



Watt Drive Antriebstechnik GmbH

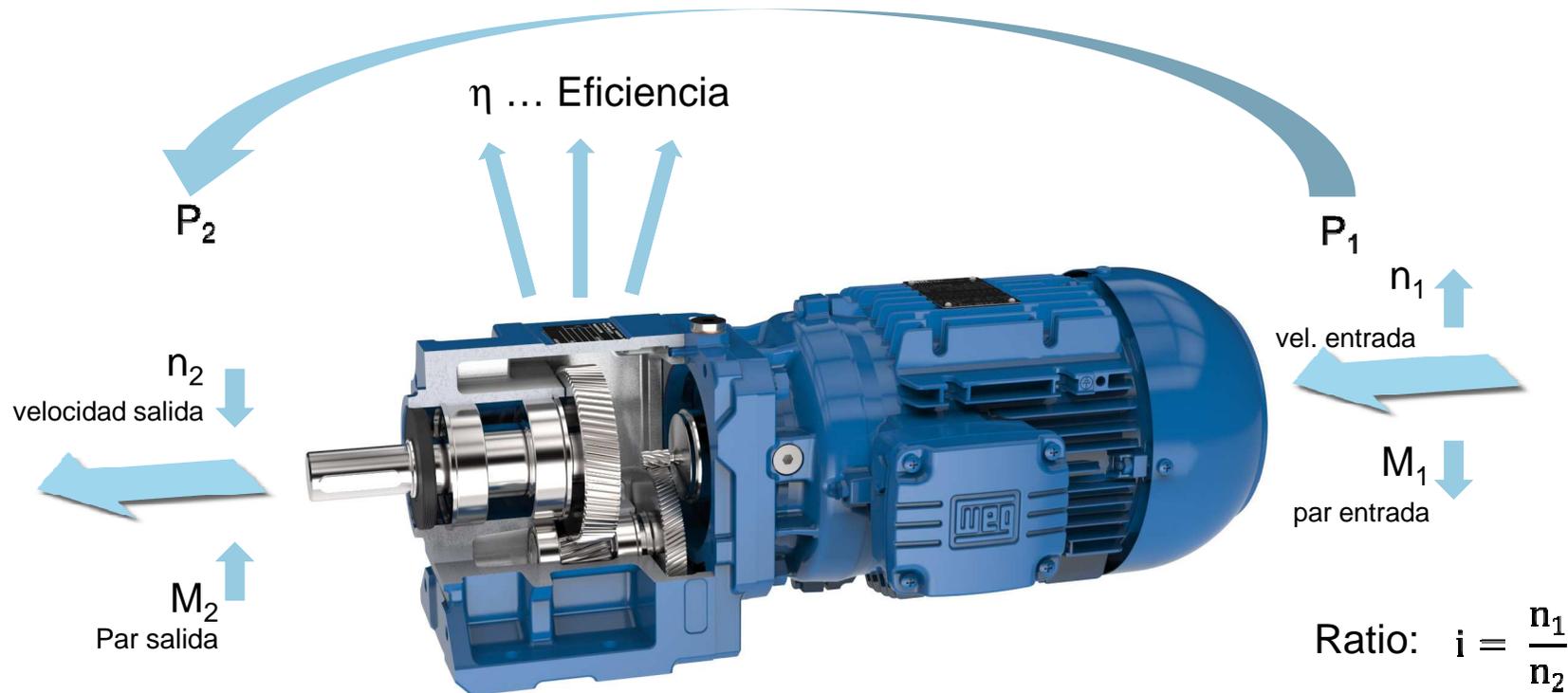


Reductores de Sistema Modular

Información básica – Motorreductores

Definición:

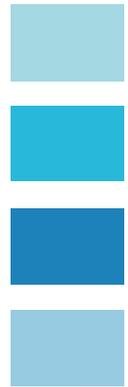
El reductor se emplea para reducir la velocidad y aumentar el par de un motor eléctrico.



Par de salida: $M_2[\text{Nm}] = 9550 \times \frac{P_1[\text{kW}]}{n_2[\text{rpm}]} \times \eta$

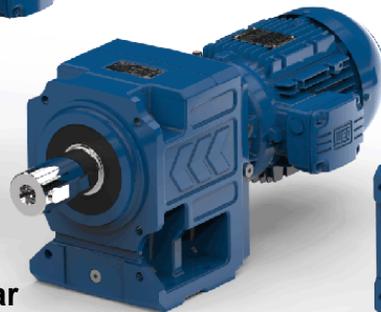
MAS® - Modular Drive System

Multitud de componentes uniformes integrados en diferentes aplicaciones de reductores
UNIBLOCK® - DESIGN



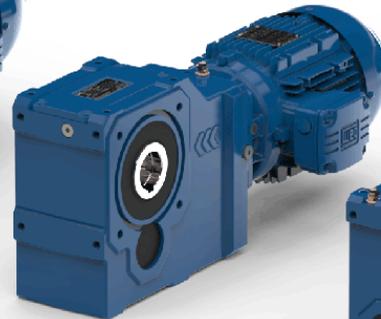
Motorreductor pendular

A



Motorreductor helicoidal coaxial

H



Motorreductor ortogonal cónico

K



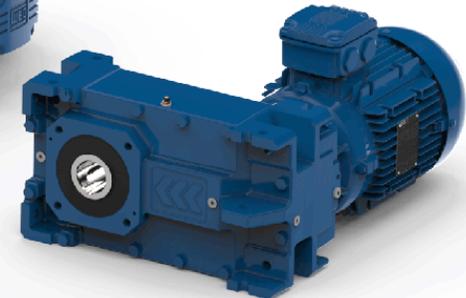
Motorreductor helicoidal sin-fin

S



Sin-fin corona

W



Motorreductor ejes paralelos

F

Reductores – Rango de pares



	20 Nm	50 Nm	80 Nm	100 Nm	200 Nm	300 Nm	400 Nm	550 Nm	800 Nm	1200 Nm	1500 Nm	2000 Nm	3000 Nm	5000 Nm	8000 Nm	14000 Nm	20000 Nm
H				40 100Nm	50 180Nm	55 270Nm	60 400Nm	65 550Nm	70 800Nm		80 1400Nm	85 2000Nm	110 3000Nm	130 5000Nm	133 8000Nm	136 14000Nm	
H		41E 50Nm	51E 80Nm	60E 150Nm	70E 250Nm		80E 400Nm			110E 1100Nm							
A				46 220Nm		56 400Nm		66 800Nm		76 1500Nm		86 2800Nm					
F													111 5000Nm	131 8000Nm	137 14000Nm		
S				454 120Nm	455 240Nm		506 480Nm	507 640Nm	608 1100Nm		609 1300Nm						
K				40 100Nm	50 200Nm		60 400Nm		70 800Nm	75 1250Nm	77 1500Nm		80 2700Nm	85 4600Nm	110 8000Nm	136 14000Nm	139 20000Nm
W	30E 20Nm	40E 40Nm	50E 80Nm	63E 130Nm	75E 200Nm												

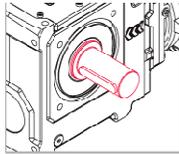
Reductores – Límite de potencia térmica



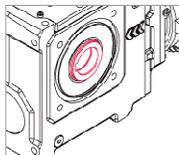
	20 Nm	50 Nm	80 Nm	100 Nm	200 Nm	300 Nm	400 Nm	550 Nm	800 Nm	1200 Nm	1500 Nm	2000 Nm	3000 Nm	5000 Nm	8000 Nm	14000 Nm	20000 Nm
H				40 1,8kW	50 3,6kW	55 5kW	60 6,1kW	65 8,3kW	70 11kW		80 18,5kW	85 22kW	110 37kW	130 45kW	133 65kW	136 75kW	
H		41E 2kW	51E 4kW	60E 7,7kW	70E 15,6kW		80E 25,2kW			110E 46,3kW							
A				46 3,9kW		56 5,6kW		66 11,9kW		76 20,1kW		86 30,5kW					
F													111 55kW	131 70kW	137 65kW		
S				454 -	455 -		506 -	507 -	608 -		609 -						
K				40 3,3kW	50 5,9kW		60 10kW		70 18kW	75 25,1kW	77 12,6kW		80 18,5kW	85 30kW	110 40kW	136 60kW	139 81kW
W	30E -	40E -	50E -	63E -	75E -												

Resumen programa MAS®

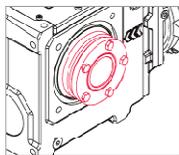
Shaft



Output shaft

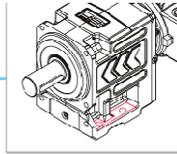


Hollow shaft

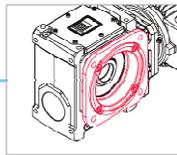


Hollow shaft + Shrink disc

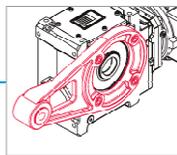
Assembly, Mounting



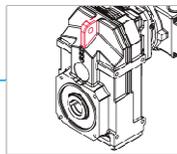
Foot



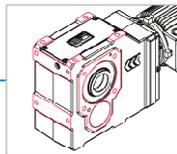
Flange



Torque arm



Shaft mounted type



UNIFI CCM type

Gear Type



Helical gear unit



Shaft mounted gear unit



Parallel shaft gear unit



Helical bevel gear unit

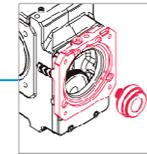


Helical worm gear unit

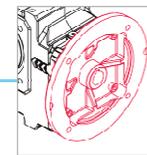


Worm gear unit

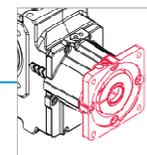
Input Types



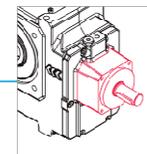
Direct mounting



IEC, NEMA adapter



SERVO adapter



Input shaft unit

Integral Motor



WAF

IEC MOTORS



WAF

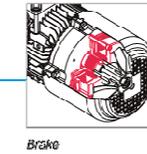


WAG

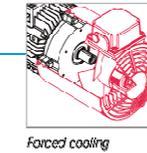


WAC

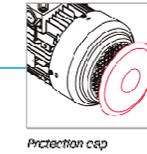
Modular Motor System



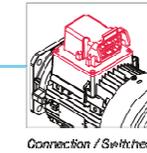
Brake



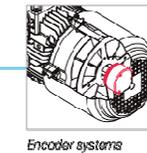
Forced cooling



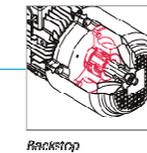
Protection cap



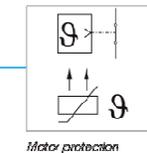
Connection / Switches



Encoder systems



Backstop



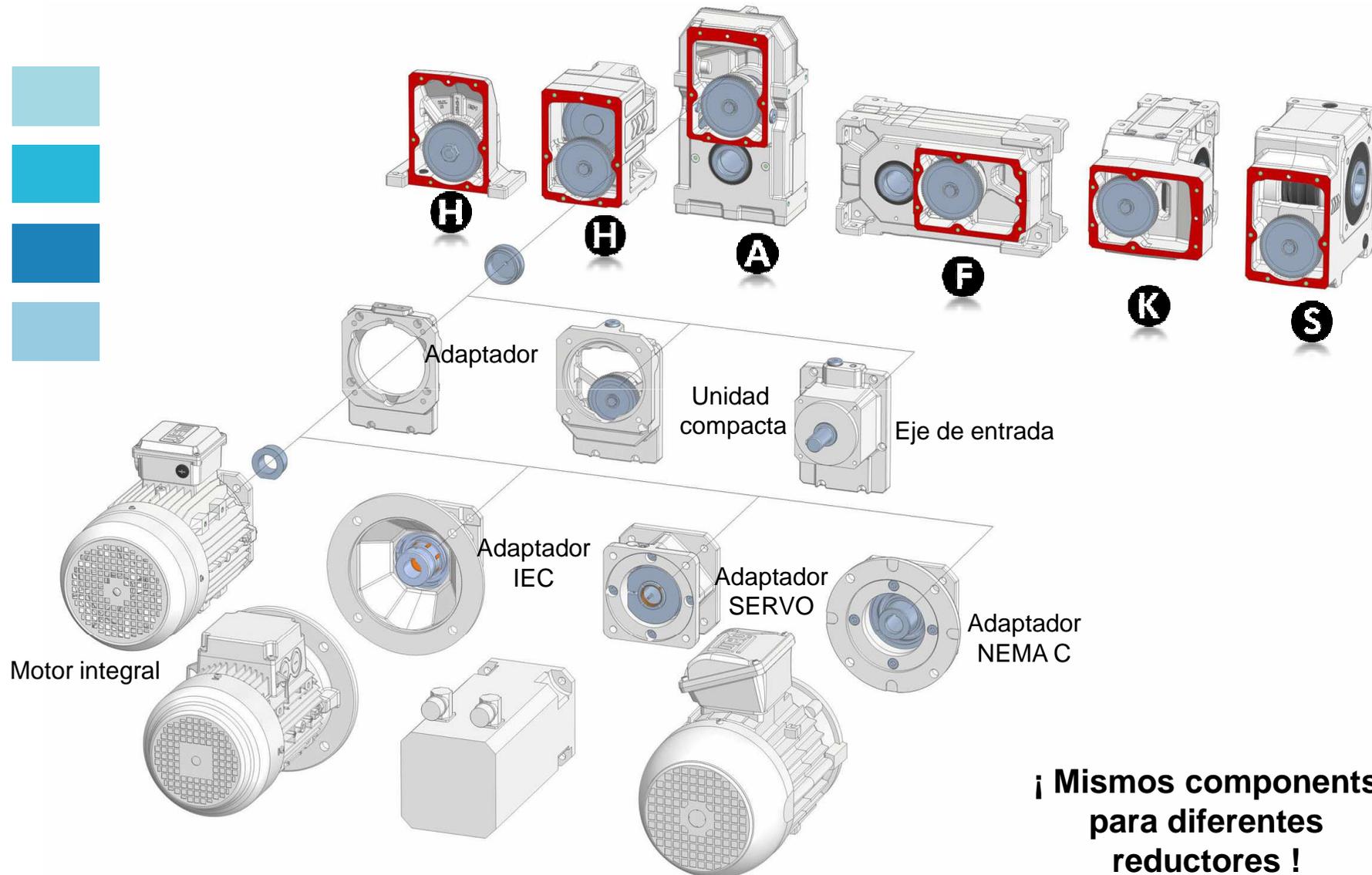
Motor protection

Electronic System



MVEOR

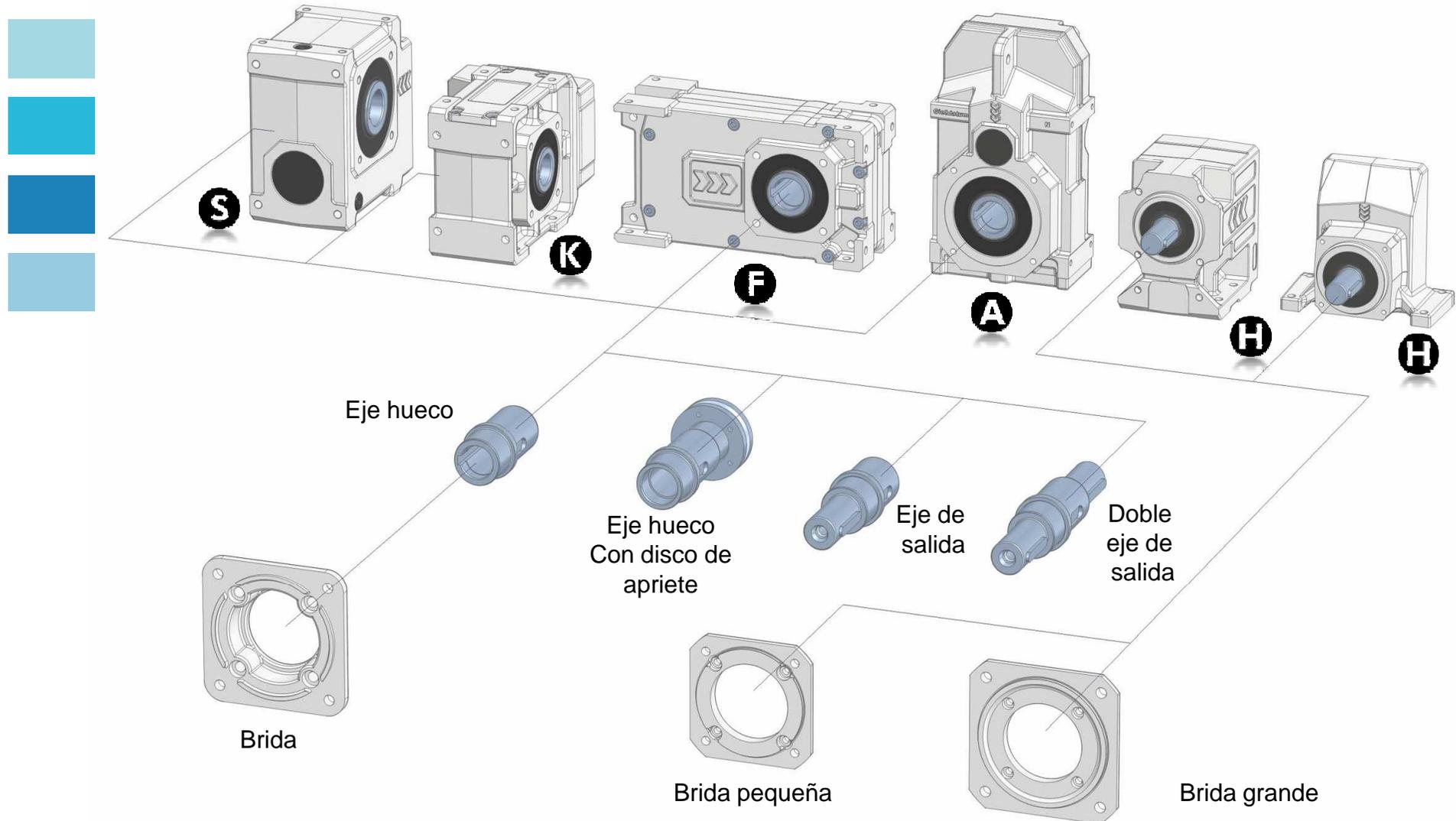
Sistema modular MAS®



**¡ Mismos componentes
para diferentes
reductores !**

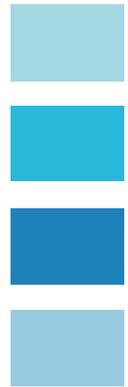
MAS® - Modular Gear System

¡ Mismos ejes y bridas para diferentes reductores !

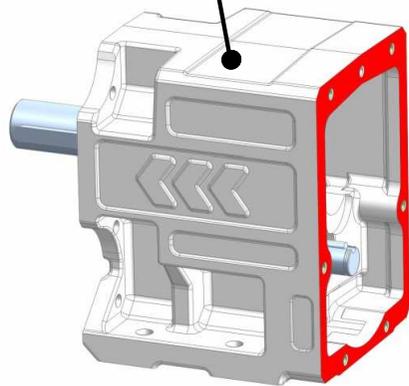


Concepto de reductor pre-ensamblado

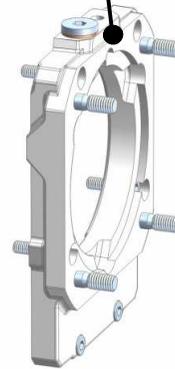
Ejemplo: motorreductor helicoidal



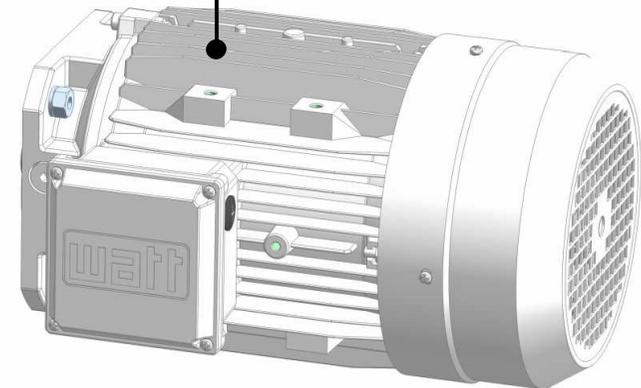
Reductor pre-ensamblado



Adaptador



Motor integral



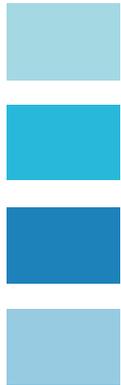
Primera etapa:
Piñón eje y
1ª etapa



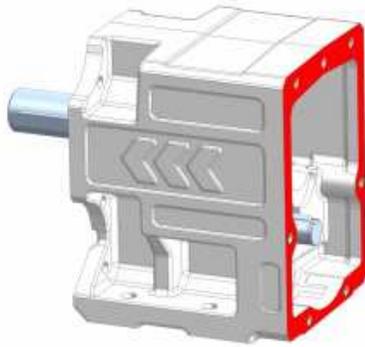
Buje



Concepto de reductor pre-ensamblado

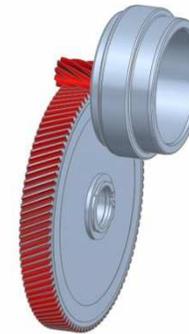


Unidad pre-ensamblada:



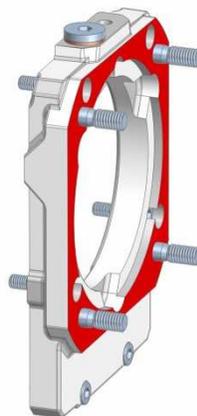
- Etapa de solda fija
- Carcasa UNIBLOCK
- Igual para todas las posiciones de montaje

Primera etapa:



- Se emplea el piñón del eje para diferentes distancias al centro del engranaje
- 1er engranaje de diferentes diámetros según modelo.

Adaptador:



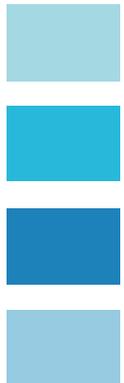
- El mismo para todos los reductores del mismo tamaño (por ejemplo tamaño 5)

Buje:



- Conexión del piñón modular a diferentes diámetros de eje de motor

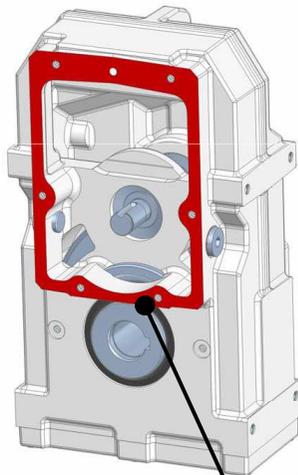
Concepto de reductor pre-ensamblado



Reductor
pendular

A

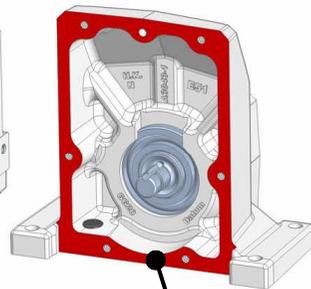
A.. 56A,S
 $M_2 = 400 \text{ Nm}$



Reductor Helicoidal
de una etapa

H

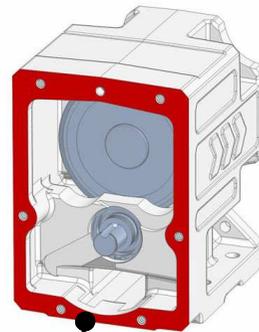
H. 51E
 $M_2 = 87 \text{ Nm}$



Reductor
Helicoidal

H

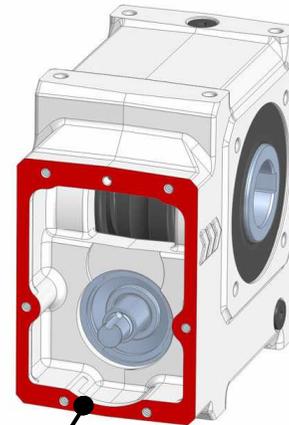
H. 50A,S
 $M_2 = 180 \text{ Nm}$



Reductor sin-fin
con prerreducción

S

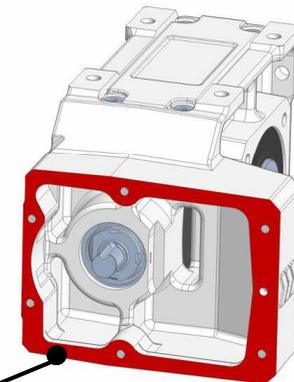
S.. 506A,B,S
 $M_2 = 505 \text{ Nm}$



Reductor
ortogonal

K

K.. 50A
 $M_2 = 200 \text{ Nm}$

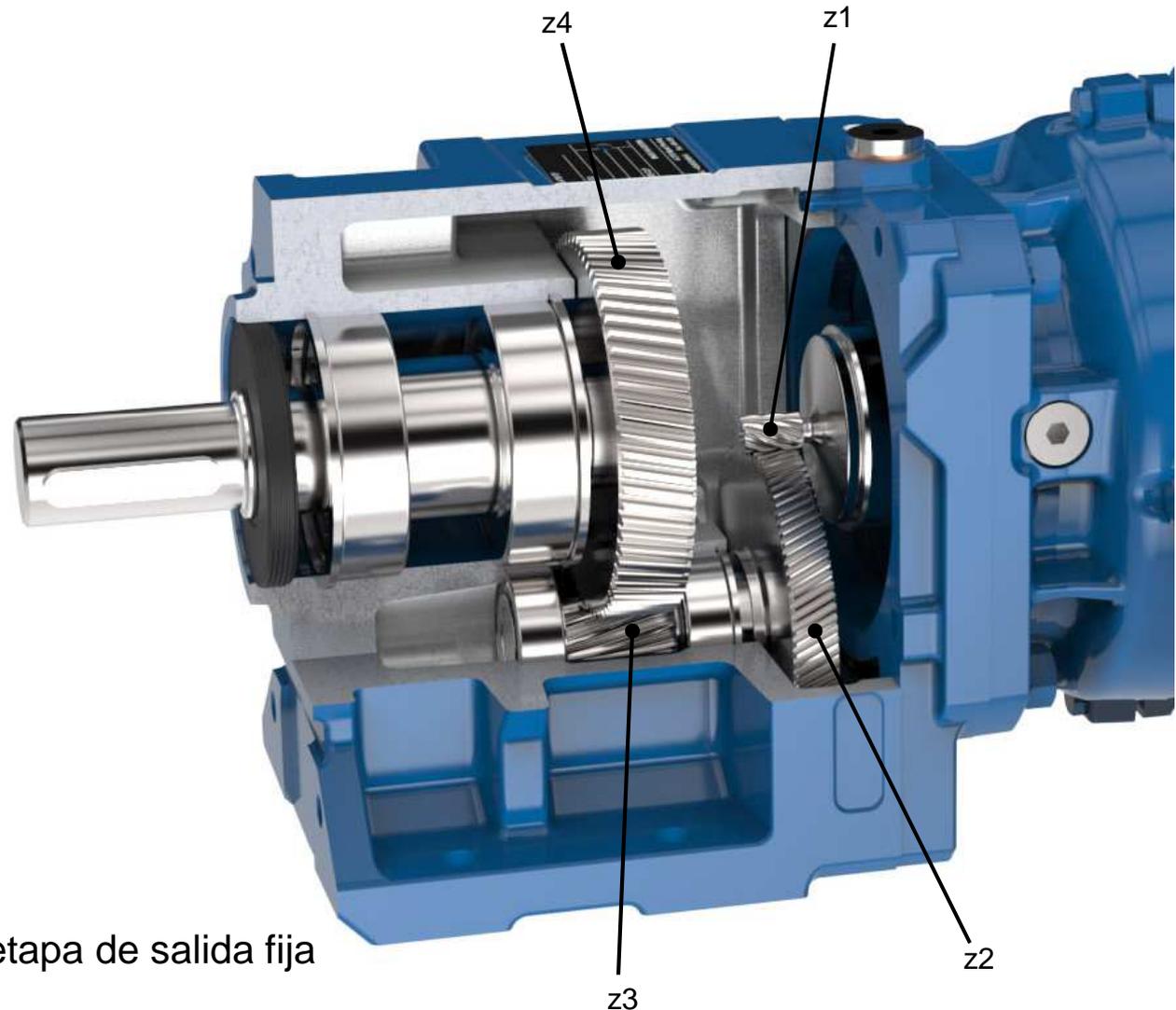


Misma forma para todos los reductores

Concepto de reducción – Etapas de salida fijas

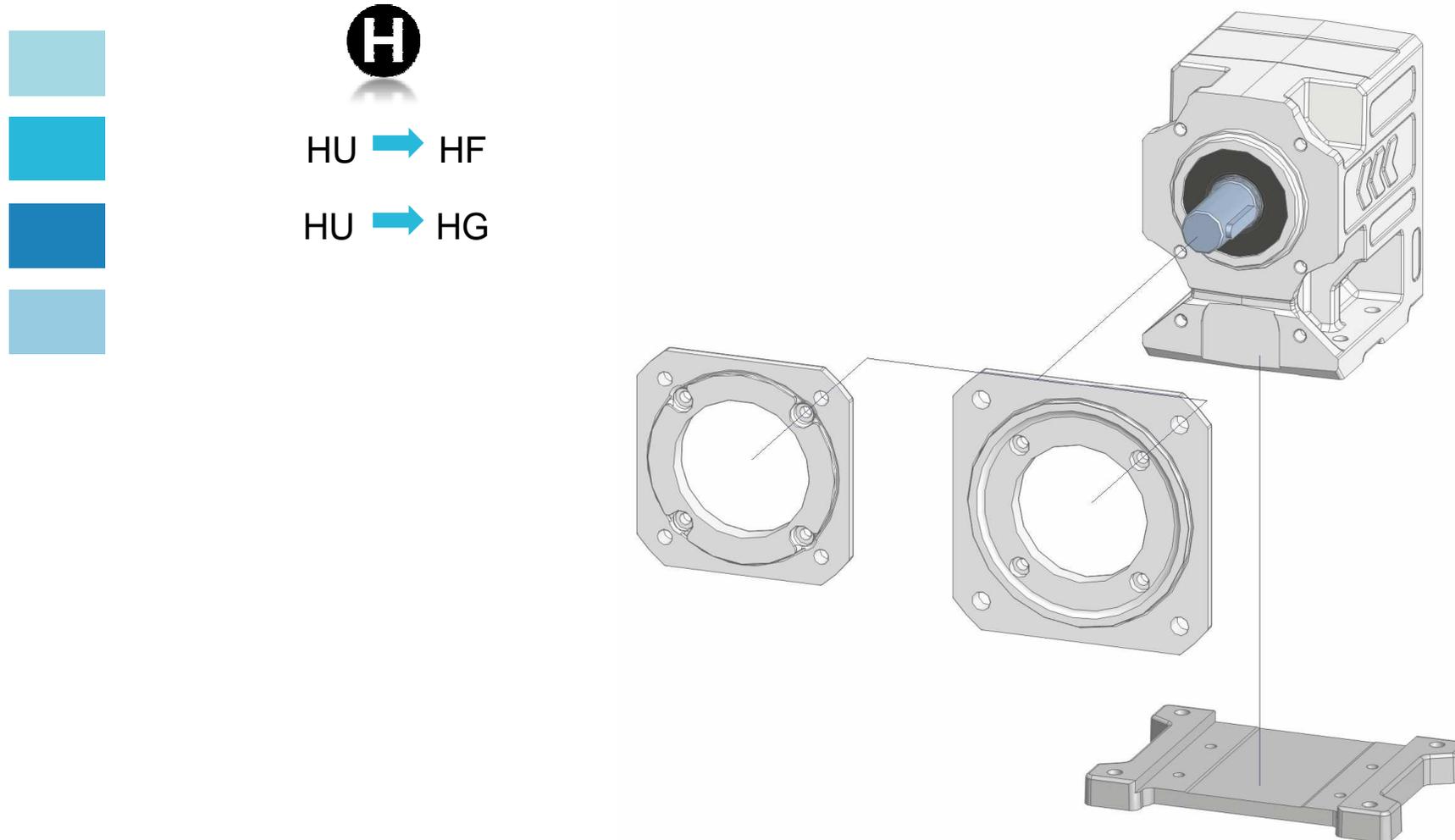
Ejemplo tamaño H. 50..

reducción i	entrada variable		salida fija	
	z1	z2	z3	z4
75,56	9	100	10	68
67,32	10	99		
60,58	11	98		
54,97	12	97		
50,22	13	96		
43,89	11	71		
39,67	12	70		
36,09	13	69		
30,03	12	53		
27,20	13	52		
23,80	12	42		
20,83	16	49		
17,76	18	47		
15,30	20	45		
13,11	28	54		
11,19	31	51		
9,60	34	48		
8,27	37	45		
6,80	41	41		
5,59	45	37		



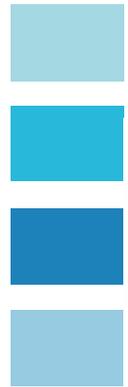
Reductor pre-ensamblado con etapa de salida fija

Reductor helicoidal



Las carcasas Uniblock pueden montar bridas o patas indistintamente

Reductores con eje macizo



S

K

F

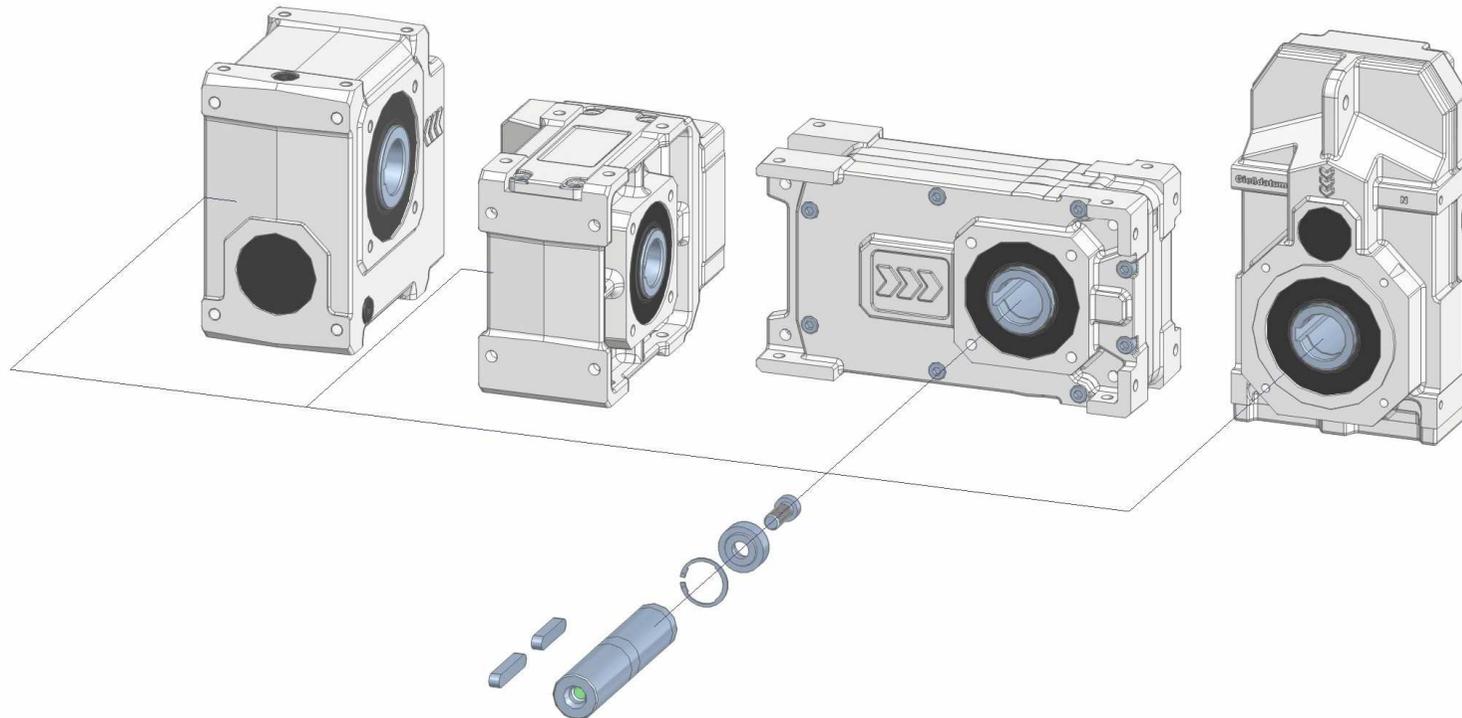
A

SUA → SU

KUA → KU

FUA → FU

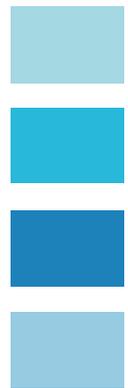
ASA → AS



Se le añade el eje a los modelos con eje hueco

Se pueden emplear múltiples tamaños de eje

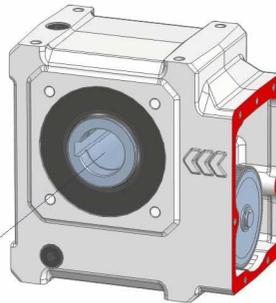
Brazo de reacción y brida de salida



S

SUA → SFA

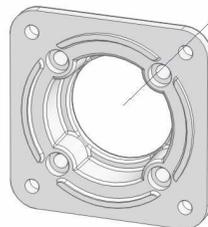
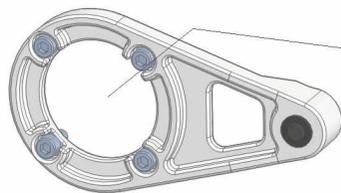
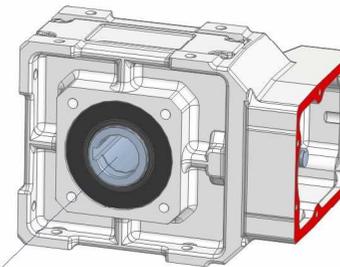
SUA → SSA



K

KUA → KFA

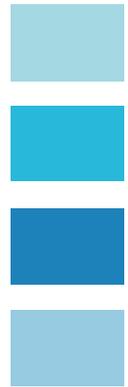
KUA → KSA



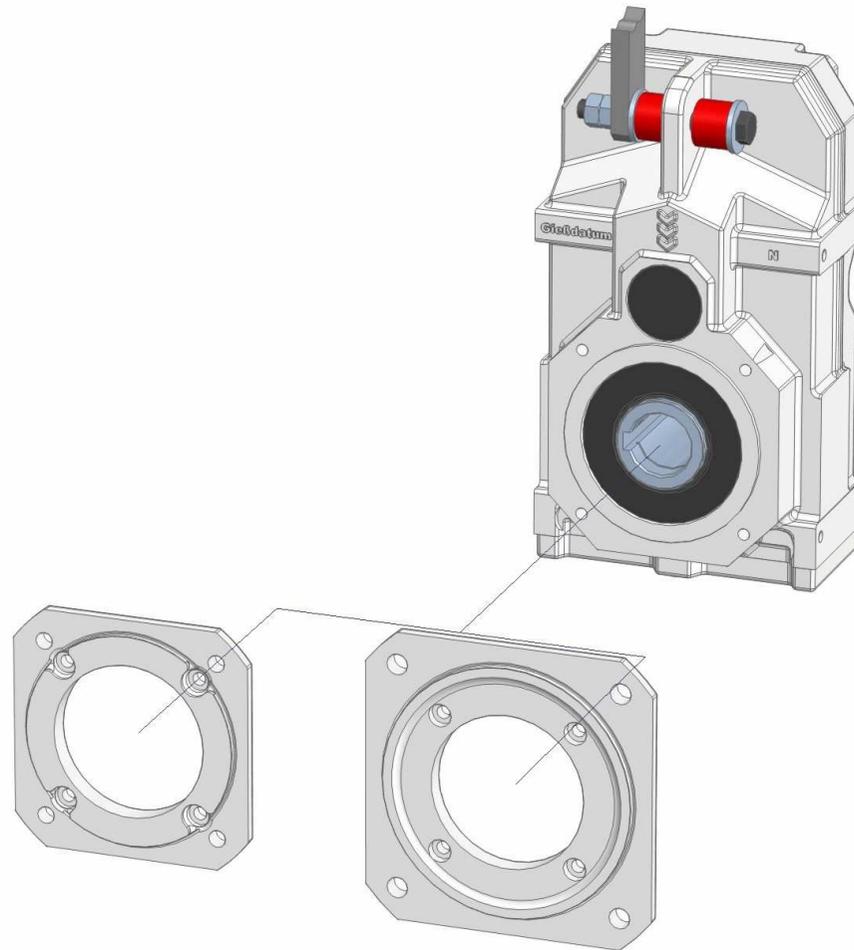
Eje hueco con ajuste por brida

Varios modos de montaje del brazo de reacción

Soporte reacción anti-vibratorio



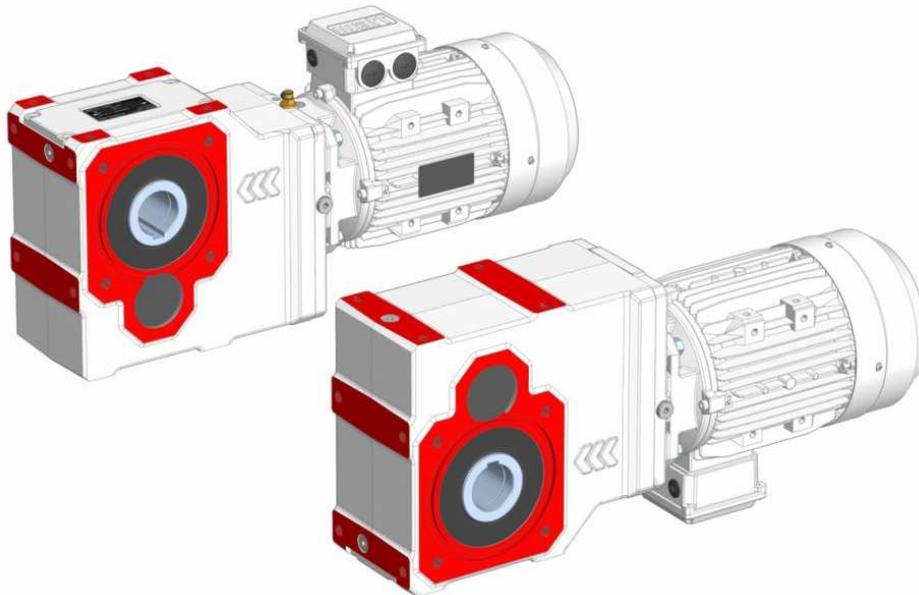
ASA → AFA



Carcasa Uniblock con brazo de reacción integrado o brida de salida

Diseño Uniblock

Un reductor pre-ensamblado válido para:



- Todas las posiciones de montaje
- Costes de almacén reducidos
- Brida o patas
- Eje hueco o macizo
- Todas las reducciones disponibles
- Diversas potencias de motor acoplables
- Flexibilidad de adaptadores
- Facilidad de ensamblaje

Ejemplo: Diversos usos de la primera etapa tamaño 5

H

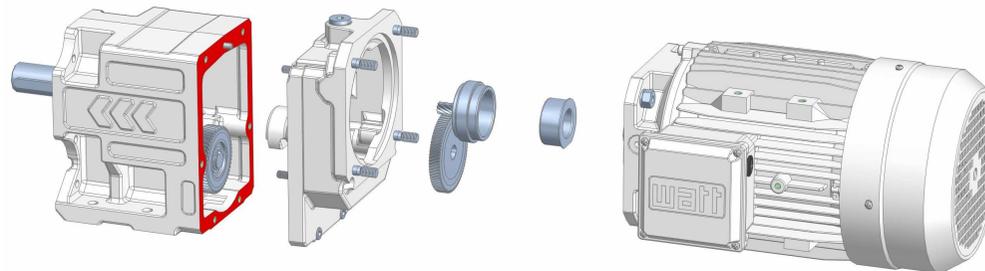
A

F

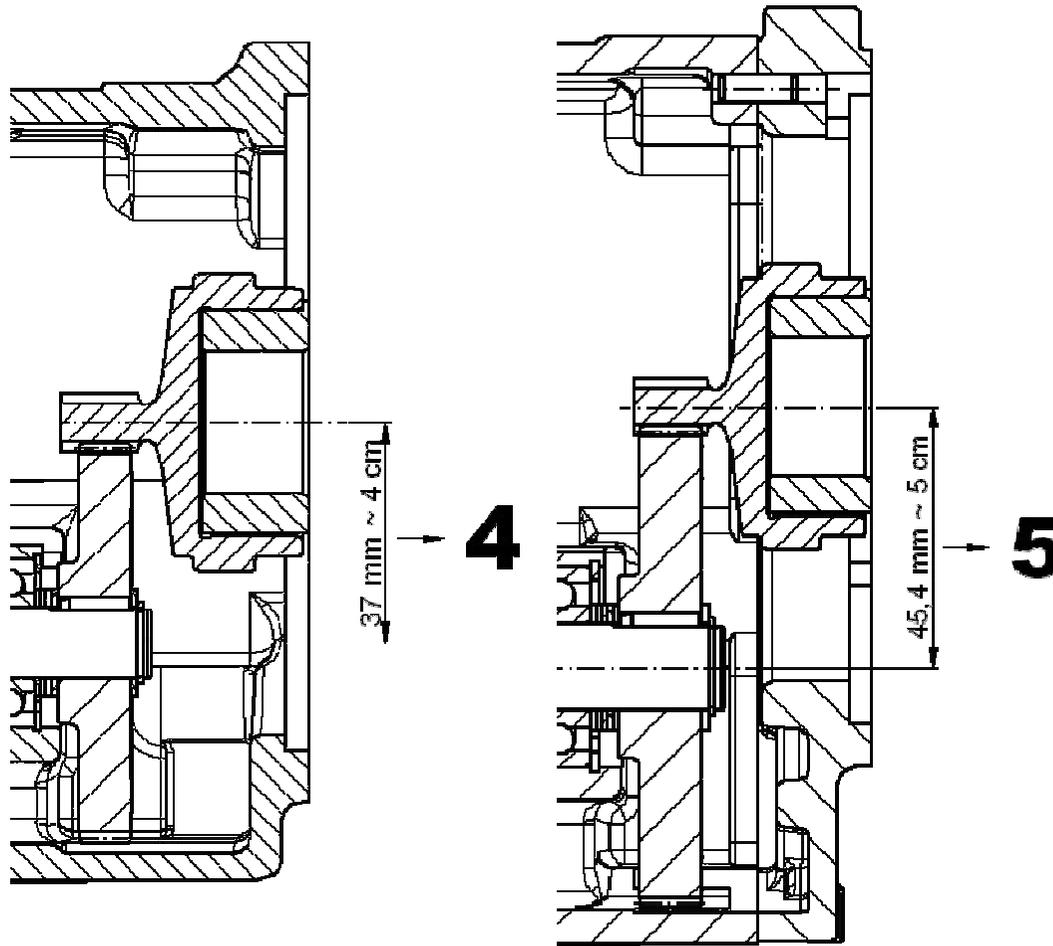
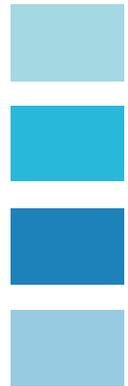
K

S

Helicoidal	Etapas	Ejes paralelos	Etapas	Pendular	Etapas	Cónico Ortogonal	Etapas	Helicoidal sin-fin corona	Etapas
H. 51E	1	A.. 56A,S	2	F.. 110D	4	K.. 50A	2	S.. 506A,B,S	2
H. 50A,S	2	A.. 76C	3	F.. 130D	4	K.. 70C	3	S.. 507A,B,S	2
H. 55A	2	A.. 86C	3	F.. 137D	4	K.. 75C	3		
H. 70C	3					K.. 77C	4		
H. 80C	3					K.. 80C	4		
H. 85C	3					K.. 110D	5		
H. 110D	4					K.. 136D	5		
H. 130D	4					K.. 139D	5		
H. 133F	5								
H. 136F	5								



Distancias entre centros



Tamaño reductor	Distancia entre centro [mm]
4	37
5	45,4
6	58,1
7	71
8	81
11	114,8
13	134
14 (H. 136A)	137

Primera etapa

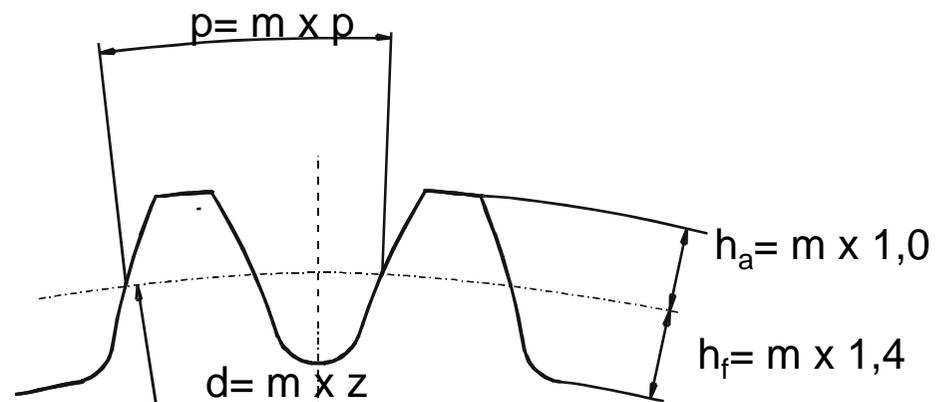
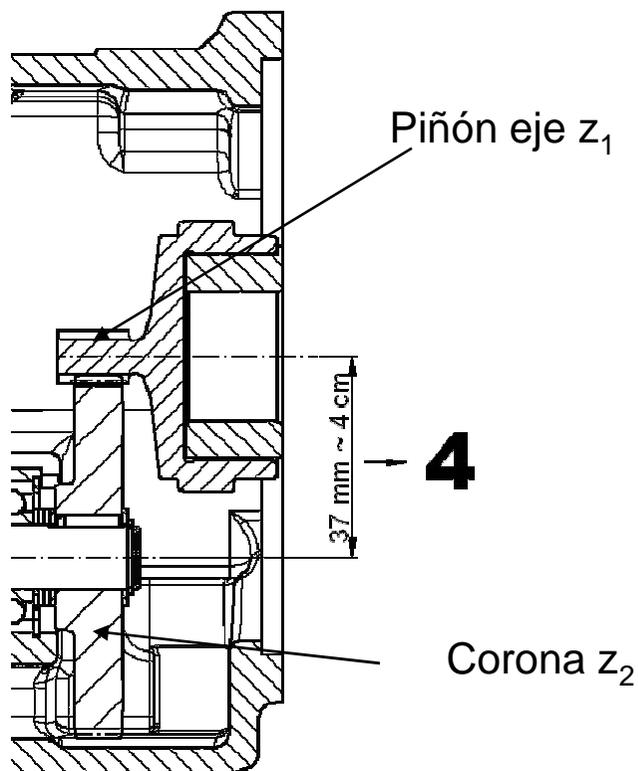
„Código – ZT“ **0407/11056 (tamaño 4)**

04 ... / = Distancia aproximada centros. [cm] ($a \sim 4$ cm)

.. 07 / = Módulo 1ª etapa ($m=0,75$)

..... / 11 ... = Número de dientes piñón ($z_1=11$)

..... / .. 056 = Número de dientes corona ($z_2=56$)



- m ... Módulo
- z ... Número de dientes
- p ... Paso
- d ... Diámetro del paso
- h_a ... Tooth dedendum
- h_f ... Dedendum tooth depth



Gracias por su atención.