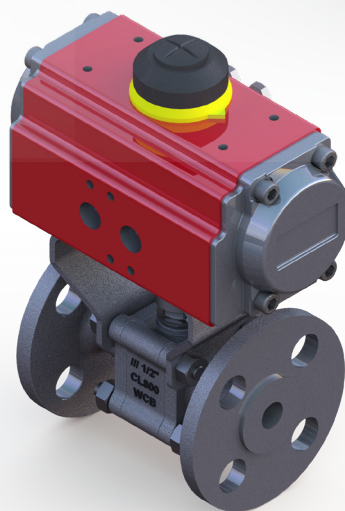
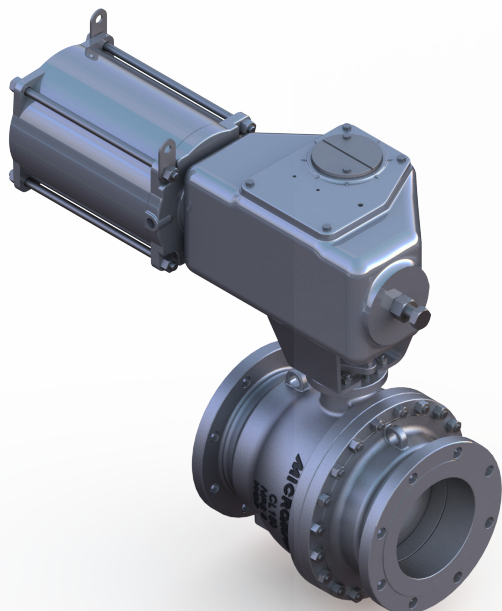


# ATUADORES PNEUMÁTICOS

## *PNEUMATIC ACTUATORS*

### *ACTUADORES NEUMÁTICOS*



# Micromazza®

## CATÁLOGO DE PRODUTOS

*PRODUCTS CATALOG / CATALOGO DE PRODUCTOS*

Rev.00-2023

# ATUADORES PNEUMÁTICOS - TIPO PINHÃO E CREMALHEIRA

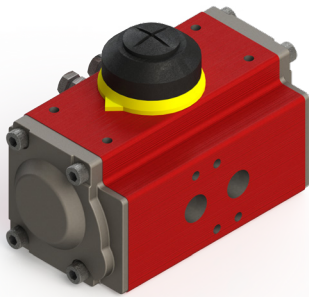
*Pneumatic Actuators - Rack and Pinion type*

*Actuadores Neumáticos - tipo Piñón y Cremallera*

Os atuadores pneumáticos ATM podem ser facilmente utilizados em instalações onde houver linhas de ar comprimidos. Estes equipamentos são adequados para válvulas de acionamento rotativo com giro de 0° a 90° para abrir ou fechar. Sua principal utilização está relacionada a válvulas do tipo esfera e borboleta. este catálogo tem o objetivo de apresentar informações sobre o funcionamento, instalação e montagem deste equipamento.

*ATM pneumatic actuators can be easily used in installations where there are compressed air lines. These equipment are suitable for rotary actuation valves with rotation from 0° to 90° to open or close. Its main use is related to ball and butterfly valves. This catalog is intended to present information about the operation, installation and assembly of this equipment.*

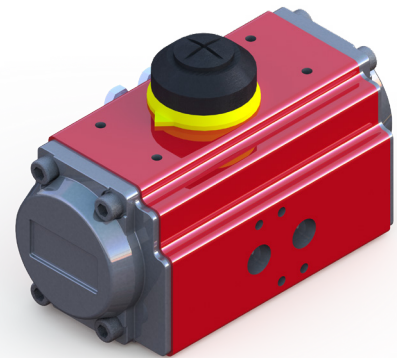
*Los actuadores neumáticos ATM se pueden utilizar fácilmente en instalaciones donde hay líneas de aire comprimido. Estos equipos son aptos para válvulas de accionamiento rotativo con rotación de 0° a 90° para abrir o cerrar. Su uso principal está relacionado con válvulas de bola y mariposa. Este catálogo está destinado presentar información sobre el funcionamiento, instalación y montaje de este equipo.*



**MODELO: ATM 0012**

*MODEL: ATM 0012*

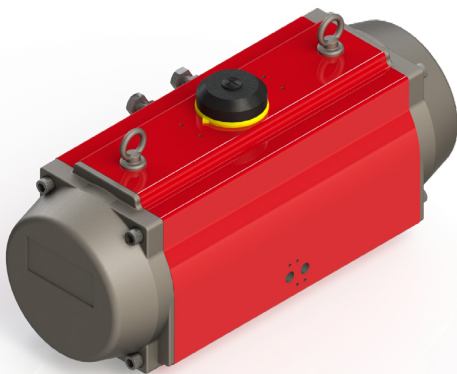
*MODELO: ATM 0012*



**MODELO: ATM 0020 até ATM 0255**

*MODEL: ATM 0020 to ATM 0255*

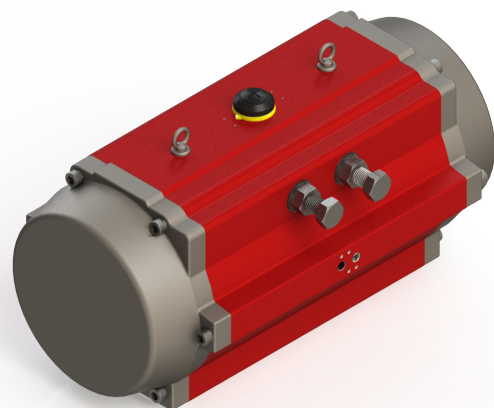
*MODELO: ATM 0012 a ATM 0255*



**MODELO: ATM 0435 até ATM 5700**

*MODEL: ATM 0435 to ATM 5700*

*MODELO: ATM 0435 a ATM 5700*



**MODELO: ATM 8000**

*MODEL: ATM 8000*

*MODELO: ATM 8000*



# CARACTERÍSTICAS

## Features / Características

O Atuador Pneumático do tipo Pinhão e Cremalheira da série ATM, possui alta qualidade e estabilidade, baixo atrito, longa vida, o tempo de abertura e fechamento pode atingir mais de 1 milhão de vezes. Ele combina com números de tecnologia avançada para enfrentar diferentes desafios ambientais severos, a excelente confiabilidade e segurança podem atender aos requisitos rígidos de controle automático.

The ATM series Rack and Pinion Pneumatic Actuator features high quality and stability, low friction, long life, opening and closing time can reach more than 1 million times. It matches numbers of advanced technology to meet different severe environmental challenges, the excellent reliability and safety can meet the strict requirements of automatic control.

El actuador neumático de piñón y cremallera de la serie ATM presenta alta calidad y estabilidad, baja fricción, larga vida, el tiempo de apertura y cierre puede alcanzar más de 1 millón de veces. Coincide con números de tecnología avanzada para enfrentar diferentes desafíos ambientales severos, la excelente confiabilidad y seguridad pueden cumplir con los estrictos requisitos de control automático.

DADOS TÉCNICOS TECHNICAL DATA / DATOS TÉCNICOS	
Torque de saída / Output torque / Torsión de salida:	de 8 à / from / a 10.000 Nm
Pressão de Projeto / Project Pressure / Presión del proyecto:	até / up to / hasta 10 bar (145 PSI)
Pressão de fornecimento de ar / Air supply pressure / Presión de suministro de aire :	a pressão mínima de fornecimento de ar é 3 bar (40 PSI) e a pressão máxima é de 8 bar (120 PSI) / the minimum air supply pressure is 3 bar (40 PSI) and the maximum pressure is 8 bar (120 PSI) / la presión mínima de suministro de aire es de 3 bar (40 PSI) y la presión máxima es de 8 bar (120 PSI)
Curso de rotação / Rotation course / Curso de rotación :	0° a / to / a 90°/
Padrão do flange para acoplamento / Flange pattern for coupling / Patrón de brida de acoplamiento :	ISO 5211 / ISO 5211 / ISO 5211
Material do corpo / Body material / Cuerpo material :	carcaça de alumínio / aluminum shell / carcasa de aluminio
Certificação / Certification / Certificación :	toda a série está de acordo com a norma IEC 61508 e passou pela certificação de nível seguro SIL 3 / the whole series complies with the IEC 61508 standard and passed the SIL 3 safe level certification / toda la serie cumple con el estándar IEC 61508 y pasó la certificación de nivel seguro SIL 3
Autenticações / Authentications / Autenticaciones :	ATEX e CE aprovadas emitidas pelo órgão de autenticação TÜV da Alemanha / ATEX and CE approved issued by the German TÜV authentication body / Aprobado por ATEX y CE emitido por el organismo de autenticación alemán TÜV
Temperatura de operação / Operating Temperature / Temperatura de funcionamiento :	Temperatura Padrão / standard temperature / temperatura estándar: - 20° a/to/a 80°C Baixa Temperatura / low temperature / baja temperatura: - 40° a/to/a 80°C Alta Temperatura / higt temperature / alta temperatura: - 15° a/to/a 150°C
Curso de rotação / Rotation course / Curso de rotación :	90°, 120°, 135°, 180° direção dupla / dual direction / dirección dual, +/-5° de ajuste / degrees of adjustment / grados de ajuste
Flange de montagem padrão / Standard mounting flange / Brida de montaje estándar :	ISO 5211 e / and / y DIN 3337
Tratamento padrão / Standard treatment / Tratamiento estándar :	anodizado duro com carcaça de alumínio, niquelado, anodizado duro + poliéster epóxi, anodizado duro + revestimento de PTFE, entre outros, disponíveis de acordo com o ambiente diferente / hard anodized with aluminum housing, nickel plated, hard anodized + epoxy polyester, hard anodized + PTFE coating, etc., available according to different environment / anodizado duro con carcasa de aluminio, niquelado, anodizado duro + poliéster epoxi, anodizado duro + revestimiento de PTFE, etc., disponible según diferentes entornos

## PADRÃO DE MONTAGEM / Mounting pattern/ Patrón de montaje

FIGURA 1 - Conexão da fonte de ar do tipo NAMUR

FIGURE 1 - NAMUR type air source connection /  
FIGURA 1 - Conexión de fuente de aire tipo NAMUR



FIGURA 2 - Montagem superior padrão VDI/VDE 3845

FIGURE 2 - Standard top mount VDI/VDE 3845 /  
FIGURA 2 - Montaje superior estándar VDI/VDE 3845

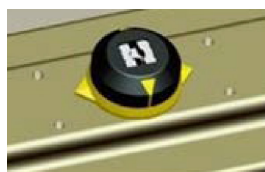


FIGURA 3 - Encaixe padrão ISO 5211

FIGURE 3 - ISO 5211 standard fitting /  
FIGURA 3 - Ajuste estándar ISO 5211



FIGURA 4 - Montagem das molas para atuador retorno por mola

FIGURE 4 - Assembly of springs for spring return actuator /  
FIGURA 4 - Montaje de resortes para actuador de actuador de retorno por resorte



\* A quantidade de molas por atuador pode ser definida de acordo com o torque necessário. A posição de montagem de diferentes quantidades de molas é de acordo com a tabela ao lado (a parte vermelha é a posição para colocar molas).

\* The number of springs per actuator can be set according to the required torque. The mounting position of different amounts of springs is according to the table beside (the red part is the position to place springs).

\* El número de resortes por actuador se puede configurar de acuerdo con el torque requerido. La posición de montaje de las diferentes cantidades de resortes es de acuerdo a la tabla al lado (la parte roja es la posición para colocar los resortes).

# PRINCÍPIO DE TRABALHO

Principle of work / Principio de trabajo

## Princípio operacional do atuador pneumático tipo Dupla Ação (DA)

Operating principle of Double Acting (DA) type pneumatic actuator

Principio de funcionamiento del actuador neumático de Doble Acción (DA)

Os detalhes do funcionamento deste equipamento são apresentados na Figura 5, Figura 6 e são explicados a seguir: Quando a pressão da fonte de ar entra no corpo do cilindro do atuador entre os dois pistões na entrada (A), empurra os pistões em direção às extremidades do corpo. O ar entre os pistões e as extremidades do cilindro é liberado para a linha (B). Neste processo o pistão aciona o eixo de saída no sentido anti-horário de (0° a 90°).

The operation details of this equipment are presented in Figure 5, Figure 6 and are explained below: When air source pressure enters the actuator cylinder body between the two pistons at inlet (A), pushes the pistons towards the ends of the body. The air between the pistons and the ends of the cylinder is released to line (B). In this process, the piston drives the output shaft counterclockwise from (0° to 90°).

Los detalles de funcionamiento de este equipo se presentan en la Figura 5, Figura 6 y se explican a continuación: Cuando la presión de la fuente de aire ingresa al cuerpo del cilindro del actuador entre los dos pistones en la entrada (A), empuja los pistones hacia los extremos del cuerpo. El aire entre los pistones y los extremos del cilindro es liberado a la línea (B). En este proceso, el pistón impulsa el eje de salida en sentido antihorario desde (0° a 90°).

De outro modo, quando a pressão da fonte de ar entra nas extremidades do corpo do cilindro pela entrada (B), empurra os pistões em direção um contra o outro, liberando o ar para a linha (A). Neste caso o eixo de saída gira no sentido horário de (90° a 0°).

Otherwise, when the pressure from the air source enters the ends of the cylinder body through the inlet (B), pushes the pistons towards each other, releasing air to line (A). In this case the output shaft rotates clockwise from (90° to 0°).

De lo contrario, cuando la presión de la fuente de aire entre en los extremos del cuerpo del cilindro a través de la entrada (B), empuja los pistones uno hacia el otro, liberando aire a la línea (A). En este caso, el eje de salida gira en el sentido de las agujas del reloj de (90° a 0°).

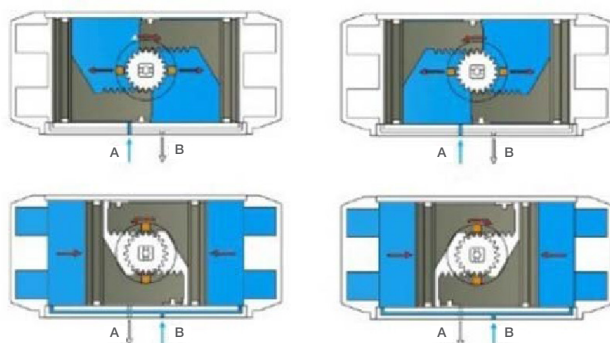
Se os pistões forem montados em direções opostas um do outro, o eixo de saída passa rotacionar na direção inversa da nominal, ou seja, o tipo reverso dupla ação (montagem anti-horária).

If the pistons are mounted in opposite directions from each other, the output shaft will rotate in the reverse direction of the nominal, i.e. double acting reverse type (counterclockwise mounting).

Si los pistones se montan en direcciones opuestas entre sí, el eje de salida girará en dirección inversa a la nominal, es decir, tipo inverso de doble efecto (montaje en sentido contrario a las agujas del reloj).

FIGURA 5 - Detalhe do atuador pneumático do tipo Dupla Ação

FIGURE 5 - Detail of the Double Action pneumatic actuator /  
FIGURA 5 - Detalle del actuador neumático Doble Acción

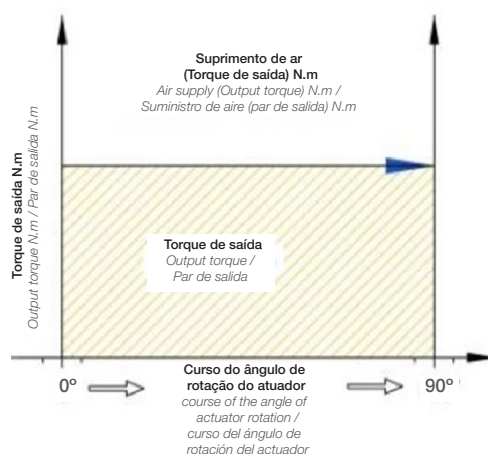


Sentido de montagem horário  
Atuador Dupla Ação  
Clockwise mounting direction  
Double Action Actuator /  
Sentido de montaje en sentido horario  
Actuador de doble acción

Sentido de montagem anti-horário  
Atuador Dupla Ação  
Counterclockwise mounting direction  
Double Action Actuator /  
Sentido de montaje en sentido antihorario  
Actuador de doble acción

FIGURA 6 - Gráfico do acionamento

FIGURE 6 - Activation Graph /  
FIGURA 6 - Gráfico de activación



# PRINCÍPIO DE TRABALHO

Principle of work / Principio de trabajo

## Princípio operacional do atuador pneumático tipo Retorno por Mola (SR)

Operating principle of Spring Return (SR) type pneumatic actuator

Principio de funcionamiento del actuador neumático de Retorno por Resorte (SR)

Os detalhes do funcionamento deste equipamento são apresentados na Figura 7, Figura 8 e são explicados a seguir: A pressão da fonte de ar entra no corpo do cilindro do atuador entre os dois pistões na entrada (A), empurra os pistões em direção às extremidades do corpo do cilindro. Nesta ação, as molas são comprimidas e o ar entre os pistões é liberado para a linha (B). Neste processo, o eixo de saída gira no sentido anti-horário de (0° a 90°).

The operation details of this equipment are presented in Figure 7, Figure 8 and are explained below: Air source pressure enters the actuator cylinder body between the two pistons at inlet (A), pushes the pistons towards the ends of the cylinder body. In this action, the springs are compressed and the air between the pistons is released to line (B). In this process, the output shaft rotates counterclockwise from (0° to 90°).

Los detalles de funcionamiento de este equipo se presentan en la Figura 7, Figura 8 y se explican a continuación: La presión de la fuente de aire ingresa al cuerpo del cilindro del actuador entre los dos pistones en la entrada (A), empuja los pistones hacia los extremos del cuerpo del cilindro. En esta acción, los resortes se comprimen y el aire entre los pistones se libera a la línea (B). En este proceso, el eje de salida gira en sentido antihorario de (0° a 90°).

Quando o atuador libera ar da cavidade interna, os dois pistões do cilindro se movem para a direção central pela extensão das molas, gerando rotação do eixo de saída no sentido horário (90° a 0°).

When the actuator releases air from the internal cavity, the two pistons of the cylinder move towards the central direction by the extension of the springs, generating clockwise rotation of the output shaft (90° to 0°).

Cuando el actuador libera aire de la cavidad interna, los dos pistones del cilindro se mueven hacia la dirección central por la extensión de los resortes, generando una rotación en sentido horario del eje de salida (90° a 0°).

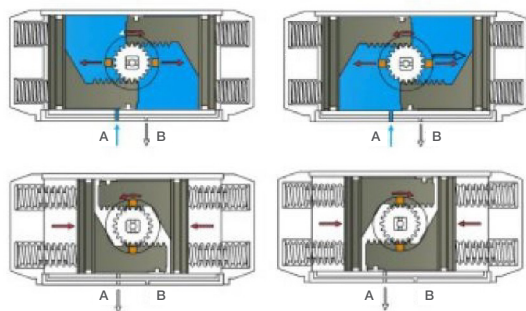
Se os pistões forem montados em direções opostas um do outro, o eixo de saída passa rotacionar na direção inversa da nominal, ou seja, o tipo reverso dupla ação (montagem anti-horária).

If the pistons are mounted in opposite directions from each other, the output shaft will rotate in the reverse direction of the nominal, i.e. double acting reverse type (counterclockwise mounting).

Si los pistones se montan en direcciones opuestas entre sí, el eje de salida girará en dirección inversa a la nominal, es decir, tipo inverso de doble efecto (montaje en sentido contrario a las agujas del reloj).

FIGURA 7 - Detalhe do atuador pneumático do tipo Retorno por Mola

FIGURE 7 - Detail of the Spring Return pneumatic actuator /  
FIGURA 7 - Detalle del actuador neumático Retorno por Resorte

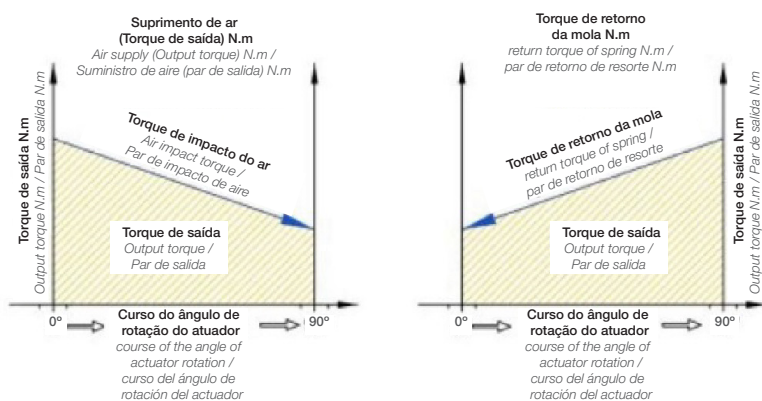


Sentido de montagem horário  
Atuador Retorno por Mola  
Clockwise mounting direction  
Spring Return Actuator /  
Sentido de montaje en sentido horario  
Actuador de Retorno por Resorte

Sentido de montagem anti-horário  
Atuador Retorno por Mola  
Counterclockwise mounting direction  
Spring Return Actuator /  
Sentido de montaje en sentido antihorario  
Actuador de Retorno por Resorte

FIGURA 8 - Gráfico do acionamento

FIGURE 8 - Activation Graph /  
FIGURA 8 - Gráfico de activación



# ESPECIFICAÇÃO DAS PARTES DO PRODUTO

## Specification of product parts

## Especificación de las piezas del producto

### AJUSTE DE CURSO

#### STROKE ADJUSTMENT / AJUSTE DE CARRERA

Os dois parafusos independentes de cursos externos de paragem, podem ajustar-se  $\pm 5^\circ$  em ambas direções de abertura e fechamento com facilidade e precisão.

The two independent screws with external stop strokes can be adjusted  $\pm 5^\circ$  in both opening and closing directions with ease and accuracy.

Los dos tornillos independientes con carrera de tope externa se pueden ajustar  $\pm 5^\circ$  en ambas direcciones de apertura y cierre con facilidad y precisión.

### CORPO

#### BODY / CUERPO

O corpo do cilindro extrudado, é feito de liga de alumínio de alta qualidade com encaixe usinado fino e superfície externa anodizada dura (a anodização seria fornecida em ocasião especial + revestimento de teflon) para prolongar a vida útil e baixar o coeficiente de atrito.

The extruded cylinder body is made of high quality aluminum alloy with fine machined fit and hard anodized outer surface (anodizing would be provided in special occasion + teflon coating) to extend the service life and lower the friction coefficient.

El cuerpo del cilindro extruido está hecho de una aleación de aluminio de alta calidad con un ajuste mecanizado fino y una superficie exterior anodizada dura (se proporcionaría anodizado en ocasiones especiales + recubrimiento de teflón) para prolongar la vida útil y reducir el coeficiente de fricción.

### TAMPAS DAS EXTREMIDADES

#### END CAP / TAPAS EXTREMAS

Superfícies em alumínio, injetado com pó metálico e pintado em diferentes cores, ou pulverizado em PTFE ou níquel.

Aluminum surfaces, injected with metallic powder and painted in different colors, or sprayed in PTFE or nickel.

Superfícies de alumínio, inyectadas con polvo metálico y pintadas en diferentes colores, o pulverizadas en PTFE o níquel.

### FIXADORES

#### FASTENERS / SUJETADORES

Todos os fixadores são feitos de aço inoxidável para a anti-corrosão a longo prazo.

All fasteners are made of stainless steel for long term anti-corrosion.

Todos los sujetadores están hechos de acero inoxidable para una protección contra la corrosión a largo plazo.

### INDICADOR DE POSIÇÃO

#### POSITION INDICATOR / INDICADOR DE POSICIÓN

Indicador visual (padrão) em campo, feito de plástico.

Visual indicator (standard) in the field, made of plastic.

Indicador visual (estándar) em campo, fabricado em plástico.

### PINHÃO

#### PINION / PIÑÓN

O pinhão é de alta precisão e integrativo, feito de aço de liga níquelada, em total conformidade com os mais recentes padrões das normas ISO 5211 e DIN 3337. As dimensões podem ser personalizadas e o material de aço inoxidável está disponível.

Pinion is high precision and integrative, made of alloy steel nickel-plated, in full compliance with the latest standards of ISO 5211 and DIN 3337.

Dimensions can be customized and stainless steel material is available.

El piñón es de alta precisión e integrador, hecho de acero aleado, níquelado, en total conformidad con los últimos estándares de ISO 5211 y DIN 3337.

Las dimensiones se pueden personalizar y el material de acero inoxidable está disponible.

### VEDAÇÃO

#### SEAL / SELLO

Em NBR para temperaturas normais, para aplicações a altas e baixas temperaturas utilizar Viton ou Silicone.

In NBR for normal temperatures, for applications at high and low temperatures use Viton or Silicone.

En NBR para temperaturas normales, para aplicaciones a altas y bajas temperaturas usar Viton o Silicona.

### MOLAS DE ALTA PERFORMANCE

#### HIGH PERFORMANCE SPRINGS / RESORTES DE ALTO RENDIMIENTO

Tem uma forte resistência à corrosão e vida útil através da utilização de materiais importados de alta qualidade, processamento de revestimento, montagem de pré-pressão, que pode ser desmontado com segurança e convenientemente para satisfazer diferentes requisitos de torque, alterando a quantidade das molas.

It has strong corrosion resistance and service life through the use of high-quality imported materials, plating processing, pre-press assembly, which can be safely and conveniently disassembled to satisfy different torque requirements by changing the quantity of springs.

Tiene una fuerte resistencia a la corrosión y una vida útil mediante el uso de materiales importados de alta calidad, procesamiento de placas, ensamblaje de preimpresión, que se puede desarmar de manera segura y conveniente para satisfacer diferentes requisitos de torque al cambiar la cantidad de resortes.

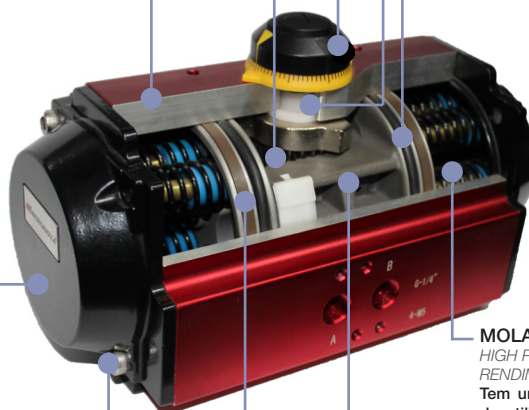
### PISTÕES

#### PISTONS / PISTONES

Os pistões de cremalheira dupla, são feitos de alumínio fundido de alta qualidade tratado com anodização rígida, posição de montagem simétrica, operação rápida, resistência ao impacto, resistência ao desgaste, longa vida útil, basta inverter o pistão para alterar a direção de rotação do pinhão.

Double rack pistons, are made of high quality cast aluminum treated with hard anodizing, symmetrical mounting position, fast operation, impact resistance, wear resistance, long service life, just reverse the piston to change the direction of rotation of the pinion.

Los pistones de cremallera doble, están hechos de aluminio fundido de alta calidad tratado con anodizado duro, posición de montaje simétrica, operación rápida, resistencia al impacto, resistencia al desgaste, larga vida útil, solo invierta el pistón para cambiar la dirección de rotación del piñón.



### MANCAIS E GUIAS

#### BEARINGS AND GUIDES / COJINETES Y GUIAS

Feito de material composto de baixo atrito e longa duração para evitar o contato direto entre metais. A manutenção e substituição são fáceis e convenientes.

Made of low-friction composite material and long lasting to avoid direct contact between metals. Maintenance and replacement are easy and convenient.

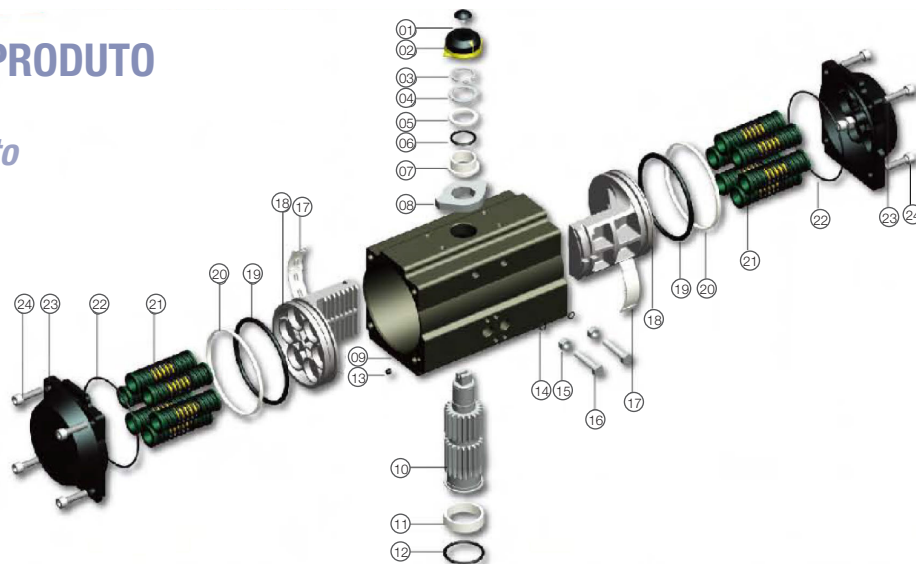
Hecho de material compuesto de baja fricción y de larga duración para evitar el contacto directo entre metales. El mantenimiento y el reemplazo son fácil y conveniente.



# PARTES E MATERIAIS DO PRODUTO

Product parts and materials

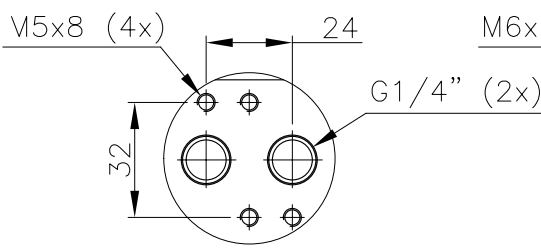
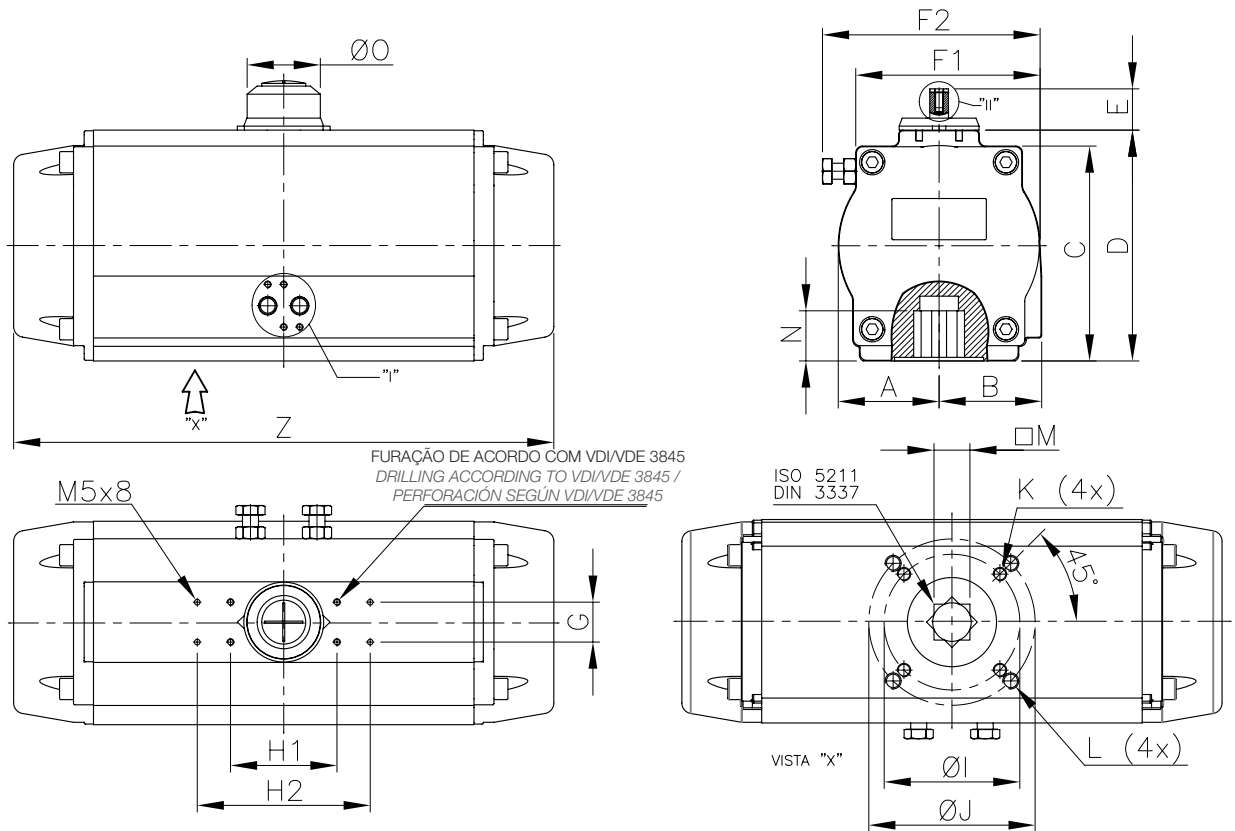
Piezas y materiales del producto



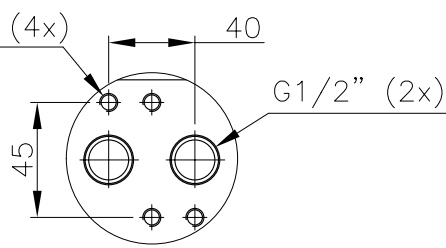
Nº Nº Nº	DENOMINAÇÃO DENOMINATION NOMBRE	QTDE. QTY. CANT.	MATERIAL (PADRÃO) MATERIAL (STANDARD) MATERIAL (ESTÁNDAR)	TRATAMENTO DA SUPERFÍCIE SURFACE TREATMENT / TRATAMIENTO DE SUPERFICIES		MATERIAL OPCIONAL OPTIONAL MATERIAL MATERIAL OPCIONAL
				MATERIAL DA SUPERFÍCIE SURFACE MATERIAL MATERIAL SUPERFICIAL	TRATAMENTO OPCIONAL DA SUPERFÍCIE OPTIONAL SURFACE TREATMENT TRATAMIENTO DE SUPERFICIE OPCIONAL	
01	<b>Parafuso indicador</b> <i>Indicator screw / Tornillo indicador</i>	01	<b>Plástico</b> <i>Plastic / Plástico</i>			
02	<b>Indicador</b> <i>Indicator / Indicador</i>	01	<b>Plástico</b> <i>Plastic / Plástico</i>			
03	<b>Anel de retenção</b> <i>Indicator screw / Tornillo indicador</i>	01	<b>Aço Inoxidável</b> <i>Stainless steel / Acero inoxidable</i>			
04	<b>Arruela de pressão</b> <i>Lock washer / Arandela de seguridad</i>	01	<b>Aço Inoxidável</b> <i>Stainless steel / Acero inoxidable</i>			
05	<b>Arruela externa</b> <i>External washer / Arandela exterior</i>	01	<b>Plástico</b> <i>Plastic / Plástico</i>			
06,12	<b>O'ring / O'ring / O'ring</b>	01	<b>NBR</b>			<b>Viton/Silicone</b> <i>Viton/ Silicone / Vitón/Silicona</i>
07	<b>Arruela interna</b> <i>Internal washer / Arandela interior</i>	01	<b>Plástico</b> <i>Plastic / Plástico</i>			
08	<b>Posicionador</b> <i>Positioner / Posicionador</i>	01	<b>S45C</b>	<b>Banhado à níquel</b> <i>nickel plated / niquelado</i>		
09	<b>Corpo</b> <i>Body / Cuerpo</i>	01	<b>6005-T5</b>	<b>Anodizado duro</b> <i>Hard anodized / Anodizado duro</i>	<b>Anodizado duro+poliéster Epoxy / Hard anodized+polyester Epoxy/ Anodizado duro+poliéster Epoxy ou PTFE/Niquelado / or PTF/ Nickel plated / o PTFE/Niquelado</b>	
10	<b>Pinhão</b> <i>Pinion / Piñón</i>	01	<b>S45C</b>	<b>Banhado à níquel</b> <i>nickel plated / niquelado</i>		<b>Aço Inoxidável</b> <i>Stainless steel / Acero inoxidable</i>
11	<b>Rolamento interno do pinhão</b> <i>Pinion internal bearing / Cojinete interior del piñón</i>	01	<b>Plástico</b> <i>Plastic / Plástico</i>			
13	<b>Bujão</b> <i>Plug / Tapón</i>	02	<b>NBR</b>			<b>Viton/Silicone</b> <i>Viton/ Silicone / Vitón/Silicona</i>
14,19	<b>O'ring / O'ring / O'ring</b>	02	<b>NBR</b>			<b>Viton/Silicone</b> <i>Viton/ Silicone / Vitón/Silicona</i>
15	<b>Porca de ajuste</b> <i>Adjusting nut / tuerca de ajuste</i>	02	<b>AISI 304</b>			
16	<b>Parafuso de ajuste</b> <i>Adjusting screw / Tornillo de ajuste</i>	02	<b>AISI 304</b>			
17	<b>Guia do pistão</b> <i>Piston guide / Guía de pistón</i>	02	<b>Plástico</b> <i>Plastic / Plástico</i>			
18	<b>Pistão</b> <i>Piston / Pistón</i>	02	<b>Alumínio</b> <i>Aluminum / Aluminio</i>		<b>Anodizado</b> <i>Anodized / Anodizado</i>	
20	<b>Rolamento do Pistão</b> <i>Piston Bearing / Rodamiento de pistón</i>	02	<b>Material para resistência ao desgaste / Wear resistant material / Material resistente al desgaste</b>			
21	<b>Mola</b> <i>Spring / Resorte</i>	0 - 12	<b>Aço de alta resistência</b> <i>High strength steel / Acero de alta resistencia</i>	<b>Revest. por imersão</b> <i>Coating by immersion / Revest. por inmersión</i>		
22	<b>O'ring / O'ring / O'ring</b>	02	<b>NBR</b>			
23	<b>Tampa</b> <i>Cap / Tapa</i>	02	<b>Alumínio</b> <i>Aluminum / Aluminio</i>	<b>Tinta em pó</b> <i>Powder paint / pintura en polvo</i>	<b>PTFE/Niquelado</b> <i>PTFE/Nickel plated / PTFE/Niquelado</i>	
24	<b>Parafuso da tampa</b> <i>Cap screw / Tornillo de tapa</i>	08	<b>AISI 304</b>			

# DIMENSIONAL

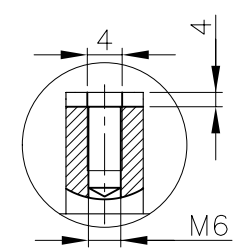
## Dimensional / Dimensional



DETALHE / DETAIL / DETALLE "I"  
NORMA / STANDARD / ESTÁNDAR NAMUR G1/4"



DETALHE / DETAIL / DETALLE "I"  
NORMA / STANDARD / ESTÁNDAR NAMUR G1/2"



DETALHE / DETAIL / DETALLE "II"  
NAMUR

MODELO MODEL MODELO	A	B	C	D	E	F1	F2	G	H1	H2	ØI	ØJ	K	L	□M	N	Ø0	Z	CONEXÃO DE AR AIR CONNECTION CONEXIÓN DE AIRE
ATM 0012 DA	37,0	24,0	45,0	60,0	20,0	65,5	76,5	30,0	80,0	-	36,0	50,0	M5x8	M6x10	11,0	14,0	40,0	125,0	G1/4"
ATM 0012 SR																		150,0	
ATM 0020	30,5	41,5	65,5	72,0	20,0	65,5	80,5	30,0	80,0	-	36,0	70,0	M5x8	M6x10	11,0	14,0	40,0	150,0	G1/4"
ATM 0035	36,0	47,0	81,0	88,0	20,0	72,5	88,2	30,0	80,0	-	50,0	70,0	M6x10	M8x13	14,0	19,0	40,0	172,0	G1/4"
ATM 0050	42,5	53,0	94,0	100,0	20,0	81,5	94,4	30,0	80,0	-	50,0	70,0	M6x10	M8x13	14,0	19,0	40,0	188,0	G1/4"
ATM 0075	46,0	57,0	98,5	109,0	20,0	92,0	116,7	30,0	80,0	-	50,0	70,0	M6x10	M8x13	17,0	23,0	40,0	221,0	G1/4"
ATM 0110	50,0	58,5	111,0	117,0	20,0	98,0	124,0	30,0	80,0	-	50,0	70,0	M6x10	M8x13	17,0	23,0	40,0	268,0	G1/4"
ATM 0160	58,0	64,0	123,5	134,5	20,0	110,0	131,0	30,0	80,0	-	70,0	102,0	M8x13	M10x16	22,0	31,0	40,0	279,0	G1/4"
ATM 0255	68,0	75,0	146,0	156,5	30,0	128,0	149,0	30,0	80,0	130,0	70,0	102,0	M8x13	M10x16	22,0	31,0	55,0	322,0	G1/4"
ATM 0435	76,0	77,0	161,5	173,5	30,0	138,5	163,5	30,0	80,0	130,0	102,0	125,0	M10x16	M12x20	27,0	35,0	55,0	406,0	G1/4"
ATM 0665	87,5	87,5	185,5	198,5	30,0	159,0	184,5	30,0	80,0	130,0	102,0	125,0	M10x16	M12x20	27,0	35,0	55,0	475,0	G1/4"
ATM 1000	103,5	103,5	216,5	231,0	30,0	189,5	223,5	30,0	130,0	-	-	140,0	-	M16x25	36,0	40,0	80,0	544,0	G1/4"
ATM 1200	113,5	113,5	236,0	256,0	30,0	211,0	245,0	30,0	130,0	-	-	140,0	-	M16x25	36,0	40,0	80,0	562,0	G1/4"
ATM 1800	130,5	130,5	266,5	292,0	30,0	246,5	288,0	30,0	130,0	-	-	165,0	-	M20x25	46,0	58,0	80,0	642,0	G1/4"
ATM 2700	147,5	147,5	302,0	331,0	30,0	274,0	315,5	30,0	130,0	-	-	165,0	-	M20x25	46,0	58,0	80,0	740,0	G1/2"
ATM 3800	162,0	173,0	329,0	352,0	30,0	312,0	361,0	30,0	130,0	-	-	165,0	-	M20x25	46,0	55,0	80,0	774,0	G1/2"
ATM 5700	190,0	195,0	382,0	408,0	30,0	362,0	426,0	30,0	130,0	-	165,0	254,0	M20x25	M16x25	46,0	55,0	80,0	912,0	G1/2"
ATM 8000	260,0	260,0	440,0	464,0	30,0	450,0	514,0	30,0	130,0	-	165,0	254,0	M20x25	M16x25	55,0	60,0	80,0	945,0	G1/2"



# VOLUME (L), PESO (KG) E TEMPO DE ATUAÇÃO (s)

Volume (L), Weight (kg) and Acting time (s)

Volumen (L), Peso (Kg) y Tiempo de actuación (s)

VOLUME / VOLUME / VOLUMEN (L)				
MODELO MODEL MODELO	DUPLA AÇÃO (DA) DOUBLE ACTION (DA) DOBLE ACCIÓN (DA)		RETORNO POR MOLA (SR) SPRING RETURN (SR) RETORNO POR RESORTE (SR)	
	ABERTURA OPENING APERTURA	FECHAMENTO CLOSURE CIERRE	ABERTURA OPENING APERTURA	FECHAMENTO CLOSURE CIERRE
	ATM 0012	0,07	0,08	0,07
ATM 0020	0,12	0,17	0,12	0,14
ATM 0035	0,21	0,29	0,21	0,24
ATM 0050	0,29	0,43	0,29	0,37
ATM 0075	0,42	0,65	0,42	0,55
ATM 0110	0,68	0,97	0,68	0,81
ATM 0160	0,92	1,35	0,92	1,14
ATM 0255	1,47	2,13	1,47	1,84
ATM 0435	2,37	3,57	2,37	2,83
ATM 0665	3,77	5,42	3,77	4,49
ATM 1000	5,90	8,36	5,90	7,47
ATM 1200	7,26	11,52	7,26	10,56
ATM 1800	10,70	17,44	10,70	16,07
ATM 2700	15,90	25,60	15,90	23,86
ATM 3800	23,50	28,00	23,50	26,50
ATM 5700	34,50	45,20	34,50	42,40
ATM 8000	52,20	56,00	52,20	54,00

TEMPO / TIME / TIEMPO (S)			
MODELO MODEL MODELO	TIPO TYPE TIPO	ABERTURA OPENING APERTURA	FECHAMENTO CLOSURE CIERRE
ATM 0012	DA	0,10	0,09
	SR	0,11	0,10
ATM 0020	DA	0,12	0,11
	SR	0,20	0,17
ATM 0035	DA	0,17	0,16
	SR	0,23	0,20
ATM 0050	DA	0,18	0,17
	SR	0,30	0,20
ATM 0075	DA	0,22	0,21
	SR	0,37	0,20
ATM 0110	DA	0,27	0,26
	SR	0,43	0,33
ATM 0160	DA	0,33	0,33
	SR	0,57	0,46
ATM 0255	DA	0,42	0,42
	SR	0,75	0,32
ATM 0435	DA	0,74	0,74
	SR	1,21	1,00
ATM 0665	DA	1,03	1,03
	SR	1,75	1,30
ATM 1000	DA	1,30	1,25
	SR	2,47	1,60
ATM 1200	DA	1,65	1,63
	SR	3,25	3,00
ATM 1800	DA	3,93	3,90
	SR	3,87	4,85
ATM 2700	DA	4,10	4,10
	SR	6,30	5,50
ATM 3800	DA	4,31	4,31
	SR	8,42	7,02
ATM 5700	DA	12,11	12,11
	SR	17,58	16,30
ATM 8000	DA	20,58	20,58
	SR	29,88	27,71

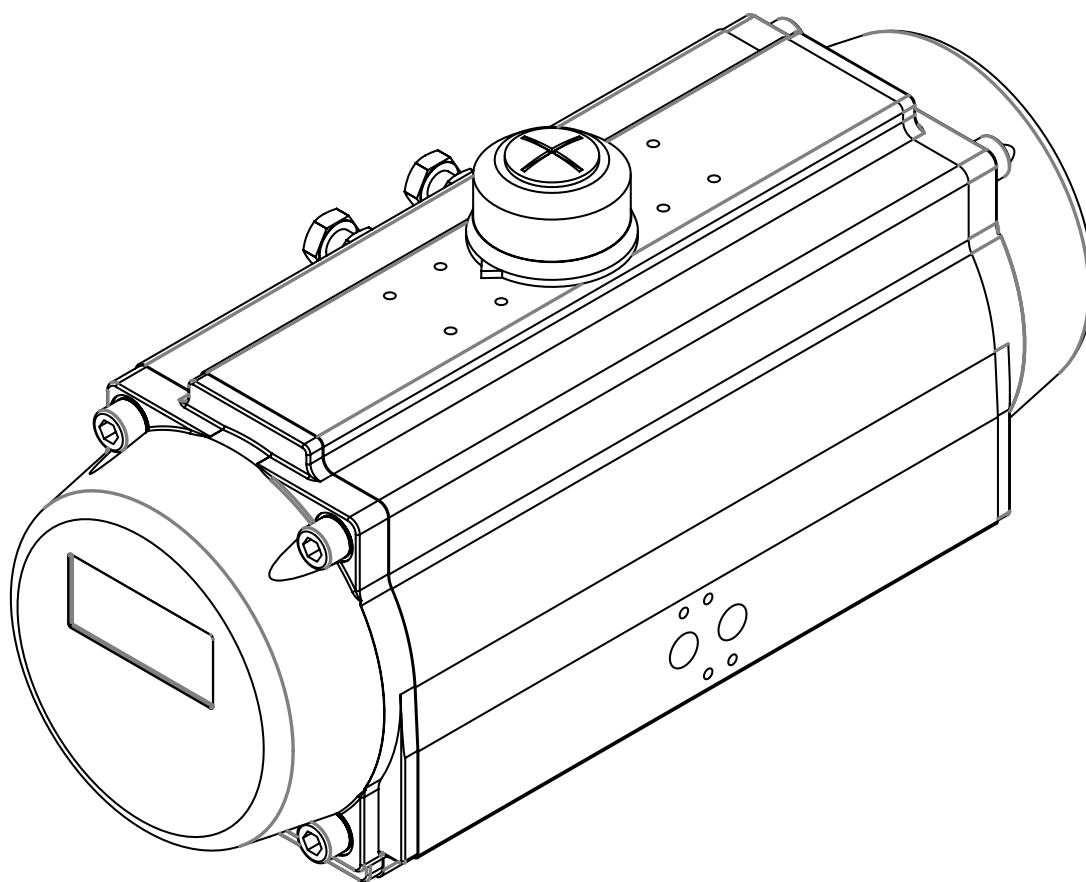
PESO / WEIGHT / PESO (L)			
MODELO MODEL MODELO	TAMANHO DO CLINDRO CYLINDER SIZE TAMAÑO DEL CILINDRO	DUPLA AÇÃO (DA) DOUBLE ACTION (DA) DOBLE ACCIÓN (DA)	RETORNO POR MOLA (SR) SPRING RETURN (SR) RETORNO POR RESORTE (SR)
ATM 0012	Ø40	1,00	1,10
ATM 0020	Ø52	1,35	1,45
ATM 0035	Ø63	2,15	2,30
ATM 0050	Ø75	2,60	2,80
ATM 0075	Ø83	3,40	3,70
ATM 0110	Ø92	4,55	5,15
ATM 0160	Ø105	5,90	6,60
ATM 0255	Ø125	9,20	10,35
ATM 0435	Ø140	12,00	14,10
ATM 0665	Ø160	20,25	23,5
ATM 1000	Ø190	31,35	36,00
ATM 1200	Ø210	45,70	53,65
ATM 1800	Ø240	54,50	65,6
ATM 2700	Ø270	79,00	98,4
ATM 3800	Ø300	99,00	122,0
ATM 5700	Ø350	156,00	197,00
ATM 8000	Ø400	212,00	255,00



# TORQUE DE AR - ATUADOR DUPLA AÇÃO

*Air Torque / Par de aire - Double Action Actuator / Actuador de Doble Acción*

MODELO MODEL MODELO	TORQUE DE AR (Unid.: Nm) - ATUADOR DUPLA AÇÃO																			
	AIR TORQUE (Unid.: Nm) - DOUBLE ACTION ACTUATOR / PAR DE AIRE (Unid.: Nm) - ACTUADOR DE DOBLE ACCIÓN																			
	2 bar		2.5 bar		3 bar		4 bar		4.5 bar		5 bar		5.5 bar		6 bar		7 bar		8 bar	
	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°
ATM 0012 DA	5		6		7		10		11		12		13		14		17		19	
ATM 0020 DA	8		10		12		16		18		20		22		24		28		32	
ATM 0035 DA	14		18		22		29		32		36		40		43		50		57	
ATM 0050 DA	20		25		31		41		46		51		56		61		71		81	
ATM 0075 DA	31		39		47		62		70		78		86		94		109		125	
ATM 0110 DA	46		57		69		92		103		115		126		138		161		184	
ATM 0160 DA	67		83		100		133		150		166		183		200		233		266	
ATM 0255 DA	101		126		151		201		226		251		276		302		352		402	
ATM 0435 DA	172		215		258		344		387		430		473		516		602		688	
ATM 0665 DA	268		334		401		535		602		669		736		803		937		1070	
ATM 1000 DA	427		533		640		854		960		1067		1174		1280		1494		1707	
ATM 1200 DA	532		665		798		1064		1198		1331		1464		1597		1863		2129	
ATM 1800 DA	774		968		1161		1548		1742		1935		2129		2322		2709		3096	
ATM 2700 DA	1176		1470		1763		2351		2645		2939		3233		3527		4115		4703	
ATM 3800 DA	1545		1932		2318		3091		3477		3863		4250		4636		5409		6181	
ATM 5700 DA	2314		2892		3471		4628		5206		5784		6363		6941		8098		9255	
ATM 8000 DA	3297		4121		4945		6594		7418		8242		9066		9890		11539		13187	



# TORQUE DE AR - ATUADOR RETORNO POR MOLA

Air Torque / Par de aire - Spring Return Actuator / Actuador de Retorno por Resorte

MODELO MODEL MODELO	TORQUE DE AR (Unid.: Nm) - ATUADOR RETORNO POR MOLA																			
	AIR TORQUE (Unid.: Nm) - SPRING RETURN ACTUATOR / PAR DE AIRE (Unid.: Nm) - ACTUADOR DE RETORNO POR RESORTE																			
	MOLAS SPRINGS RESORTES	2.5 bar		3 bar		4 bar		5 bar		5.5 bar		6 bar		7 bar		8 bar		TORQUE MOLAS TORQUE SPRINGS RESORTES DE PAR		
QTDE. QTY. CANT.	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	INÍCIO (90°)	FINAL (0°)
ATM 0012 SR	2					4,6	2,5	6,9	4,9	8,1	6,1	9,3	7,3	11,7	9,7	14,1	12,1	7,0	5,0	
ATM 0020 SR	5	5,8	3,8	7,9	5,9													6,2	4,2	
	6	5,0	2,6	7,0	4,6	11,1	8,7											7,5	5,1	
	7	4,1	1,3	6,2	3,4	10,2	7,4	14,2	11,4	16,3	13,5							8,7	5,9	
	8			5,3	2,1	9,1	6,2	13,4	10,2	15,4	12,2	17,4	14,2					10,0	6,8	
	9			4,5	0,9	8,5	4,9	12,5	8,9	14,6	11,0	16,6	13,0	20,6	17,0			11,2	7,6	
	10					7,7	3,7	11,7	7,7	13,7	9,7	15,7	11,7	19,8	15,8			12,5	8,5	
	11					6,8	2,4	10,8	6,4	12,9	8,5	14,9	10,5	18,9	14,5	23,0	18,6	13,7	9,3	
	12						10,0	5,2	12,0	7,2	14,0	9,2	18,1	13,3	22,1	17,3	15,0	10,2		
ATM 0035 SR	5	10,9	7,2	14,5	10,7	21,6	17,9											10,6	6,9	
	6	9,6	5,1	13,1	8,6	20,2	15,7	27,3	22,8									12,7	8,2	
	7	8,2	3,0	11,7	6,5	18,9	13,6	26,0	20,7	29,5	24,3							14,8	9,6	
	8			10,4	4,4	17,5	11,5	24,6	18,6	28,2	22,2	31,7	25,7	38,8	32,8			16,9	11,0	
	9			9,0	2,3	16,1	9,4	23,2	16,5	26,8	20,0	30,3	23,6	37,5	30,7			19,1	12,3	
	10					14,7	7,3	21,9	14,4	25,4	17,9	29,0	21,5	36,1	28,6	43,2	35,7	21,2	13,7	
	11					13,4	5,1	20,5	12,3	24,0	15,8	27,6	19,4	34,7	26,5	41,8	33,6	23,3	15,1	
	12						19,1	10,1	22,7	13,7	26,2	17,3	33,3	24,4	40,5	31,5	25,4	16,4		
ATM 0050 SR	5	14,6	10,6	19,7	15,6	29,8	25,7											14,6	10,5	
	6	12,5	7,6	17,6	12,7	27,7	22,8	37,7	32,8									17,6	12,7	
	7	10,4	4,7	15,5	9,7	25,5	19,8	35,6	29,9	40,7	34,9							20,5	14,8	
	8			13,4	6,8	23,4	16,9	33,5	27,0	38,6	32,0	43,6	37,1	53,7	47,1			23,4	16,9	
	9			11,2	3,9	21,3	14,0	31,4	24,1	36,4	29,1	41,5	34,1	51,6	44,2			26,3	19,0	
	10					19,2	11,0	29,3	21,1	34,3	26,2	39,4	31,2	49,5	41,3	59,5	51,4	29,3	21,2	
	11					17,1	8,1	27,2	18,2	32,2	23,2	37,3	28,3	47,3	38,4	57,4	48,4	32,2	23,2	
	12						25,1	15,3	30,1	20,3	35,2	25,4	45,2	35,4	55,3	45,5	35,1	25,3		
ATM 0075 SR	5	22,8	15,3	30,5	23,0	45,9	38,4											23,3	15,8	
	6	19,6	10,6	27,3	18,3	42,8	33,8	58,2	49,2									28,0	19,0	
	7	16,5	6,0	24,2	13,7	39,6	29,1	55,0	44,5	62,7	52,3							32,6	22,1	
	8			21,0	9,0	36,4	24,4	51,9	39,9	59,6	47,6	67,3	55,3	82,7	70,7			37,3	25,3	
	9			17,8	4,4	33,3	19,8	48,7	35,2	56,4	42,9	64,1	50,6	79,6	66,1			41,9	28,4	
	10					30,1	15,1	45,5	30,6	53,3	38,3	61,0	46,0	76,4	61,4	91,8	76,8	46,6	31,6	
	11					27,0	10,5	42,4	25,9	50,1	33,6	57,8	41,3	73,2	56,7	88,7	72,2	51,2	34,8	
	12						39,2	21,2	46,9	29,0	54,7	36,7	70,1	52,1	85,5	67,5	55,9	37,9		
ATM 0110 SR	5	33,5	22,1	44,9	33,5	67,7	56,2											34,8	23,3	
	6	28,9	15,1	40,2	26,5	63,0	49,3	85,7	72,0									41,7	28,0	
	7	24,2	8,2	35,6	19,6	58,3	42,3	81,1	65,1	92,4	76,4							48,7	32,7	
	8			30,9	12,6	53,6	35,4	76,4	58,1	87,8	69,5	99,1	80,9	121,9	103,6			55,6	37,4	
	9			26,2	5,7	49,0	28,4	71,7	51,2	83,1	62,5	94,5	73,9	117,2	96,7			62,6	42,0	
	10					44,3	21,5	67,1	44,2	78,4	55,6	89,8	67,0	112,6	89,7	135,3	112,5	69,5	46,7	
	11					39,6	14,5	62,4	37,3	73,8	48,6	85,1	60,0	107,9	82,8	130,6	105,5	76,5	51,4	
	12						57,7	30,3	69,1	41,7	80,5	53,0	103,2	75,8	126,0	98,5	83,4	56,0		
ATM 0160 SR	5	51,0	33,0	67,0	49,0	100,0	82,0											50,0	32,0	
	6	44,0	23,0	61,0	39,0	94,0	72,0	127,0	105,0									60,0	38,0	
	7	38,0	13,0	54,0	29,0	87,0	62,0	120,0	95,0	137,0	111,0	153,0	128,0					70,0	44,0	
	8			48,0	19,0	81,0	52,0	114,0	85,0	130,0	101,0	147,0	118,0	180,0	151,0			80,0	51,0	
	9			42,0	9,0	75,0	42,0	108,0	75,0	124,0	91,0	141,0	108,0	173,0	141,0			90,0	57,0	
	10					68,0	32,0	101,0	65,0	118,0	81,0	134,0	98,0	167,0	131,0	200,0	164,0	100,0	63,0	
	11					62,0	22,0	95,0	55,0	111,0	72,0	128,0	88,0	161,0	121,0	194,0	154,0	110,0	70,0	
	12						89,0	45,0	105,0	62,0	122,0	78,0	155,0	111,0	187,0	144,0	120,0	76,0		

# TORQUE DE AR - ATUADOR RETORNO POR MOLA

Air Torque / Par de aire - Spring Return Actuator / Actuador de Retorno por Resorte

MODELO MODEL MODELO	TORQUE DE AR (Unid.: Nm) - ATUADOR RETORNO POR MOLA																			
	AIR TORQUE (Unid.: Nm) - SPRING RETURN ACTUATOR / PAR DE AIRE (Unid.: Nm) - ACTUADOR DE RETORNO POR RESORTE																			
	MOLAS SPRINGS RESORTES	2.5 bar		3 bar		4 bar		5 bar		5.5 bar		6 bar		7 bar		8 bar		TORQUE MOLAS TORQUE SPRINGS RESORTES DE PAR		
QTDE. QTY. CANT.	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	INÍCIO (90°)	FINAL (0°)
ATM 0255 SR	5	75,0	48,0	101,0	74,0	152,0	125,0												80,0	52,0
	6	63,0	30,0	88,0	55,0	138,0	106,0	188,0	156,0										95,0	63,0
	7	52,0	14,0	77,0	39,0	128,0	90,0	178,0	140,0	203,0	165,0	228,0	190,0						111,0	73,0
	8			67,0	24,0	117,0	74,0	167,0	124,0	192,0	149,0	218,0	174,0	268,0	225,0				127,0	84,0
	9			56,0	8,0	107,0	58,0	157,0	108,0	182,0	133,0	207,0	158,0	257,0	209,0				143,0	94,0
	10					96,0	42,0	146,0	92,0	171,0	117,0	197,0	143,0	247,0	193,0	297,0	243,0		159,0	105,0
	11					86,0	26,0	136,0	76,0	161,0	101,0	186,0	127,0	236,0	177,0	287,0	227,0		175,0	115,0
	12							125,0	60,0	150,0	86,0	176,0	111,0	226,0	161,0	276,0	211,0		191,0	126,0
ATM 0435 SR	5	129,0	85,0	172,0	128,0	258,0	214,0												130,0	86,0
	6	112,0	59,0	155,0	102,0	241,0	188,0	327,0	274,0										156,0	103,0
	7	95,0	33,0	138,0	76,0	224,0	162,0	310,0	248,0	353,0	291,0	396,0	334,0						182,0	120,0
	8			120,0	50,0	206,0	136,0	292,0	222,0	335,0	265,0	378,0	308,0	464,0	394,0				208,0	138,0
	9			103,0	24,0	189,0	109,0	275,0	195,0	318,0	238,0	361,0	281,0	447,0	367,0				234,0	155,0
	10					172,0	83,0	258,0	169,0	301,0	212,0	344,0	255,0	430,0	341,0	516,0	427,0		261,0	172,0
	11					155,0	57,0	241,0	143,0	284,0	186,0	327,0	229,0	413,0	315,0	499,0	401,0		287,0	189,0
	12							224,0	117,0	267,0	160,0	310,0	203,0	396,0	289,0	482,0	375,0		313,0	206,0
ATM 0665 SR	5	193,0	121,0	260,0	188,0	393,0	321,0												211,0	139,0
	6	165,0	79,0	232,0	146,0	365,0	279,0	498,0	412,0										254,0	167,0
	7	137,0	37,0	204,0	103,0	337,0	236,0	470,0	369,0	537,0	436,0								296,0	195,0
	8			176,0	61,0	309,0	194,0	442,0	327,0	509,0	394,0	575,0	460,0	709,0	593,0				338,0	223,0
	9			148,0	19,0	281,0	152,0	414,0	285,0	481,0	351,0	548,0	418,0	681,0	551,0				381,0	251,0
	10					253,0	109,0	387,0	243,0	453,0	309,0	520,0	376,0	653,0	509,0	786,0	642,0		423,0	279,0
	11					226,0	67,0	359,0	200,0	425,0	267,0	492,0	333,0	625,0	466,0	758,0	600,0		465,0	307,0
	12							331,0	158,0	397,0	225,0	464,0	291,0	597,0	424,0	730,0	557,0		508,0	335,0
ATM 1000 SR	5	333,0	221,0	440,0	328,0	654,0	541,0												312,0	200,0
	6	293,0	159,0	400,0	265,0	614,0	479,0	827,0	692,0										375,0	240,0
	7	253,0	96,0	360,0	203,0	574,0	416,0	787,0	630,0	894,0	736,0								437,0	280,0
	8			320,0	140,0	534,0	354,0	747,0	567,0	854,0	674,0	960,0	781,0	1174,0	994,0				500,0	320,0
	9			280,0	78,0	494,0	291,0	707,0	505,0	814,0	611,0	920,0	718,0	1134,0	931,0				562,0	360,0
	10					454,0	229,0	667,0	442,0	774,0	549,0	880,0	656,0	1094,0	869,0	1307,0	1082,0		625,0	400,0
	11					414,0	166,0	627,0	380,0	734,0	486,0	840,0	593,0	1054,0	806,0	1267,0	1020,0		687,0	440,0
	12							587,0	317,0	694,0	424,0	800,0	531,0	1014,0	744,0	1227,0	957,0		750,0	480,0
ATM 1200 SR	5	390,0	281,0	523,0	414,0	789,0	680,0												385,0	275,0
	6	335,0	204,0	468,0	337,0	734,0	603,0	1001,0	869,0										462,0	330,0
	7	280,0	127,0	413,0	260,0	679,0	526,0	946,0	792,0	1079,0	925,0								539,0	385,0
	8			358,0	183,0	624,0	449,0	891,0	715,0	1024,0	848,0	1157,0	981,0	1423,0	1247,0				616,0	440,0
	9			303,0	106,0	569,0	372,0	836,0	638,0	969,0	771,0	1102,0	904,0	1368,0	1170,0				693,0	495,0
	10					514,0	295,0	781,0	561,0	914,0	694,0	1047,0	827,0	1313,0	1093,0	1579,0	1359,0		770,0	550,0
	11					459,0	218,0	726,0	484,0	859,0	617,0	992,0	750,0	1258,0	1016,0	1524,0	1282,0		846,0	605,0
	12							671,0	407,0	804,0	540,0	937,0	673,0	1203,0	939,0	1469,0	1206,0		923,0	660,0
ATM 1800 SR	5	552,0	390,0	745,0	583,0	1130,0	968,0												572,0	411,0
	6	470,0	276,0	663,0	469,0	1048,0	854,0	1433,0	1239,0										687,0	493,0
	7	388,0	162,0	580,0	354,0	965,0	739,0	1351,0	1124,0	1543,0	1317,0								801,0	575,0
	8			498,0	240,0	883,0	625,0	1268,0	1010,0	1461,0	1202,0	1653,0	1395,0	2038,0	1780,0				915,0	657,0
	9			416,0	125,0	801,0	510,0	1186,0	895,0	1379,0	1088,0	1571,0	1280,0	1956,0	1665,0				1030,0	739,0
	10					719,0	396,0	1104,0	781,0	1297,0	973,0	1489,0	1166,0	1874,0	1551,0	2259,0	1936,0		1144,0	821,0
	11					637,0	281,0	1022,0	666,0	1215,0	859,0	1407,0	1051,0	1792,0	1437,0	2177,0	1822,0		1259,0	903,0
	12							940,0	552,0	1133,0	745,0	1325,0	937,0	1710,0	1322,0	2095,0	1707,0		1373,0	985,0



# TORQUE DE AR - ATUADOR RETORNO POR MOLA

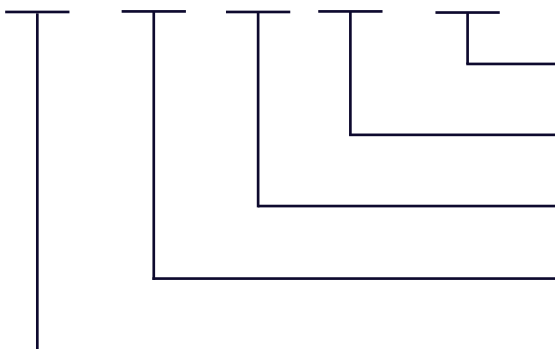
Air Torque / Par de aire - Spring Return Actuator / Actuador de Retorno por Resorte

MODELO MODEL MODELO	TORQUE DE AR (Unid.: Nm) - ATUADOR RETORNO POR MOLA																			
	AIR TORQUE (Unid.: Nm) - SPRING RETURN ACTUATOR / PAR DE AIRE (Unid.: Nm) - ACTUADOR DE RETORNO POR RESORTE																			
	MOLAS SPRINGS RESORTES	2.5 bar		3 bar		4 bar		5 bar		5.5 bar		6 bar		7 bar		8 bar		TORQUE MOLAS TORQUE SPRINGS RESORTES DE PAR		
QTDE. QTY. CANT.	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	INÍCIO (90°)	FINAL (0°)
ATM 2700 SR	5	859,0	602,0	1152,0	894,0	1737,0	1479,0												860,0	602,0
	6	739,0	430,0	1031,0	722,0	1616,0	1307,0	2201,0	1892,0										1032,0	723,0
	7	618,0	258,0	911,0	550,0	1496,0	1135,0	2080,0	1720,0	2373,0	2012,0								1204,0	843,0
	8			790,0	378,0	1375,0	963,0	1960,0	1548,0	2252,0	1840,0	2545,0	2133,0	3129,0	2717,0				1376,0	964,0
	9			670,0	206,0	1255,0	791,0	1839,0	1376,0	2132,0	1668,0	2424,0	1961,0	3009,0	2545,0				1548,0	1084,0
	10					1134,0	619,0	1719,0	1204,0	2011,0	1496,0	2304,0	1789,0	2888,0	2373,0	3473,0	2958,0	1720,0	1205,0	
	11					1014,0	447,0	1598,0	1032,0	1891,0	1324,0	2183,0	1617,0	2768,0	2201,0	3353,0	2786,0	1892,0	1325,0	
	12						1478,0	860,0	1770,0	1152,0	2063,0	1445,0	2647,0	2029,0	3232,0	2614,0	2064,0	1446,0		
ATM 3800 SR	5	1145,0	788,0	1531,0	1175,0	2304,0	1947,0												1143,0	787,0
	6	987,0	560,0	1374,0	946,0	2147,0	1719,0	2919,0	2491,0										1372,0	944,0
	7			1216,0	717,0	1989,0	1490,0	2762,0	2263,0										1601,0	1102,0
	8			1059,0	489,0	1832,0	1261,0	2604,0	2034,0	2991,0	2420,0	3377,0	2807,0	4150,0	3579,0				1829,0	1259,0
	9					1674,0	1033,0	2447,0	1805,0	2833,0	2192,0	3220,0	2578,0	3992,0	3351,0				2058,0	1416,0
	10					1517,0	804,0	2290,0	1577,0	2676,0	1963,0	3062,0	2349,0	3835,0	3122,0	4608,0	3895,0	2287,0	1574,0	
	11					1360,0	575,0	2132,0	1348,0	2519,0	1734,0	2905,0	2121,0	3678,0	2893,0	4450,0	3666,0	2515,0	1731,0	
	12						1975,0	1119,0	2361,0	1506,0	2748,0	1892,0	3520,0	2665,0	4293,0	3437,0	2744,0	1888,0		
ATM 5700 SR	5	1654,0	1095,0	2232,0	1674,0	3389,0	2831,0												1797,0	1238,0
	6	1406,0	736,0	1985,0	1314,0	3142,0	2471,0	4298,0	3628,0										2156,0	1486,0
	7			1737,0	955,0	2894,0	2112,0	4051,0	3269,0										2516,0	1734,0
	8			1489,0	595,0	2646,0	1752,0	3803,0	2909,0	4382,0	3488,0	4960,0	4066,0	6117,0	5223,0				2875,0	1981,0
	9					2399,0	1393,0	3555,0	2550,0	4134,0	3128,0	4712,0	3707,0	5869,0	4864,0				3235,0	2229,0
	10					2151,0	1034,0	3308,0	2190,0	3886,0	2769,0	4465,0	3347,0	5622,0	4504,0	6778,0	5661,0	3594,0	2477,0	
	11							3060,0	1831,0	3639,0	2409,0	42,17	2988,0	5374,0	4145,0	6531,0	5302,0	3953,0	2724,0	
	12						2812,0	1472,0	3391,0	2050,0	3969,0	2629,0	5126,0	3785,0	6283,0	4942,0	4313,0	2972,0		
ATM 8000 SR	7	2190,0	1249,0	3014,0	2073,0	4662,0	3721,0												2872,0	1931,0
	8	1914,0	838,0	2738,0	1662,0	4387,0	3311,0	6035,0	4959,0	6859,0	5783,0								3283,0	2207,0
	9			2462,0	1252,0	4111,0	2901,0	5759,0	4549,0	6583,0	5373,0								3693,0	2483,0
	10			2186,0	842,0	3835,0	2490,0	5483,0	4139,0	6307,0	4963,0	7132,0	5787,0	8780,0	7435,0				4103,0	2759,0
	11					3559,0	2080,0	5207,0	3728,0	6032,0	4552,0	6856,0	5377,0	8504,0	7025,0				4514,0	3035,0
	12					3283,0	1669,0	4931,0	3318,0	5756,0	4142,0	6580,0	4966,0	8228,0	6615,0	9877,0	8263,0	4924,0	3311,0	

## DEFINIÇÃO DA NOMENCLATURA

Definition of Nomenclature / Definición de Nomenclatura

ATM - 1200 - SR - K12 - F05



FURAÇÃO = Conforme ISO 5211 (F03-F25)

DRILLING = According to ISO 5211 (F03-F25)

TALADRADO = Según ISO 5211 (F03-F25)

QUANTIDADE DE MOLAS = De 5 a 12 molas, partilhadas em cada lado

QUANTITY OF SPRINGS = From 5 to 12 springs, shared on each side

CANTIDAD DE MUELLES = De 5 a 12 muelles, repartidos por cada lado

MODELO PARA AÇÃO = DA: Dupla ação e SR: Retorno por Mola

MODEL FOR ACTION = DA: Double Action and SR: Spring Return

MODELO POR ACCIÓN = DA: Doble Acción y SR: Retorno por Resorte

NOMENCLATURA DA CLASSIFICAÇÃO DE TORQUE = ATM 0012 até ATM 8000

TORQUE RATING NOMENCLATURE = ATM 0012 to ATM 8000

NOMENCLATURA DE CLASIFICACIÓN DE TORQUE = ATM 0012 a ATM 8000

MODELO DE ATUADOR MICROMAZZA (Tipo Pinhão e Cremalheira)

MICROMAZZA ACTUATOR MODEL (Pinion and Rack Type)

MODELO DE ACTUADOR MICROMAZZA (Tipo Piñón y Cremallera)



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