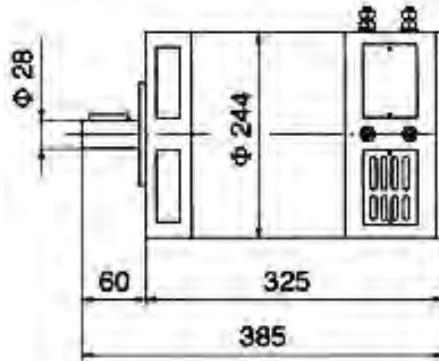
These shown below are only some example of diam. 244 Wound Field Motors that we manufacture.

Under request are available different lengths , flanges , speed and power

6000 W

24V	2160 n / min.
36V	1600 n / min.
48V	1920 n / min.
72V	1500 n / min.
80V	1650 n / min.

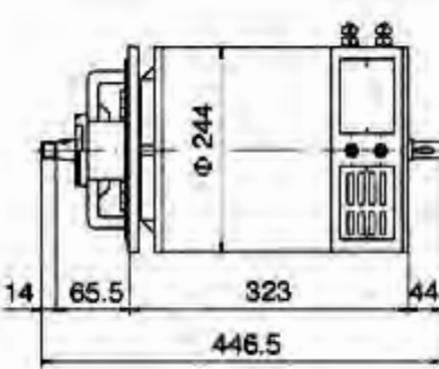
CA 244.1



8000 W

36V	1620 n / min.
48V	1400 n / min.
72V	1950 n / min.
80V	1840 n / min.

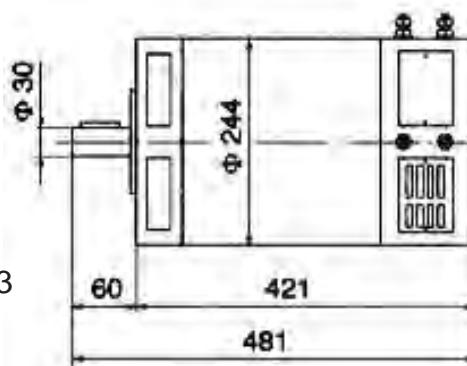
CA 244.2



10000 W

48V	1400 n / min.
72V	1800 n / min.
80V	2100 n / min.

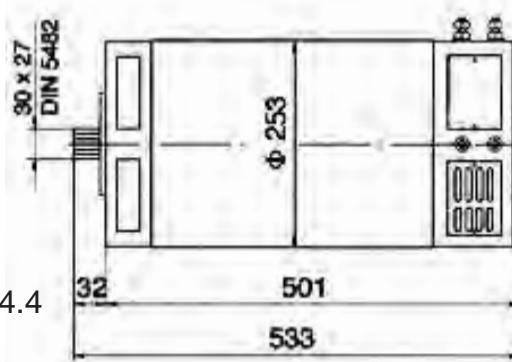
CA 244.3



14000 W

48V	2250 n / min.
72V	2280 n / min.
80V	2350 n / min.

CA 244.4



Contents

MP d = 102 - Permanent Magnet Motor	100 - 200 W	pag.	19
MP d = 113 - Permanent Magnet Motor	200 - 700 W	pag.	20
MP d = 125 - Permanent Magnet Motor	400 - 800 W	pag.	21
MP d = 151 - Permanent Magnet Motor	1.000 - 2.000 W	pag.	22

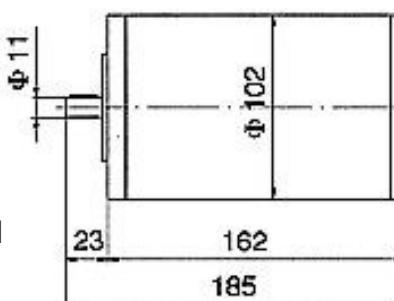
MP 102 - Permanent Magnet Motors 102 mm. diam.

100 - 200 W

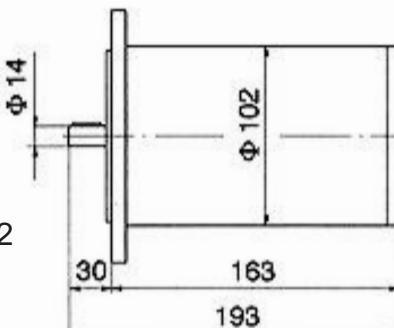
12 - 80 V

These shown below are only some example of diam. 102 Permanent Magnet Motors that we manufacture.
Under request are available different lenghts , flanges , speed and power

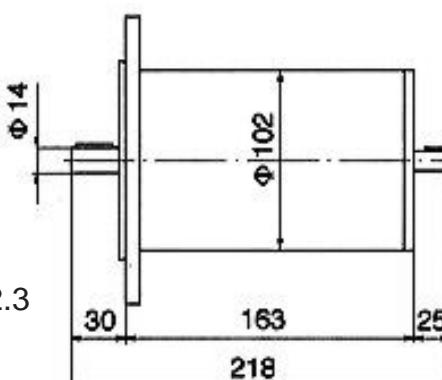
MP 102.1



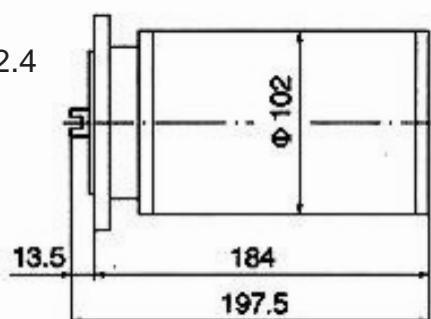
MP 102.2



MP 102.3



MP 102.4



100 W

12V	3000 n / min.
24V	2600 n / min.
36V	2800 n / min.
48V	1800 n / min.
80V	2100 n / min.

200 W

12V	1950 n / min.
24V	2000 n / min.
36V	2200 n / min.
48V	2800 n / min.
80V	3000 n / min.

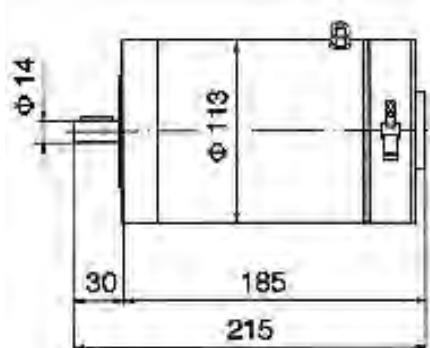
MP 113 - Permanent Magnet Motors 113 mm. diam.**200 - 700 W****12 - 80 V**

These shown below are only some example of diam. 113 Permanent Magnet Motors that we manufacture. Under request are available different lengths , flanges , speed and power

350 W

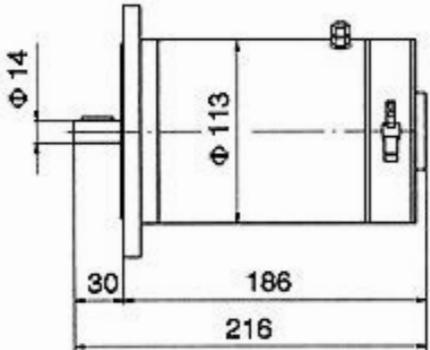
12V	1450 n / min.
24V	1500 n / min.
36V	1600 n / min.
48V	1850 n / min.
72V	1620 n / min.
80V	1710 n / min.

MP 113.1

**500 W**

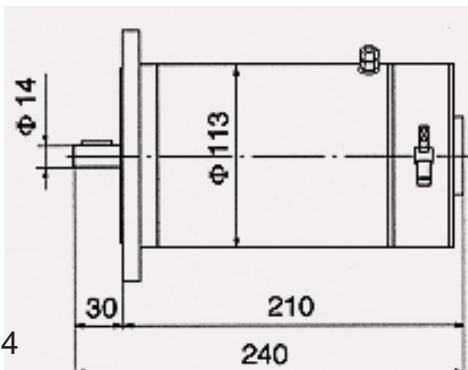
12V	2700 n / min.
24V	2850 n / min.
36V	2520 n / min.
48V	2600 n / min.
72V	2250 n / min.
80V	2500 n / min.

MP 113.2

**700 W**

12V	1700 n / min.
24V	1400 n / min.
36V	2220 n / min.
48V	1680 n / min.
72V	1550 n / min.
80V	1630 n / min.

MP 113.4



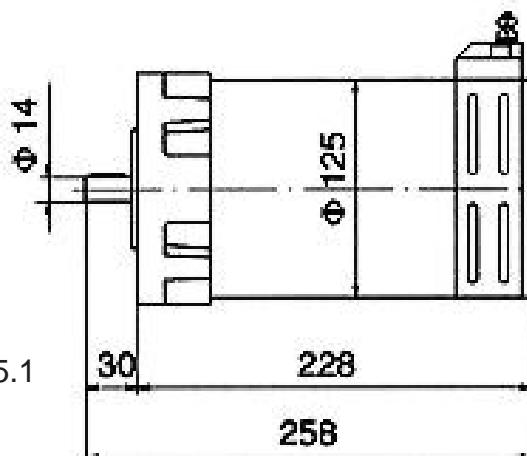
MP 125 - Permanent Magnet Motors 125 mm. diam.**400 - 800 W****12 - 80 V**

These shown below are only some example of diam. 125 Permanent Magnet Motors that we manufacture.
Under request are available different lengths , flanges , speed and power

600 W

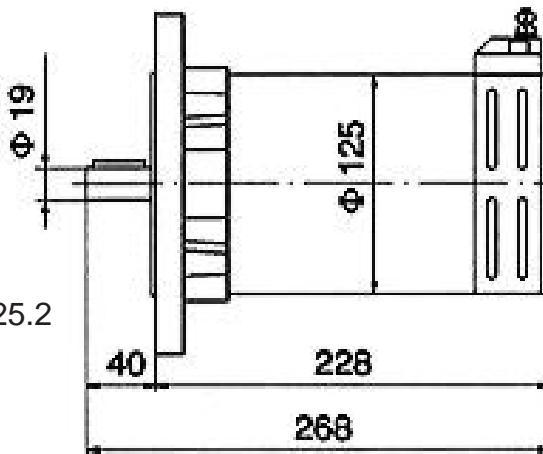
12V	2770 n / min.
24V	3000 n / min.
36V	2580 n / min.
48V	2860 n / min.
72V	2350 n / min.
80V	2500 n / min.

MP 125.1

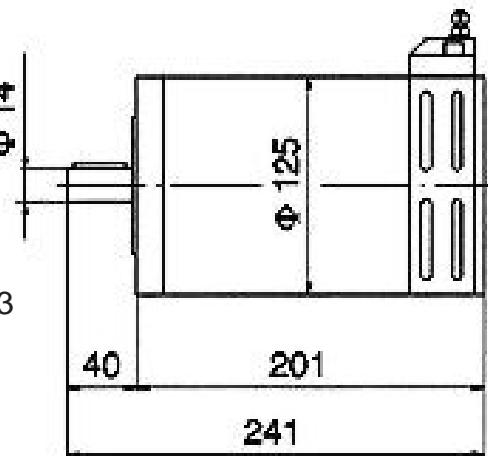
**800 W**

12V	1950 n / min.
24V	2290 n / min.
36V	2200 n / min.
48V	2780 n / min.
72V	2550 n / min.
80V	2800 n / min.

MP 125.2



MP 125.3

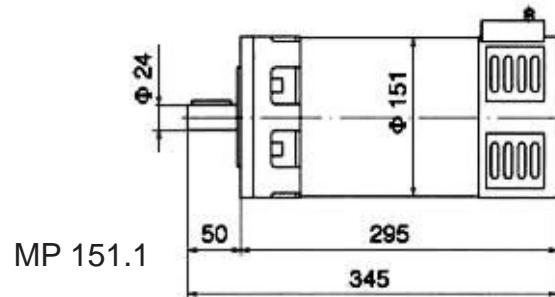


MP 151 - Permanent Magnet Motors 151 mm. diam.**1.000 - 2.000 W****12 - 80 V**

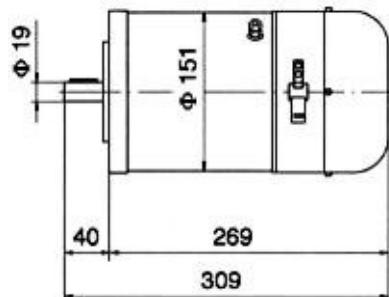
These shown below are only some example of diam. 151 Permanent Magnet Motors that we manufacture.
Under request are available different lenghts , flanges , speed and power

1000 W

12V	2600 n / min.
24V	1850 n / min.
36V	2300 n / min.
48V	2440 n / min.
72V	2830 n / min.
80V	3000 n / min.



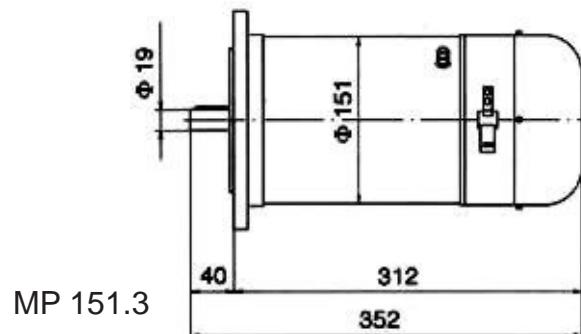
MP 151.1



MP 151.2

1500 W

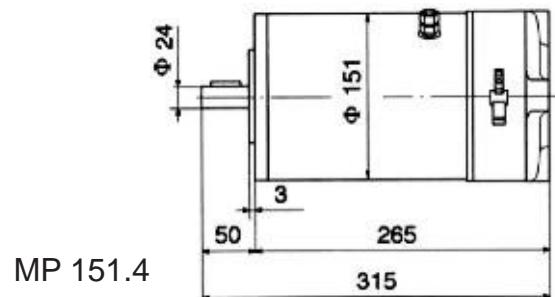
12V	1800 n / min.
24V	2500 n / min.
36V	2520 n / min.
48V	2600 n / min.
72V	2250 n / min.
80V	1400 n / min.



MP 151.3

2000 W

12V	1700 n / min.
24V	2000 n / min.
36V	1710 n / min.
48V	2600 n / min.
72V	2200 n / min.
80V	2330 n / min.



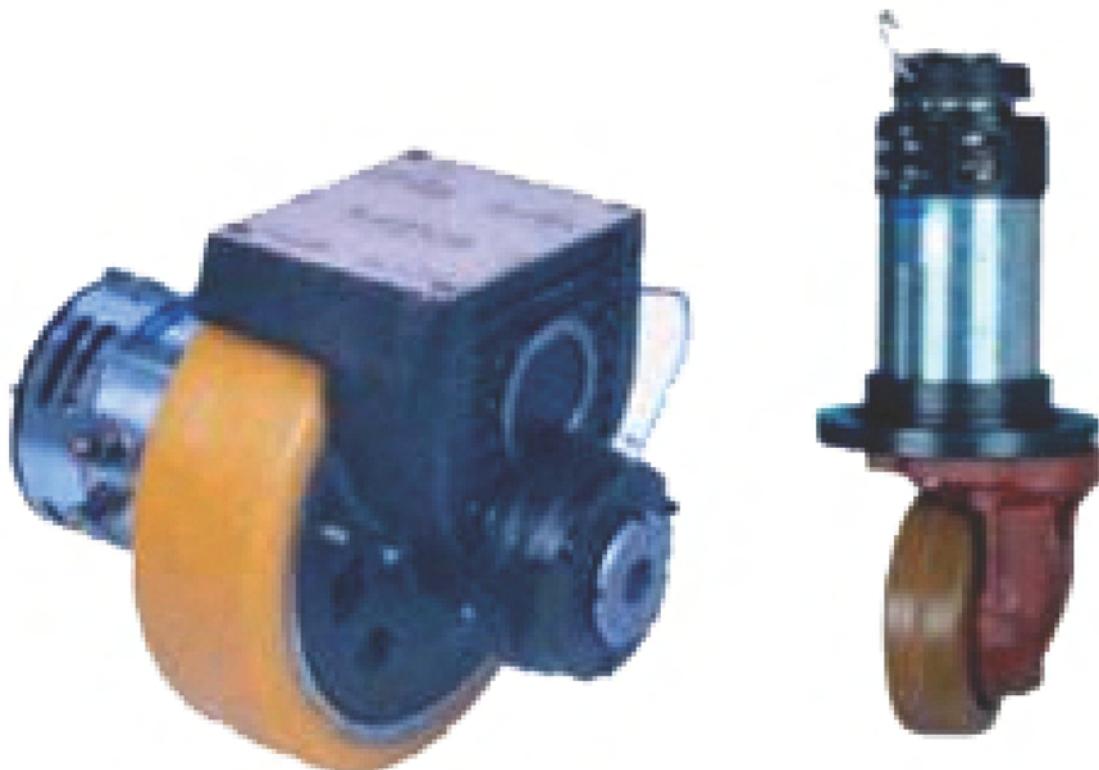
MP 151.4



HYDRAULICCOMPONENTS
HYDROSTATICTRANSMISSIONS
GEARBOXES -ACCESSORIES

HT 38 / A / 102 / 1004 / E

DC MOTOR WHEEL UNITS STEERING GEAR MOTORS



Contents

General Information	pag. 3
MRT - Motor in Wheel Units	pag. 4
MRD - Steering Gear Motors	pag. 5 - 7

GENERAL INFORMATION (continued)

DESIGN FEATURES

Type of winding	- The motor range includes :	<ul style="list-style-type: none"> - Wound field motors - Series wound - Compound wound - Shunt wound - Permanent Magnet motor
Enclosure	-	Enclosure from IP 20 up to IP 56 can be supplied.
Insulation Class F	-	Achieved by class H insulated wire, in conjunction by epoxy paints and resins. This guarantees high strength and reliability at up to 155°C winding temperature.
Bearings	-	Selected quality ball bearings with double shield and internal lubrication. On request high temperature grease or C3 tolerance bearings can be supplied.
Brushes	-	Made of carbon or graphite-metal depending on the motor characteristic. Easy to reach and maintain or, if necessary replace.
Accessories	-	Available on request : electromagnetic brakes, start contactors, thermal protection and detectable wear system, worm and planetary gearboxes, tachogenerator or encoder, forced ventilation, foot mounting adapter.

Motor

Characteristics - Speed and torque of a D.C. motor , and therefore also volumetric flow and pressure of the driven pumps, are interrelated as shown in the graphs.
The type of winding determines the curve shape.

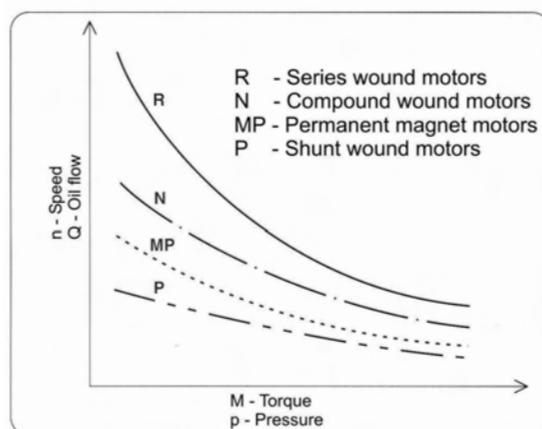
Series wound motors are characterized by excellent starting torque.

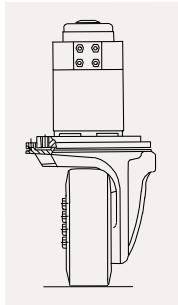
One should also note the high idle speed.

Shunt wound motors have the benefit of maintaining a practically constant speed irrespective of load variation; they have low starting torque and high starting current.

Permanent Magnet motors perform like shunt wound motors but in permanent magnet motors generally the variation in speed is greater as load changes.

As on see from the diagram, compound wound motors have intermediate features in comparison with series and shunt wound motors.



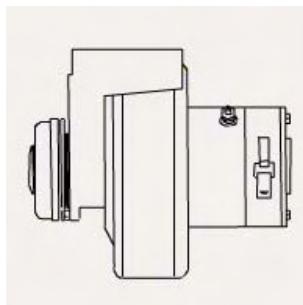
MRT - VERTICAL WHEEL DRIVE
1.500 - 3.800 W 12 - 80 V


All the models are available with rotating motor where the motor can turn together with the gear; or with a fixed motor in which case the gear can turn but the motor is fixed to the vehicle frame

	MRT 91	MRT 96	MRT 95	MRT 92	MRT 65	MRT 78
Max wheel load kg	900	1.200	2.000	2.400	1.500	1.800
Max motor power W	1.500	2.600	4.500	6.000	2.200	3.800
Max wheel torque Nm	380	500	940	1.455	440	770
Tyre diameter mm	230	260	310	343	580	453 x 178 417 x 152

* Permissible acceleration and brake torque allowed on the wheel.

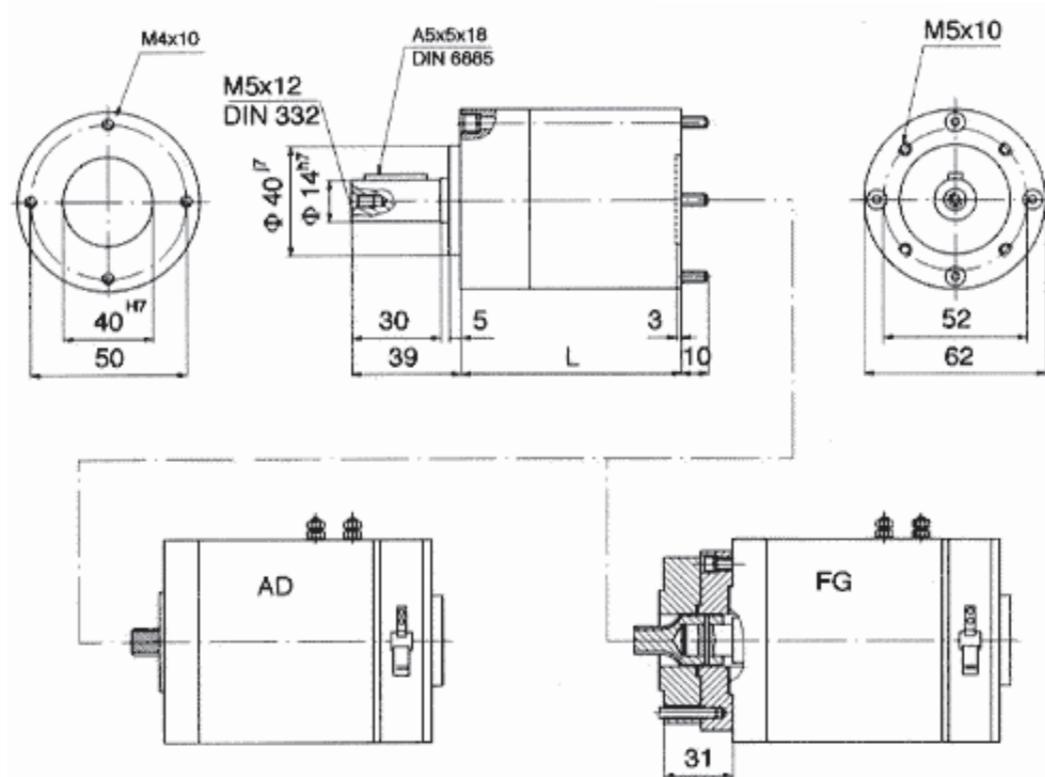
The continuous rating is shown on a single data sheet.

MRT - HORIZONTAL WHEEL DRIVE
300 - 2.200 W 12 - 80 V


	MRT 05	MRT 10	MRT 18	MRT 20	MRT 25	MRT 30	MRT 33	MRT 35
Max wheel load kg	600	660	900	900	1.000	1.000	1.800	1.800
Max motor power W	300	500	700	900	900	1000	2200	2200
Max wheel torque Nm	180	210	270	270	275	270	600	600
Tyre diameter mm	200	220	250	250	220	300	300	350

* Permissible acceleration and brake torque allowed on the wheel.

The continuous rating is shown on a single data sheet.

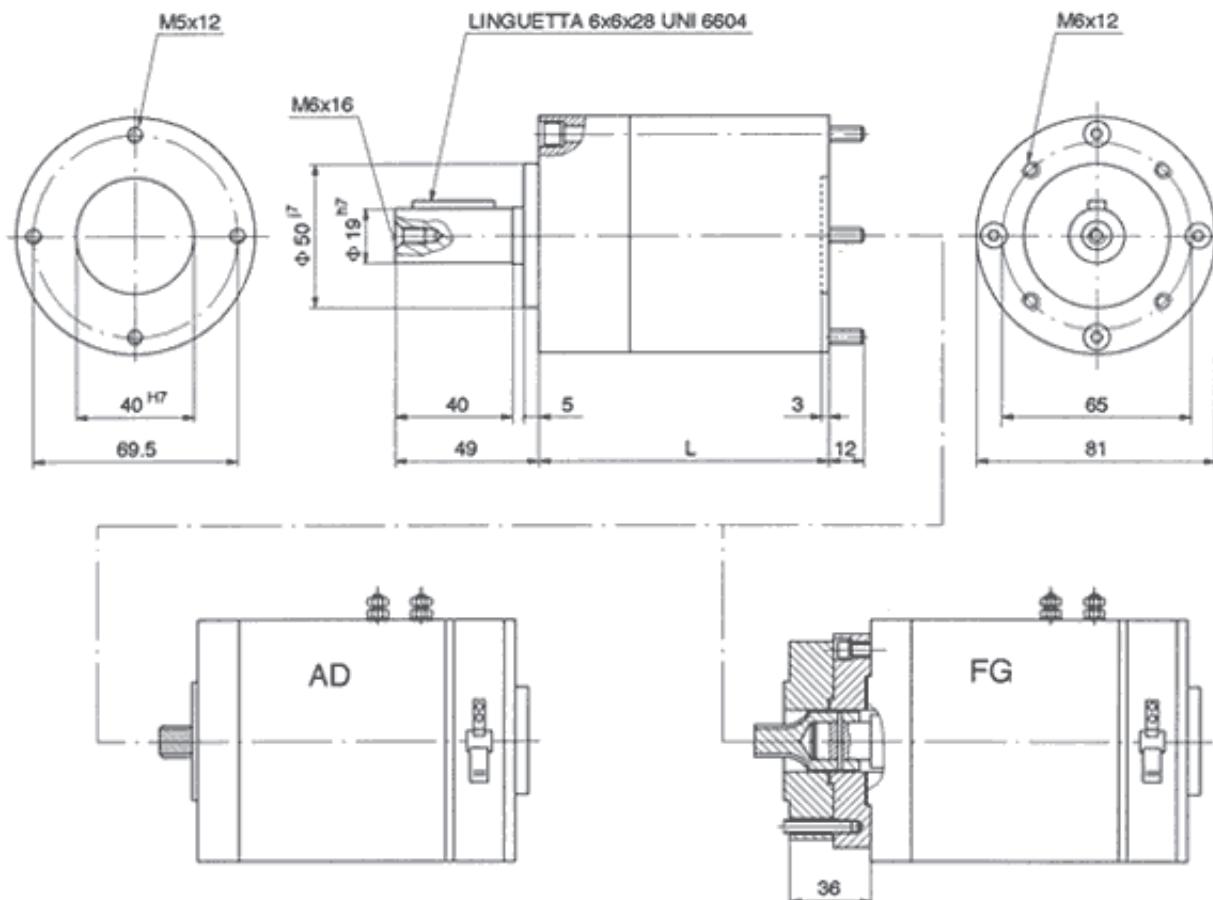
MRD - STEERING GEAR MOTORS
SP 62


	Stages		
	1	2	3
L mm	87	121	155

1:3.7 1:14 1:51
 4.2 16 59
 5.1 19 68
 6.7 22 71
 25 93
 29 100
 35 115
 46 130
 150
 181
 236

TECHNICAL DATA		1	2	3
Max input speed	r.p.m.	3000	3000	3000
Permitted output torque (CB=1)	Nm.	8	25	50
Efficency	~.	0.80	0.75	0.70
Radial Load (mid of shaft)	N	200	320	480
Axial load (center of shaft)	N	40	60	100
Lubrification	.	LIFETIME LUBRIFICATION GREASE		
Operating temperature	°C	- 20	+80(*)	
Weight	Kg	1	1.4	1.8

(*) SPECIAL GREASE ARE AVAILABLE FOR OPERATING TEMPERATURE OF -30 +120°C

MRD - STEERING GEAR MOTORS
SP 81


	Stages		
	1	2	3
L mm	72	94	115

1:3.7 1:14 1:51

4.2 16 59

5.1 19 68

6.7 22 71

25 93

29 100

35 115

46 130

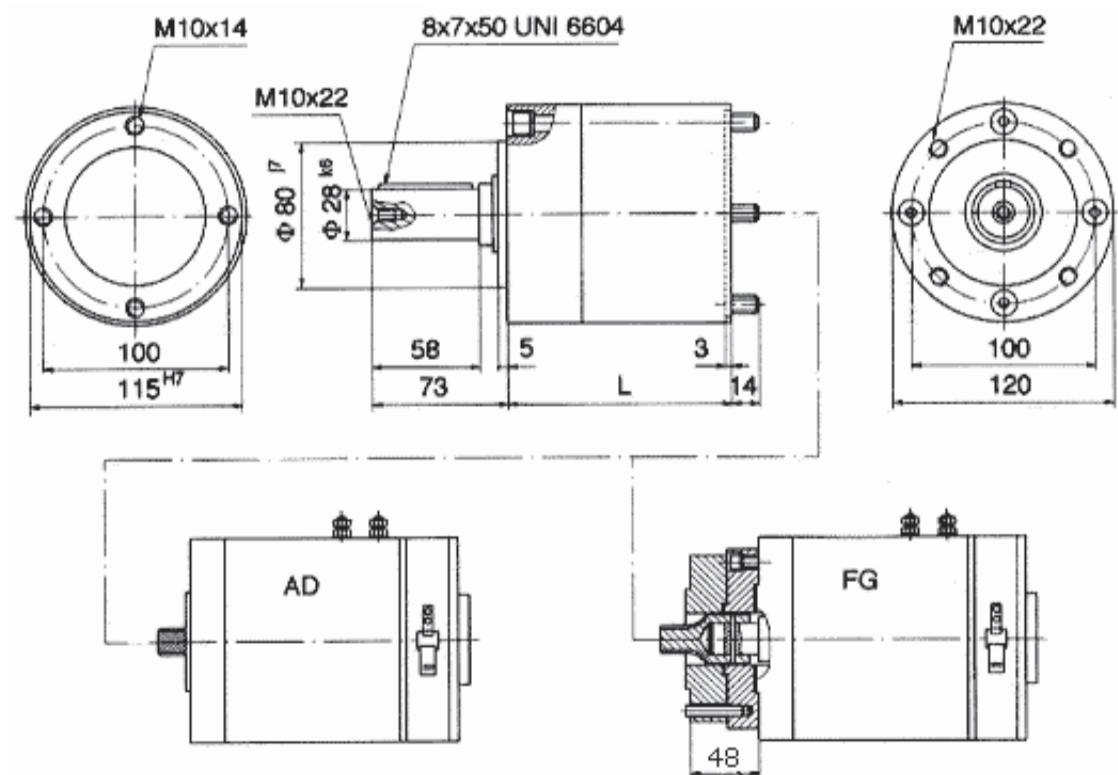
150

181

236

TECHNICAL DATA	1	2	3
Max input speed r.p.m.	3000	3000	3000
Permitted output torque Nm.	20	60	120
Efficency ~.	0.80	0.75	0.70
Radial load (mid of shaft) N	400	600	980
Axial load (center of shaft) N	80	120	200
Lubrification .	GRASSO DI LUNGA DURATA		
Operating temperature °C	- 20	+ 80(*)	
Weight Kg	1.8	2.5	3.2

(*) SPECIAL GREASES ARE AVAILABLE FOR OPERATING TEMPERATURE OF -30 +120°C

MRD - STEERING GEAR MOTORS
SP 120


	Stages		
	1	2	3
L mm	87	121	155
1:4	1:14	1:51	
7	25	93	
46	169		
	308		

TECHNICAL DATA	1	2	3
Max input speed r.p.m.	3000	3000	3000
Permitted output torque (CB=1) Nm.	50	150	300
Efficency ~.	0.80	0.75	0.70
Radial load (mid of shaft) N	500	800	1400
Axial load (center of shaft) N	120	180	300
Lubrification .	LIFETIME LUBRIFICATION GREASE		
Operating temperature °C	- 20	+ 60(*)	
Weight Kg	5.5	7.9	10.4

(*) SPECIAL GREASE ARE AVAILABLE FOR OPERATING TEMPERATURE OF -15 +80°C



As HANSA-TMP has a very extensive range of products and some products have a variety of applications, the information supplied may often only apply to specific situations.

If the catalogue does not supply all the information required, please contact HANSA-TMP. In order to provide a comprehensive reply to queries we may require specific data regarding the proposed application.

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