

BOSCH



CATÁLOGO 2004 | 2005

Motores Elétricos Motores Eléctricos Electric Motors



Aplicações industriais
Aplicaciones industriales
Industrial applications

Tecnologia e qualidade Bosch disponível para a indústria

A maioria das indústrias automobilísticas do mundo se beneficiam com a inovação tecnológica e o alto padrão de qualidade dos produtos desenvolvidos pela Bosch.

Nada mais natural do que estender a oferta de produtos para outros setores da indústria, começando por uma linha que possibilita inúmeras aplicações, a de motores elétricos.

Foram criados departamentos especiais em diversos países, responsáveis por suprir as exigências de suporte técnico e de fornecimento desses fabricantes, qualquer que seja seu porte.

O objetivo é oferecer aos clientes da indústria produtos com preços competitivos, por serem fabricados em larga escala, e que atendem aos rigorosos padrões de qualidade da indústria automotiva.

Tecnología y calidad Bosch disponible para la industria

La mayoría de las industrias automovilísticas del mundo se benefician con la innovación tecnológica y el alto estándar de calidad de los productos desarrollados por Bosch.

Nada más natural que extender la oferta de productos para otros sectores de la industria, comenzando por una línea que posibilita innumerables aplicaciones, la de motores eléctricos.

Se crearon departamentos especiales en diversos países, responsables de suplir las exigencias de soporte técnico y de suministro de esos fabricantes, de cualquier porte.

El objetivo es ofrecer a los clientes de la industria productos con precios competitivos, por fabricarse en larga escala, y que atienden a los rigurosos patrones de calidad de la industria automotriz.

Bosch technology and quality available for industry

Most automotive manufacturers worldwide take advantage of technological innovation and outstanding quality of products developed by Bosch.

There is nothing more natural than to extend our product supply to other industries. A product line to start with is that of electric motors which provides a variety of applications.

Special departments have been created in different countries. They are responsible for providing technical support and meeting supply demands by those manufacturers, whatever its size may be.

Our goal is to provide our industry customers with products at competitive prices for the fact that they are manufactured on a large scale and comply with strict quality standards in the automotive industry.

Conheça algumas das diversas aplicações industriais dos motores elétricos Bosch, no final deste catálogo.

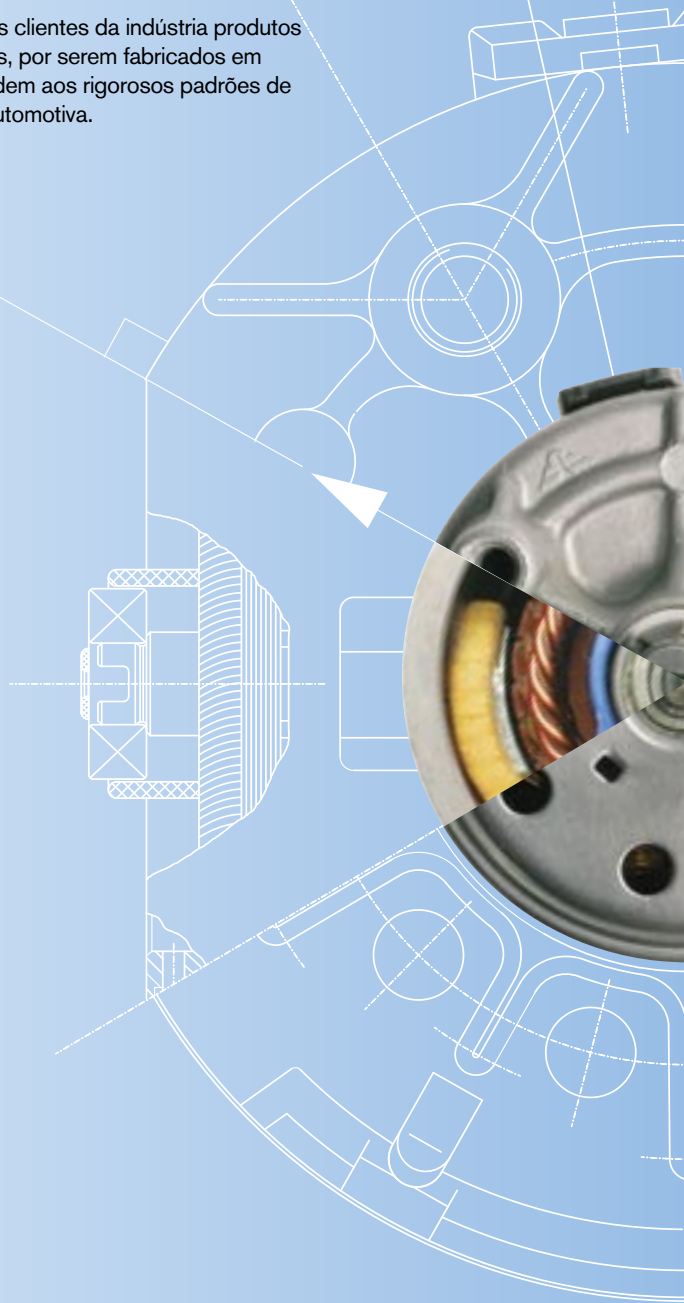
Para obter informações sobre especificações técnicas, aplicações ou fornecimento de motores elétricos, por favor contate o escritório responsável por vendas industriais (última capa deste catálogo).

Conozca algunas de las diversas aplicaciones industriales de los motores eléctricos Bosch, al final de este catálogo.

Para obtener informaciones sobre especificaciones técnicas, aplicaciones o suministro de motores eléctricos, por favor contacte la oficina responsable de ventas industriales (contraportada de este catálogo).

Learn more about some of different industrial applications of Bosch electric motors in the final pages of this catalog.

For further information on technical specifications, applications or supply of electric motors, please contact our local sales office in charge of industry customers (see the last page of this catalog).



Motores elétricos

Motores eléctricos

Electric motors

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NOTAS

Este catálogo relaciona as peças padrão fornecidas, com todas as informações técnicas normalmente exigidas pelos engenheiros, para selecionar o melhor motor para seus requisitos particulares. Estes motores foram projetados originalmente para serem usados na indústria automobilística. Antes de usar os motores para qualquer outra aplicação que não sejam as especificadas, recomendamos uma consulta à Bosch; principalmente no caso de outros requisitos, cargas, ou condições ambientais.

NOTAS

Este catálogo relaciona las autopartes estándar suministradas, con todas las informaciones técnicas normalmente exigidas por los ingenieros, para seleccionar el mejor motor según sus requisitos particulares. Estos motores fueron proyectados originalmente para ser usados en la industria automovilística. Antes de utilizar los motores en cualquier otra aplicación que no sea de las especificadas, recomendamos que consulte a Bosch; principalmente en el caso de otros requisitos, cargas, o condiciones ambientales.

Veja explicação
sobre as tabelas na
página 4.

Véase explicación
sobre las tablas en
la página 4.

NOTES

This catalog lists available standard parts and all technical data usually required by engineers to select the best motors for their particular demands. These motors were originally designed for use in the automotive industry. Before their use in any application other than those specified, we recommend that you always consult Bosch particularly in case of different demands, loads or environmental conditions.



Como utilizar este catálogo

Como utilizar este catalogo

How to use this catalog



Tipo de motor
Tipo del motor
Motor type

Tensão nominal
Tensión nominal
Nominal voltage

Potência nominal
Potencia nominal
Nominal power

U_N Tensão nominal
Tensión nominal
Nominal voltage

P_N Potência nominal
Potencia nominal
Nominal power

n_N Rotação nominal
Rotación nominal
Nominal speed

I_N Corrente nominal
Intensidad nominal
Nominal current

M_A Torque de bloqueio
Par de arranque
Breakaway torque

Rot. Direção de rotação: Direita (R) ou Esquerda (L)
Sentido de giro: Derecho (R) o Izquierdo (L)
Direction of rotation: Left (L) or Right (R)

S Classe de funcionamento
Clase de funcionamiento
Type of duty

IP Grau de proteção
Grado de protección
Degree of protection

kg Peso
Weight
Peso

Número de tipo
Referencia de pedido
Part number

Aplicações Industriais / Aplicaciones Industriales / Industrial Applications

BOSCH

BPA

12 V 24 W

U_N	12 V
P_N	24 W
n_N	1500 rpm
I_N	2 A
M_A	28 Nm
R_{rot}	L
S	S1
IP	IP 10
k_g	0,500 kg
GB	9 128 901 943

24 V 11 W

U_N	24 V
P_N	11 W
n_N	2300 rpm
I_N	0,45 A
M_A	28 Nm
R_{rot}	L
S	S1
IP	IP 10
k_g	0,480 kg
GB	9 128 901 938

A Versão do Terminal (Versão de 12V e 24V)
Versão do Terminal (Versão de 12V e 24V)
Versão do Terminal (Versão de 12V e 24V)

B Versão do Terminal (Versão de 12V e 24V)
Versão do Terminal (Versão de 12V e 24V)
Versão do Terminal (Versão de 12V e 24V)

C Versão do Terminal (Versão de 12V e 24V)
Versão do Terminal (Versão de 12V e 24V)
Versão do Terminal (Versão de 12V e 24V)

Esquema elétrico
Esquema eléctrico
Electrical diagram

Desenho dimensional
Diseño dimensional
Dimensional drawing

Curva característica
Curva característica
Characteristic curve

Dados técnicos

Valor nominal

Valor da variável (exemplo voltagem, corrente, resistência, etc.) pelo qual um motor, ventilador, bomba, suas peças ou características são medidas e pelas quais são nomeadas.

Potência de entrada P_1

$$P_1 = U \cdot I$$

P_1 Potência de entrada em W

U Voltagem em V

I Corrente em A

Potência de saída P_2

A potência de saída P_2 é sempre especificada para motores.

$$P_2 = 2 \frac{\pi}{60} \cdot M \cdot n$$

P_2 potência de saída em W

M Torque em N · m

n velocidade em min^{-1}

Eficiência η

A eficiência é a relação entre a potência mecânica P_2 e a potência elétrica de entrada P_1 .

$$\eta = \frac{P_2}{P_1}$$

Exemplo:

A uma voltagem nominal de 24 V e uma corrente nominal de 35 A, a equação teórica de potência para a Potência de entrada P_1 é:

$$P_1 = U_N \cdot I_N; P_1 = 24 \text{ V} \cdot 35 \text{ A}; P_1 = 840 \text{ W}$$

Através desta potência de entrada P_1 e da potência de saída P_{2N} determinada pelo padrão de curva característica (ver fig. pág 8), podemos calcular a eficiência η :

$$\eta = \frac{P_{2N}}{P_1} = \frac{600 \text{ W}}{840 \text{ W}} = 0.71 = 71 \%$$

Torque M_N

O torque de um motor é calculado através da seguinte equação:

$$M_N = \frac{60}{2\pi} \frac{P_{2N}}{n}$$

Velocidade Nominal n_N

A velocidade nominal é a rotação do eixo do motor, alimentado com tensão nominal no ponto de torque nominal.

Sentido de rotação

Em relação ao sentido de rotação, as especificações aplicam-se quando se olha para o eixo do motor. Em casos onde existam dois eixos, o eixo oposto ao coletor é o que determina a direção da rotação.

Valores de curto-circuito

A corrente I_k é a corrente de entrada do motor em caso de um curto-circuito, por exemplo na condição de travamento do motor. O torque máximo M_k é efetivo em caso de curto-circuito.

Grau de proteção IP

Válido para equipamentos utilizados em veículos de estrada para DIN 40 050 (part9).

- Proteção interna para o equipamento elétrico contra os efeitos de corpos estranhos, inclusive poeira.
- Proteção interna para o equipamento elétrico contra entrada de água.
- Prevenção contra toques em partes internas perigosas¹⁾ da carcaça.

1) Peças mecânicas móveis.

Montagem

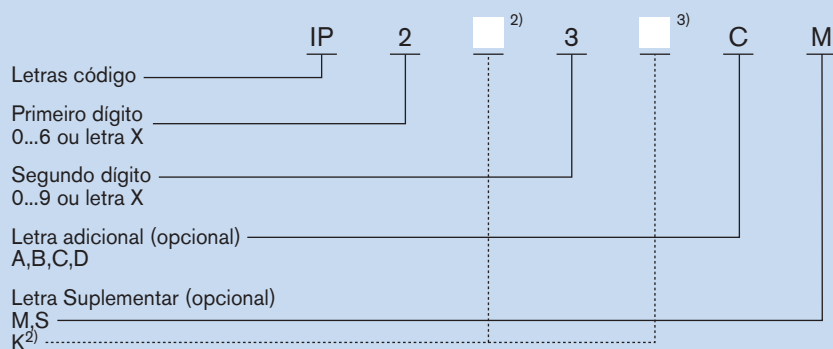
- Montagem da carcaça: Feita com a utilização de parafusos na carcaça, ou na caixa de redução. No caso dos ventiladores, isso também é feito por meio do uso de parafusos no motor ou no anel de defletor de ar.
- Montagem do flange: O escudo na parte anterior do motor possui um flange com dois ou três furos, ou há três ou quatro furos na face posterior destinados à montagem.

Resfriamento

- Resfriamento natural interno: Construção aberta, sem ventilador.
- Auto-resfriamento interno: Construção aberta, sem ventilador próprio.
- Resfriamento interno separado: Construção aberta, com ventiladores adaptados separadamente.
- Resfriamento natural de superfície: Construção fechada, sem ventilador.
- Auto-resfriamento de superfície: Construção fechada, com ventilador próprio.



Elementos do código IP



Se o dígito não for fornecido, ele deve ser substituído pela letra "X" (ex. "XX" se ambos os dígitos não forem mencionados).

Letras suplementares ou adicionais podem ser omitidas sem que tenham que ser substituídas.

²⁾ A letra suplementar "K" encontra-se imediatamente após os primeiros dígitos 5 e 6, ou imediatamente após os segundos dígitos 4, 6 e 9.

³⁾ Com o teste de água. Exemplo: IP16KB proteção contra a penetração de corpos estranhos sólidos com diâmetro maior ou igual a 50 mm, proteção contra jatos pesados de água com alta pressão, proteção contra contato com dedos.

Explicação do código IP

1º dígito e letra suplementar K	Proteção dos equipamentos contra penetração de corpos estranhos	Pessoal	2º dígito e letra suplementar K	Proteção do equipamento contra penetração de água	Letra (opcional)	Proteção de pessoal contra contato em partes perigosas	Letra (opcional)
0	Não protegido	Não protegido	0	Não protegido	A	Proteção contra contato com as costas da mão	M
1	Proteção contra corpos estranhos Ø ≥ 50 mm	Proteção contra toque com as costas da mão	1	Proteção contra água pingando verticalmente	B	Proteção contra contato com dedos	S
2	Proteção contra corpos estranhos Ø ≥ 12,5 mm	Proteção contra toque com dedos	2	Proteção contra água pingando numa inclinação de 15°	C	Proteção contra contato com ferramentas	
3	Proteção contra corpos estranhos Ø ≥ 2,5 mm	Proteção contra toques com ferramentas	3	Proteção contra spray de água	D	Proteção contra contato com ferramentas	
4	Proteção contra corpos estranhos Ø ≥ 1,0 mm	Proteção contra toques por fios	4	Proteção contra banho de água			
5K	Protegido contra poeira	Proteção contra toques por fios	4K	Proteção contra água sob pressão			
6K	Lacrado contra poeira	Proteção contra toques por fios	5	Proteção contra jatos de água			
			6	Proteção contra jatos fortes de água			
			6K	Proteção contra jatos de água com pressão			
			7	Proteção contra imersão rápida			
			8	Proteção contra imersão de longa duração			
			9K	Proteção contra limpeza de alta pressão/vapor			

Classes de funcionamento (VDE 0530)

Serviço contínuo S 1

Operação em carga contínua, com duração em que se pode alcançar um equilíbrio térmico suficiente.

Medidas para as curvas

P_1	potência de entrada
P_V	perda de potência
θ	temperatura
$\theta_{\max}$	temperatura máxima
t_B	tempo de carga
t_r	fator de duração relativa (em porcentagem)
t_S	duração do ciclo
t_{St}	tempo de permanência parada

Serviço de curta duração S 2

Operação em carga constante, duração em que, no entanto, não seja suficiente para alcançar o equilíbrio térmico, com uma parada subsequente que dure até que a temperatura do motor torne-se diferente da do resfriador em não mais que 2 K.

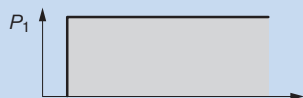
Exemplo: S 2 – 60 min.
(o tempo representa um intervalo de 60 minutos)

Serviço intermitente-periódico S 3

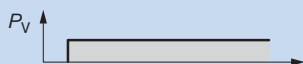
Operação composta de uma seqüência de ciclos idênticos na qual cada ciclo inclui um período numa carga constante e uma parada, onde a corrente inicial não possui nenhum efeito considerável no aquecimento.

Exemplo: S 3 – 10%
(a porcentagem refere-se ao fator da duração do ciclo)

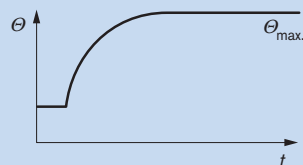
Potência de entrada



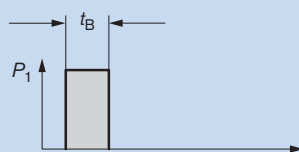
Perda de potência



Temperatura



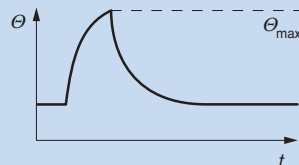
Potência de entrada



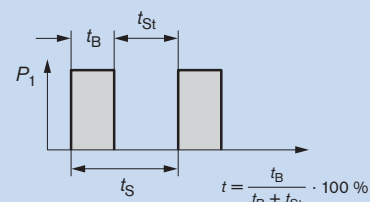
Perda de potência



Temperatura



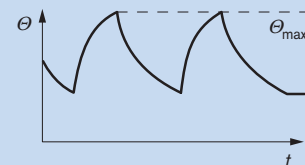
Potência de entrada



Perda de potência

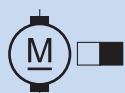


Temperatura

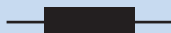


Símbolos gráficos

Motor DC magnético-permanente



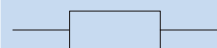
Supressor de interferência



Disco varistor



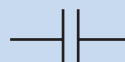
Resistência



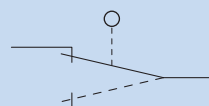
Interruptor térmico



Capacitor de supressão de interferência



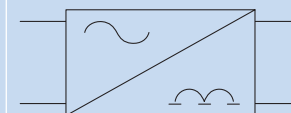
Interruptor de limite



Varistor (resistência dependente da voltagem)



Ponte retificadora





Curvas características

Uma curva vertical é traçada através do ponto de funcionamento de $160 \text{ N} \cdot \text{cm}$ perpendicular em relação ao eixo do torque. Os pontos de interseção desta linha reta com as outras curvas resultam nos dados de operação para velocidade nominal n_N , corrente nominal I_N e potência de saída mecânica P_{2N} .

Medidas para avaliação de curvas características:

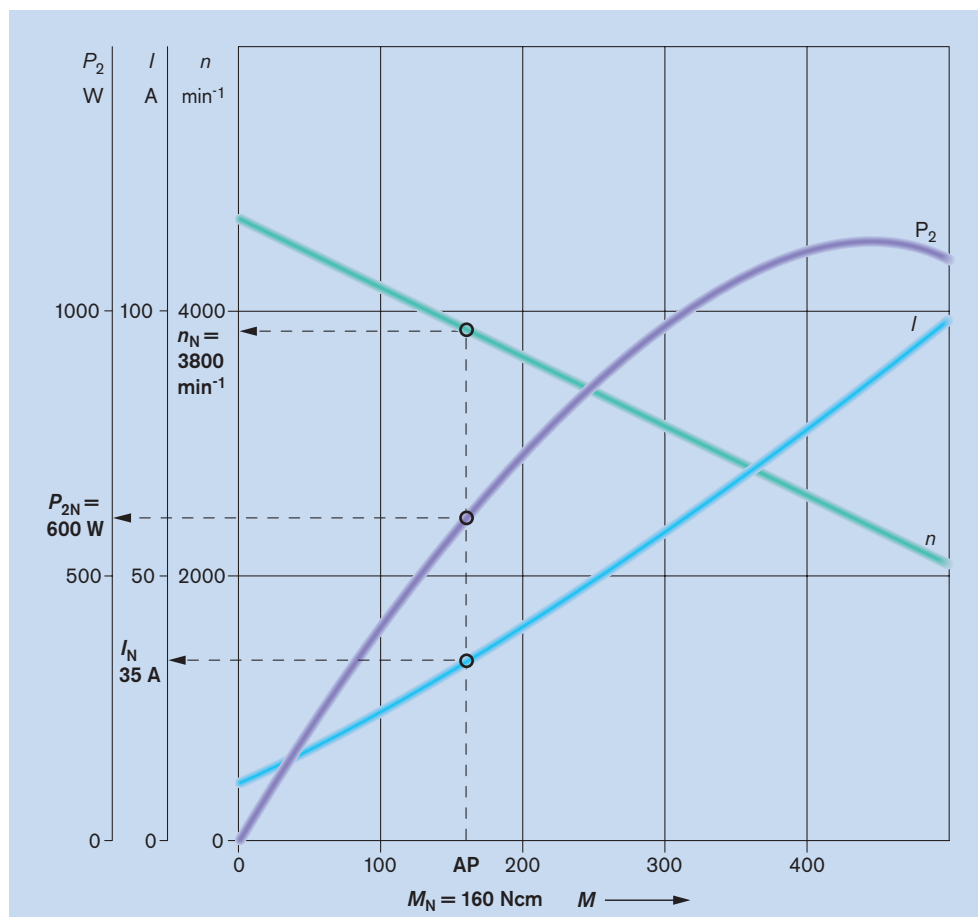
AP ponto de funcionamento
 M torque
 P_2 Potência de saída
 I corrente
 n velocidade

Exemplo:

Dado: $M_N = 160 \text{ Ncm}$.

Encontrado: $n_N = 3800 \text{ min}^{-1}$.

$P_{2N} = 600 \text{ W}$ e $I_N = 35 \text{ A}$.



Símbolo CE e declaração do fabricante com respeito às instruções EC

De acordo com as instruções EC, um símbolo CE deve acompanhar todas as máquinas, dispositivos e sistemas elétricos produzidos, importados e comercializados dentro da União Européia. As instruções EC incluem as seguintes instruções individuais relevantes para usuários de motores.

1. Instruções sobre a máquina

Estas instruções aplicam-se a máquinas em funcionamento independente ou à interconexão de máquinas para se formar sistemas.

Entretanto, não se aplicam a componentes das máquinas, por exemplo, unidades de controles elétricos ou motores elétricos que não têm funcionamento independente.

A máquina completa e a fábrica devem sempre seguir as instruções.

2. Instruções para baixa voltagem

Estas instruções devem ser aplicadas a todos os motores elétricos de voltagem nominal limite de 75 V DC e 50 V AC e maiores. Uma vez que os motores elétricos listados neste catálogo são projetados para voltagens nominais de até 24 V , eles também devem cumprir estas instruções.

3. Instruções EMC

Estas instruções se aplicam a todos os dispositivos, fábricas e sistemas elétricos e eletrônicos. Entretanto, estas instruções

também se aplicam a componentes complexos tais como motores elétricos, mas somente se eles estiverem livremente disponíveis ao público em geral. Os motores elétricos listados neste catálogo são fornecidos exclusivamente como peças de fornecedor e de reposição e, conforme seção § 5 da Lei EMC, não necessitam ser acompanhadas do símbolo CE. Os valores limite para propagação e emissão de interferência de alta frequência são definidos em EN 55 014 da Lei EMC. Pelas razões mencionadas acima, os motores elétricos Bosch nunca precisam levar o símbolo CE.

Favor entrar em contato conosco caso haja dúvidas em relação a pedidos para sua aplicação em particular.

Datos técnicos

Valor Nominal

Valor de la variable (ejemplo voltaje, corriente, resistencia...) por la cual un motor, ventilador, bomba, sus autopartes o características son medidas y por las cuales son nombradas.

Potencia de entrada P_1

$$P_1 = U \cdot I$$

P_1 Potencia de entrada en W

U Voltaje en V

I Corriente en A

Potencia de salida P_2

La potencia de salida P_2 siempre se especifica para motores.

$$P_2 = 2 \frac{\pi}{60} \cdot M \cdot n$$

P_2 potencia de salida en W

M Torque en N · m

n velocidad en min^{-1}

Eficiencia η

La eficiencia es la relación entre la potencia mecánica P_2 y la potencia eléctrica de entrada P_1 .

$$\eta = \frac{P_2}{P_1}$$

Ejemplo:

Para un voltaje nominal de 24 V y una corriente nominal de 35 A, la ecuación teórica de potencia para la Potencia de entrada P_1 es:

$$P_1 = U_N \cdot I_N; P_1 = 24 \text{ V} \cdot 35 \text{ A}; P_1 = 840 \text{ W}$$

Mediante esta potencia de entrada P_1 y de la potencia de salida P_{2N} determinada por el estándar de curva característica (véase fig. pág. 12), podemos calcular la eficiencia η :

$$\eta = \frac{P_{2N}}{P_1} = \frac{600 \text{ W}}{840 \text{ W}} = 0.71 = 71 \%$$

Torque M_N

El torque de un motor se calcula por medio de la siguiente ecuación:

$$M_N = \frac{60}{2\pi} \frac{P_{2N}}{n}$$

Velocidad Nominal n_N

La velocidad nominal es la rotación del eje del motor, alimentado con tensión nominal en el punto de torque nominal.

Sentido de rotación

Con relación al sentido de rotación, las especificaciones se aplican cuando se ve el eje del motor. En los casos donde existan dos ejes, el eje opuesto al colector es el que determina la dirección de la rotación.

Valores de cortocircuito

La corriente I_k es la corriente de entrada del motor en caso de un cortocircuito, por ejemplo, en el caso de trabamamiento del motor. El torque máximo M_k es efectivo en caso de cortocircuito.

Grado de protección IP

Válido para equipos utilizados en vehículos de carretera para DIN 40 050 (part9).

- Protección interna del equipo eléctrico contra los efectos de cuerpos extraños, incluso polvo.
- Protección interna del equipo eléctrico contra la entrada de agua.
- Prevención contra toques en partes internas peligrosas¹⁾ de la carcasa.

1) Piezas mecánicas móviles.

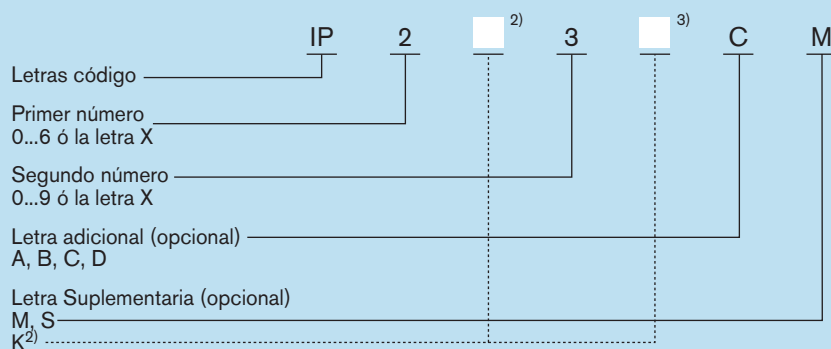
Montaje

- Montaje de la carcasa: Esto se efectúa mediante el uso de tornillos en la carcasa, o en la caja de reducción. En el caso de los ventiladores, esto también se hace por uso de tornillos en el motor o en el anillo deflector de aire.
- Montaje del flange: el escudo en la parte anterior del motor posee un flange con dos o tres orificios, o hay tres o cuatro agujeros en el lado posterior destinados al montaje.

Enfriamiento

- Enfriamiento natural interno: Construcción abierta, sin ventilador
- Auto-Enfriamiento interno: Construcción abierta, sin ventilador propio.
- Enfriamiento interno separado: Construcción abierta, con ventiladores adaptados separadamente
- Enfriamiento natural de superficie: Construcción cerrada, sin ventilador
- Auto-Enfriamiento de superficie: Construcción cerrada, con ventilador propio.

Elementos del código IP



Si el número no se informa, el mismo debe sustituirse por la letra "X" (ej. "XX" si ninguno de los dos números se menciona).

Letras suplementarias o adicionales pueden omitirse sin que tengan que ser sustituidas.

²⁾ La letra suplementaria "K" se encuentra inmediatamente después de los primeros números 5 y 6, o inmediatamente después de los segundos números 4, 6 y 9.

³⁾ Con la prueba de agua. Ejemplo: IP16KB protección contra la penetración de cuerpos extraños sólidos con diámetro mayor o igual a 50 mm, protección contra chorros pesados de agua a alta presión, protección contra el contacto con los dedos.

Explicación del código IP

1º número y letra suplementaria K	Protección de equipos contra penetración de cuerpos extraños	Personal	2º número y letra suplementaria K	Protección del equipo contra penetración de agua	Letra (opcional)	Protección del personal contra el contacto con partes peligrosas	Letra (opcional)
0	No protegido	No protegido	0	No protegido	A	Protección contra contacto con el dorso de la mano	M
1	Protección contra cuerpos extraños Ø ≥ 50 mm	Protección contra toque con el dorso de la mano	1	Protección contra agua goteando verticalmente	B	Protección contra contacto con los dedos	S
2	Protección contra cuerpos extraños Ø ≥ 12,5 mm	Protección contra toques con los dedos	2	Protección contra agua goteando en una inclinación de 15°	C	Protección contra contacto con herramientas	
3	Protección contra cuerpos extraños Ø ≥ 2,5 mm	Protección contra toques con herramientas	3	Protección contra spray de agua	D	Protección contra contacto con herramientas	
4	Protección contra cuerpos extraños Ø ≥ 1,0 mm	Protección contra toques por alambres	4	Protección contra baño de agua			
5K	Protegido contra polvo	Protección contra toques por alambres	4K	Protección contra agua bajo presión			
6K	Sellado contra polvo	Protección contra toques por alambres	5	Protección contra chorros de agua			
			6	Protección contra chorros fuertes de agua			
			6K	Protección contra chorros de agua con presión			
			7	Protección contra inmersión rápida			
			8	Protección contra inmersión de larga duración			
			9K	Protección contra limpieza de alta presión / vapor			

Clases de funcionamiento (VDE 0530)

Servicio continuo S 1

Operación en carga continua, con duración en que se puede alcanzar un equilibrio térmico suficiente.

Medidas para las curvas

P_1	potencia de entrada
P_v	potencia de pérdida
θ	temperatura
$\theta_{\max}$	temperatura máxima
t_B	tiempo de carga
t_r	factor de duración relativa (en porcentaje)
t_s	tiempo de funcionamiento
t_{St}	tiempo de inmovilización

Servicio breve S 2

Operación en carga constante, duración que no sea suficiente para alcanzar el equilibrio térmico, con una parada subsecuente que dure hasta que la temperatura del motor se torne diferente de la del enfriador en no más de 2 K.

Ejemplo: S 2 – 60 min.
(el tiempo representa un intervalo de 60 minutos)

Servicio intermitente-periódico S 3

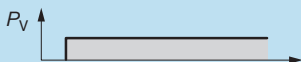
Operación compuesta de una secuencia de ciclos idénticos en la cual cada ciclo incluye un período a una carga constante y una parada, donde la corriente inicial no posee ningún efecto considerable en el calentamiento.

Ejemplo: S 3 – 10%
(el porcentaje se refiere al factor de la duración del ciclo)

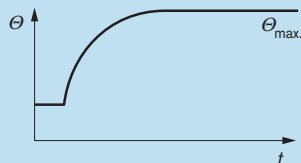
Potencia de entrada



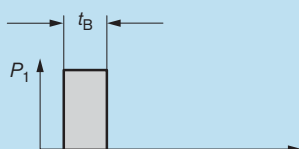
Potencia de pérdida



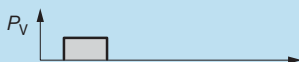
Temperatura



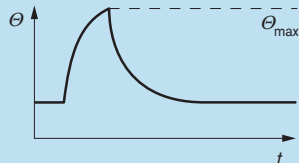
Potencia de entrada



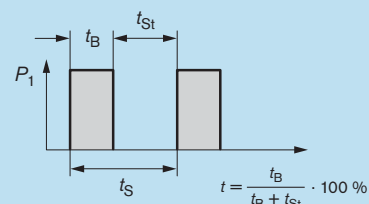
Potencia de pérdida



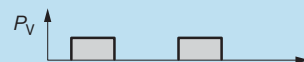
Temperatura



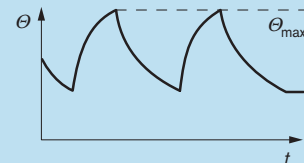
Potencia de entrada



Potencia de pérdida

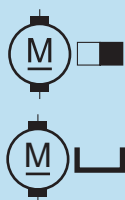


Temperatura



Símbolos gráficos

Motor DC magnético-permanente



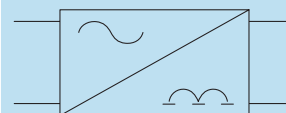
Disco varistor



Capacitor de supresión de interferencia



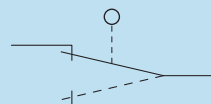
Puente rectificadora



Resistencia



Interruptor de límite



Supresor de interferencia



Interruptor térmico



Varistor (resistencia dependiente del voltaje)





Curvas características

Una curva vertical se traza a través del punto de funcionamiento de $160 \text{ N} \cdot \text{cm}$ perpendicular en relación al eje del torque. Los puntos de intersección de esta línea recta con las otras curvas resultan en los datos de operación para velocidad nominal n_N , corriente nominal I_N y potencia de salida mecánica P_{2N} .

Medidas para evaluación de curvas características:

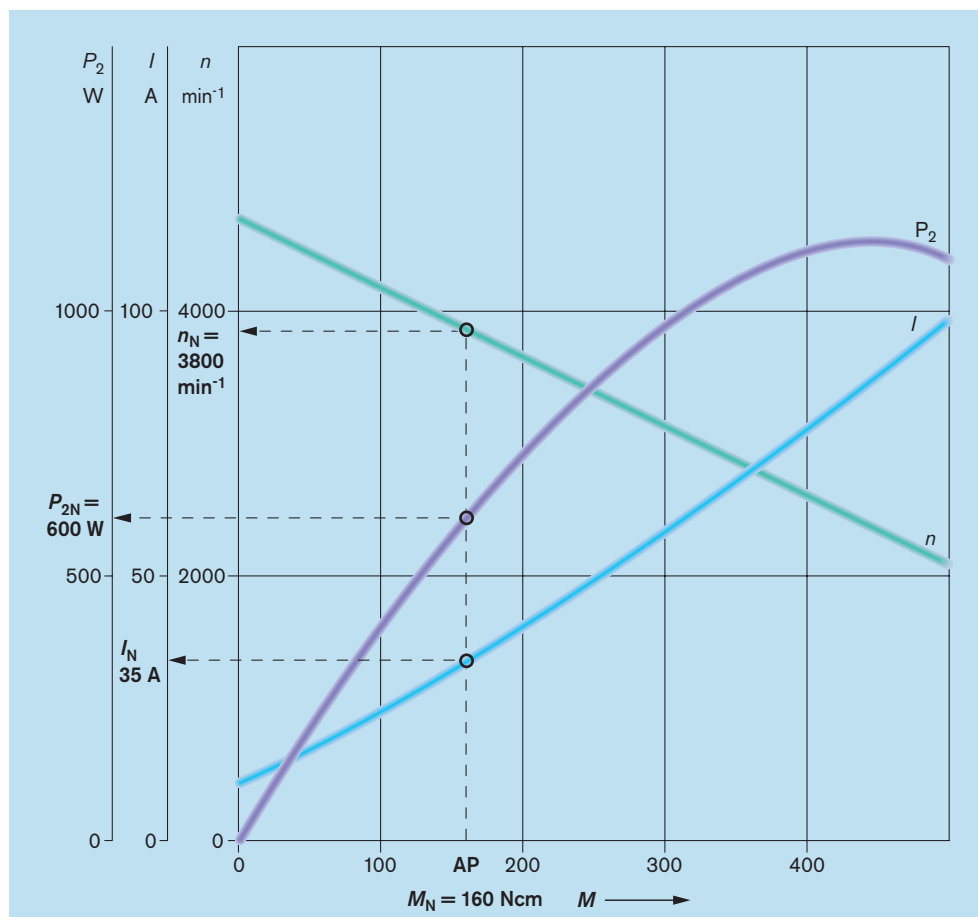
AP punto de funcionamiento
 M torque
 P_2 Potencia de salida
 I corriente
 n velocidad

Ejemplo:

Dado: $M_N = 160 \text{ Ncm}$.

Encontrado: $n_N = 3800 \text{ min}^{-1}$.

$P_{2N} = 600 \text{ W}$ y $I_N = 35 \text{ A}$.



Símbolo CE y declaración del fabricante con respecto a las instrucciones EC

De acuerdo con las instrucciones EC, un símbolo CE debe acompañar a todas las máquinas, dispositivos y sistemas eléctricos producidos, importados y comercializados dentro de la Unión Europea. Las instrucciones EC incluyen las siguientes instrucciones individuales relevantes para usuarios de motores.

1. Instrucciones sobre la máquina

Estas instrucciones se aplican a máquinas de funcionamiento independiente o a la interconexión de máquinas para formar sistemas.

Sin embargo, no se aplican a los componentes de las máquinas, como por ejemplo, unidades de controles eléctricos o motores eléctricos que no tienen

funcionamiento independiente. La máquina completa y la fábrica deben siempre seguir las instrucciones.

2. Instrucciones para bajo voltaje

Estas instrucciones deben aplicarse a todos los motores eléctricos de voltaje nominal límite de 75 V DC y 50 V AC y mayores.

Una vez que los motores eléctricos listados en este catálogo se proyectan para voltajes nominales de hasta 24 V , los mismos también deben cumplir estas instrucciones.

3. Instrucciones EMC

Estas instrucciones se aplican a todos los dispositivos, fábricas y sistemas eléctricos y electrónicos. No obstante, estas instrucciones también se aplican

a componentes complejos tales como motores eléctricos, pero solamente si los mismos están libremente disponibles al público en general. Los motores eléctricos listados en este catálogo se abastecen exclusivamente como partes del productor y de recambio y, conforme sección § 5 de la Ley EMC, no necesitan estar acompañadas del símbolo CE. Los valores límite para propagación y emisión de interferencia de alta frecuencia se definen en EN 55 014 de la Ley EMC.

Por las razones antes mencionadas, los motores eléctricos Bosch nunca necesitan llevar el símbolo CE.

Favor entre en contacto con nosotros en caso que haya dudas con relación a pedidos para su aplicación en particular.

Technical data

Nominal Value

Value of a variable (e.g. voltage, current, resistance ...) for which a motor, fan, pump, its parts or characteristics are measured and by which they are named.

Power input P_1

$$P_1 = U \cdot I$$

P_1 Power input in W

U Voltage in V

I Current in A

Power output P_2

The power output P_2 is always specified for motors.

$$P_2 = 2 \frac{\pi}{60} \cdot M \cdot n$$

P_2 power output in W

M torque in N · m

n Speed in min⁻¹

Efficiency η

The efficiency is the relationship between mechanical power output P_2 and electrical power input P_1 .

$$\eta = \frac{P_2}{P_1}$$

Example:

At a nominal voltage of 24 V and a nominal current of 35 A, a theoretical wattage rating for the power input P_1 is:

$$P_1 = U_N \cdot I_N; P_1 = 24 \text{ V} \cdot 35 \text{ A}; P_1 = 840 \text{ W}$$

From this power input P_1 and the power output P_{2N} determined from the characteristic-curve pattern (see fig. on page 16), we are able to calculate the efficiency η :

$$\eta = \frac{P_{2N}}{P_1} = \frac{600 \text{ W}}{840 \text{ W}} = 0.71 = 71 \%$$

Torque M_N

The torque of a motor is calculated using the following equation:

$$M_N = \frac{60}{2\pi} \frac{P_{2N}}{n}$$

Nominal speed n_N

The nominal speed is the speed output by a motor supplied with nominal voltage and driven with nominal power.

Direction of rotation

Specifications regarding direction of rotation apply when looking onto the shaft end of the motor.

In the case of motors with two shaft ends, the shaft end opposite the commutator determines the direction of rotation.

Short-circuit values

The current I_k is the current taken by the motor in the case of short circuit, i.e. in the locked-armature condition.

The maximum torque M_k is effective in the case of short circuit.

IP degree of protection

Valid for electrical equipment used in road vehicles to DIN 40 050 (part 9)

- Protection of the electrical equipment inside the housing against the effects of solid foreign bodies including dust.
- Protection of the electrical equipment inside the housing against ingress of water.
- Prevention of personnel touching hazardous parts¹⁾ inside the housing.

¹⁾ Moving, mechanical parts.

Mounting

- **Housing mounting:** this is performed using screws on the motor housing or on the gear- assembly housing. In the case of fans, this is also performed using screws either on the driving motor or on the air-deflector ring.
- **Flange mounting:** The drive-end shield of the motor has a 2-hole or 3-hole flange or there are three or four tapped holes on the end face for mounting.

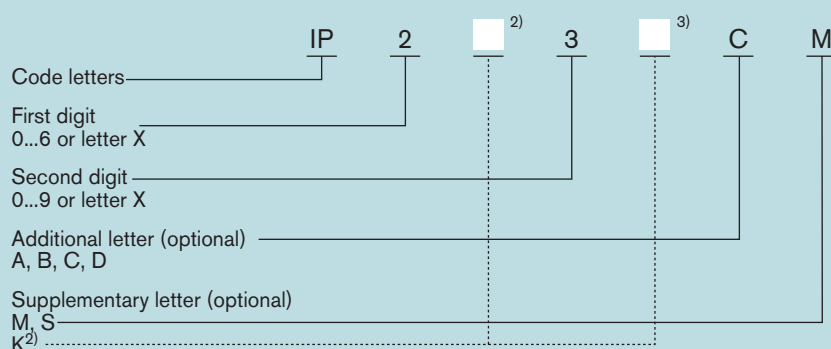
Cooling

- **Internal natural cooling:** Open construction, without fan.
- **Internal self-cooling:** Open construction, with own fan.
- **Internal separate cooling:** Open construction, with separately driven fan.
- **Surface natural cooling:** Enclosed construction, without fan.
- **Surface self-cooling:** Enclosed construction, with own fan.





Elements of the IP code



If a digit is not given, it must be replaced by the letter "X" (i.e. "XX" if both digits are not given). Additional and/or supplementary letters can be omitted without having to be replaced.

²⁾ The supplementary letter "K" stands either immediately after the first digits 5 and 6 or immediately after the second digits 4, 6, and 9.

³⁾ With the water test. Example: IP16KB protection against the penetration of solid foreign bodies with diameter ≥ 50 mm, protection against heavy jet water with high pressure, protection against contact with fingers.

Explanation of the IP code

1st digit and supplementary letter K	Protection of electrical equipment against penetration by foreign bodies	Personnel	2nd digit and supplementary letter K	Protection of electrical equipment against ingress of water	Letter (optional)	Protection of personnel against contact with hazardous parts	Letter (optional)
0	Not protected	Not protected	0	Not protected	A	Protection against contact with back of hand	M Movement of moving parts ³⁾
1	Protection against foreign bodies $\varnothing \geq 50$ mm	Protection against being touched by back of hand	1	Protection against vertically dripping water	B	Protection against contact with fingers	S Standstill of moving parts ³⁾
2	Protection against foreign bodies $\varnothing \geq 12.5$ mm	Protection against being touched by fingers	2	Protection against dripping water, 15° inclined	C	Protection against contact tools	
3	Protection against foreign bodies $\varnothing \geq 2.5$ mm	Protection against being touched by tools	3	Protection against spray water	D	Protection against contact with wires	
4	Protection against foreign bodies $\varnothing \geq 1.0$ mm	Protection against being touched by wires	4	Protection against splash water			
5K	Protected against dust	Protection against being touched by wires	4K	Protection against splash water with high pressure			
6K	Dust-tight	Protection against being touched by wires	5	Protection against jet water			
			6	Protection against heavy jet water			
			6K	Protection against heavy jet water with high pressure			
			7	Protection against short-term immersion			
			8	Protection against long-term immersion			
			9K	Protection against high pressure/ steam-pressure cleaning			

Types of duty (VDE 0530)

Continuous-running duty S 1

Operation at constant load. The duration of which is sufficient to reach thermal equilibrium.

Key to curves

- P_1 power point
- P_V power loss
- θ temperature
- $\theta_{\max}$ maximum temperature
- t_B load time
- t_r relative duration factor (in percent)
- t_S cycle duration
- t_{St} standstill time

Short-time duty S 2

Operation at constant load, duration which is not sufficient to reach thermal equilibrium, with a subsequent rest lasting until the motor temperature differs no more than 2 K from the temperature of the coolant.

Example: S 2 – 60 min
(The time means 60 minutes rating)

Intermittent-periodic duty S 3

Operation composed of a sequence of identical cycles of which each cycle includes a period at constant load and a rest whereby the starting current does not have any considerable effect on heating.

Example: S 3 – 10%
(The percent figure refers to the cyclic duration factor)

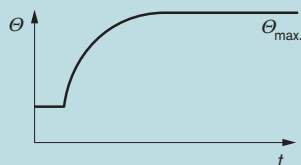
Power input



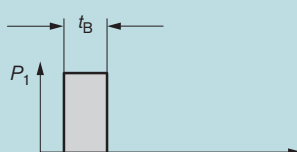
Power loss



Temperature



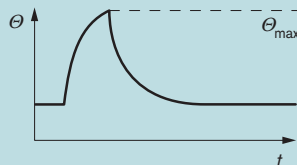
Power input



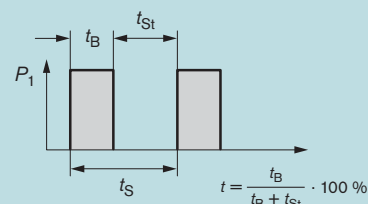
Power loss



Temperature



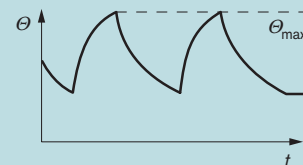
Power input



Power loss

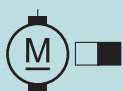


Temperature



Símbolos Gráficos

Permanent-magnet DC motor



Varistor disc



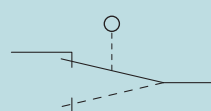
Resistor



Interference-suppression capacitor



Limit-switch



Interference-suppression choke



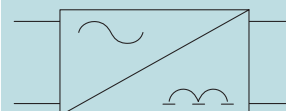
Thermo-switch



Varistor (voltage-dependent resistor)



Bridge rectifier





Characteristic curves

A vertical line is drawn through the specified working point of $160 \text{ N} \cdot \text{cm}$, perpendicular with respect to the torque axis. The points of intersection of this straight line with the other curves results in the operating data for nominal speed n_N , nominal current I_N and mechanical power output P_{2N} .

Key for evaluation of characteristic curves:

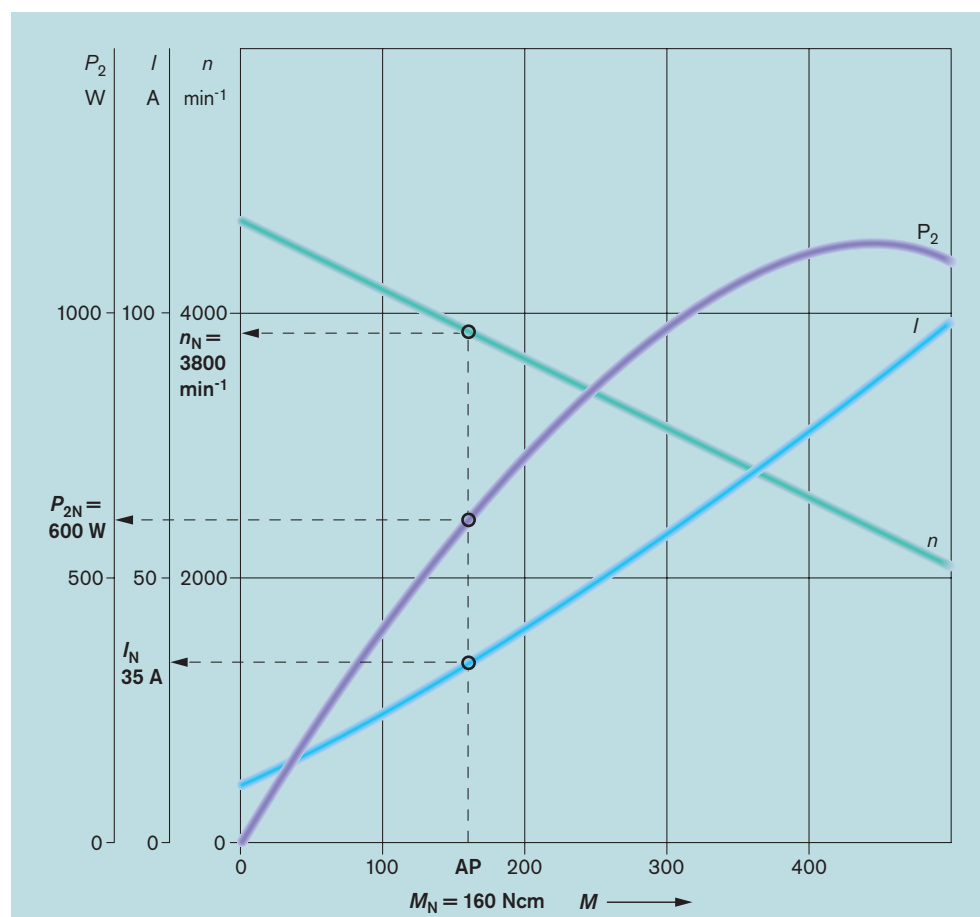
AP Working point
 M Torque
 P_2 Power output
 I Current
 n Speed

Example:

Given: $M_N = 160 \text{ Ncm}$.

Found: $n_N = 3800 \text{ min}^{-1}$.

$P_{2N} = 600 \text{ W}$ and $I_N = 35 \text{ A}$.



CE symbol and manufacturer's declaration as per EC directive

In accordance with the EC directive, a CE symbol must be attached to all electrically driven machinery, devices, and systems manufactured, imported, and sold within the European Union. The EC directive includes the following individual directives relevant for users of motors.

1. Machine directive

This directive applies to independently functional machinery or the interlinking of machines to form entire systems. However, it does not apply to machine components, for example, electric control units or electric motors which have no independent function. The complete machine and plant must always fulfil the directive.

2. Low-voltage directive

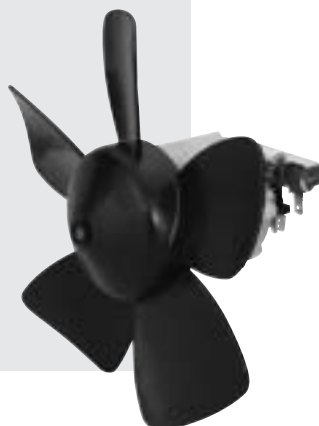
This directive must be applied to all electric motors from a nominal voltage limit of 75 V DC and 50 V AC and greater. Since the electric motors listed in this catalog are designed for nominal voltages of up to 24 V, they must also comply with this directive.

3 EMC directive

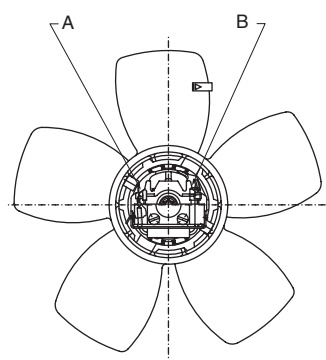
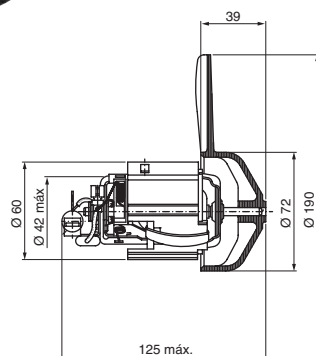
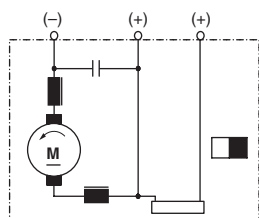
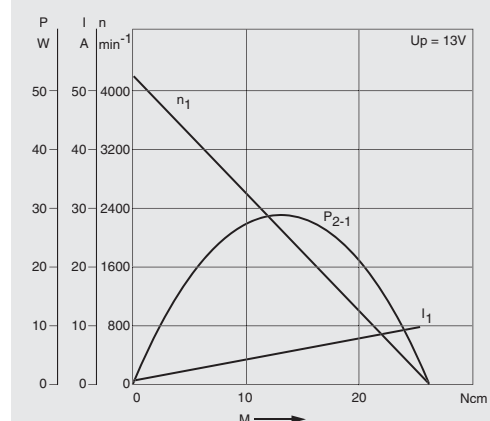
This directive applies to all electric and electronic devices, plants, and systems. However, this directive also applies to complex components such as electric motors, but only if they are freely available to the general public. The electric motors listed in this catalog are supplied exclusively as supplier and replacement

parts and, as per § 5 section of the EMC Law, do not have to bear the CE symbol.

BPA

12 V 24 W

U_N	12 V	
P_N	24 W	
n_N	VI 1650 rpm	VII 2900 rpm
I_N	2 A	3,5 A
M_A	26 Ncm	
Rot.	L	
S	S1	
IP	IP 10	
kg	0,500 kg	
Ⓜ	9 130 081 043	



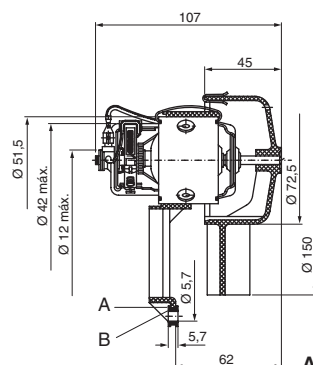
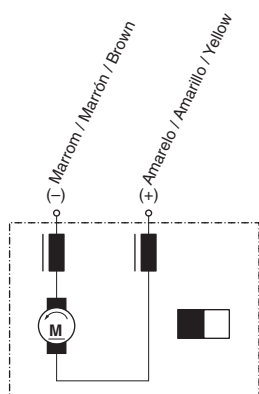
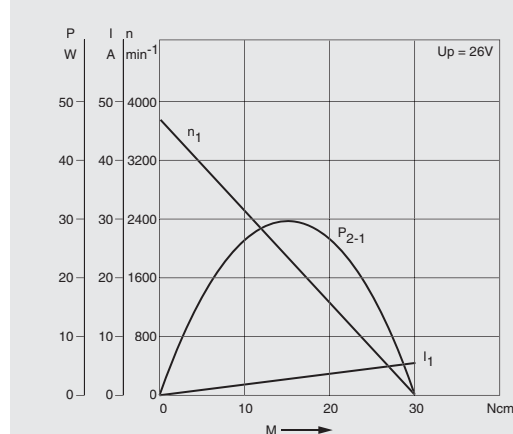
A Conexão (+) Terminal chato de 6,3 x 0,8
 Conexión (+) Terminal plano de 6,3 x 0,8
 Connection (+) flat terminal 6,3 x 0,8

B Conexão (-) Terminal fêmea para terminal macho de 6,3 x 0,8
 Conexión (-) Terminal hembra para terminal macho de 6,3 x 0,8
 Connection (-) Female terminals for male terminals 6,3 x 0,8

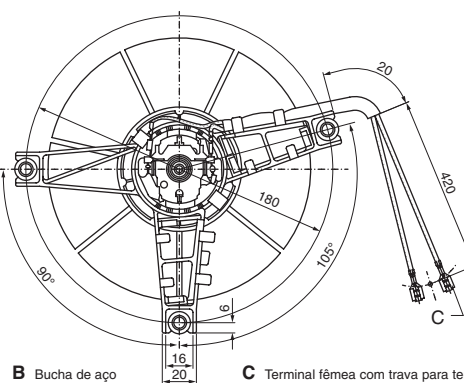
BPA

24 V 11 W

U_N	24 V	
P_N	11 W	
n_N	3300 rpm	
I_N	1,5 A	
M_A	30 Ncm	
Rot.	L	
S	S1	
IP	IP 10	
kg	0,480 kg	
Ⓜ	9 130 081 050	



A Bucha de borracha
 Taquete de caucho
 Rubber bushing



B Bucha de aço
 Taquete de acero
 Steel bushing

C Terminal fêmea com trava para terminal macho de 6,3 x 0,8
 Terminal hembra con traba para terminal macho de 6,3 x 0,8
 Female terminal with lock for male terminal 6,3 x 0,8

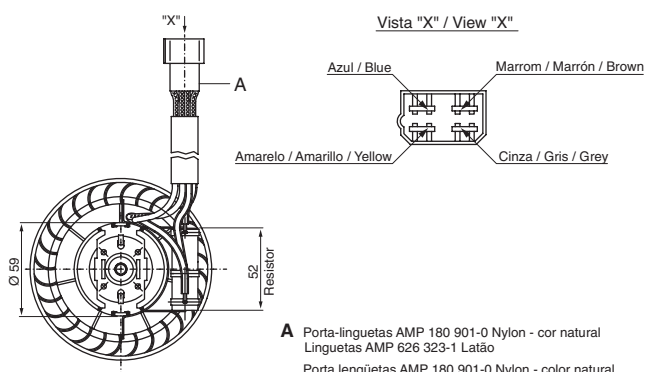
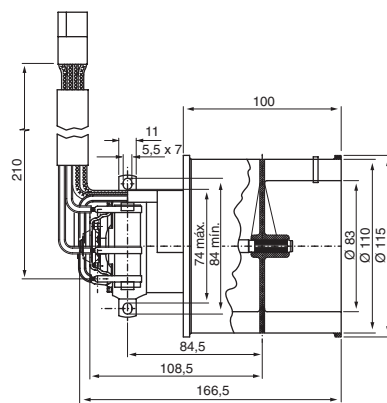
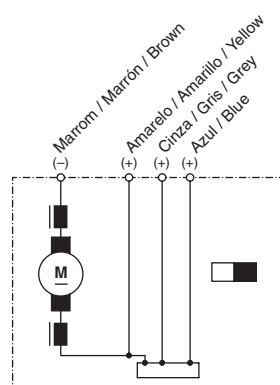
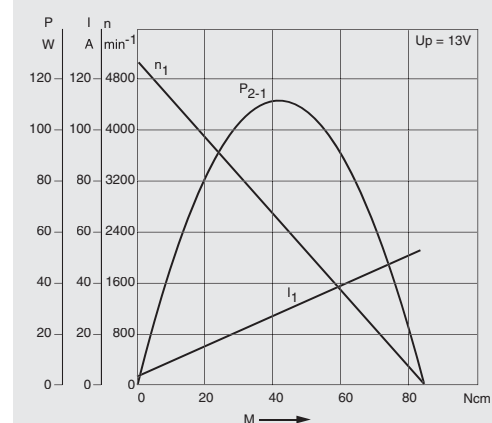


CPB

12 V 78 W



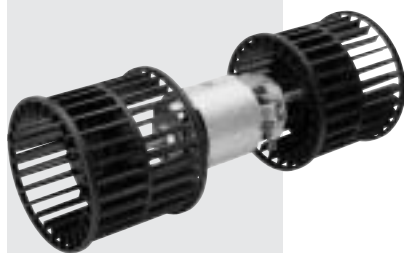
U_N	12 V		
P_N	78 W		
n_N	VI 2000 rpm	VII 3050 rpm	VIII 3950 rpm
I_N	5 A	10 A	18 A
M_A	84 Ncm		
Rot.	L		
S	S1		
IP	IP 10		
kg	0,845 kg		
	9 130 081 021		



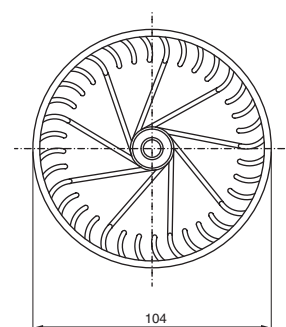
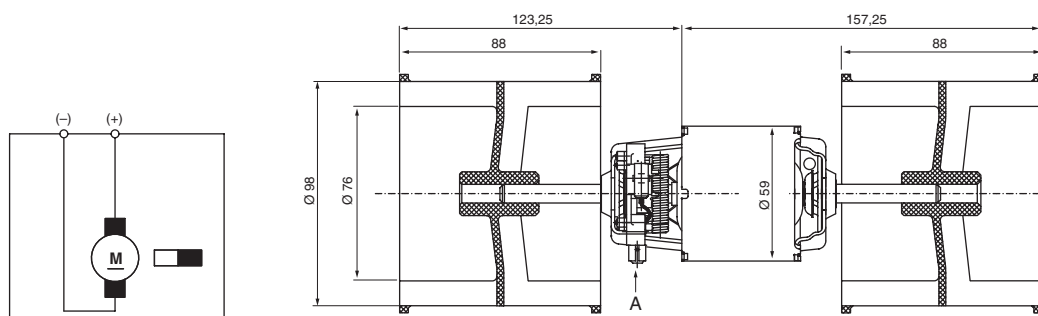
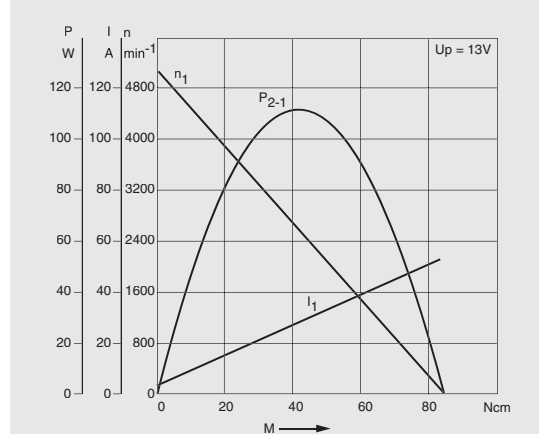
A Porta-linguetas AMP 180 901-0 Nylon - cor natural
Linguetas AMP 626 323-1 Latão
Porta lengüetas AMP 180 901-0 Nylon - color natural
Lengüetas AMP 626 323-1 Latón
Latch compartment AMP 180 901-0 Nylon - natural color
Latch AMP 626 323-1 Brass

CPB

12 V 78 W



U_N	12 V
P_N	78 W
n_N	3950 rpm
I_N	18 A
M_A	84 Ncm
Rot.	R
S	S1
IP	IP 10
kg	0,450 kg
	9 130 081 029

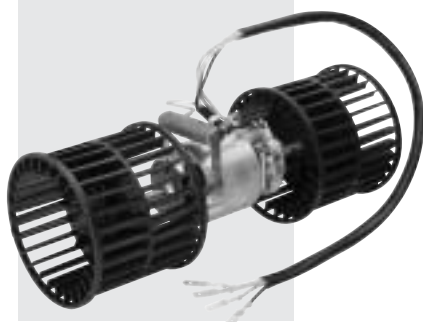


A Terminais de encaixe / Terminales de encaje / Fitting terminals

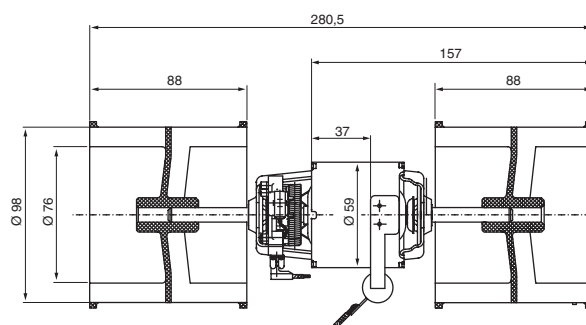
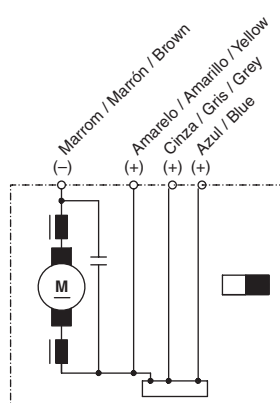
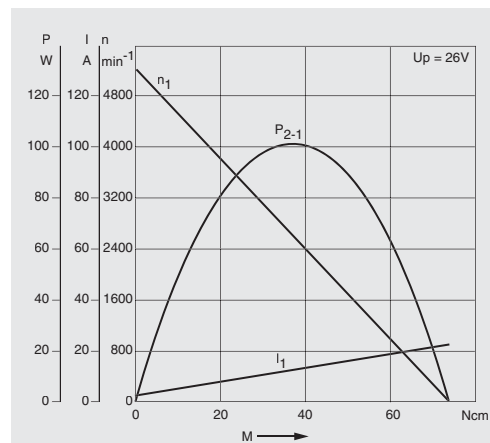
(+) Terminal macho 6,3 x 0,8 / (+) Terminal macho 6,3 x 0,8 / (+) Male terminals 6,3 x 0,8

(-) Terminal fêmea para terminal macho 6,3 x 0,8 / (-) Terminal hembra para terminal macho 6,3 x 0,8 / (-) Female terminals for male terminals 6,3 x 0,8

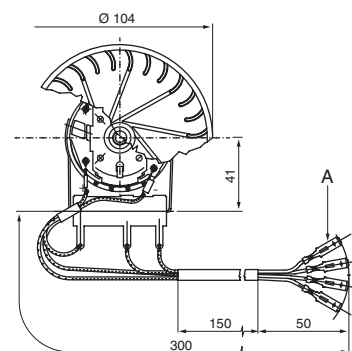
CPB

24 V 78 W

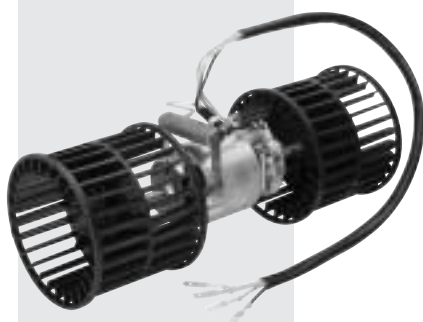
U_N	24 V		
P_N	78 W		
n_N	VI 2000 rpm	VII 3050 rpm	VIII 3950 rpm
I_N	3 A	6 A	9 A
M_A	74 Ncm		
Rot.	R		
S	S1		
IP	IP 10		
kg	0,925 kg		
	9 130 081 042		



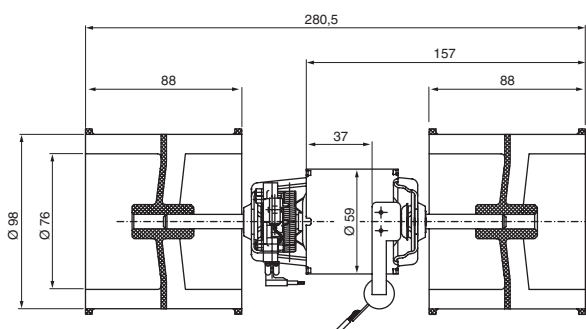
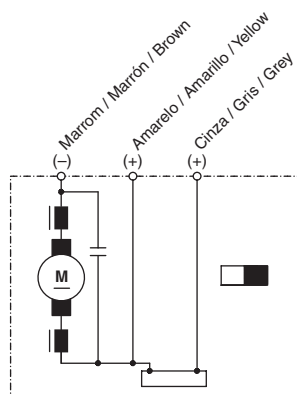
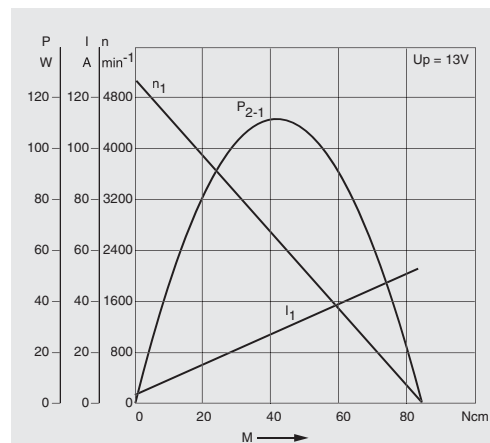
A Terminais chatos 6,3 x 0,8 conforme AMP 42241-3
 Terminales planos 6,3 x 0,8 conforme AMP 42241-3
 Flat terminals 6,3 x 0,8 in accordance with AMP 42241-3



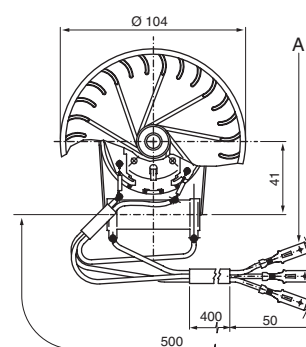
CPB

12 V 78 W

U_N	12 V	
P_N	78 W	
n_N	VI 3050 rpm	VII 3950 rpm
I_N	10 A	18 A
M_A	84 Ncm	
Rot.	R	
S	S1	
IP	IP 10	
kg	0,945 kg	
	9 130 081 044	



A Terminais chatos 6,3 x 0,8 conforme AMP 42241-3
 Terminales planos 6,3 x 0,8 conforme AMP 42241-3
 Flat terminals 6,3 x 0,8 in accordance with AMP 42241-3



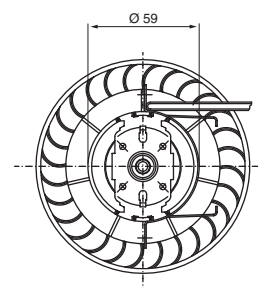
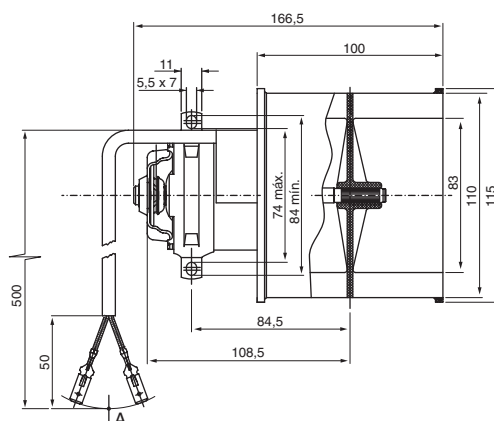
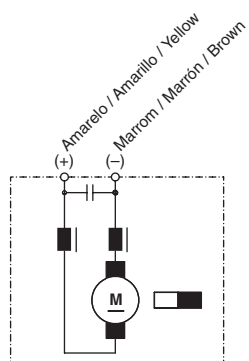
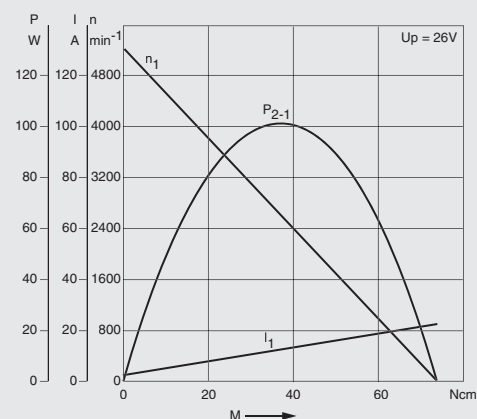
CPB



CPB

24 V 78 W

U_N	24 V
P_N	78 W
n_N	3950 rpm
I_N	9 A
M_A	74 Ncm
Rot.	L
S	S1
IP	IP 10
kg	0,820 kg
Ⓜ	9 130 081 047



A Terminais conf. AMP 626323

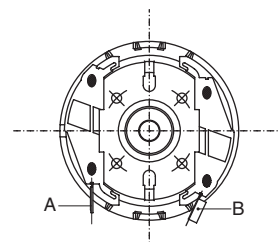
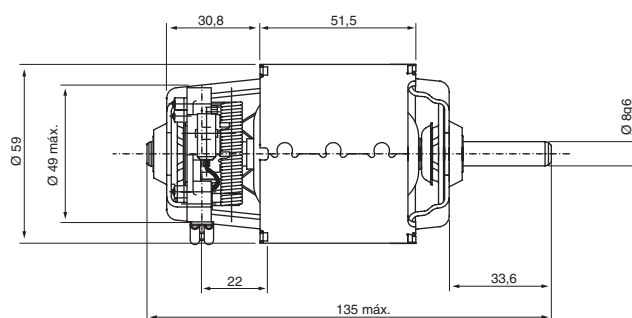
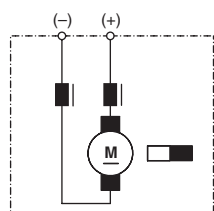
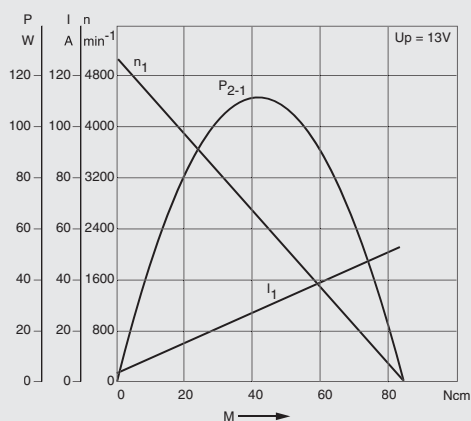
Terminales conf. AMP 626323

Terminals in accordance with AMP 626323

CPB

12 V 55 W

U_N	12 V
P_N	55 W
n_N	4350 rpm
I_N	16 A
M_N	12 Ncm
M_A	84 Ncm
Rot.	R
S	S1
IP	IP 10
kg	0,670 kg
Ⓜ	9 130 081 051



A Conexão (+) Terminal chato de 6,3 x 0,8

Conexión (+) Terminal plano de 6,3 x 0,8

Connection (+) flat terminal 6,3 x 0,8

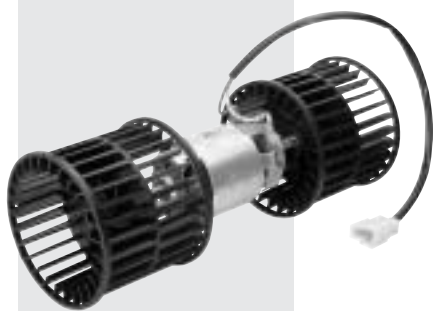
B Conexão (-) Terminal fêmea para terminal macho de 6,3 x 0,8

Conexión (-) Terminal hembra para terminal macho de 6,3 x 0,8

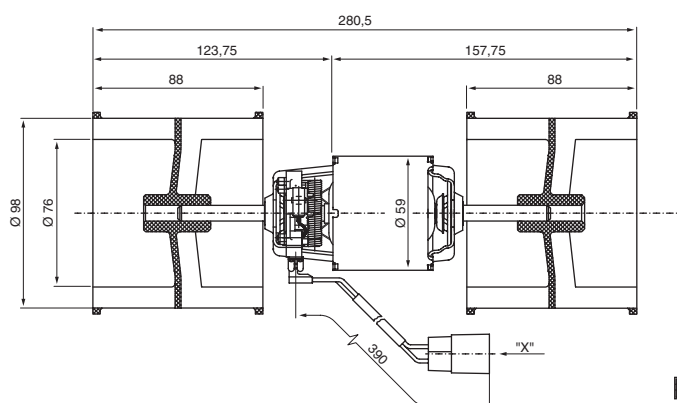
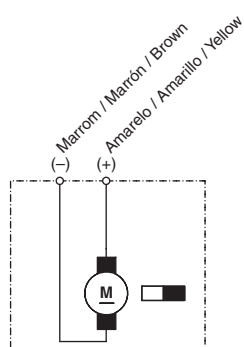
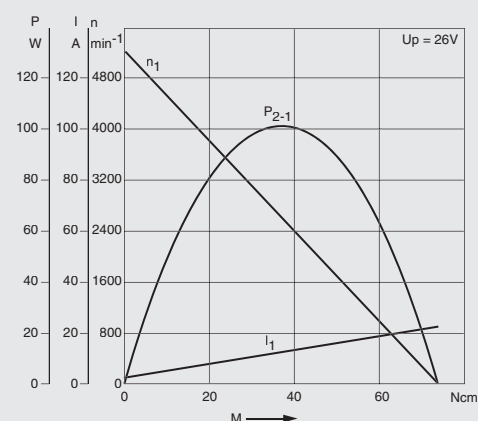
Connection (-) Female terminals for male terminals 6,3 x 0,8

CPB

24 V 80 W

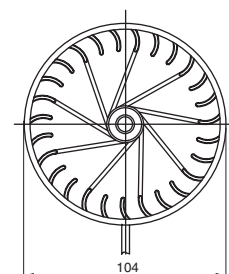


U_N	24 V
P_N	80 W
n_N	3950 rpm
I_N	9 A
M_A	75 Ncm
Rot.	R
S	S1
IP	IP 10
kg	0,900 kg
Ⓜ	9 130 451 049



Vista "X" / View "X"

Marrom / Marrón / Brown
Amarelo / Amarillo / Yellow

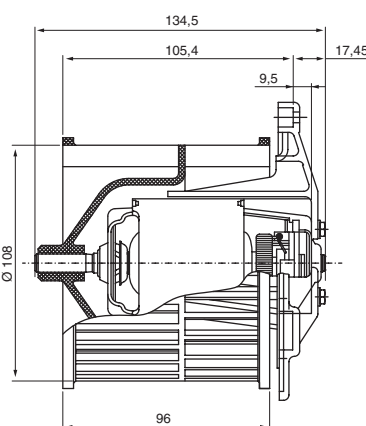
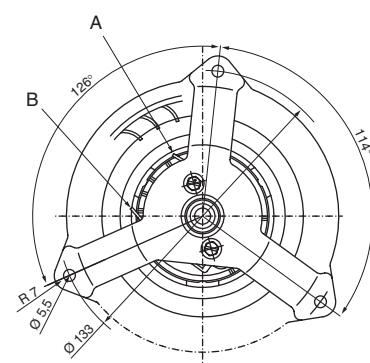
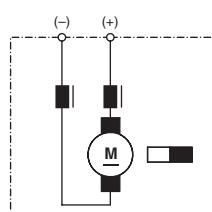
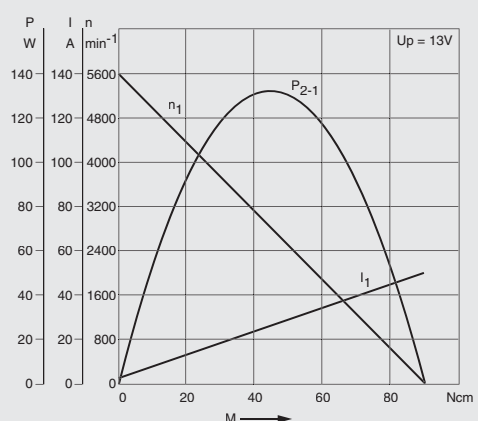


CPB

12 V 88 W



U_N	12 V
P_N	88 W
n_N	4440 rpm
I_N	13 A
M_A	90 Ncm
Rot.	R
S	S1
IP	IP 10
kg	1,700 kg
Ⓜ	9 130 451 074



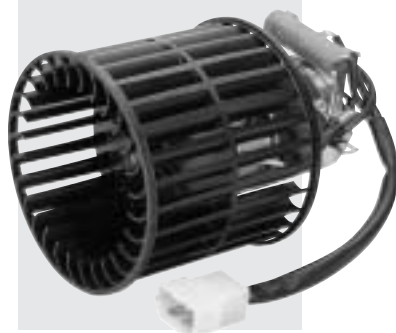
A Conexão (+) Terminal chato de 6,3 x 0,8
Conexión (+) Terminal plano de 6,3 x 0,8
Connection (+) flat terminal 6,3 x 0,8

B Conexão (-) Terminal fêmea para terminal macho de 6,3 x 0,8
Conexión (-) Terminal hembra para terminal macho de 6,3 x 0,8
Connection (-) Female terminals for male terminals 6,3 x 0,8

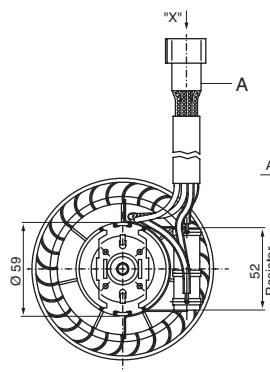
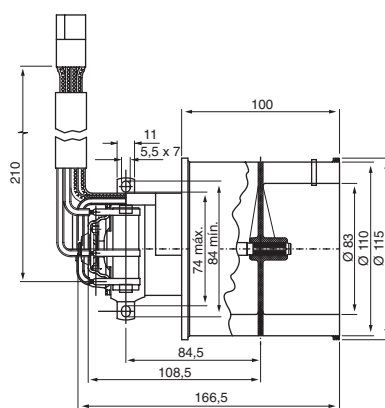
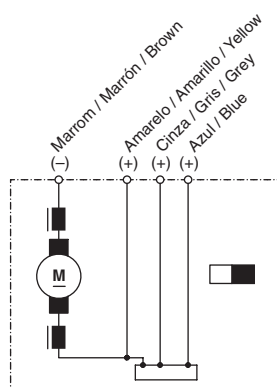
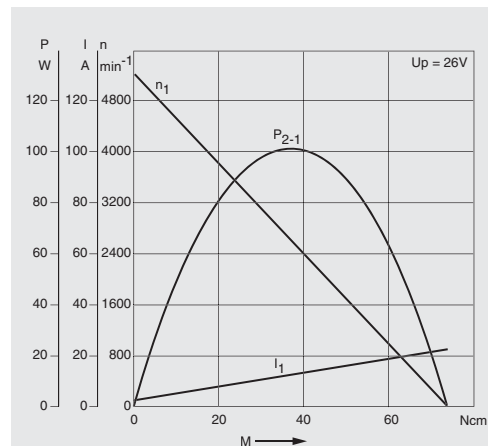


CPB

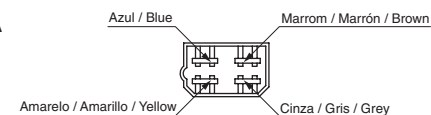
24 V 78 W



U_N	24 V		
P_N	78 W		
n_N	VI 2000 rpm	VII 3050 rpm	VIII 3950 rpm
I_N	3 A	6 A	11 A
M_A	75 Ncm		
Rot.	L		
S	S1		
IP	IP 10		
kg	0,860 kg		
Ⓜ	9 130 451 131		



Vista "X" / View "X"



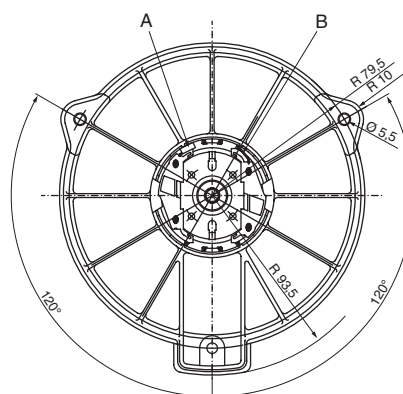
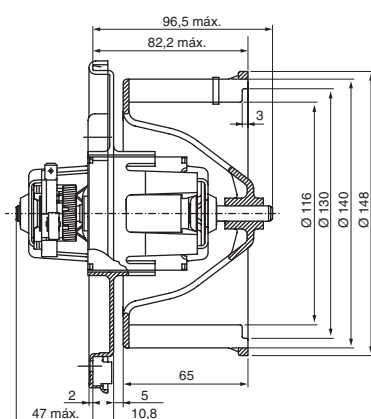
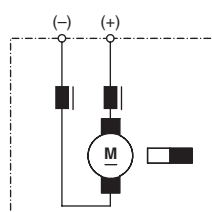
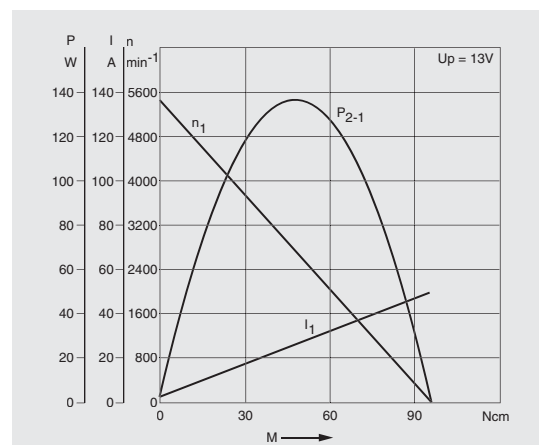
- A** Porta-linguetas AMP 180 901-0 Nylon - cor natural
 Linguetas AMP 626 323-1 Latão
 Porta lengüetas AMP 180 901-0 Nylon - color natural
 Lengüetas AMP 626 323-1 Latón
 Latch compartment AMP 180 901-0 Nylon - natural color
 Latch AMP 626 323-1 Brass

CPB

12 V 125 W



U_N	12 V
P_N	125 W
n_N	3370 rpm
I_N	20 A
M_A	96 Ncm
Rot.	R
S	S1
IP	IP 10
kg	0,900 kg
Ⓜ	9 130 451 143



- A** Conexão (-) Terminal fêmea para terminal macho de 6,3 x 0,8
 Conexión (-) Terminal hembra para terminal macho de 6,3 x 0,8
 Connection (-) Female terminals for male terminals 6,3 x 0,8

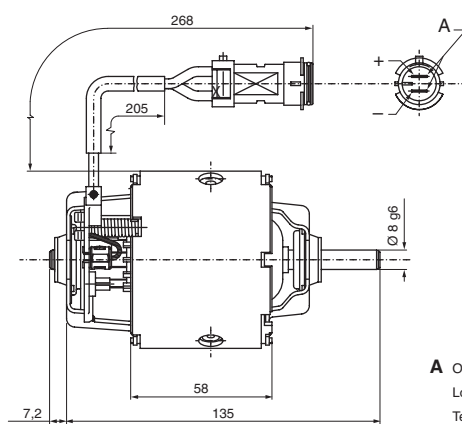
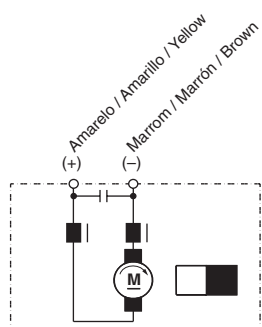
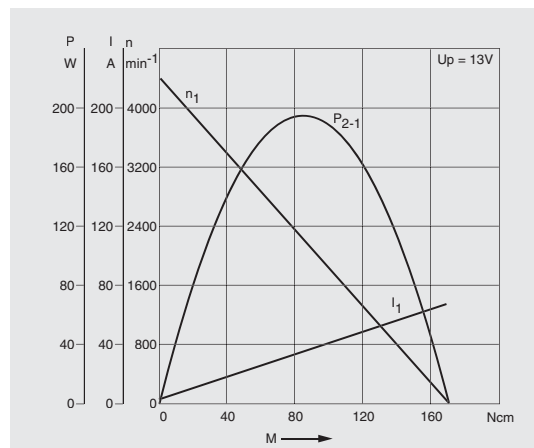
- B** Conexão (+) Terminal chato de 6,3 x 0,8
 Conexión (+) Terminal plano de 6,3 x 0,8
 Connection (+) flat terminal 6,3 x 0,8

DPD

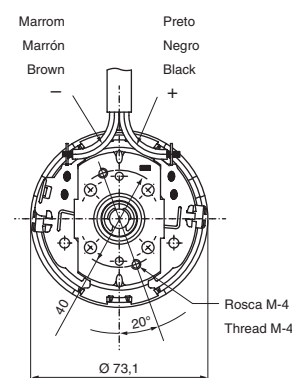
12 V 134 W



U_N	12 V
P_N	134 W
n_N	3400 rpm
I_N	16 A
M_N	42 Ncm
M_A	170 Ncm
Rot.	R
S	S1
IP	IP 10
kg	0,800 Kg
Ⓜ	9 130 451 123

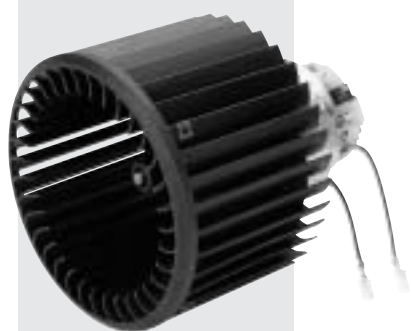


A Os terminais 6,3 x 2,5 N° AMP 626319-1
Los terminales 6,3 x 2,5 N° AMP 626319-1
Terminals 6,3 x 2,5 Number AMP 626319-1

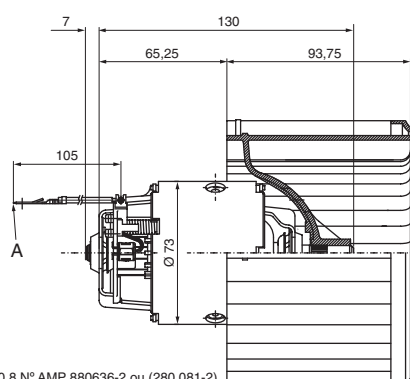
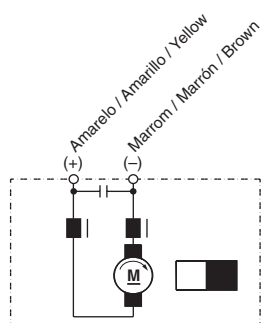
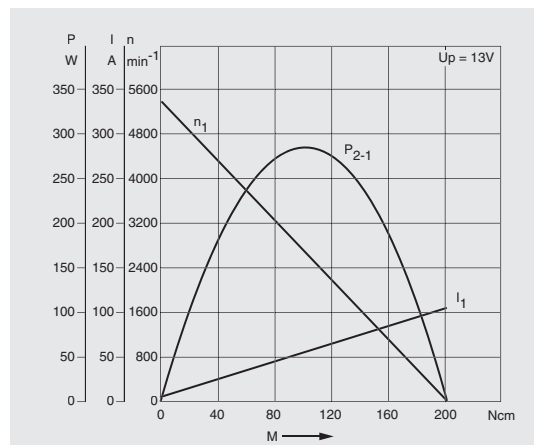


DPD

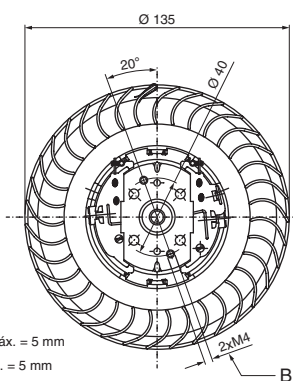
12 V 200 W



U_N	12 V
P_N	200 W
n_N	4140 rpm
I_N	29,8 A
M_A	203 Ncm
Rot.	L
S	S1
IP	IP 10
kg	1,300 kg
Ⓜ	9 130 451 238



A (2x) Terminal 6,3 x 0,8 N° AMP 880636-2 ou (280 081-2)
(2x) Terminal 6,3 x 0,8 N° AMP 880636-2 ó (280 081-2)
(2x) Terminals 6,3 x 0,8 Number AMP 880636-2 or (280 081-2)



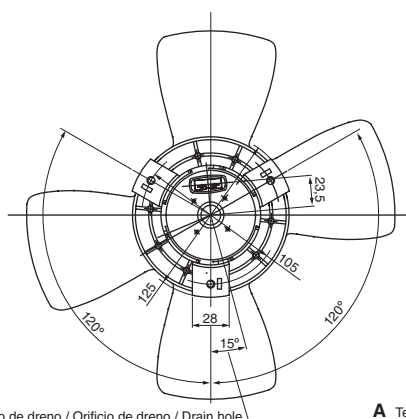
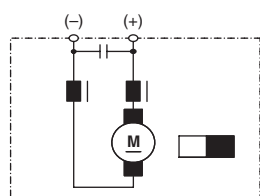
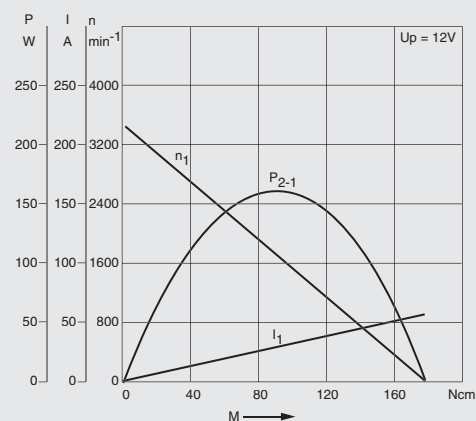
B Aparafusar máx. = 5 mm
Atornillar max. = 5 mm
Max. screw = 5 mm

DPG

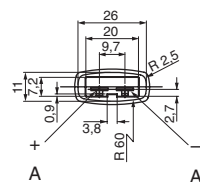
12 V 100 W



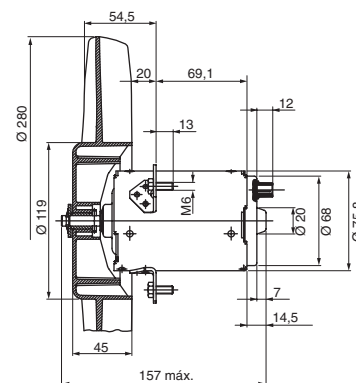
U_N	12 V
P_N	100 W
n_N	2700 rpm
I_N	13 A
M_A	179 Ncm
Rot.	R
S	S1
IP	IP 23
kg	1,770 kg
Ⓜ	9 130 081 032



Furo de dreno / Orificio de dreno / Drain hole



A Terminais machos 6,3 x 0,8 / Terminales machos 6,3 x 0,8 / Drain hole 6,3 x 0,8

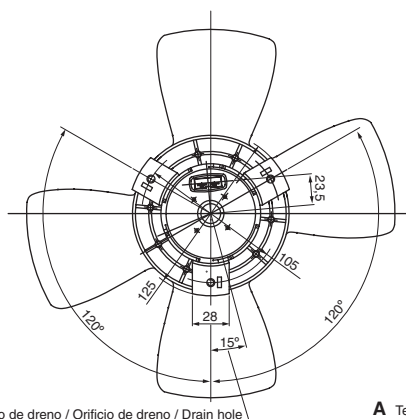
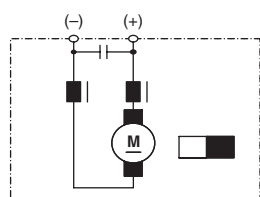
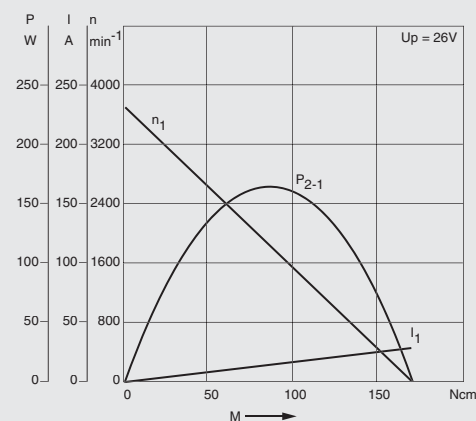


DPG

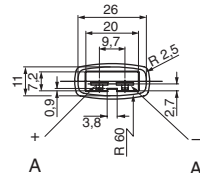
24 V 100 W



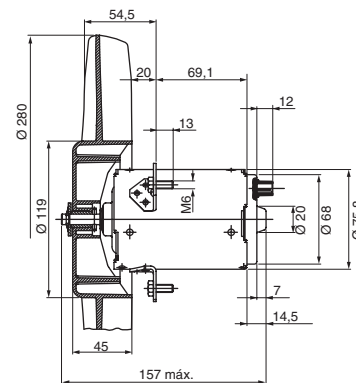
U_N	24 V
P_N	100 W
n_N	3000 rpm
I_N	8 A
M_A	170 Ncm
Rot.	R
S	S1
IP	IP 23
kg	1,700 kg
Ⓜ	9 130 081 055



Furo de dreno / Orificio de dreno / Drain hole



A Terminais machos 6,3 x 0,8 / Terminales machos 6,3 x 0,8 / Drain hole 6,3 x 0,8

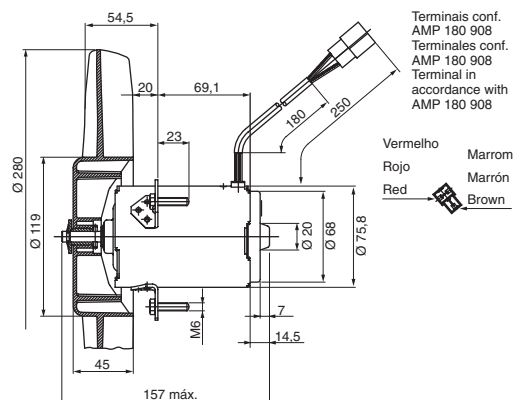
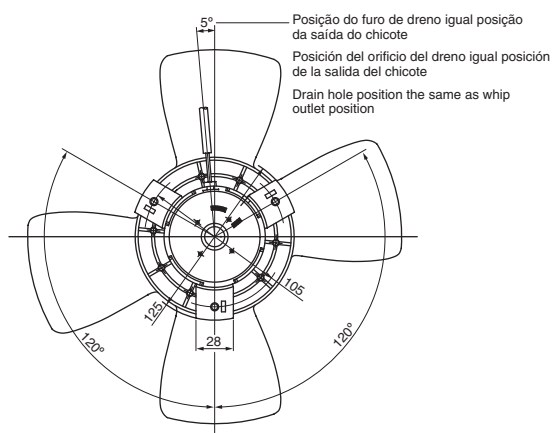
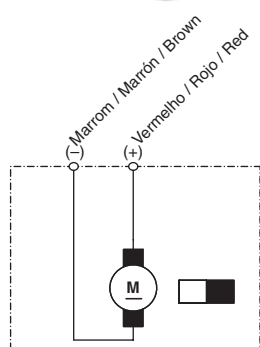
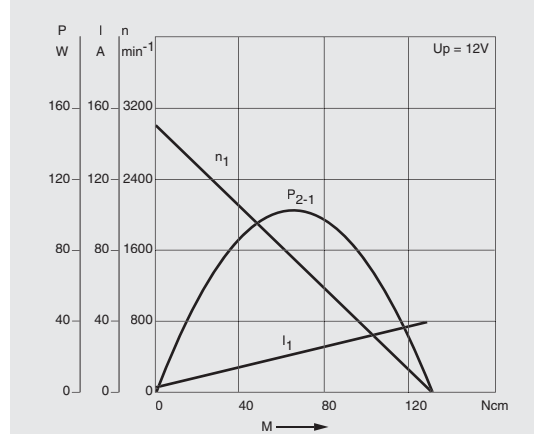


DPG

12 V 57 W



U_N	12 V
P_N	57 W
n_N	2500 rpm
I_N	11 A
M_A	1300 Ncm
Rot.	R
S	S1
IP	IP 23
kg	1,760 kg
	9 130 081 058

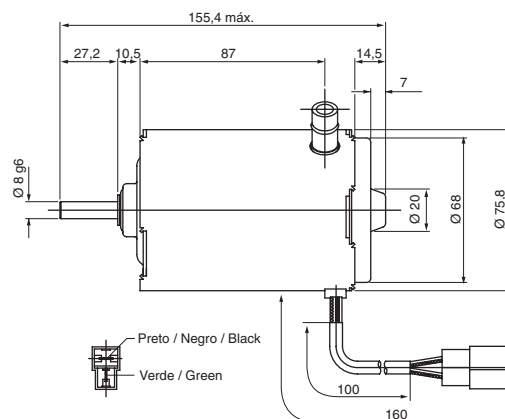
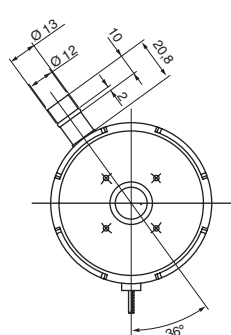
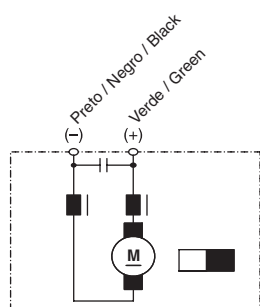
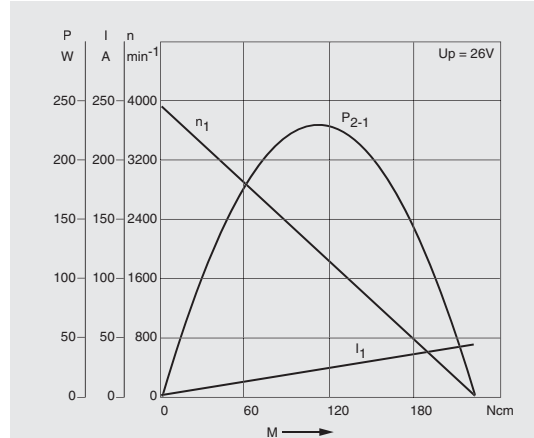


DPG

24 V 70 W



U_N	24 V
P_N	70 W
n_N	3600 rpm
I_N	6 A
M_N	20 Ncm
M_A	224 Ncm
Rot.	L
S	S1
IP	IP 23
kg	1,500 kg
	9 130 081 060

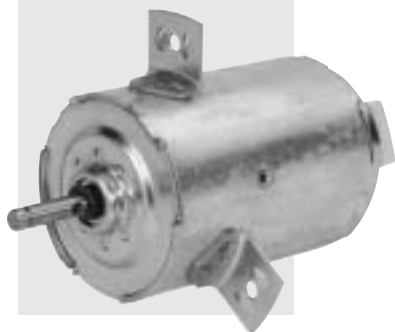


DPG

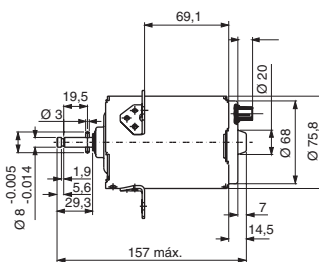
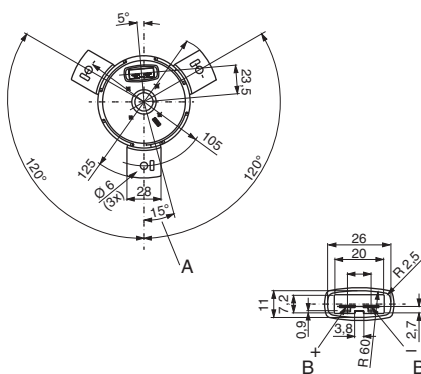
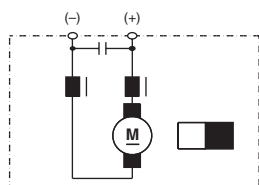
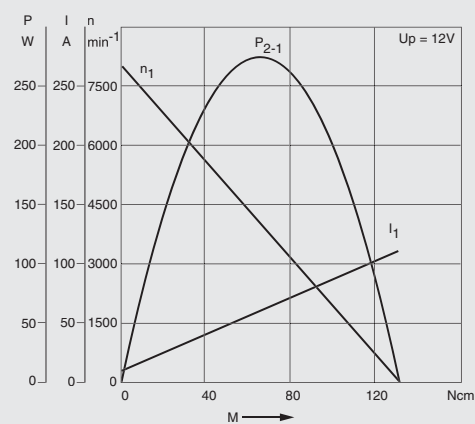


DPG

12 V 142 W



U_N	12 V
P_N	142 W
n_N	6800 rpm
I_N	26 A
M_N	20 Ncm
M_A	131 Ncm
Rot.	R
S	S1
IP	IP 23
kg	0,430 kg
Ⓜ	9 130 451 109



A Furo de dreno

Orificio de drenaje
Drain hole

B Terminais machos 6,3 x 0,8

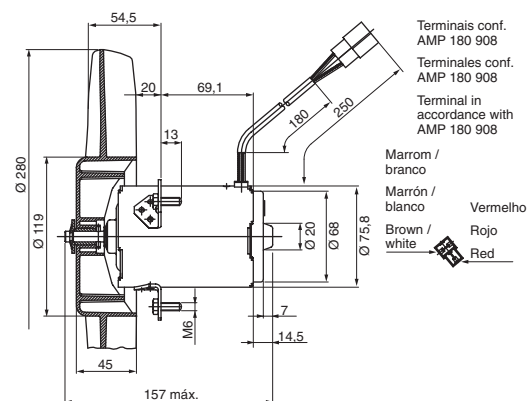
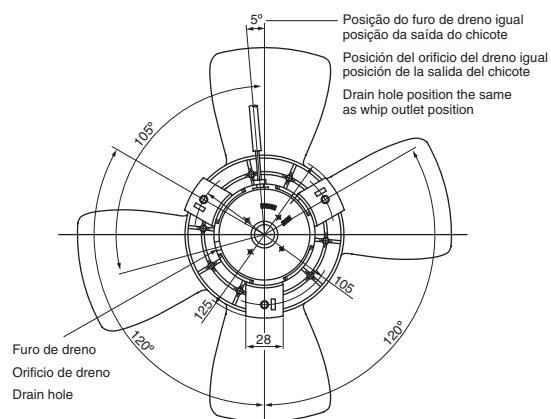
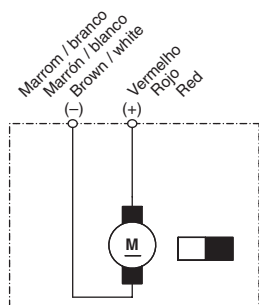
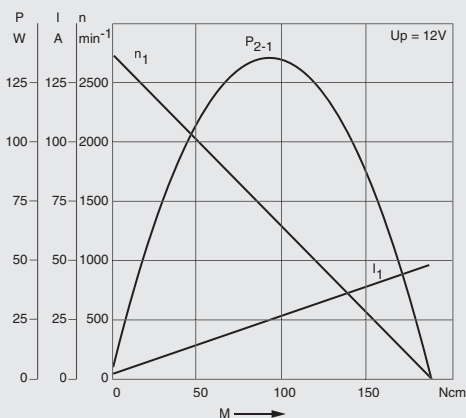
Terminales machos 6,3 x 0,8
Male terminals 6,3 x 0,8

DPG

12 V 65 W



U_N	12 V
P_N	65 W
n_N	2340 rpm
I_N	9 A
M_A	190 Ncm
<i>Rot.</i>	R
<i>S</i>	S1
<i>IP</i>	IP 23
<i>kg</i>	2,390 kg
Ⓢ	9 130 451 115



Terminais conf.
AMP 180 908

Terminales conf.
AMP 180 908

Terminal in
accordance with
AMP 180 908

Marrom /
branco

Marrón /
blanco

Brown /
white

Vermelho

Rojo

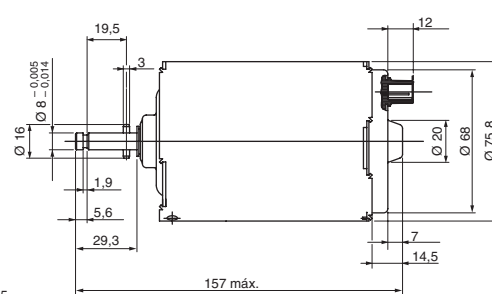
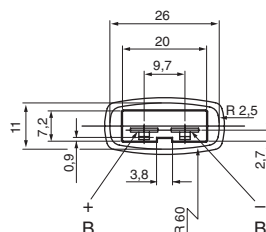
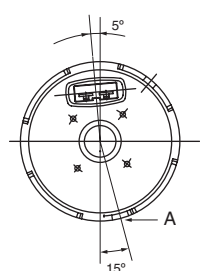
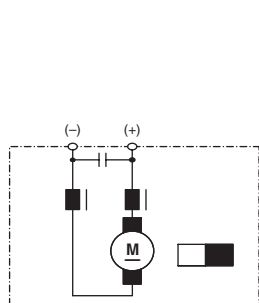
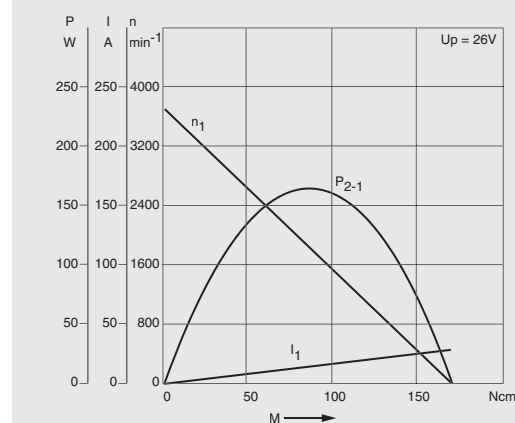
Red

DPG

24 V 100 W



U_N	24 V
P_N	100 W
n_N	3000 rpm
I_N	8 A
M_N	25 Ncm
M_A	170 Ncm
Rot.	R
S	S1
IP	IP 23
kg	1,465 kg
Ⓜ	9 130 451 116



A Furo de dreno
Orificio de dreno
Drain hole

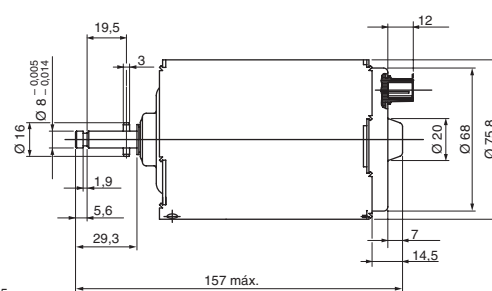
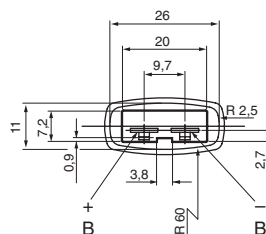
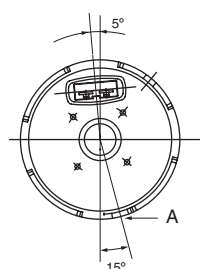
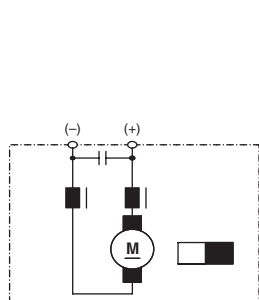
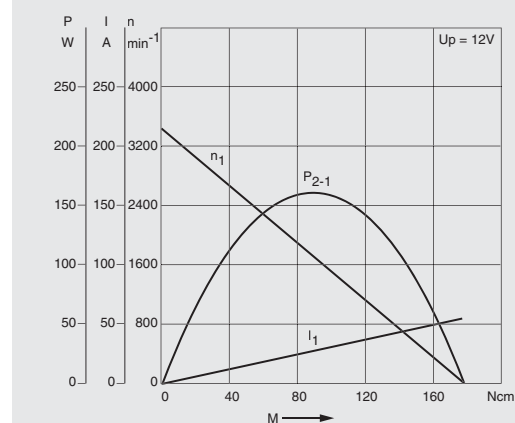
B Terminais machos 6,3 x 0,8
Terminales machos 6,3 x 0,8
Male terminals 6,3 x 0,8

DPG

12 V 100 W



U_N	12 V
P_N	100 W
n_N	2700 rpm
I_N	13 A
M_N	40 Ncm
M_A	179 Ncm
Rot.	R
S	S1
IP	IP 23
kg	1,520 kg
Ⓜ	9 130 451 117

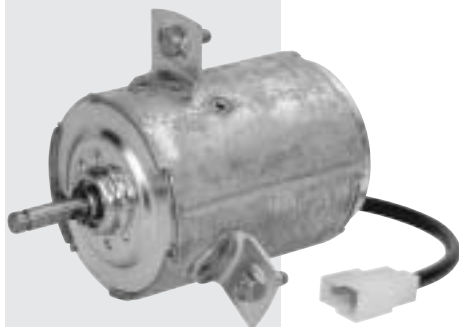


A Furo de dreno
Orificio de dreno
Drain hole

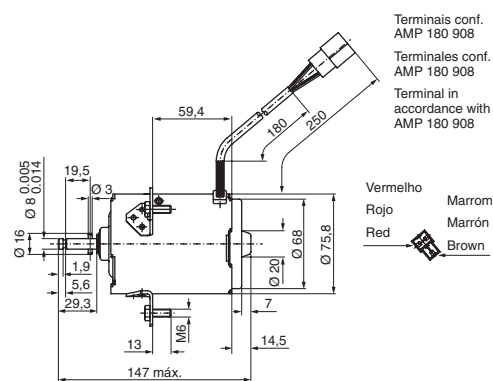
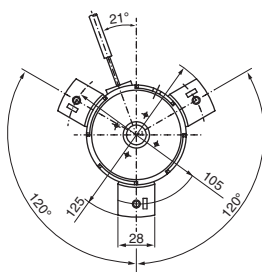
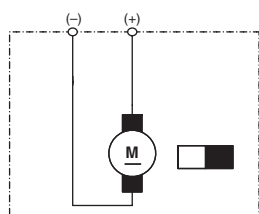
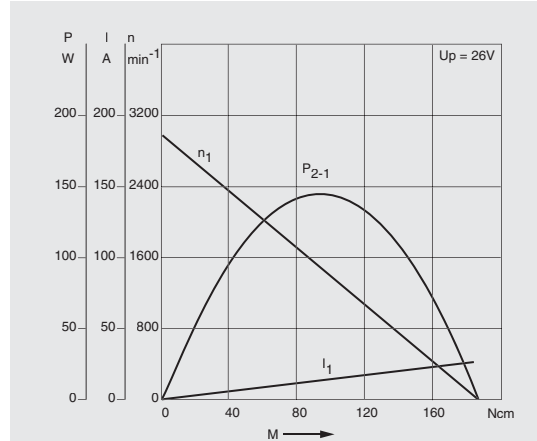
B Terminais machos 6,3 x 0,8
Terminales machos 6,3 x 0,8
Male terminals 6,3 x 0,8



DPG

24 V 35 W

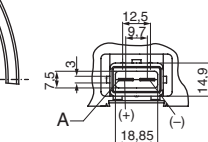
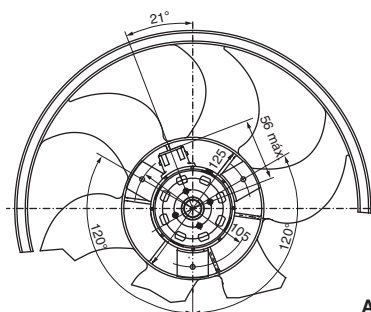
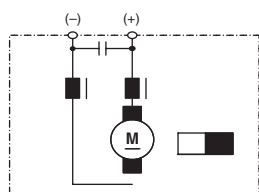
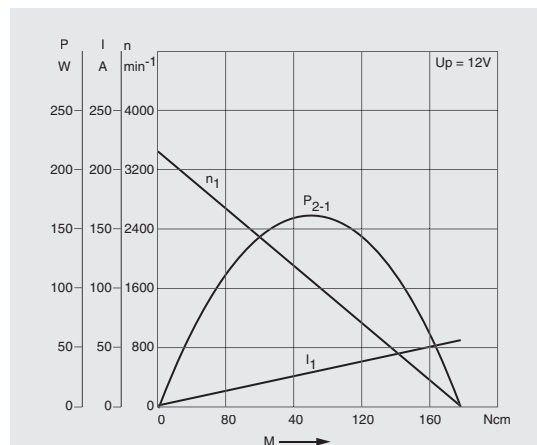
U_N	24 V
P_N	35 W
n_N	2800 rpm
I_N	2,8 A
M_N	12 Ncm
M_A	187 Ncm
Rot.	L
S	S1
IP	IP 23
kg	1,465 kg
Ⓜ	9 130 451 236



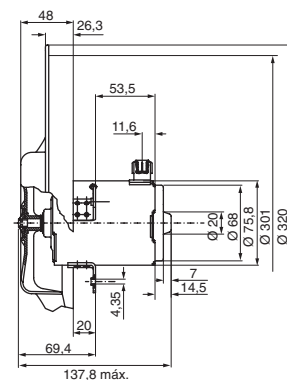
DPG

12 V 92 W

U_N	12 V
P_N	92 W
n_N	2850 rpm
I_N	14,5 A
M_A	179 Ncm
Rot.	R
S	S1
IP	IP 23
kg	0,900 kg
Ⓜ	F 006 KM0 402



A Terminal N 017 473
Material: CuSn6 F48 ou CuSn6 F55 - DIN 17 670
Terminal N 017 473
Material: CuSn6 F48 ó CuSn6 F55 - DIN 17 670
Terminal N 017 473
Material: CuSn6 F48 ou CuSn6 F55 - DIN 17 670

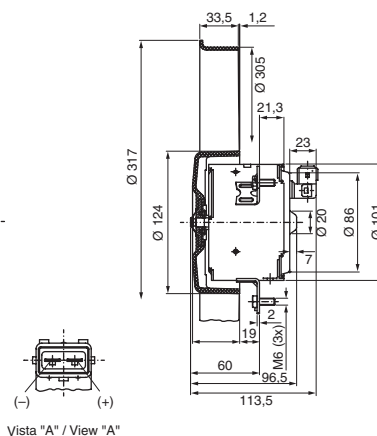
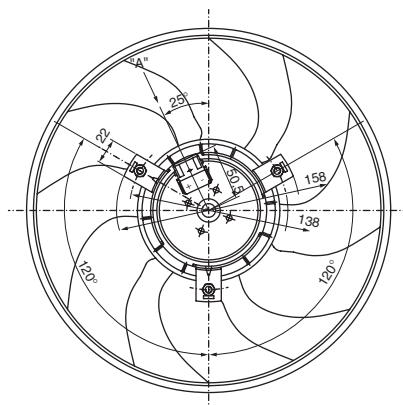
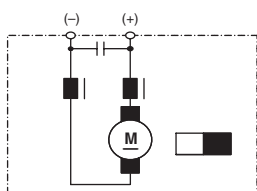
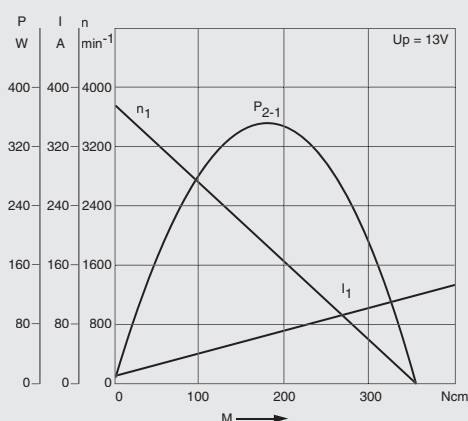


GPC

12 V 155 W



U_N	12 V
P_N	155 W
n_N	3300 rpm
I_N	25 A
M_A	350 Ncm
<i>Rot.</i>	R
<i>S</i>	S1
<i>IP</i>	IP 03
<i>kg</i>	1,800 kg
	9 130 451 165



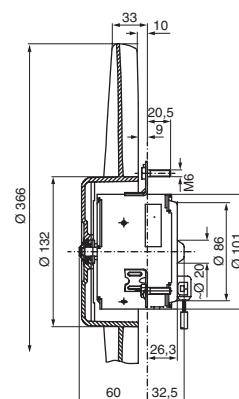
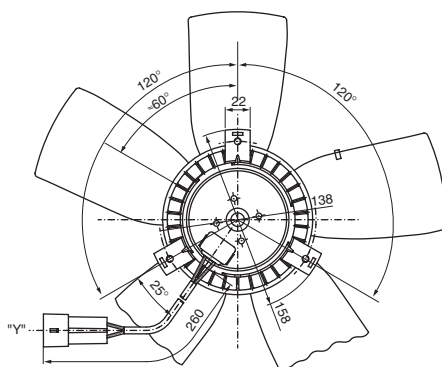
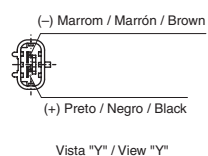
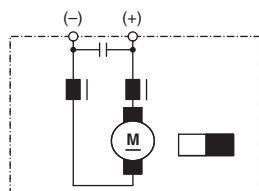
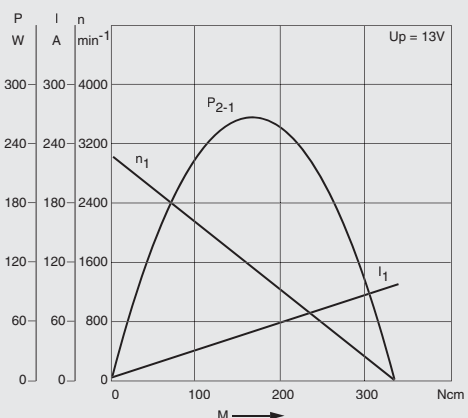
Vista "A" / View "A"

GPC

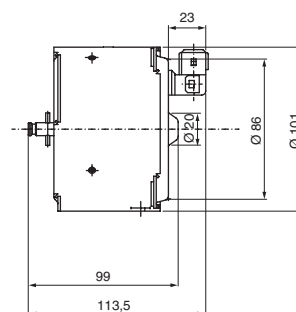
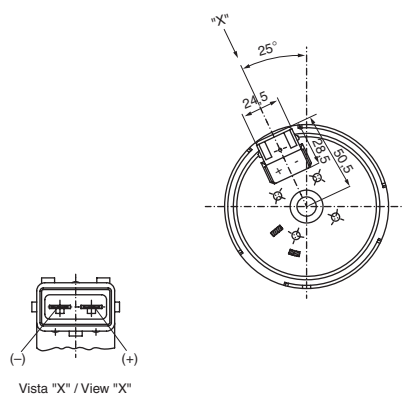
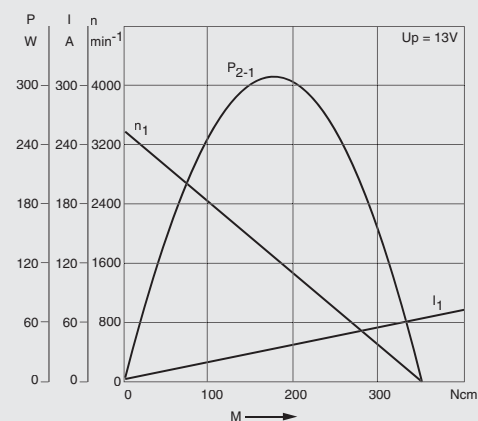
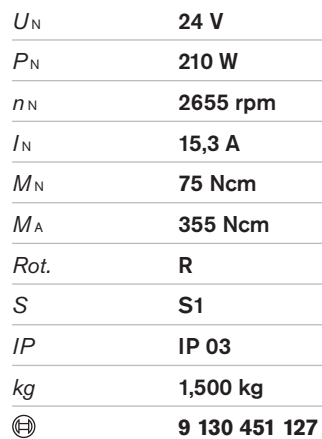
12 V 140 W



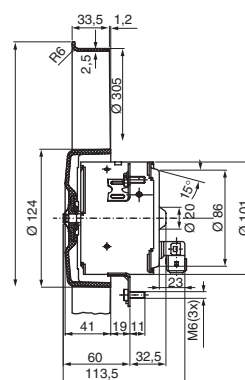
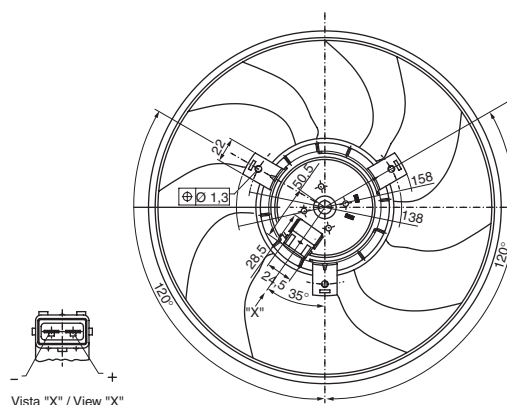
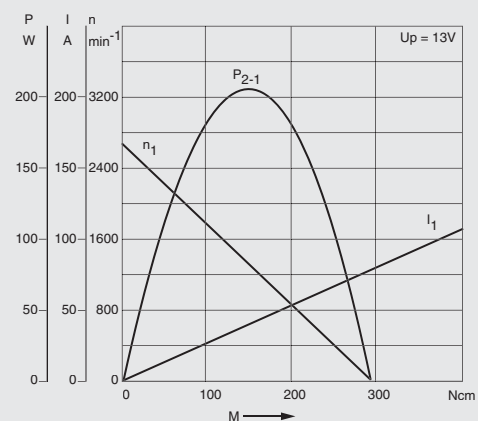
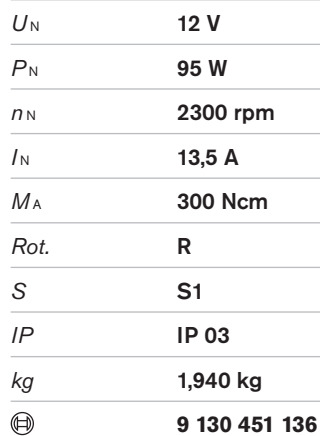
U_N	12 V
P_N	140 W
n_N	2600 rpm
I_N	22 A
M_A	340 Ncm
<i>Rot.</i>	R
<i>S</i>	S1
<i>IP</i>	IP 03
<i>kg</i>	1,500 kg
Ⓢ	9 130 451 125



24 V 210 W



12 V 95 W

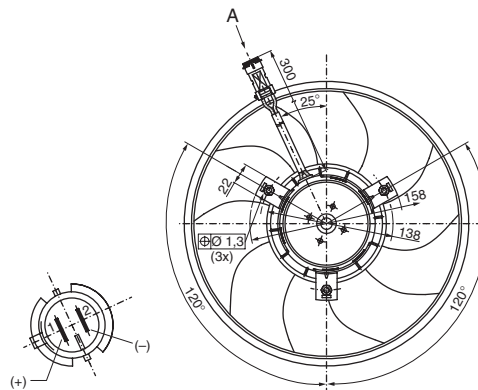
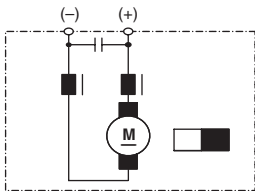
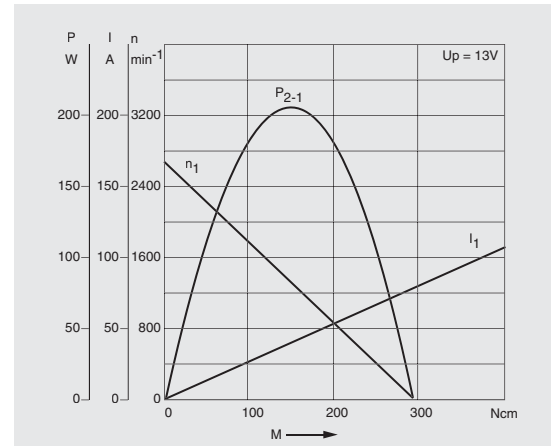


GPC

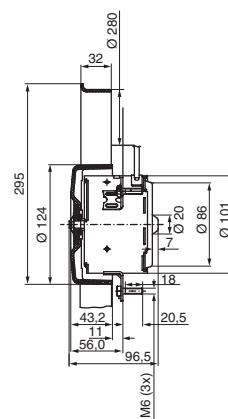
12 V 70 W



U_N	12 V
P_N	70 W
n_N	2400 rpm
I_N	10 A
M_A	300 Ncm
Rot.	R
S	S1
IP	IP 23
kg	1,830 kg
Ⓜ	9 130 451 216



Vista "A" / View "A"



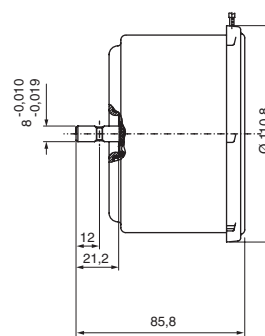
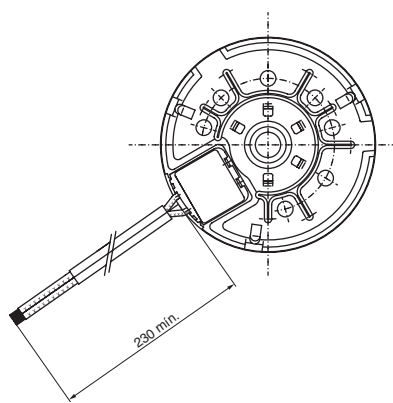
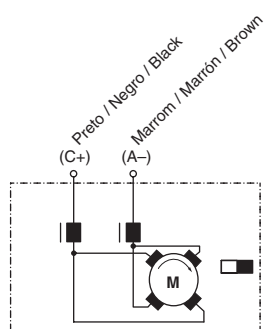
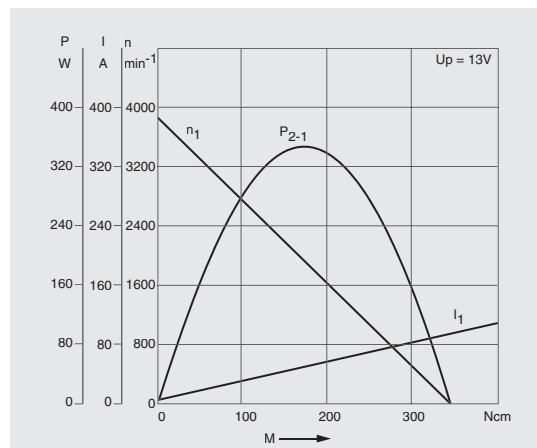
GPC



GPB

12 V 240 W

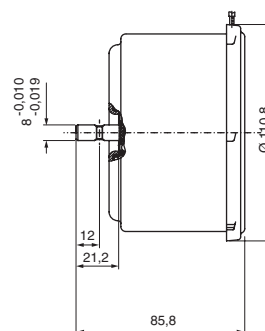
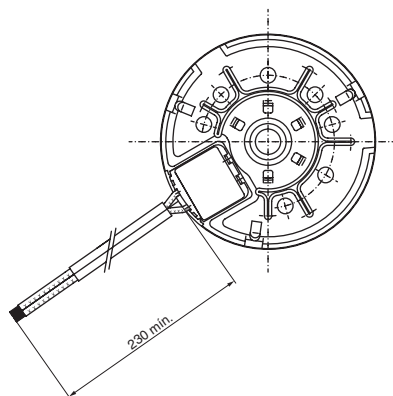
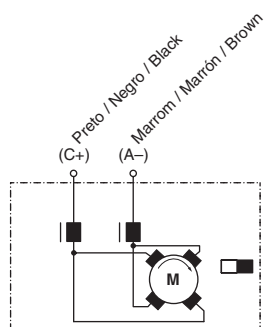
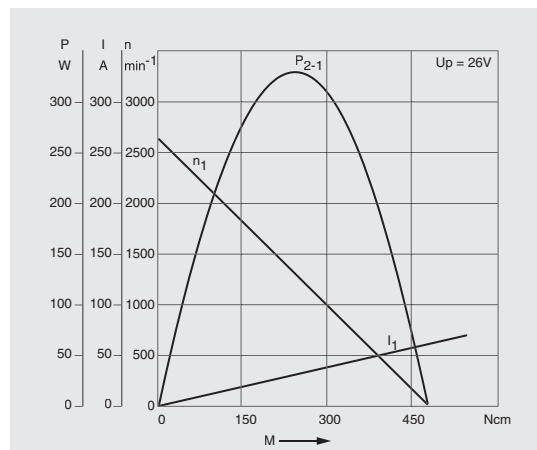
U_N	12 V
P_N	240 W
n_N	3025 rpm
I_N	25,3 A
M_N	75 Ncm
M_A	350 Ncm
Rot.	R
S	S1
IP	IP 03
kg	1,540 Kg
Ⓜ	F 006 KM0 60E



GPB

24 V 175 W

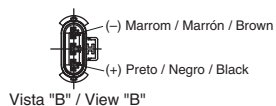
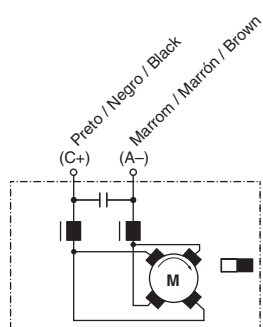
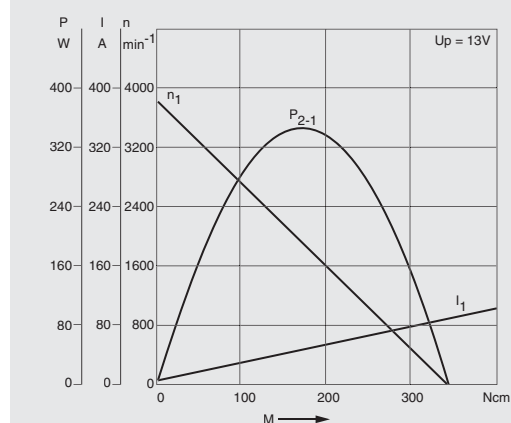
U_N	24 V
P_N	175 W
n_N	2200 rpm
I_N	10,5 A
M_N	75 Ncm
M_A	480 Ncm
Rot.	R
S	S1
IP	IP 03
kg	1,565 Kg
Ⓜ	F 006 KM0 60F



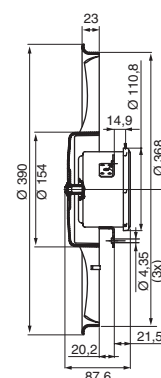
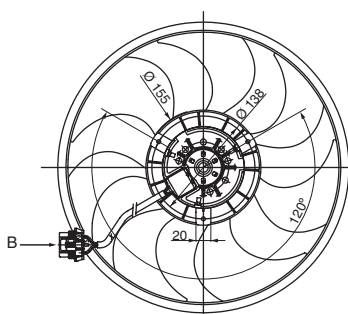
GPB

12 V 305 W

U_N	12 V
P_N	305 W
n_N	2600 rpm
I_N	25 A
M_A	350 Ncm
Rot.	R
S	S1
IP	IP 03
kg	1,585 kg
Ⓜ	F 006 KM0 611



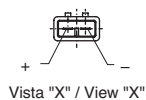
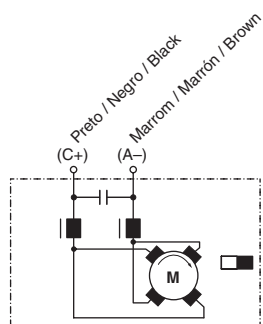
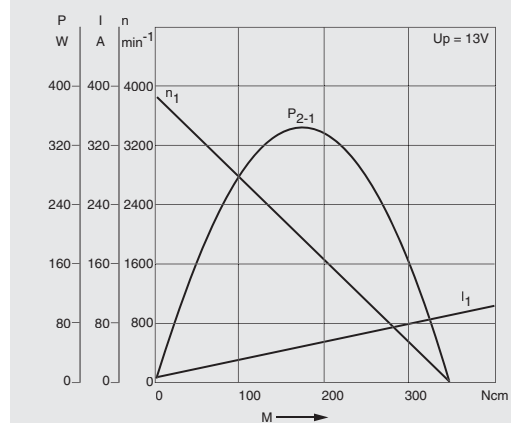
Vista "B" / View "B"



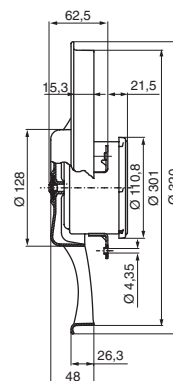
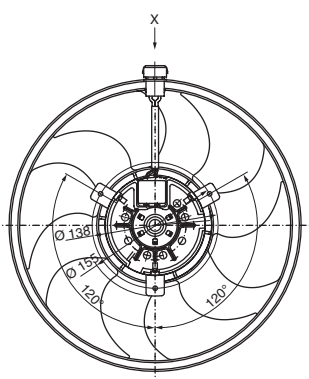
GPB

12 V 170 W

U_N	12 V
P_N	170 W
n_N	3400 rpm
I_N	23 A
M_A	380 Ncm
Rot.	R
S	S1
IP	IP 03
kg	0,900 kg
Ⓜ	F 006 KM0 615



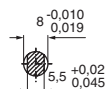
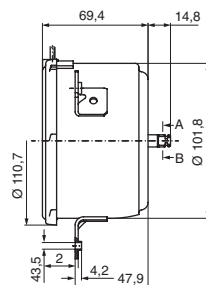
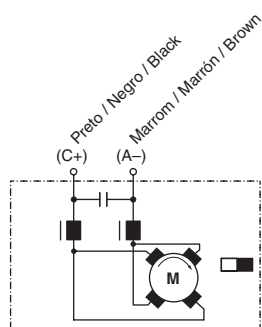
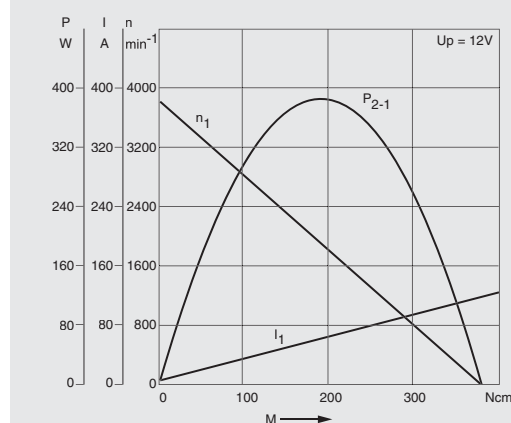
Vista "X" / View "X"



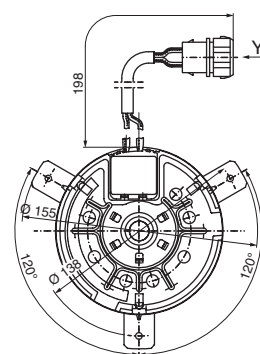
GPB

12 V 245 W

U_N	12 V
P_N	245 W
n_N	3115 rpm
I_N	28,5 A
M_N	75 Ncm
M_A	380 Ncm
Rot.	R
S	S1
IP	IP 03
kg	1,300 kg
Ⓜ	F 006 KM1 682

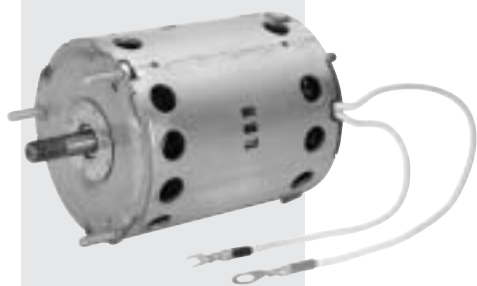


Corte A-B / Section A-B

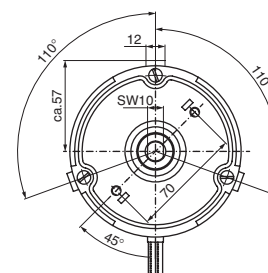
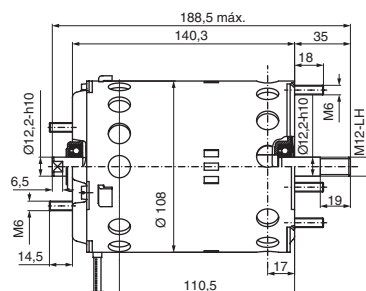
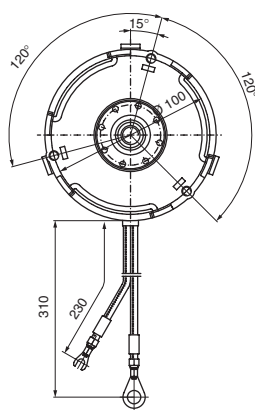
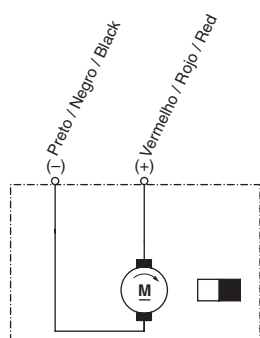
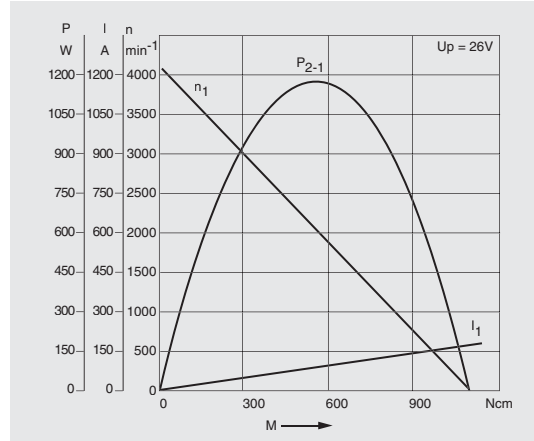


Vista Y / View Y

GPA

24 V 750 W

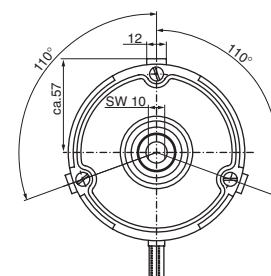
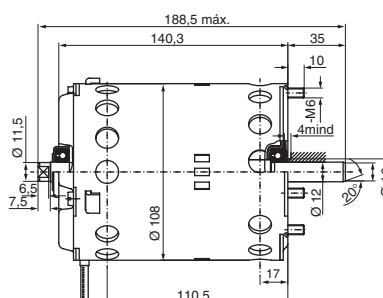
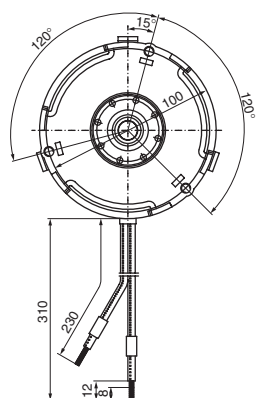
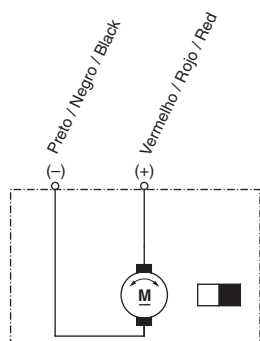
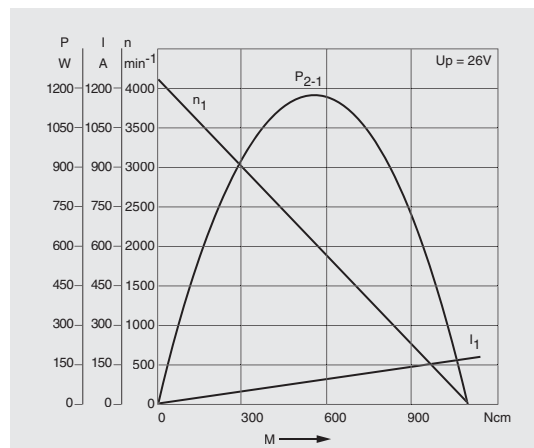
U_N	24 V
P_N	750 W
n_N	3300 rpm
I_N	35 A
M_N	150 Ncm
M_A	1100 Ncm
Rot.	R
S	S1
IP	IP 10
kg	3,800 kg
Ⓜ	0 130 302 013



GPA

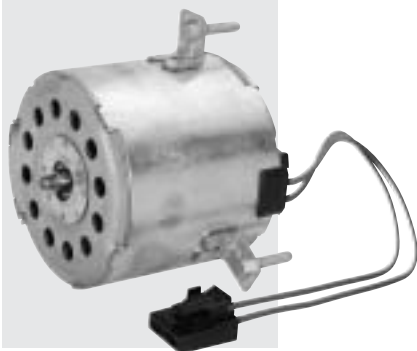
24 V 750 W

U_N	24 V
P_N	750 W
n_N	3250 rpm
I_N	35 A
M_N	150 Ncm
M_A	1100 Ncm
Rot.	L
S	S1
IP	IP 10
kg	3,800 kg
Ⓜ	0 130 302 014

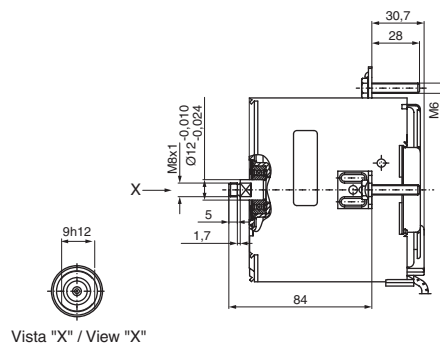
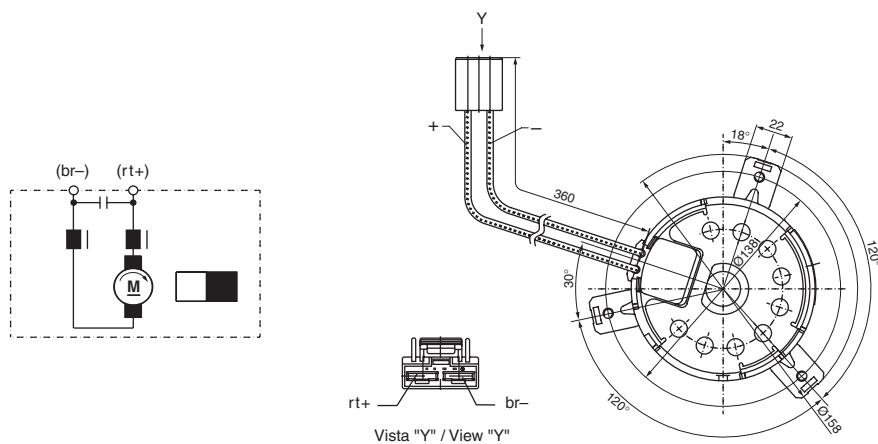
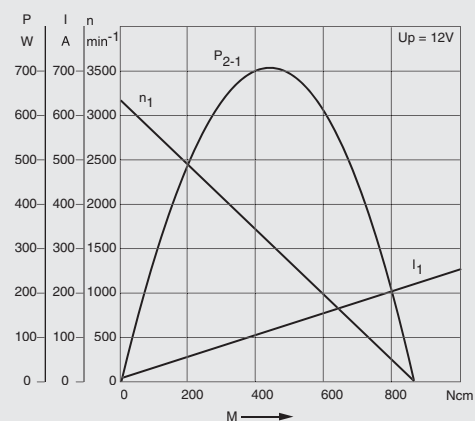


GPA

12 V 300 W



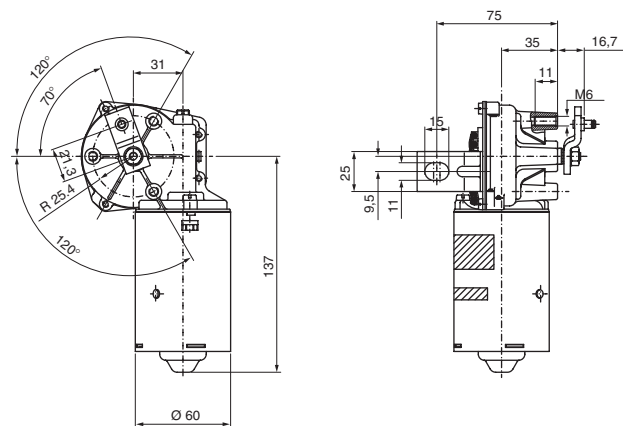
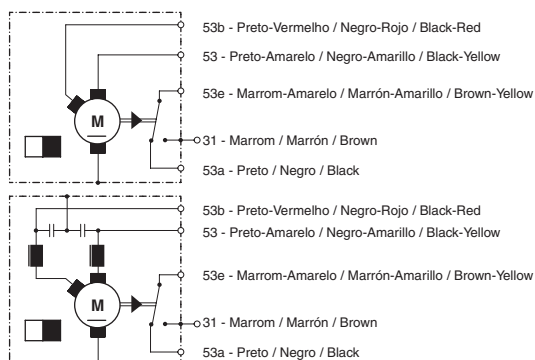
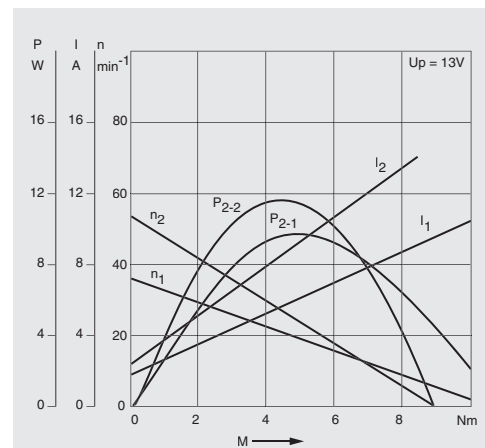
U_N	12 V
P_N	300 W
n_N	2800 rpm
I_N	33 A
M_N	100 Ncm
M_A	855 Ncm
Rot.	R
S	S1
IP	IP 03
kg	2,670 kg
	F 006 KM0 62H



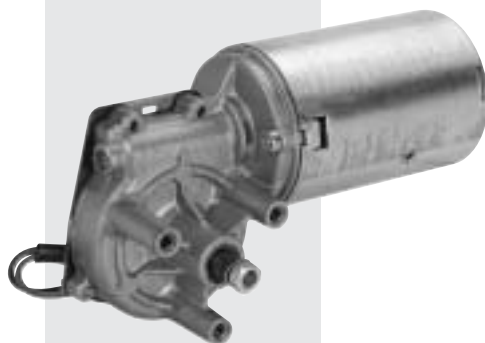
CHP

12 V 5,5 W / 6,5 W

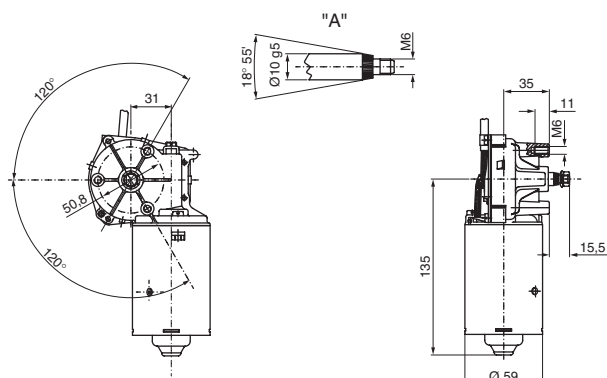
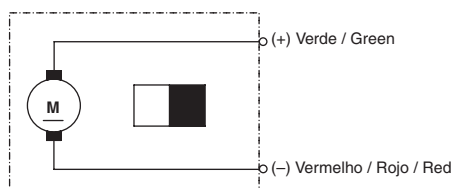
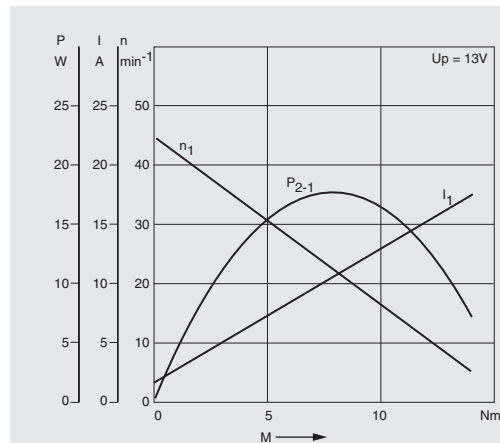
U_N	12 V	
P_N	5,5 W / 6,5 W	
	VI	VII
n_N	28 rpm	42 rpm
I_N	3,5 A	5,5 A
$I_{M\dot{A}X.}$	10,5 A	14,1 A
M_N	2 Nm / 1,5 Nm	
M_A	10 Nm / 8,5 Nm	
i	54 : 1	
Rot.	L	
S	S1	
IP	IP 44	
kg	1,100 kg	
Ⓜ	9 390 082 031	



CHP

12 V 12 W

U_N	12 V
P_N	12 W
	VI
n_N	38 rpm
I_N	5 A
$I_{M\dot{A}X.}$	17,5 A
M_N	3,5 Nm
M_A	14 Nm
i	54 : 1
Rot.	L
S	S1
IP	IP 44
kg	1,100 kg
Ⓜ	9 390 082 064



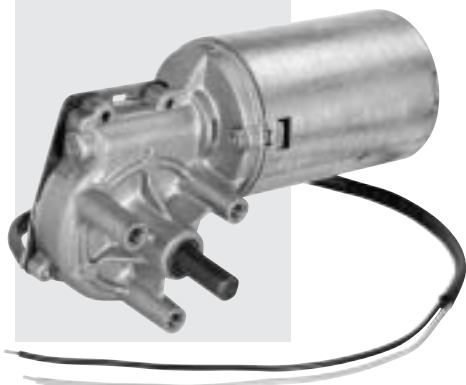
A Detalhe da ponta do eixo / Detalle del punto del eje / Shaft point details

CHP

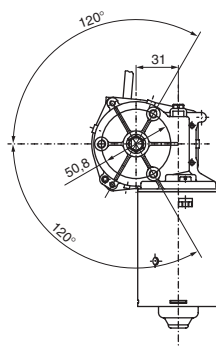
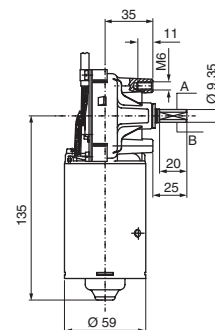
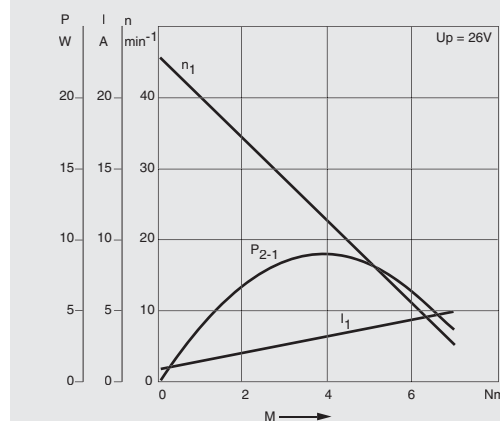


CHP

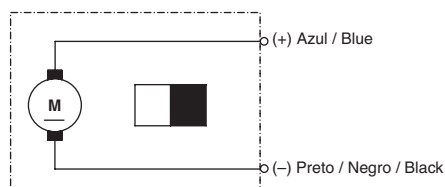
24 V 6 W



U_N	24 V
P_N	6 W
	VI
n_N	35 rpm
I_N	2,0 A
$I_{M\dot{A}X.}$	5 A
M_N	1,75 Nm
M_A	7 Nm
i	54 : 1
Rot.	L
S	S1
IP	IP 44
kg	1,100 kg
Ⓜ	9 390 453 008

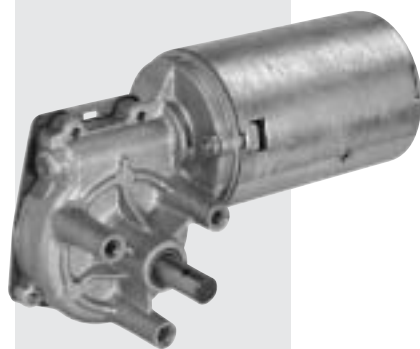


X Corte A-B / Section A-B

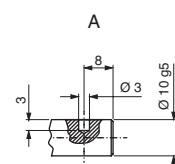
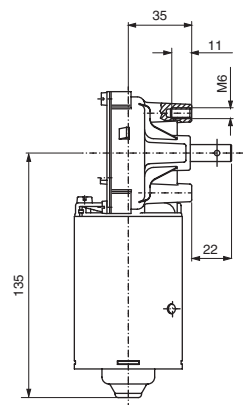
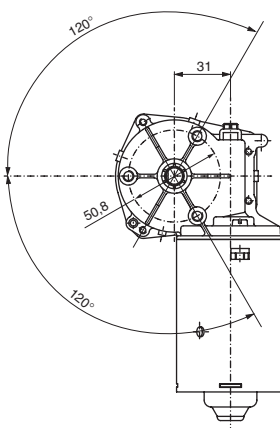
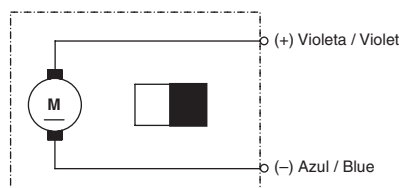
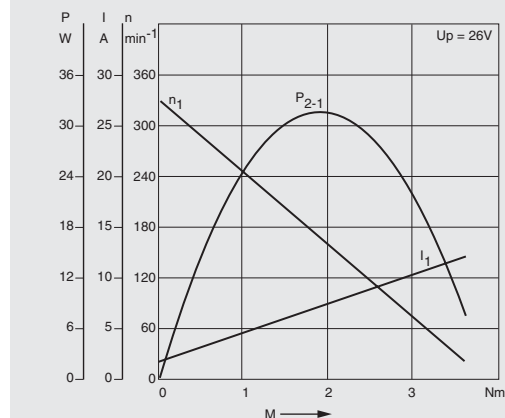


CHP

24 V 22 W



U_N	24 V
P_N	22 W
	VI
n_N	250 rpm
I_N	4 A
$I_{M\dot{A}X.}$	12 A
M_N	0,95 Nm
M_A	3,8 Nm
i	41 : 1
Rot.	L
S	S1
IP	IP 44
kg	1,100 kg
Ⓜ	9 390 453 009

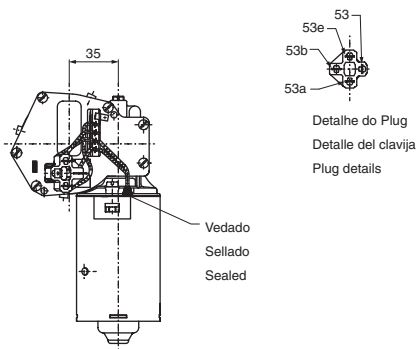
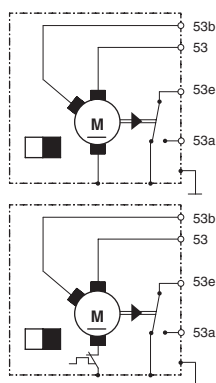
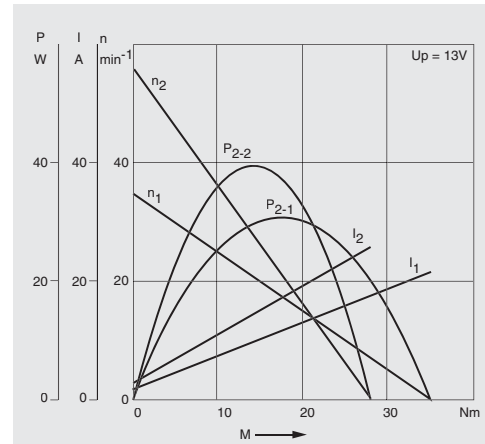
A Detalhe da ponta do eixo
Detalle del punto del eje
Shaft point details

CEP

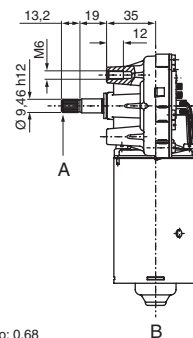
12 V 24 W / 28 W



U_N	12 V	
P_N	24 W / 28 W	
n_N	VI 26 rpm	VII 43 rpm
I_N	7,0 A	9,0 A
$I_{M\acute{A}X.}$	21,6 A	26 A
M_N	8 Nm / 6,5 Nm	
M_A	31 Nm / 25 Nm	
i	63 : 1	
Rot.	R	
S	S1	
IP	IP 44	
kg	1,100 kg	
Ⓜ	9 390 453 023	



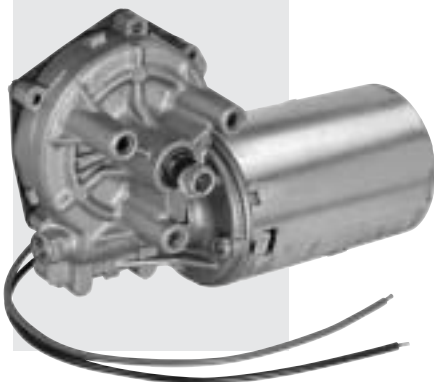
A Ângulo do flanco do dente: 90° - Nº de dentes: 42 - Passo: 0,68
 Ángulo del flanco del diente 90° - Nº de dientes: 42 - Paso: 0,68
 Tooth flank angle 90° - Number of teeth: 42 - Span: 0,68



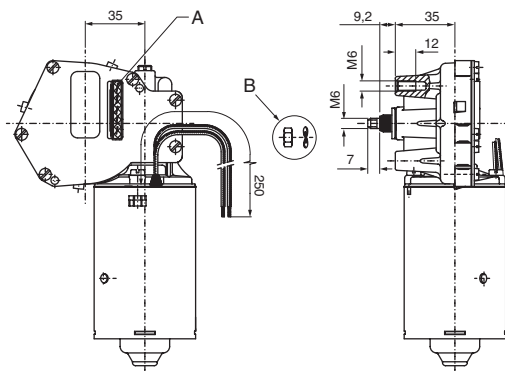
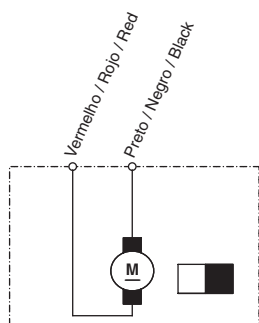
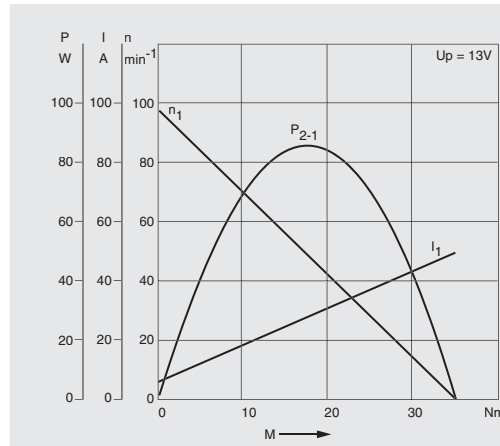
B Desenhado sem o plug
 Dibujado sin clavija
 Drawn without plug

CEP

12 V 57 W



U_N	12 V
P_N	57 W
n_N	75 rpm
I_N	18 A
$I_{M\acute{A}X.}$	50 A
M_N	9 Nm
M_A	36 Nm
i	63 : 1
Rot.	R
S	S1
IP	IP 44
kg	1,100 kg
Ⓜ	9 390 453 042



A Encaixe dos terminais vedados à prova d'água
 Encaje de los terminales sellados a prueba de agua
 Water proof sealed terminal fitting

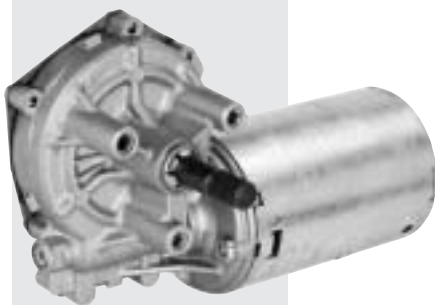
B Porca e arruela para rosca M6, fornecidas montadas.
 Tuerca y rondana para rosca M6, suministradas montadas
 Nut and washer for thread M6, supplied assembled

C Furo de dreno Ø 5
 Orificio de drenaje
 Drain hole

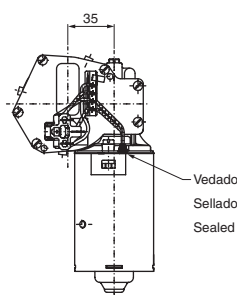
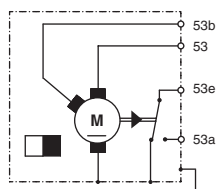
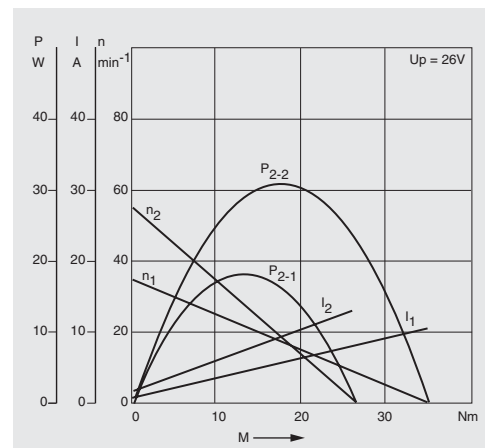


CEP

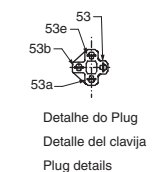
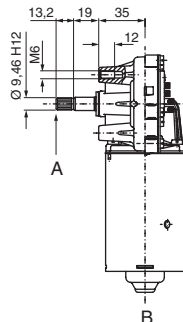
24 V 13 W / 20 W



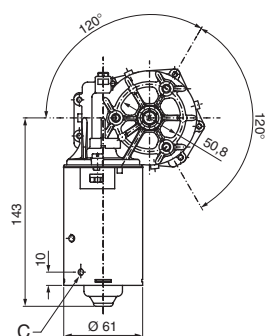
U_N	24 V	
P_N	13 W / 20 W	
n_N	VI 28 rpm	VII 40 rpm
I_N	3,5 A	5,0 A
$I_{M\acute{A}X.}$	10,3 A	13 A
M_N	7,5 Nm / 6 Nm	
M_A	30 Nm / 25 Nm	
i	63 : 1	
Rot.	R	
S	S1	
IP	IP 44	
kg	1,100 kg	
Ⓜ	F 006 WM0 308	



A Ângulo do flanco do dente: 90° - Nº de dentes: 42 - Passo: 0,68
 Ángulo del flanco del diente 90° - Nº de dientes: 42 - Paso: 0,68
 Tooth flank angle 90° - Number of teeth: 42 - Span: 0,68



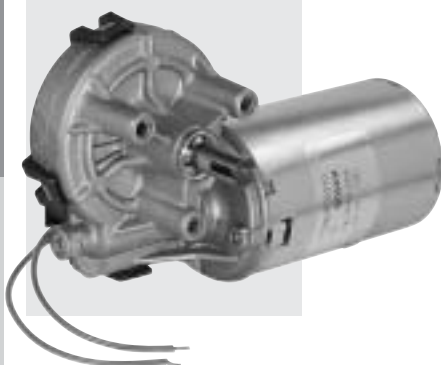
B Desenhado sem o plug
 Dibujado sin clavija
 Drawn without plug



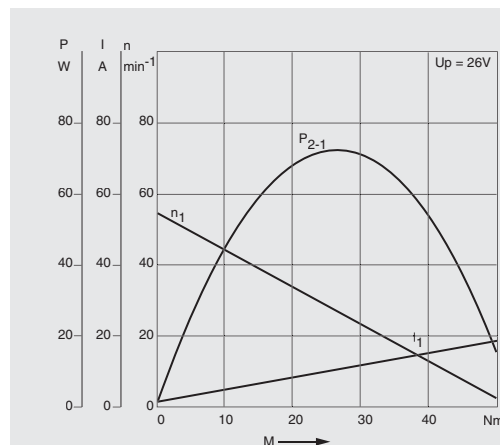
C Furo de dreno Ø 5
 Orificio de dreno
 Drain hole

CEP

24 V 46 W



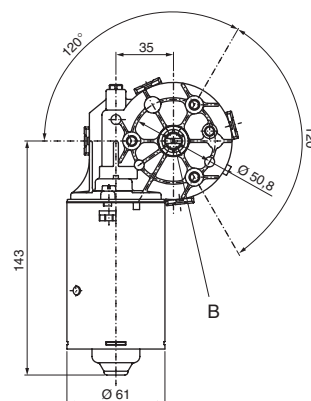
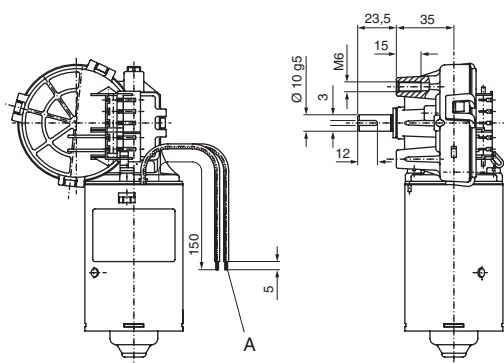
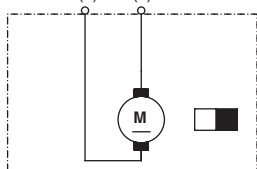
U_N	24 V
P_N	46 W
n_N	VI 45 rpm
I_N	5,0 A
$I_{M\acute{A}X.}$	18,6 A
M_N	10 Nm
M_A	48 Nm
i	63 : 1
Rot.	L / R
S	S1
IP	IP 44
kg	1,100 kg
Ⓜ	F 006 WM0 310



Vermelho (+)
 Rojo (+)
 Red (+)

(-) Verde
 (-) Green

(-) Vermelho
 (-) Rojo
 (-) Red

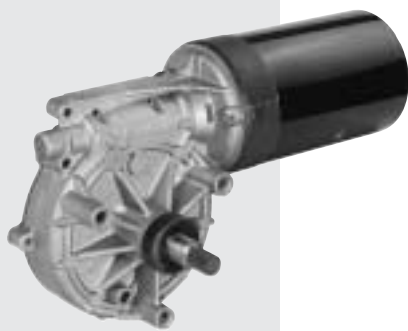


A Ponta não estanhada
 Punta no estañada
 Non-tinned tip

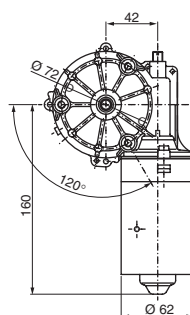
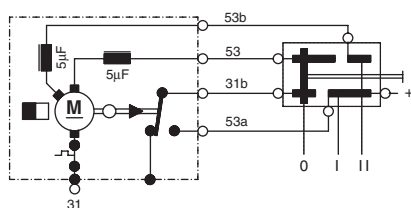
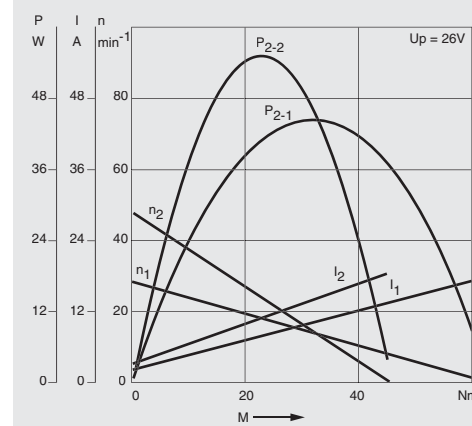
B Rasgo do eixo será fornecido em qualquer posição
 Rasgo del eje se suministrará en cualquier posición
 Shaft rip will be supplied in any position

CDP

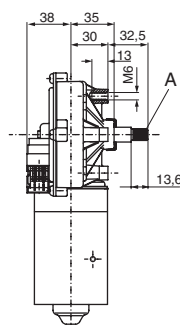
24 V 50 W



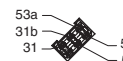
U_N	24 V	
P_N	50 W	
n_N	VI 28 rpm	VII 46 rpm
I_N	3 A	4 A
$I_{MÁX.}$	17 A	18,3 A
M_N	3 Nm	
M_A	50 Nm	
i	77 : 1	
Rot.	L	
S	S1	
IP	IP 44	
kg	1,300 kg	
Ⓜ	0 390 242 400	



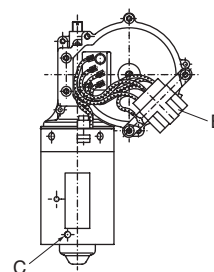
A Ângulo do flanco do dente: 90° - Nº de dentes: 42 - Passo: 0,675
 Ángulo del flanco del diente 90° - Nº de dientes: 42 - Paso: 0,675
 Tooth flank angle 90° - Number of teeth: 42 - Span: 0,675



Detalhe do Plug
 Detalle del clavija
 Plug details



B Plug referência Nº AMP 180 906
 Clavija referencia Nº AMP 180 906
 Reference plug Number AMP 180 906

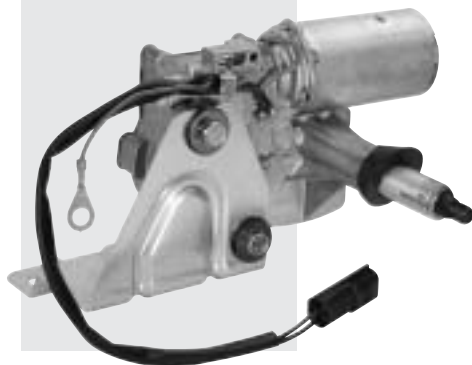


C Furo de dreno
 Orificio de dreno
 Drain hole

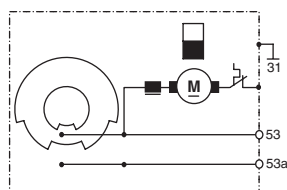
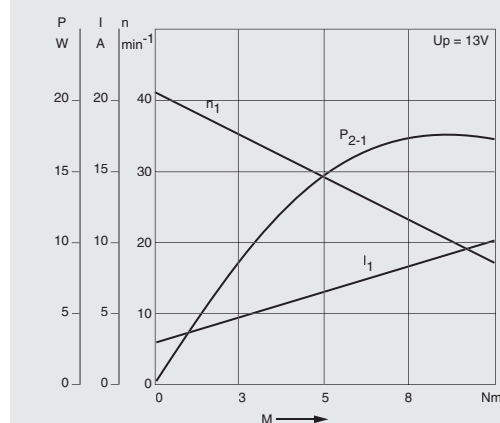


ADO

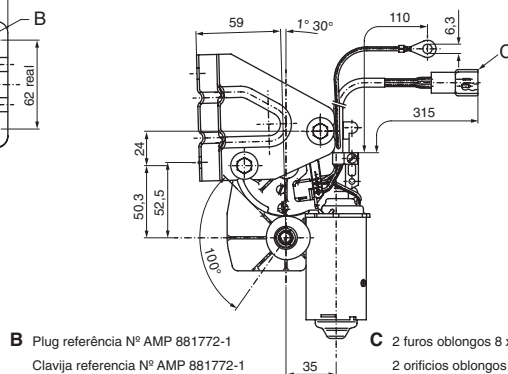
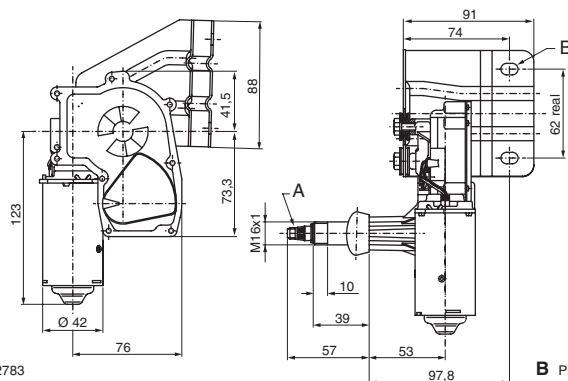
12 V 4,0 W



U_N	12 V
P_N	4,0 W
V_i	
n_N	38 rpm
I_N	3,4 A
$I_{M\text{AX.}}$	10,1 A
M_N	0,5 Nm
M_A	3 Nm
Rot.	L / R
S	S1
IP	IP 44
kg	1,100 kg
Ⓜ	9 390 456 030



A Ponta do eixo A10 x M8 conf. DIN 72783
Punta del eje A10 x M8 conf. DIN 72783
Spindle A10 X M8 in accordance with DIN72783

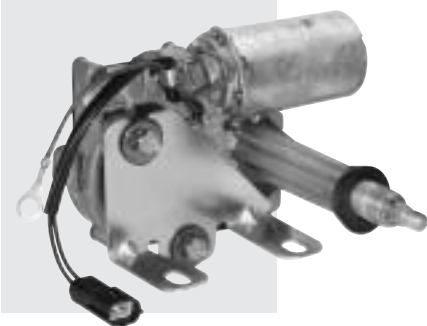


B Plug referência Nº AMP 881772-1
Clavija referencia Nº AMP 881772-1
Reference plug Number AMP 881772-1

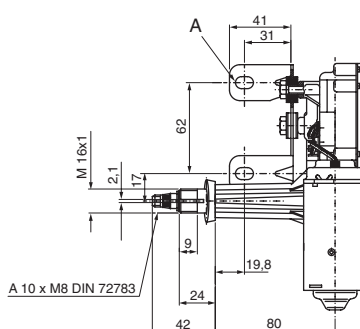
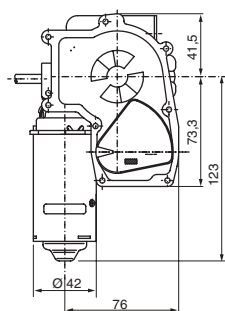
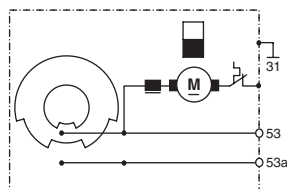
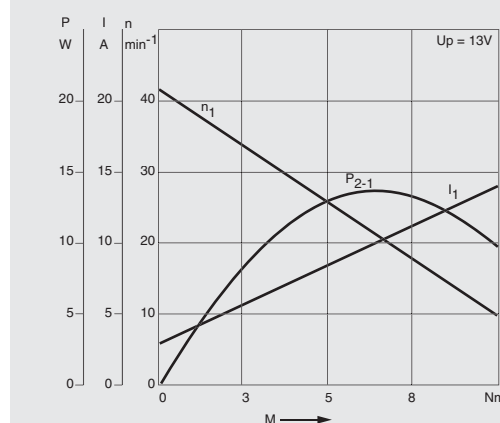
C 2 furos oblongos 8 x 12
2 orificios oblongos 8 x 12
2 oblong holes 8 x 12

ADO

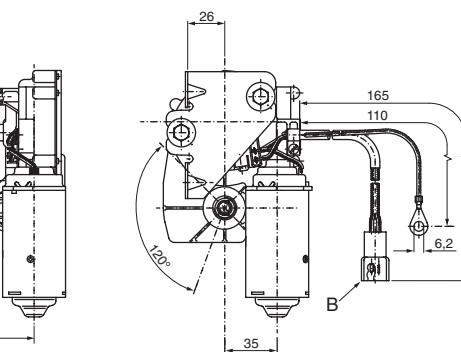
12 V 4,0 W



U_N	12 V
P_N	4,0 W
V_i	
n_N	38 rpm
I_N	3,4 A
$I_{M\text{AX.}}$	14 A
M_N	0,5 Nm
M_A	3 Nm
Rot.	L / R
S	S1
IP	IP 44
kg	1,100 kg
Ⓜ	9 390 456 029



A 2 furos oblongos 8 x 12
2 orificios oblongos 8 x 12
2 oblong holes 8 x 12

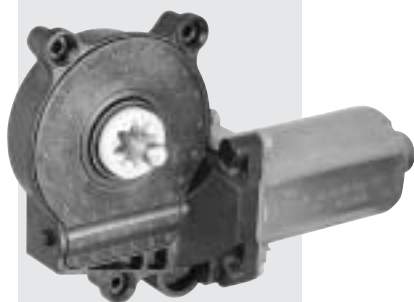


B Plug referência Nº AMP 881772-1
Clavija referencia Nº AMP 881772-1
Reference plug Number AMP 881772-1

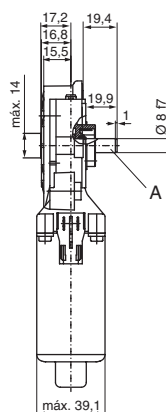
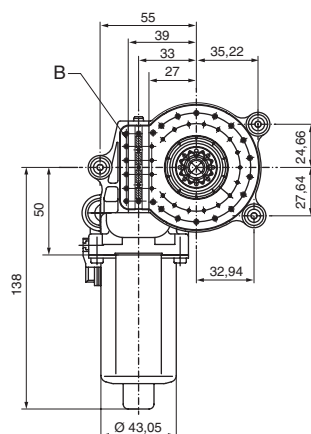
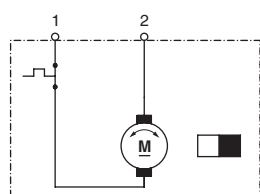
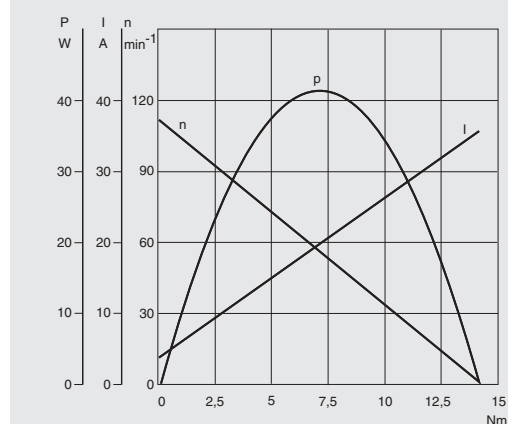


FPG

12 V 11,1 W



U_N	12 V
P_N	11,1 W
n_N	106 rpm
I_N	6 A
$I_{M\text{AX.}}$	36,0 A
M_N	1 Nm
M_A	14,2 Nm
i	73 : 1
Rot.	L / R
S	S2 - 5 min
IP	IP 5X
kg	0,650 kg
Ⓡ	0 130 821 678
Ⓛ	0 130 821 679



A O eixo deve ser apoiado no plano de parafusagem.
Folga máx. admitida 0,1

El eje debe apoyarse en el plano de destornillamiento.
Holgura máx. admitida 0.1

The shaft must be supported on the screw plan.
Max. clearance acceptable 0.1

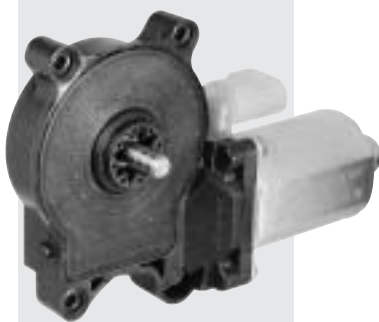
B Tampa da Caixa Redutora soldada por ultrassom
Marcas de Soldagem (ao redor de uma área de 15mm)
Altura máx. admissível 1,2

Tapa de la caja reductora soldada con ultrasonido
Marcas de soldadura (alrededor de un área de 15 mm)
Altura máx. admisible 1,2

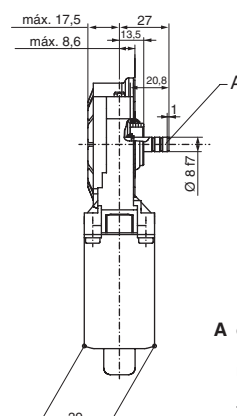
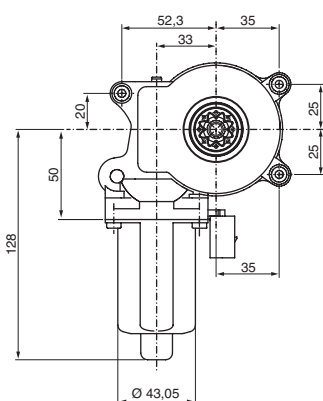
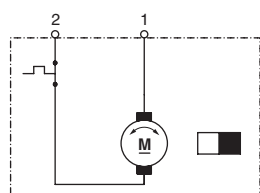
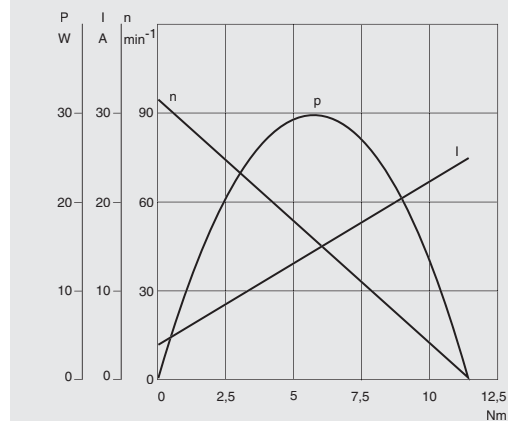
Reduction gear lid welded by ultrasound
Welding mark (around a 15-mm area)
Max. height acceptable 1.2

FPG

12 V 8,9 W



U_N	12 V
P_N	8,9 W
n_N	85 rpm
I_N	6 A
$I_{M\text{AX.}}$	25,0 A
M_N	1 Nm
M_A	12 Nm
i	73 : 1
Rot.	L / R
S	S2 - 5 min
IP	IP 5X
kg	0,560 kg
Ⓡ	0 130 821 412
Ⓛ	0 130 821 413



A O eixo deve ser apoiado no plano de parafusagem.
Folga máx. admitida 0,1

El eje debe apoyarse en el plano de destornillamiento.
Holgura máx. admitida 0.1

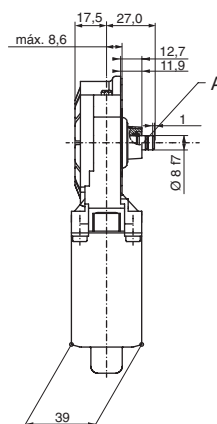
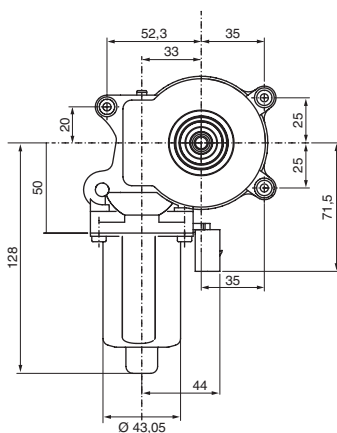
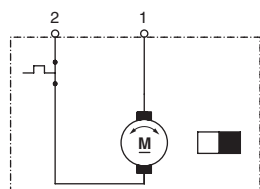
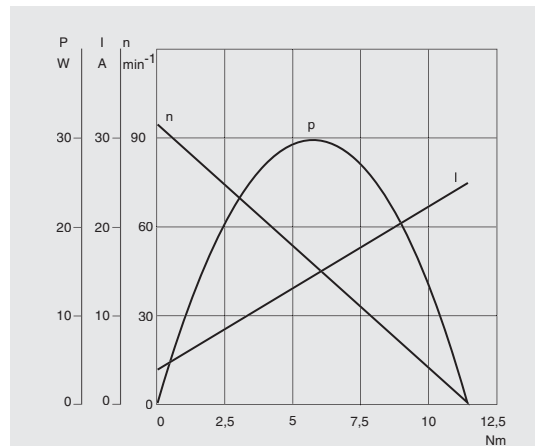
The shaft must be supported on the screw plan.
Max. clearance acceptable 0.1

FPG

12 V 8,9 W



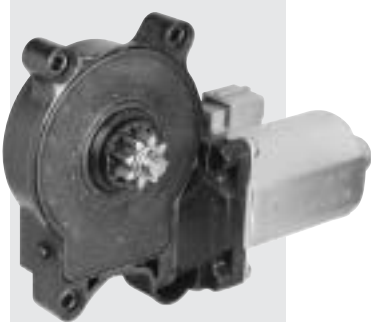
U_N	12 V
P_N	8,9 W
n_N	85 rpm
I_N	6 A
$I_{M\text{AX.}}$	25,0 A
M_N	1 Nm
M_A	12 Nm
i	73 : 1
Rot.	L / R
S	S2 - 5 min
IP	IP 5X
kg	0,560 kg
Ⓜ R	0 130 821 416
Ⓜ L	0 130 821 417



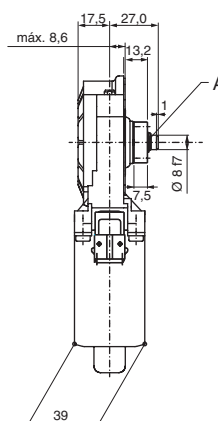
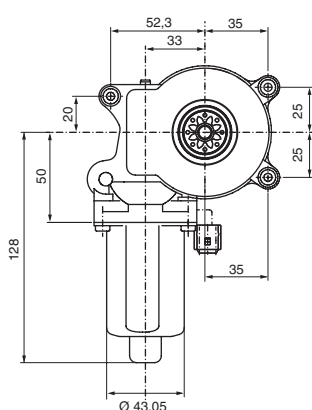
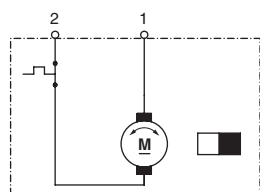
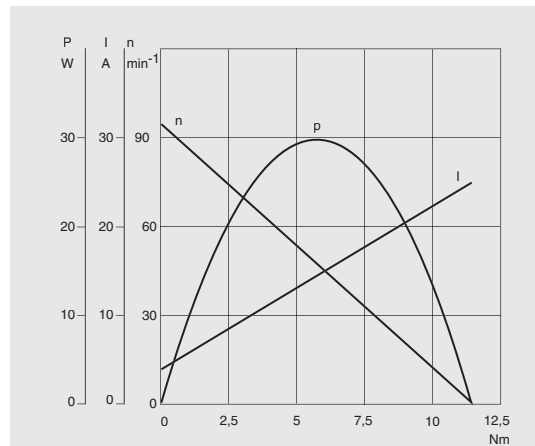
A O eixo deve ser apoiado no plano de parafusagem.
Folga máx. admitida 0,1
El eje debe apoyarse en el plano de destornillamiento.
Holgura máx. admitida 0,1
The shaft must be supported on the screw plan.
Max. clearance acceptable 0.1

FPG

12 V 8,9 W



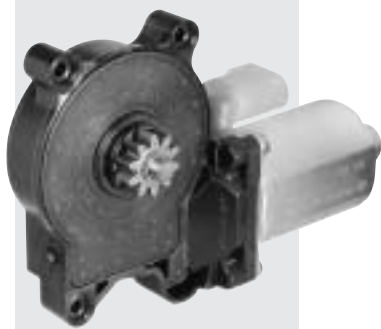
U_N	12 V
P_N	8,9 W
n_N	85 rpm
I_N	6 A
$I_{M\text{AX.}}$	25,0 A
M_N	1 Nm
M_A	12 Nm
i	73 : 1
Rot.	L / R
S	S2 - 5 min
IP	IP 5X
kg	0,560 kg
Ⓜ R	0 130 821 418
Ⓜ L	0 130 821 419



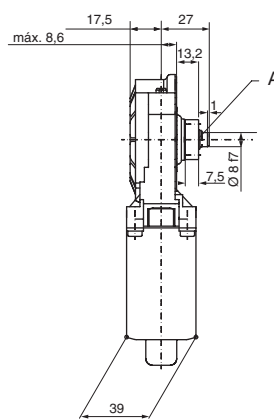
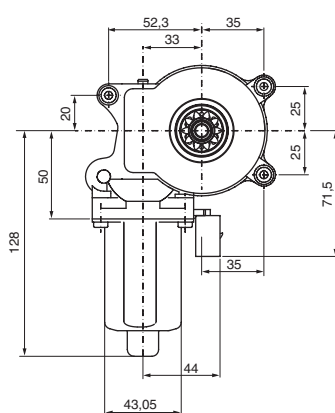
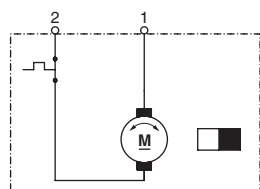
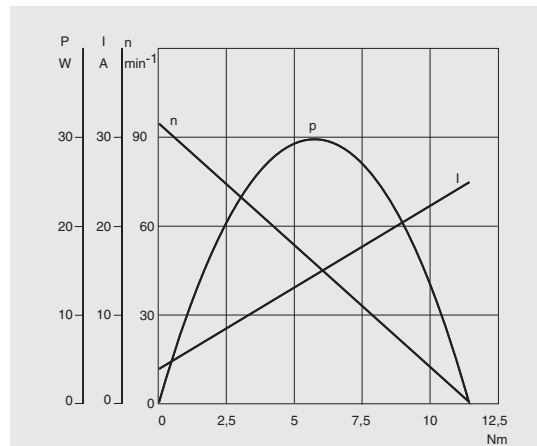
A O eixo deve ser apoiado no plano de parafusagem.
Folga máx. admitida 0,1
El eje debe apoyarse en el plano de destornillamiento.
Holgura máx. admitida 0,1
The shaft must be supported on the screw plan.
Max. clearance acceptable 0.1



FPG

12 V 8,9 W

U_N	12 V
P_N	8,9 W
n_N	85 rpm
I_N	6 A
$I_{M\text{AX.}}$	25,0 A
M_N	1 Nm
M_A	12 Nm
i	73 : 1
Rot.	L / R
S	S2 - 5 min
IP	IP 5X
kg	0,560 kg
Ⓜ R	0 130 821 968
Ⓜ L	0 130 821 969

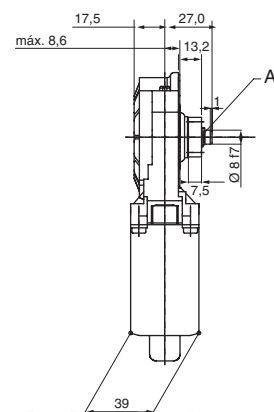
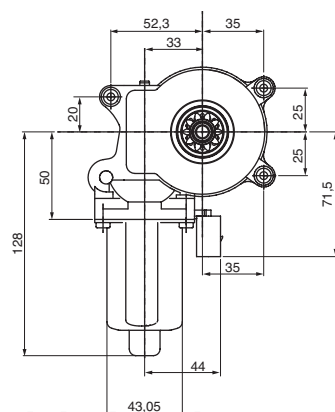
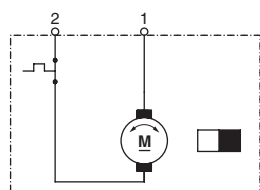
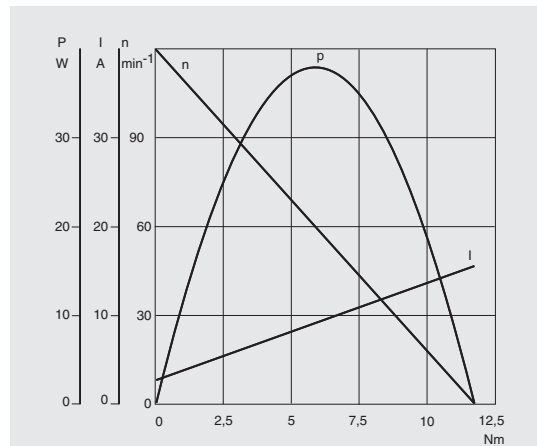


A O eixo deve ser apoiado no plano de parafusagem.
Folga máx. admitida 0,1
El eje debe apoyarse en el plano de destornillamiento.
Holgura máx. admitida 0.1
The shaft must be supported on the screw plan.
Max. clearance acceptable 0.1

FPG

24 V 11,6 W

U_N	24 V
P_N	11,6 W
n_N	110,5 rpm
I_N	4 A
$I_{M\text{AX.}}$	15,5 A
M_N	1 Nm
M_A	12 Nm
i	73 : 1
Rot.	L / R
S	S2 - 5 min
IP	IP 5X
kg	0,560 kg
Ⓜ R	0 130 821 978
Ⓜ L	0 130 821 979

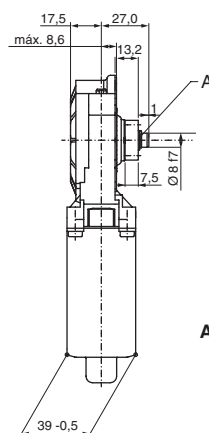
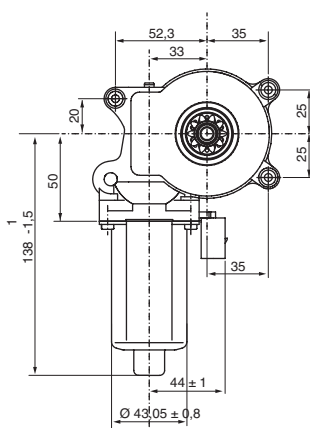
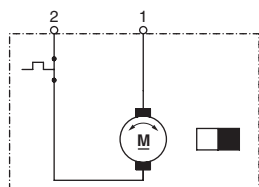
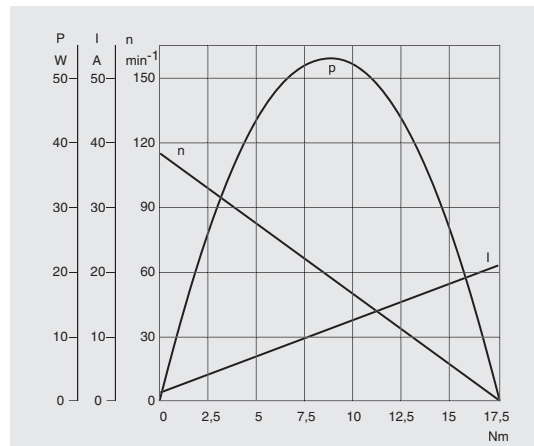


A O eixo deve ser apoiado no plano de parafusagem.
Folga máx. admitida 0,1
El eje debe apoyarse en el plano de destornillamiento.
Holgura máx. admitida 0.1
The shaft must be supported on the screw plan.
Max. clearance acceptable 0.1

FPG

24 V 11,5 W

U_N	24 V
P_N	11,5 W
n_N	110 rpm
I_N	3 A
$I_{MAX.}$	21,0 A
M_N	1 Nm
M_A	17,5 Nm
i	73 : 1
Rot.	L / R
S	S2 - 5 min
IP	IP 5X
kg	0,600 kg
Ⓜ R	0 130 821 424
Ⓜ L	0 130 821 425

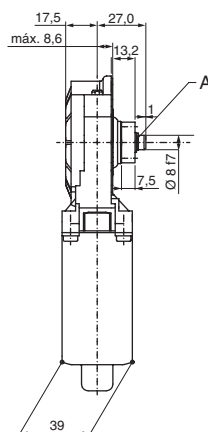
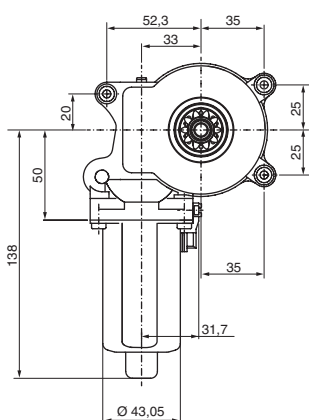
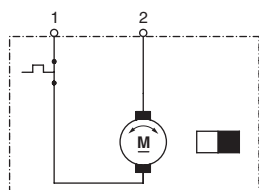
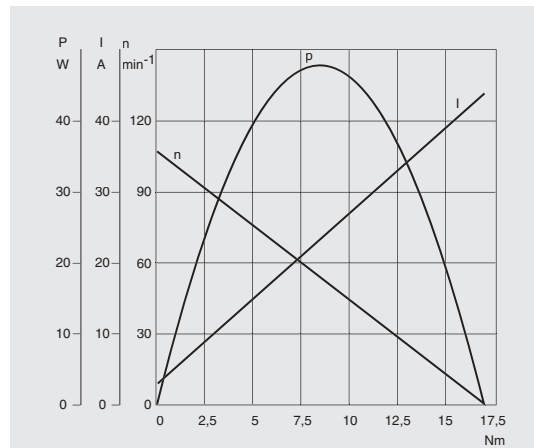


A O eixo deve ser apoiado no plano de parafusagem.
Folga máx. admitida 0,1
El eje debe apoyarse en el plano de destornillamiento.
Holgura máx. admitida 0.1
The shaft must be supported on the screw plan.
Max. clearance acceptable 0.1

FPG

12 V 10,2 W

U_N	12 V
P_N	10,2 W
n_N	98 rpm
I_N	6 A
$I_{MAX.}$	42,0 A
M_N	1 Nm
M_A	16,9 Nm
i	73 : 1
Rot.	L / R
S	S2 - 5 min
IP	IP 5X
kg	0,600 kg
Ⓜ R	0 130 821 428
Ⓜ L	0 130 821 429



A O eixo deve ser apoiado no plano de parafusagem.
Folga máx. admitida 0,1
El eje debe apoyarse en el plano de destornillamiento.
Holgura máx. admitida 0.1
The shaft must be supported on the screw plan.
Max. clearance acceptable 0.1

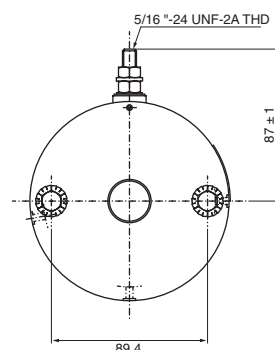
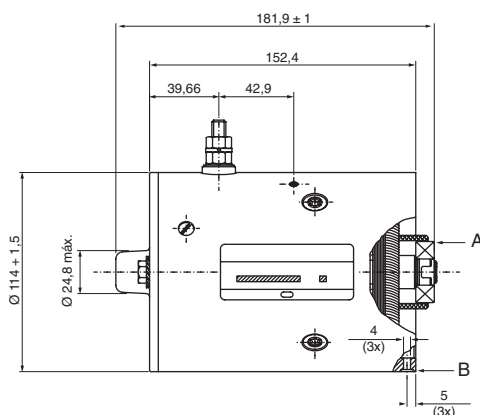
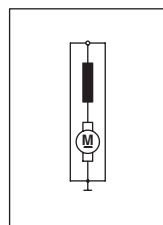
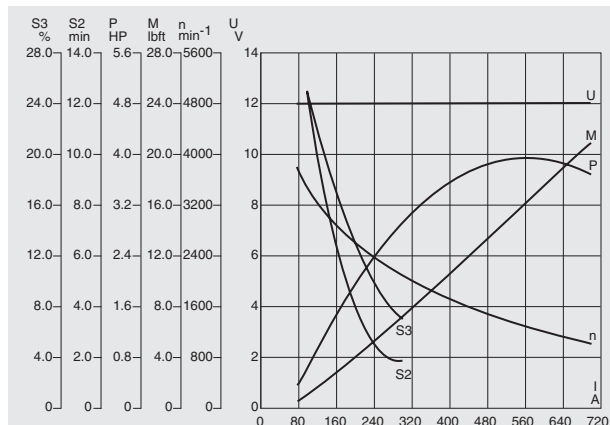


MH

12 V 1,3 kW



U_N	12 V	
P_N	1,3 kW (valor a 5,4 Nm)	
n_N	2260 rpm	
I_N	200 A	
Rot.	L	
S	S2	S3
	4 min	13 %
IP	IP 44	
	F 000 MM0 005	



A Rolamento 6202-ZZ
Rodamiento 6202-ZZ
Rolling Bearing 6202-ZZ

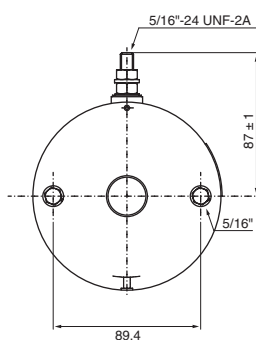
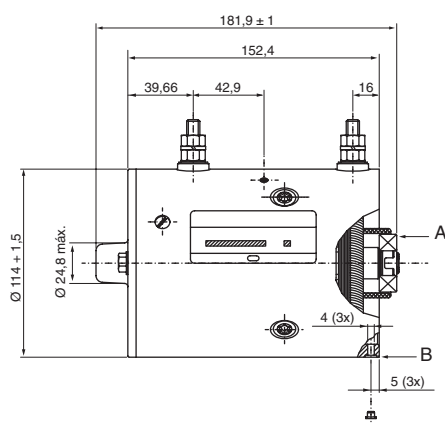
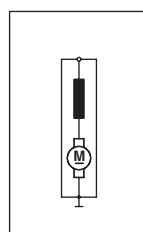
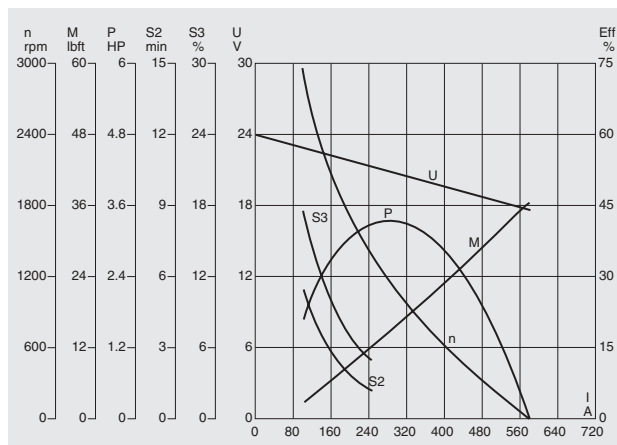
B Furo de dreno
Orificio de dreno
Drain hole

MH

24 V 1,6 kW



U_N	24 V	
P_N	1,6 kW (valor a 5,4 Nm)	
n_N	2650 rpm	
I_N	120 A	
Rot.	L	
S	S2	S3
	4,5 min	14,8 %
IP	IP 44	
	F 000 MM0 003	



A Rolamento 6202-ZZ
Rodamiento 6202-ZZ
Rolling Bearing 6202-ZZ

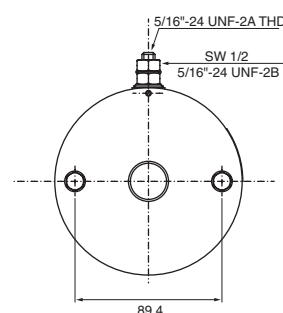
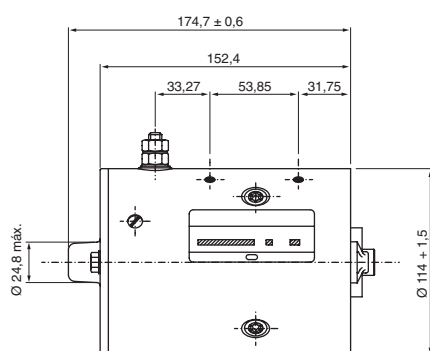
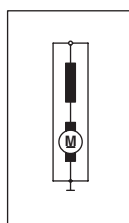
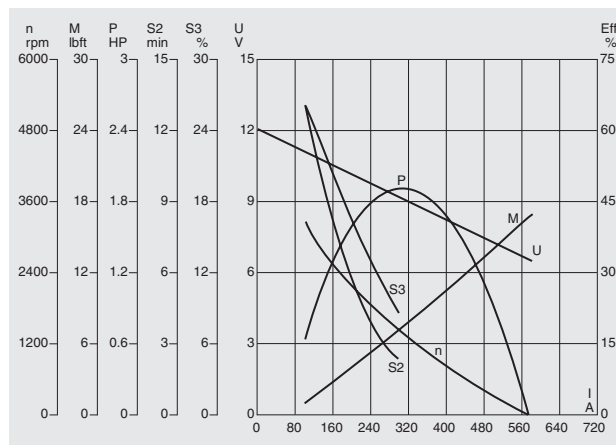
B Furo de dreno
Orificio de dreno
Drain hole

MH

12 V 1,2 kW



U_N	12 V	
P_N	1,2 kW (valor a 5,4 Nm)	
n_N	2100 rpm	
I_N	200 A	
Rot.	L	
S	S2	S3
	5,5 min	16,3 %
IP	IP 44	
Ⓜ	9 130 450 043	

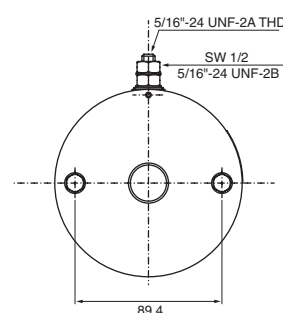
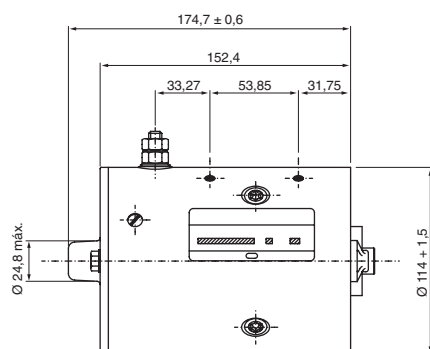
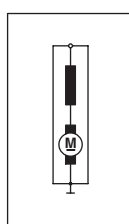
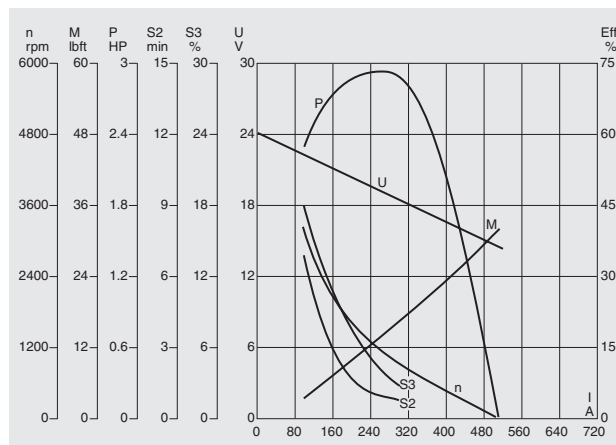


MH

24 V 1,8 kW



U_N	24 V	
P_N	1,8 kW (valor a 5,4 Nm)	
n_N	3100 rpm	
I_N	110 A	
Rot.	R	
S	S2	S3
	6,3 min	16,5 %
IP	IP 44	
Ⓜ	9 130 450 044	

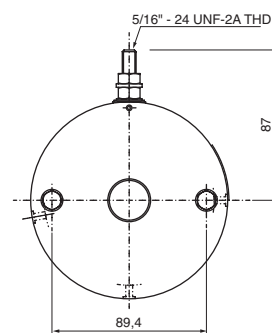
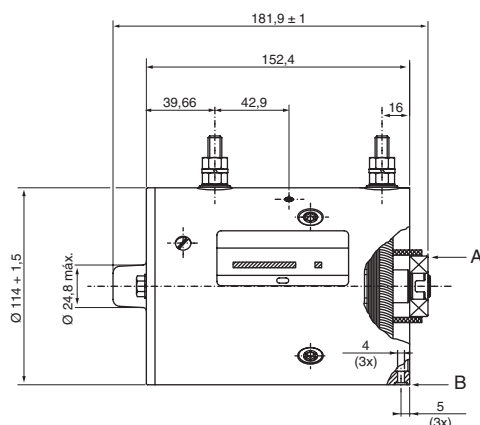
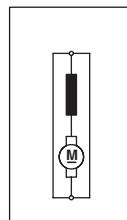
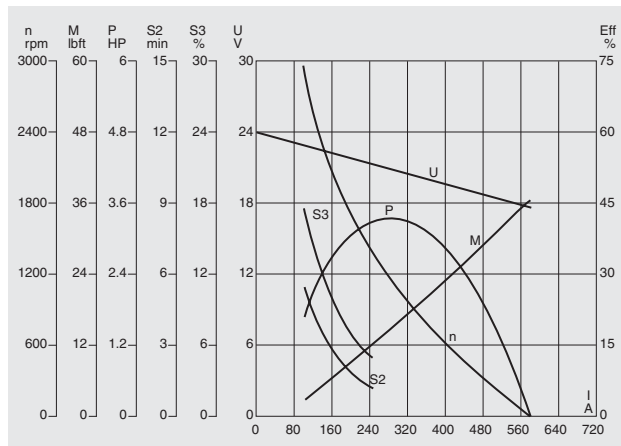


MH

24 V 1,6 kW



U_N	24 V	
P_N	1,6 kW (valor a 5,4 Nm)	
n_N	2650 rpm	
I_N	120 A	
Rot.	R	
S	S2	S3
	4,5 min	14,8 %
IP	IP 44	
Ⓜ	9 130 450 051	



A Rolamento 6202-ZZ
Rodamiento 6202-ZZ
Rolling Bearing 6202-ZZ

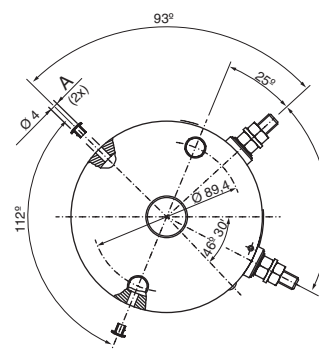
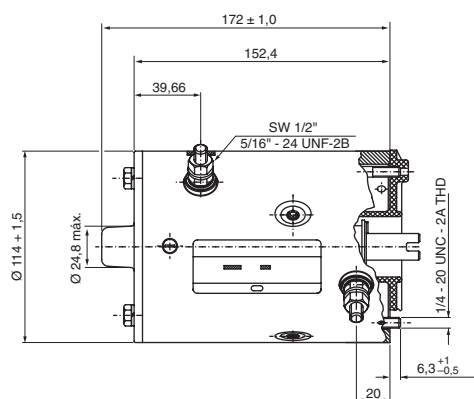
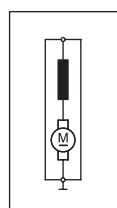
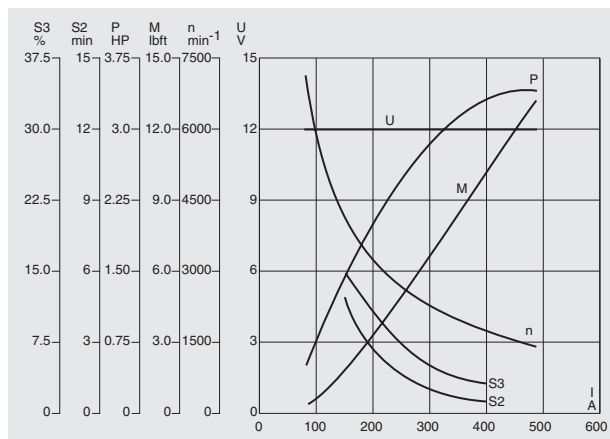
B Furo de drenaje
Orificio de drenaje
Drain hole

MH

12 V 1,4 kW



U_N	12 V	
P_N	1,4 kW (valor a 5,4 Nm)	
n_N	2490 rpm	
I_N	213 A	
Rot.	R	
S	S2	S3
	3 min	12 %
IP	IP 44	
Ⓜ	9 130 450 099	

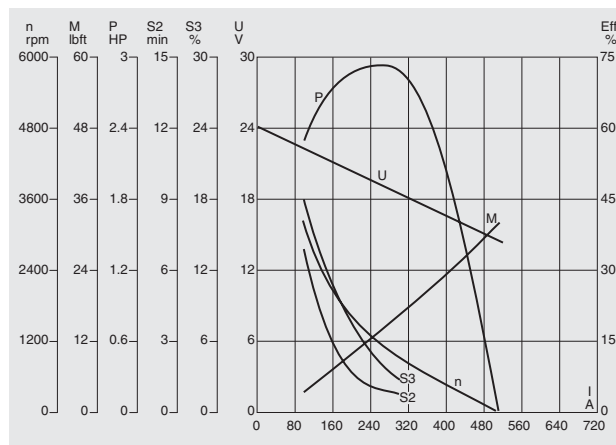


A Furo de drenaje / Orificio de drenaje / Drain hole

MR

24 V 1,8 kW

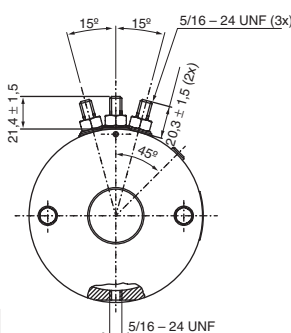
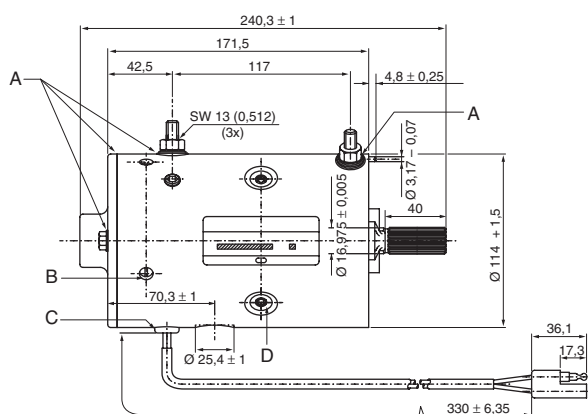
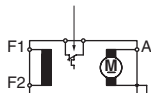
U_N	24 V
P_N	1,8 kW (valor a 5,4 Nm)
n_N	3100 rpm
I_N	110 A
Rot.	L / R
S	S2 6,3 min S3 16,5 %
IP	IP 44
	F 000 MM0 617



T.P.D. (Dispositivo de proteção térmica)
430° ± 22 °F abertura do switch
normalmente fechado

T.P.D. (Dispositivo de protección térmica)
430° ± 22 °F abertura del switch
normalmente cerrado

T.P.D. (Thermal Protection Device)
430° ± 22 °F switch opening normally
closed



A Vedação: anel "O"
Sellado: anillo "O"
Sealing: Ring "O"

B Vedação: adesivo 3M (3x)
Sellado: adhesivo 3M (3x)
Sealing: adhesive 3M (3x)

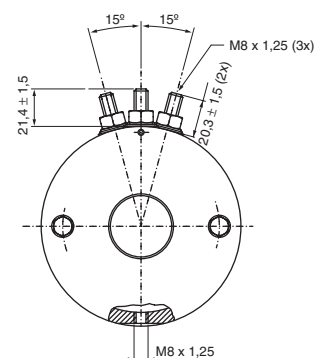
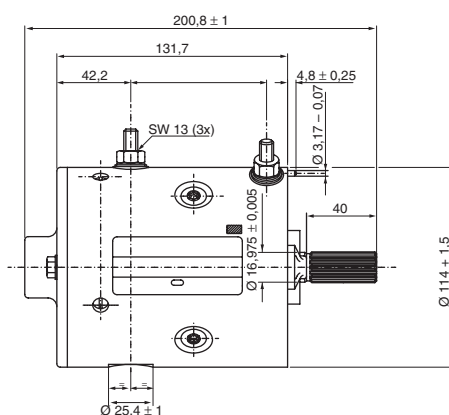
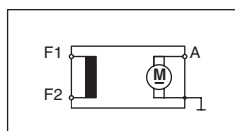
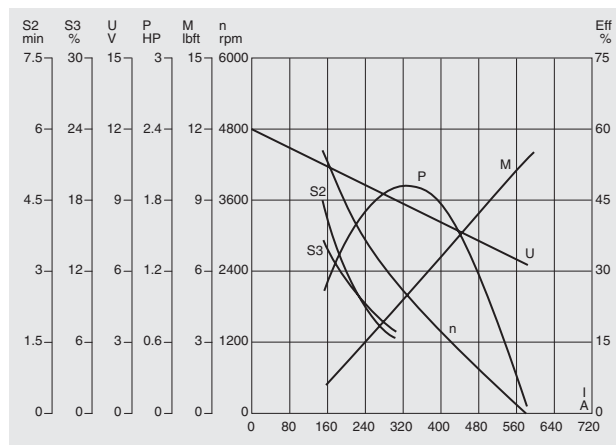
C Vedação: adesivo 3M
Sellado: adhesivo 3M
Sealing: adhesive 3M

D Vedação: adesivo Loctite (4x)
Sellado: adhesivo Loctite (4x)
Sealing: adhesive Loctite (4x)

MR

12 V 1,4 kW

U_N	12 V
P_N	1,4 kW (valor a 5,4 Nm)
n_N	2450 rpm
I_N	280 A
Rot.	L / R
S	S2 1,72 min S3 7,5 %
IP	IP 44
	F 000 MM0 612

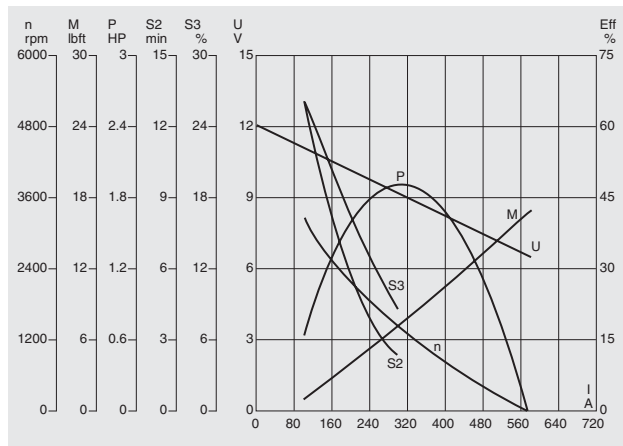


MR

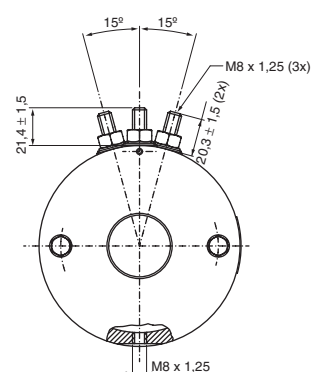
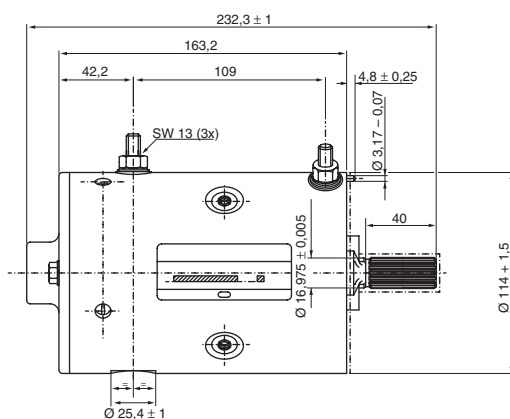
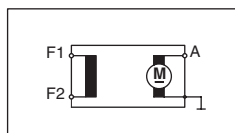
12 V 1,2 kW



U_N	12 V
P_N	1,2 kW (valor a 5,4 Nm)
n_N	2100 rpm
I_N	200 A
Rot.	L / R
S	S2 5,5 min S3 16,3 %
IP	IP 44
Ⓜ	F 000 MM0 622



MR

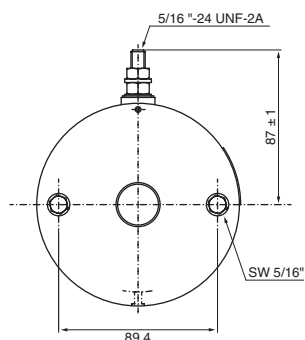
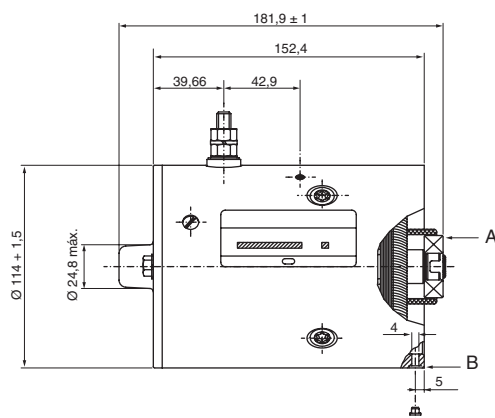
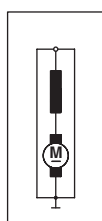
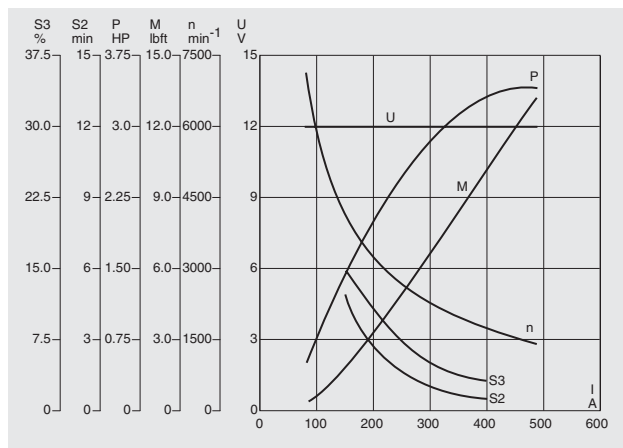


MR

12 V 1,4 kW



U_N	12 V
P_N	1,4 kW (valor a 5,4 Nm)
n_N	2490 rpm
I_N	219 A
Rot.	L
S	S2 3 min S3 11,8 %
IP	IP 44
Ⓜ	F 000 MM0 001



A Rolamento 6202-ZZ
Rodamiento 6202-ZZ
Rolling Bearing 6202-ZZ

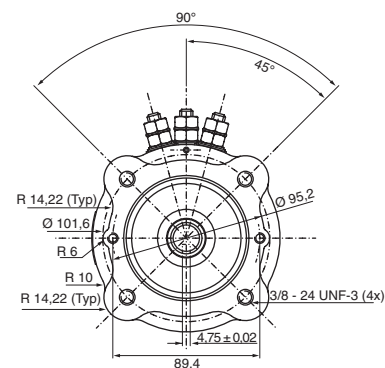
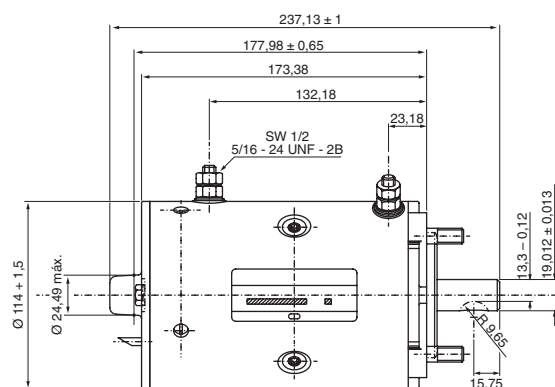
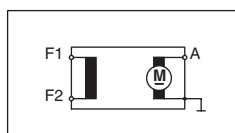
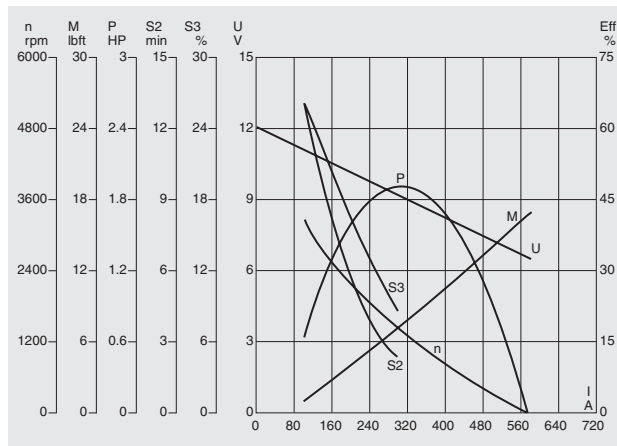
B Furo de dreno
Orificio de dreno
Drain hole

MR

12 V 1,2 kW



U_N	12 V	
P_N	1,2 kW (valor a 5,4 Nm)	
n_N	2100 rpm	
I_N	200 A	
Rot.	L / R	
S	S2	S3
	5,5 min	16,3 %
IP	IP 44	
	F 000 MM0 616	

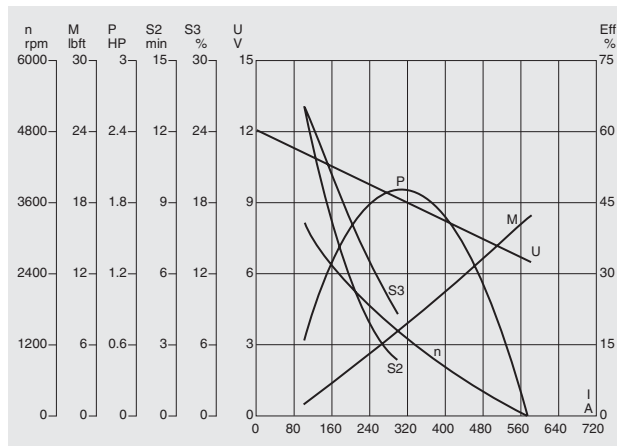


MR

12 V 1,2 kW



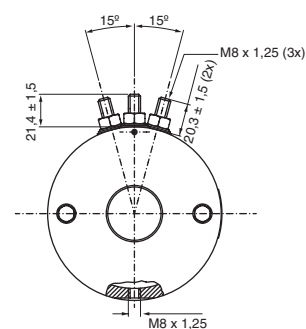
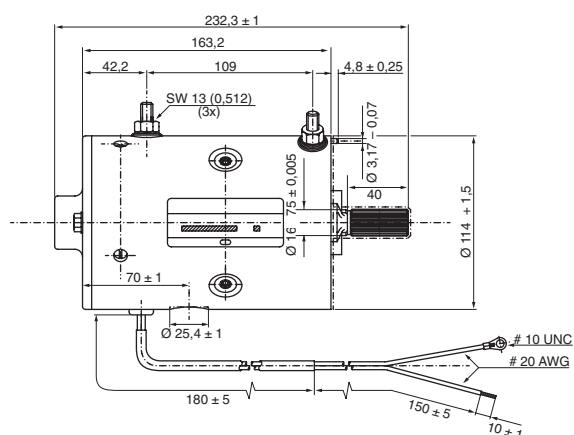
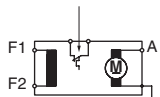
U_N	12 V	
P_N	1,2 kW (valor a 5,4 Nm)	
n_N	2100 rpm	
I_N	200 A	
Rot.	L / R	
S	S2	S3
	5,5 min	16,3 %
IP	IP 44	
	F 000 MM0 618	



T.P.D. (Dispositivo de proteção térmica)
165° ± 10 °F abertura do switch
normalmente fechado

T.P.D. (Dispositivo de protección térmica)
165° ± 10 °F abertura del switch
normalmente cerrado

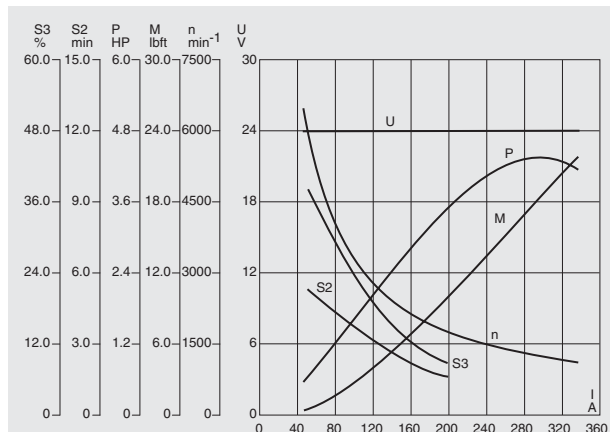
T.P.D. (Thermal Protection Device)
165° ± 10 °F switch opening normally
closed



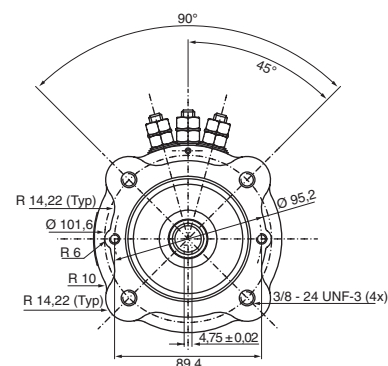
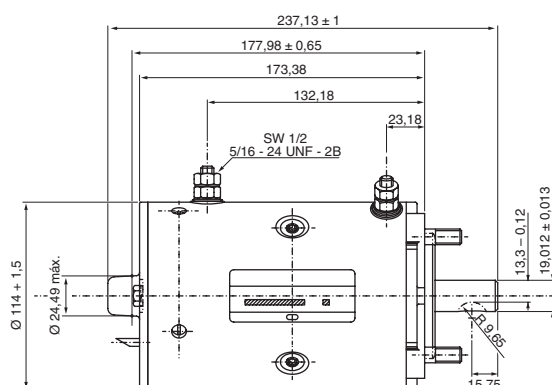
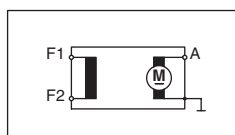
MR

24 V 1,5 kW

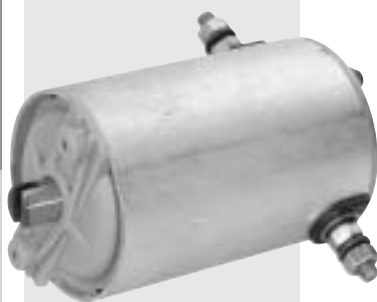
U_N	24 V	
P_N	1,5 kW (valor a 5,4 Nm)	
n_N	2550 rpm	
I_N	113 A	
Rot.	L / R	
S	S2	S3
	5,1 min	13,5 %
IP	IP 44	
Ⓜ	F 000 MM0 619	



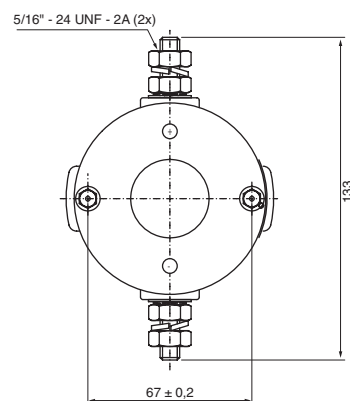
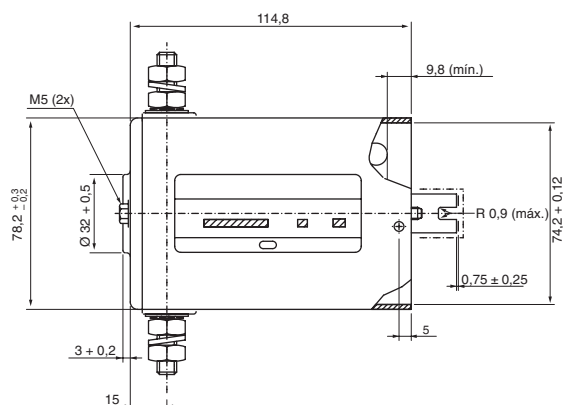
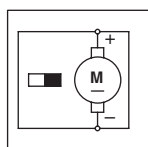
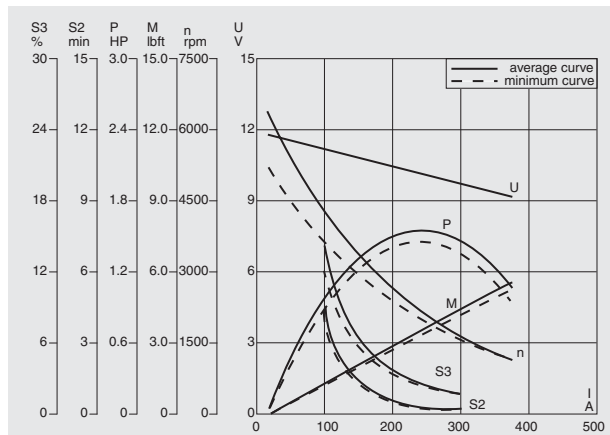
MR

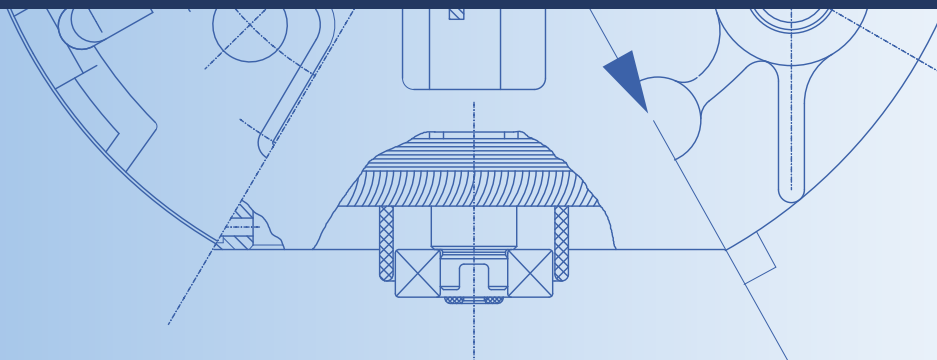


MR

12 V 1,0 kW

U_N	12 V	
P_N	1,0 kW (valor a 5,4 Nm)	
n_N	3250 rpm	
I_N	160 A	
Rot.	R	
S	S2	S3
	1,3 min	6 %
IP	IP 44	
Ⓜ	F 000 MM0 804	





Exemplos de aplicações industriais dos motores elétricos Bosch

BPA

- Ventilação interna de ambulância
- Secador de mãos

CPB

- Refrigeração/exaustão de cabines
- Pulverizadores
- Climatizadores

DPD

- Bomba de porão
- Sistemas de ventilação de freio para caminhões/ônibus

DPG

- Bombas para transporte de líquidos
- Portões automáticos
- Compressor calibrador de pneus

GPC/GPB/GPA

- Portões automáticos
- Ventilação de carroceria tipo baú
- Cadeiras de rodas
- Minicompressores
- Veículos elétricos de pequeno porte

GPD

- Compressores

CHP

- Automação de mesas para escritório/informática
- Balanças etiquetadoras
- Máquinas processadoras de valores
- Churrasqueiras motorizadas

CEP

- Cadeiras odontológicas
- Camas hospitalares
- Esteiras ergométricas

CDP

- Automação de painéis publicitários
- Automação de painéis industriais

EFP

- Automação industrial

ADO

- Tanque misturador de leite

FPG

- Automação industrial
- Automação de janelas residenciais
- Automação de antenas parabólicas
- Abertura e fechamento de trava de porta de carroceria tipo baú
- Telas de projetores
- Cortinas industriais/hospitalares
- Placas de anúncio

MH

- Unidade hidráulica

MR

- Guincho

Ejemplos de aplicaciones industriales de los motores eléctricos Bosch

BPA

- Ventilación interna de ambulancias
- Secador de manos

CPB

- Refrigeración/extracción de aire de cabinas
- Pulverizadores
- Climatizadores

DPD

- Bomba subterránea
- Sistemas de ventilación de freno para camiones/Autobuses

DPG

- Bombas para transporte de líquidos
- Portones automáticos
- Compressor calibrador de neumáticos

GPC/GPB/GPA

- Portones automáticos
- Ventilación de carrocería tipo baúl
- Sillas de ruedas
- Minicompressores
- Vehículos eléctricos de pequeño porte

GPD

- Compressores

CHP

- Automación de mesas para oficina/informática
- Balanzas etiquetadoras
- Máquinas procesadoras de valores
- Parrillas para asar motorizadas

CEP

- Sillones odontológicos
- Camas hospitalarias
- Bandas ergométricas

CDP

- Automación de paneles publicitarios
- Automación de paneles industriales

EFP

- Automación industrial

ADO

- Tanque mezclador de leche

FPG

- Automación industrial
- Automación de ventanas residenciales
- Automación de antenas parabólicas
- Abertura y cierre de traba de puerta de carrocería tipo baúl
- Pantallas de proyectores
- Cortinas industriales/hospitalarias
- Placas de anuncio

MH

- Unidad hidráulica

MR

- Grúa

Examples of industrial applications of Bosch electric motors

BPA

- Internal ventilation for ambulances
- Hand dryers

CPB

- Cabin Cooling/exhaustion
- Sprayers
- Climatizers

DPD

- Basement pump
- Brake ventilation systems for trucks/buses

DPG

- Liquid transport pumps
- Automated gates
- Tyre pressure gauge compressor

GPC/GPB/GPA

- Automated gates
- Box van body ventilation
- Wheel chairs
- Mini-compressors
- Small-sized electric motors

GPD

- Compressors

CHP

- Automation of office/computer tables
- Labeling scales
- ATM machines
- Electric barbecue grills

CEP

- Dentist chairs
- Hospital beds
- Treadmill ergometer

CDP

- Automation of advertising panels
- Automation of industrial panels

EFP

- Industrial Automation

ADO

- Bulk milk tank

FPG

- Industrial automation
- Home window automation
- Parabolic antenna automation
- Opening and closing of box van body door locks
- Projector screens
- Hospital/industrial curtains
- Advertising plates

MH

- Hydraulic Units

MR

- Winches

BOSCH

6 008 FP1 553/200406

RBLA-AA/PMA - 06.2004 - BR

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Sujeito a alterações sem aviso prévio.
Esta edição elimina todas as anteriores.

Sujeto a alteraciones sin previo aviso.
Esta edición cancela toda las anteriores.

Subject to changes without prior notice.
This version replaces all previous ones.



Engenharia de Desenvolvimento
Ingeniería de Desarrollo
Development Engineering



Linha de produção
Línea de producción
Assembly Line



Departamento de Testes
Departamento de Pruebas
Test Department



Bosch Campinas (São Paulo) - Matriz na América Latina
Bosch Campinas (São Paulo) - Matriz de América Latina
Bosch Campinas (São Paulo) - Latin America head office

Motores elétricos com excelência mundial Bosch

Os motores elétricos apresentados neste catálogo são produzidos pela Bosch Brasil, um dos maiores investimentos da Bosch – grupo que atualmente possui 236 fábricas e 225.000 funcionários no mundo. No Brasil a Bosch está estabelecida desde 1954 e conta com aproximadamente 12.000 empregados.

Mais de 35 países importam os produtos fabricados pela Bosch Brasil, como sistemas de ignição, injeção eletrônica, Diesel, freios, além de ferramentas elétricas.

Nossos motores elétricos também são aplicados pelas principais montadoras e exportados para indústrias de outros setores em diversos países.

Contatos no Brasil:

0800 70 45446

www.bosch.com.br/motores

Motores eléctricos con excelencia mundial Bosch

Los motores eléctricos presentados en este catálogo los produce Bosch Brasil, una de las más altas inversiones de Bosch – grupo que actualmente posee 236 fábricas y 225.000 empleados en el mundo. En Brasil Bosch está establecida desde 1954 y cuenta con aproximadamente 12.000 empleados.

Más de 35 países importan los productos fabricados por Bosch Brasil, como sistemas de encendido, inyección electrónica, Diesel, frenos, además de herramientas eléctricas.

Nuestros motores eléctricos también los utilizan las principales ensambladoras y se exportan a industrias de otros sectores en diversos países.

Contactos en Latinoamérica:

dcmotor.export@br.bosch.com

Electric motors with Bosch global excellence

Electric motors shown in this catalog are manufactured by Bosch Brazil, one of Bosch highest investments – a group which currently has 236 manufacturing sites and 225,000 employees around the world. Bosch has been operating in Brazil since 1954 and it has approximately 12,000 employees countrywide.

Over 35 countries import products manufactured by Bosch Brazil, such as ignition systems, electronic injection systems, Diesel injection systems, and braking systems besides power tools.

Our electric motors are also applied by major automobile manufacturers and exported to a multitude of other industries in different countries.

USA contacts:

dcmotor.export@br.bosch.com