TRANSTECNO®
the modular gearmotor

ZP

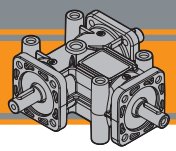
ZP

Right-angle bevel gearboxes

Rinvii angolari
Right-angle bevel gearboxes



brand of TRANSTECNO®



ENERGY SAVING

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Caratteristiche tecniche

I rinvii angolari serie ZP sono stati progettati per applicazioni industriali dove occorre trasmettere un moto rotatorio tra alberi disposti perpendicolarmente tra loro.

Sono disponibili:

- 4 grandezze: ZP1 ZP2, ZP3 e ZP4
- 3 rapporti: 1/1 , 1/2 e 1/3 (dalla grandezza 2)
- 2 o 1 prese moto uscita;
- 1 flangia ingresso e 2 flange uscita.
- 2 flange ingresso e 2 flange uscita solo per ZP2

Caratteristiche comuni a tutta la serie sono:

- Carter monoblocco in lega di alluminio predisposta per il fissaggio in 4 punti o ,in alternativa, alle flange in corrispondenza delle prese moto
- Coppia Conica Spiroidale GLEASON in acciaio al Nikel Cromo con trattamento di Cementazione - Tempra
- Alberi maschio in acciaio al carbonio protetti superficialmente contro la corrosione con trattamento di fosfatazione .Le sedi linguetta (non presenti sulla taglia ZP1) possono assumere qualsiasi posizione angolare
- Sulle taglie ZP2 e ZP3 è previsto un albero uscita cavo con sede linguetta
- Cuscinetti radiali a sfere
- Anelli di Tenuta tipo A in NBR o Tappi in NBR ove l'albero non è sporgente
- Lubrificazione con olio sintetico ISO 150, ad esclusione delle grandezze 1 fornita con grasso minerale 00 EP permanente

Technical features

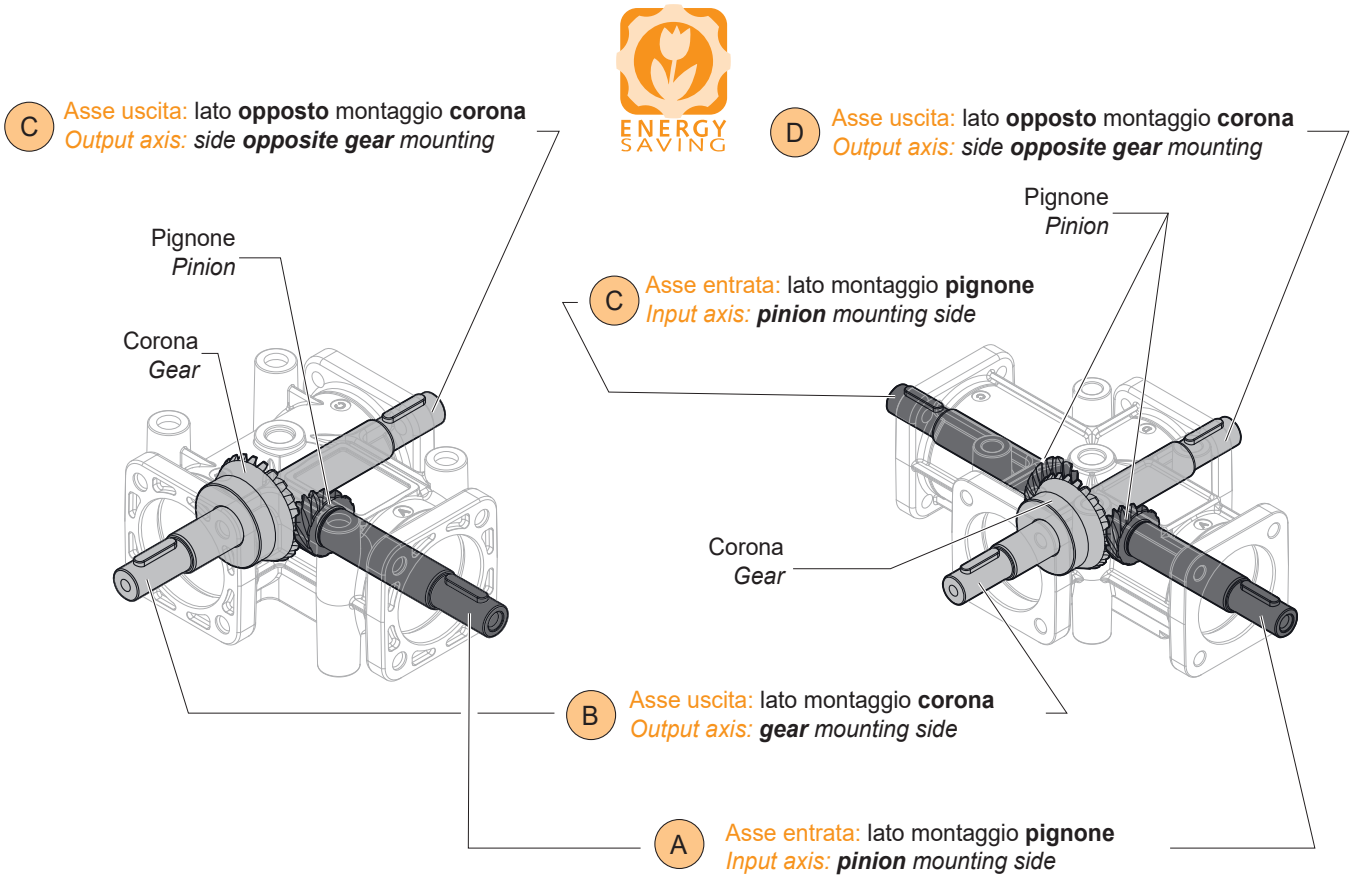
ZP-series right-angle bevel gearboxes are designed for industrial applications where rotary motion must be transmitted between perpendicularly arranged shafts.

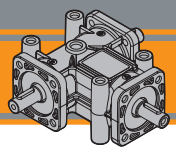
Those available:

- *4 sizes: ZP1 ZP2, ZP3 and ZP4*
- *3 ratios: 1/1 , 1/2 and 1/3 (from size 2)*
- *2 or 1 output power take-off;*
- *1 input flange and 2 output flanges.*
- *2 input and 2 output flanges only for ZP2*

Common features throughout the series are:

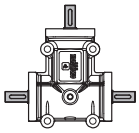
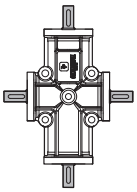
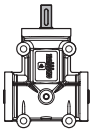
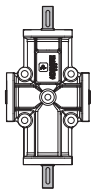
- *One-piece aluminium alloy casing prepared for 4-point fixing or, alternatively, to flanges at the power take-off*
- *GLEASON spiral bevel gear in Nickel Chrome steel with Case hardening treatment*
- *Solid shafts in carbon steel, surface protected against corrosion with phosphating treatment. Feather key seats (not present on size ZP1) can assume any angular position*
- *On sizes ZP2 and ZP3 a hollow output shaft with keyway is provided*
- *Radial ball bearings*
- *NBR type A sealing rings or NBR plugs where the shaft does not protrude*
- *Lubrication with synthetic oil ISO 150, except size 1 supplied with permanent 00 EP mineral grease*



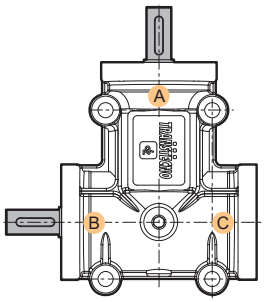


Designazione — *Classification*

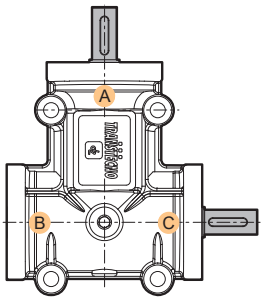
RINVIO ANGOLARE / *RIGHT-ANGLE BEVEL GEARBOX*

ZP	1	0	S	4P	A	B	-	-
Tipo *Type*	Grandezza *Size*	Rapporto *Ratio*	Tipo di montaggio *Monting type*	Flangia *Flange*	Albero in A *Shaft in A*	Albero in B *Shaft in B*	Albero in C *Shaft in C*	Albero in C *Shaft in C*
ZP			**S**	**4P**	**A**	**B**	**C**	**D**
	**1** **2** **3** **4**	**0 - 1** (i = 1/1) **2 - 3** (i = 1/2) **4 - 5** (i = 1/3)	**FS** **...**				**-**	**-**
	**2**	**20 - 21** (i = 1/1) **22 - 23** (i = 1/2) **24 - 25** (i = 1/3) ZP2 - 4 vie *ZP2 - 4 shafts*						
	**2** **3**	**11** (i = 1/1) **13** (i = 1/2) **15** (i = 1/3) Albero cavo *Hollow shaft*			**3V**			
	**2**				**4V**			

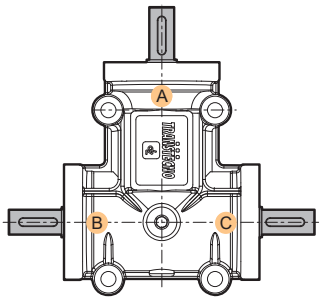
Versione — *Version*



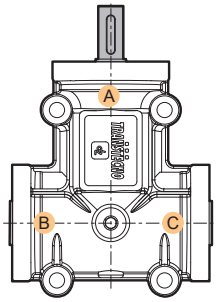
S..AB



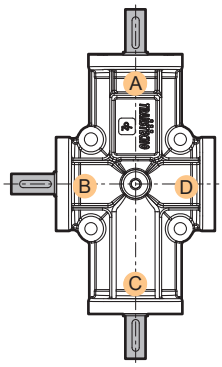
FS..AC



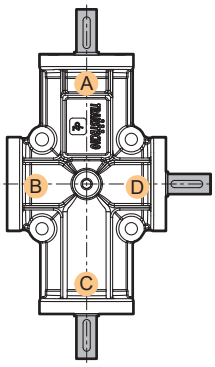
...ABC



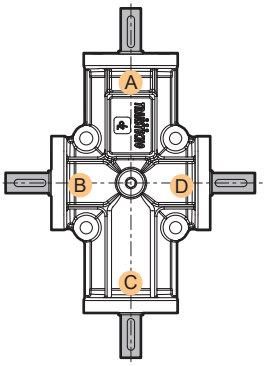
...3V



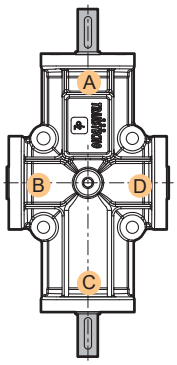
S..ABC



FS..ACD

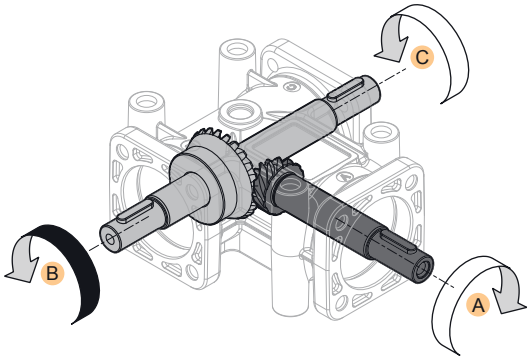


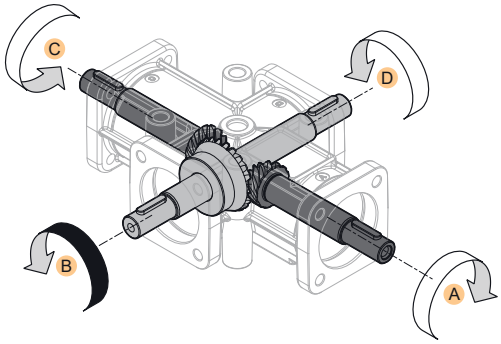
...ABCD



...4V

Sensi di rotazione — *Direction of rotation*





Simbologia — *Symbols*

n_1	[min^{-1}]	Velocità in ingresso / *Input speed*
n_2	[min^{-1}]	Velocità in uscita / *Output speed*
i		Rapporto di riduzione / *Ratio*
P_1	[kW]	Potenza in entrata / *Input power*
M_2	[Nm]	Coppia nominale in uscita in funzione di P_1 / *Output torque referred to P_1*
Pn_1	[kW]	Potenza nominale in entrata / *Nominal input power*
Mn_2	[Nm]	Coppia nominale in uscita in funzione di Pn_1 / *Nominal output torque referred to Pn_1*
sf		Fattore di servizio / *Service factor*
R_1	[N]	Carico radiale ammissibile in entrata / *Permitted input radial load*
A_1	[N]	Carico assiale ammissibile in entrata / *Permitted input axial load*
R_2	[N]	Carico radiale ammissibile in uscita / *Permitted output radial load*
A_2	[N]	Carico assiale ammissibile in uscita / *Permitted output axial load*
Kg	[kg]	Peso del solo riduttore / *Weight of the gearbox only*

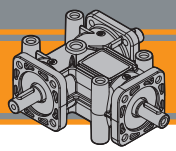
Lubrificazione — *Lubrication*

I rinvii angolari serie ZP , sono forniti completi di lubrificante sintetico ISO 150 , ad esclusione della grandezza 1 fornita con grasso minerale 00 EP.

Possono essere installati in qualunque posizione di montaggio e non necessitano di manutenzione.

ZP-series right-angle bevel gearboxes are supplied complete with synthetic lubricant ISO 150, except size 1 supplied with 00 EP mineral grease.

They can be installed in any mounting position and are maintenance-free.



Carichi radiali e assiali

Entrata / Input

Radial and axial loads

Per carichi radiali o assiali superiori a quelli di tabella si prega di contattare il servizio tecnico

For radial or axial loads higher than those in the table, please contact technical service

	n1 [min^{-1}]	i	n_2 [min^{-1}]	R_1 [N]	A_1 [N]	n1 [min^{-1}]	i	n_2 [min^{-1}]	R_1 [N]	A_1 [N]
ZP 1	50	1	50	200	160	100	1	100	200	160
		2	25				2	50		
	250	1	250	150	160	500	1	500	82	160
		2	125	200			2	250	200	
	750	1	750	65	160	1000	1	1000	35	140
		2	375	200			2	500	200	160
	1500	1	1500	15	85	2000	1	2000	10	50
		2	750	200	160		2	1000	200	160
	2500	1	2500	5	25	3000	1	3000	*	*
		2	1250	175	160		2	1500	150	160
ZP 2	50	1	50	520	420	100	1	100	520	420
		2	25				2	50		
		3	17				3	33		
	250	1	250	520	420	500	1	500	450	420
		2	125				2	250	480	410
		3	83				3	167	520	420
	750	1	750	375	420	1000	1	1000	250	410
		2	375	440	405		2	500	300	300
		3	250	520	420		3	333	510	420
	1500	1	1500	150	300	2000	1	2000	100	200
		2	750		150		2	1000		100
		3	500	450	360		3	667	400	300
	2500	1	2500	50	100	3000	1	3000	*	*
		2	1250		50		2	1500		
		3	833	350	275		3	1000	300	250
ZP 3	50	1	50	960	640	100	1	100	960	640
		2	25				2	50		
		3	17				3	33		
	250	1	250	735	570	500	1	500	360	400
		2	125	960	640		2	250	960	640
		3	83				3	167		
	750	1	750	230	300	1000	1	1000	50	150
		2	375	960	640		2	500	780	520
		3	250				3	333	960	640
	1500	1	1500	*	75	2000	1	2000	*	50
		2	750	400	300		2	1000	200	200
		3	500	960	640		3	667	960	640
	2500	1	2500	*	25	3000	1	3000	*	*
		2	1250	100	100		2	1500	*	*
		3	833	960	640		3	1000	960	640
ZP 4	50	1	50	960	640	100	1	100	960	640
		2	25				2	50		
		3	17				3	33		
	250	1	250	740	620	500	1	500	400	500
		2	125	960	640		2	250	960	640
		3	83				3	167		
	750	1	750	300	400	1000	1	1000	150	250
		2	375	960	640		2	500	730	520
		3	250				3	333	960	640
	1500	1	1500	75	150	2000	1	2000	50	100
		2	750	350	300		2	1000	200	200
		3	500	960	640		3	667	960	640
	2500	1	2500	*	50	3000	1	3000	*	*
		2	1250	100	100		2	1500	*	*
		3	833	960	640		3	1000	960	640

* Contattare il servizio tecnico

* *Contact technical service*

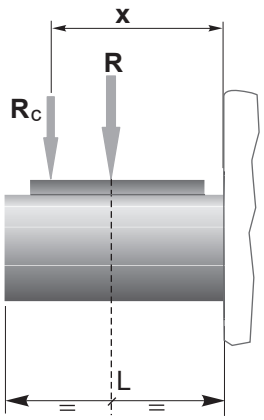
Carichi radiali

Entrata / Input

Radial loads

Quando il carico radiale risultante non è applicato sulla mezzeria dell'albero occorre calcolare quello effettivo con la seguente formula:

When the resulting radial load is not applied on the centre line of the shaft it is necessary to calculate the effective load with the following formula:

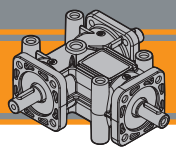


$$R_c = \frac{R \cdot a}{(b+x)} \leq R_{..MAX}$$

$$R \leq R_c$$

a, b = valori riportati nella tabella
a, b = values given in the table

	i	a	b	R_{max} [N]
ZP 1	1 2	49	39	200
ZP 2	1 2 3	70	55	520
ZP 3	1 2 3	107	87	960
ZP 4	1 2 3	112	87	960



Carichi radiali e assiali

Uscita / Output

Radial and axial loads

Per carichi radiali o assiali superiori a quelli di tabella si prega di contattare il servizio tecnico

For radial or axial loads higher than those in the table, please contact technical service

	n1 [min^{-1}]	i	n_2 [min^{-1}]	R_1 [N]	A_1 [N]	n1 [min^{-1}]	i	n_2 [min^{-1}]	R_1 [N]	A_1 [N]
ZP 1	50	1	50	200	160	100	1	100	200	160
		2	25				2	50		
	250	1	250	200	160	500	1	500	200	160
		2	125				2	250		
	750	1	750	200	160	1000	1	1000	200	160
		2	375				2	500		
	1500	1	1500	150	130	2000	1	2000	100	100
		2	750	200	160		2	1000	200	160
	2500	1	2500	75	75	3000	1	3000	50	50
		2	1250	200	160		2	1500	200	160
ZP 2	50	1	50	520	420	100	1	100	520	420
		2	25				2	50		
		3	17				3	33		
	250	1	250	520	420	500	1	500	520	420
		2	125				2	250		
		3	83				3	167		
	750	1	750	520	420	1000	1	1000	520	420
		2	375				2	500		
		3	250				3	333		
	1500	1	1500	510	410	2000	1	2000	500	400
		2	750	520	420		2	1000	520	420
		3	500				3	667		
	2500	1	2500	400	325	3000	1	3000	300	250
		2	1250	520	420		2	1500	520	420
		3	833				3	1000		
ZP 3	50	1	50	960	640	100	1	100	960	640
		2	25				2	50		
		3	17				3	33		
	250	1	250	960	640	500	1	500	960	640
		2	125				2	250		
		3	83				3	167		
	750	1	750	960	640	1000	1	1000	880	640
		2	375				2	500	960	
		3	250				3	333		
	1500	1	1500	700	570	2000	1	2000	600	500
		2	750	960	640		2	1000	960	640
		3	500				3	667		
	2500	1	2500	500	400	3000	1	3000	400	300
		2	1250	960	640		2	1500	960	640
		3	833				3	1000		
ZP 4	50	1	50	960	640	100	1	100	960	640
		2	25				2	50		
		3	17				3	33		
	250	1	250	960	640	500	1	500	960	640
		2	125				2	250		
		3	83				3	167		
	750	1	750	960	640	1000	1	1000	930	640
		2	375				2	500	960	
		3	250				3	333		
	1500	1	1500	750	570	2000	1	2000	600	500
		2	750	960	640		2	1000	960	640
		3	500				3	667		
	2500	1	2500	500	400	3000	1	3000	400	300
		2	1250	960	640		2	1500	960	640
		3	833				3	1000		

Per le versioni con albero uscita CAVO ZP211.., ZP213.., ZP215.. e ZP311.., ZP313.. e ZP315 contattare il servizio tecnico

For versions with HOLLOW output shaft ZP211.., ZP213.., ZP215.. and ZP311.., ZP313.. and ZP315 contact technical service

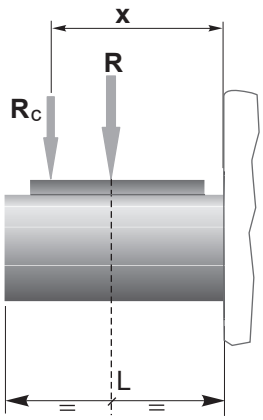
Carichi radiali

Uscita / Output

Radial loads

Quando il carico radiale risultante non è applicato sulla mezzeria dell'albero occorre calcolare quello effettivo con la seguente formula:

When the resulting radial load is not applied on the centre line of the shaft it is necessary to calculate the effective load with the following formula:

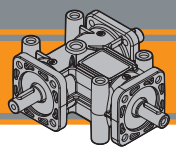


$$R_c = \frac{R \cdot a}{(b+x)} \leq R_{..MAX}$$

$$R \leq R_c$$

a, b = valori riportati nella tabella
a, b = values given in the table

	i	a	b	R_{max} [N]
ZP 1	1 2	70.5	60.5	200
ZP 2	1 2 3	107	92	520
ZP 3	1 2 3	150	130	960
ZP 4	1 2 3	155	130	960



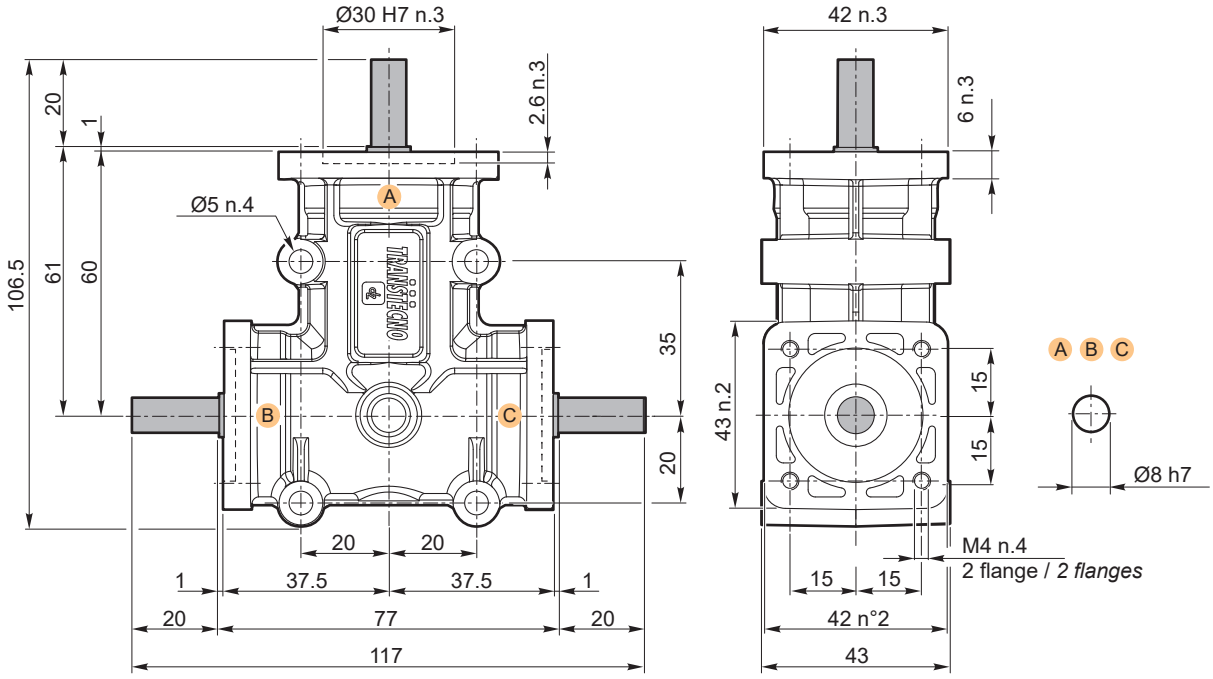
Dati tecnici

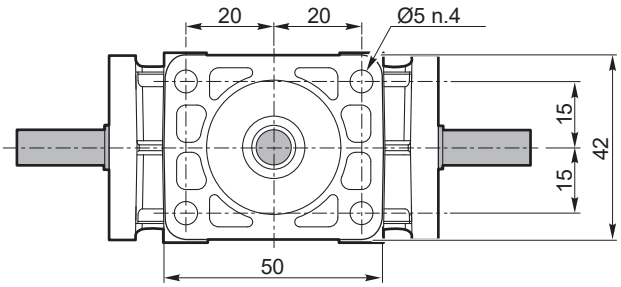
Technical data

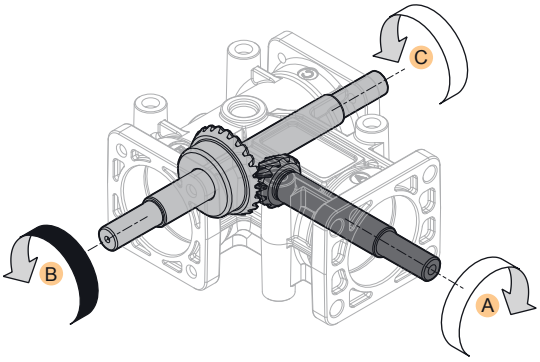
	i	n_1 [min^{-1}]	n_2 [min^{-1}]	M_{n2} [Nm]	P_{n1} [kW]	n_1 [min^{-1}]	n_2 [min^{-1}]	M_{n2} [Nm]	P_{n1} [kW]	n_1 [min^{-1}]	n_2 [min^{-1}]	M_{n2} [Nm]	P_{n1} [kW]	n_1 [min^{-1}]	n_2 [min^{-1}]	M_{n2} [Nm]	P_{n1} [kW]	n_1 [min^{-1}]	n_2 [min^{-1}]	M_{n2} [Nm]	P_{n1} [kW]
ZP 1	1	50	50	4.7	0.02	100	100	4.5	0.05	250	250	4.1	0.10	500	500	3.9	0.20	750	750	3.85	0.29
	2		25	7.5	0.02		50	7.0	0.04		125	6.7	0.08		250	6.0	0.15		375	5.6	0.21
	1	1000	1000	3.7	0.37	1500	1500	3.45	0.52	2000	2000	3.3	0.66	2500	2500	3.15	0.79	3000	3000	3.0	0.90
	2		500	4.8	0.24		750	4.3	0.32		1000	4.2	0.42		1250	4.0	0.50		1500	3.9	0.59
ZP 2	1	50	50	19	0.10	100	100	18	0.18	250	250	17	0.41	500	500	15.7	0.79	750	750	15.2	1.15
	2		25	26	0.07		50	26	0.13		125	24.5	0.31		250	23	0.58		375	22	0.81
	3		17	18	0.03		33	17.5	0.06		83	16.7	0.14		167	16.3	0.27		250	16.1	0.40
	1	1000	1000	14.7	1.48	1500	1500	14.3	2.16	2000	2000	14	2.81	2500	2500	13	3.27	3000	3000	12	3.62
	2		500	19	0.93		750	16	1.21		1000	14.5	1.46		1250	14.3	1.79		1500	14	2.11
	3		333	15	0.50		500	13.5	0.68		667	13	0.84		833	12.5	1.05		1000	12	1.21
ZP 3	1	50	50	87	0.44	100	100	73	0.73	250	250	56	1.41	500	500	49	2.46	750	750	46	3.47
	2		25	90	0.23		50	82	0.41		125	63.5	0.80		250	55	1.38		375	52	1.96
	3		17	33	0.06		33	32	0.11		83	30.4	0.25		167	29.3	0.49		250	28.6	0.72
	1	1000	1000	41	4.12	1500	1500	36	5.43	2000	2000	35	7.04	2500	2500	33	8.29	3000	3000	31	9.35
	2		500	45	2.26		750	39	2.94		1000	37	3.72		1250	36.3	4.56		1500	35	5.28
	3		333	27	0.90		500	25.5	1.28		667	25	1.68		833	24.5	2.05		1000	24	2.41
ZP 4	1	50	50	87	0.44	100	100	73	0.73	250	250	56	1.41	500	500	49	2.46	750	750	46	3.47
	2		25	90	0.23		50	82	0.41		125	63.5	0.80		250	55	1.38		375	52	1.96
	3		17	33	0.06		33	32	0.11		83	30.4	0.25		167	29.3	0.49		250	28.6	0.72
	1	1000	1000	41	4.12	1500	1500	36	5.43	2000	2000	35	7.04	2500	2500	33	8.29	3000	3000	31	9.35
	2		500	45	2.26		750	39	2.94		1000	37	3.72		1250	36.3	4.56		1500	35	5.28
	3		333	27	0.90		500	25.5	1.28		667	25	1.68		833	24.5	2.05		1000	24	2.41

Dimensioni *Dimensions*

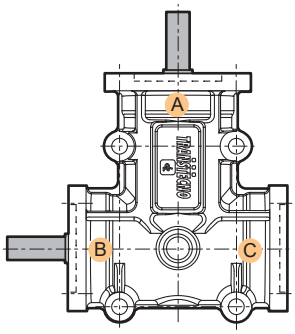
ZP 1 ... 4P ...

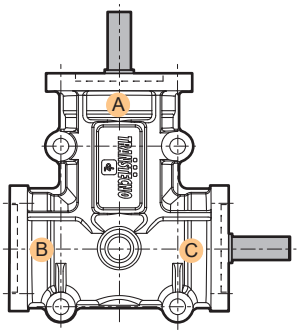






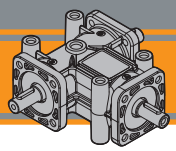
i	Code	Kg
1	ZP 11 4P ABC	0.6
2	ZP 13 4P ABC	





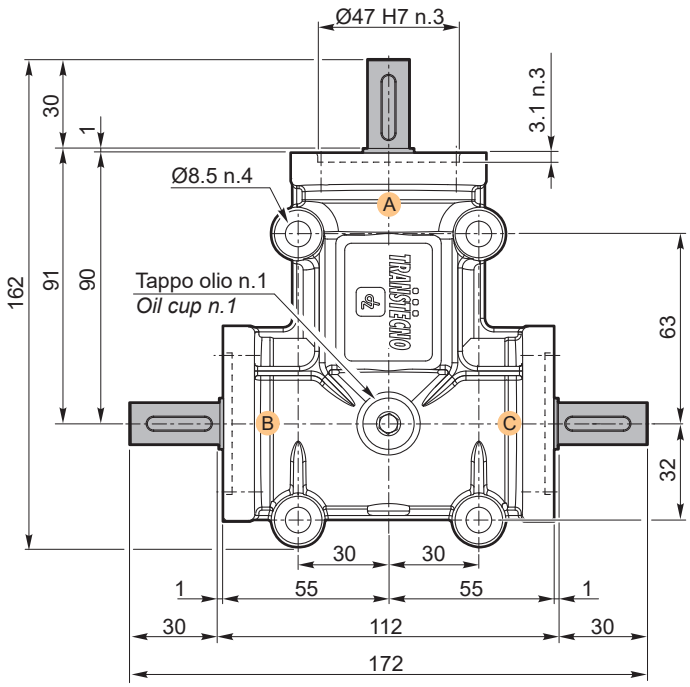
i	Code	Kg
1	ZP 10 S 4P AB	0.6
2	ZP 12 S 4P AB	

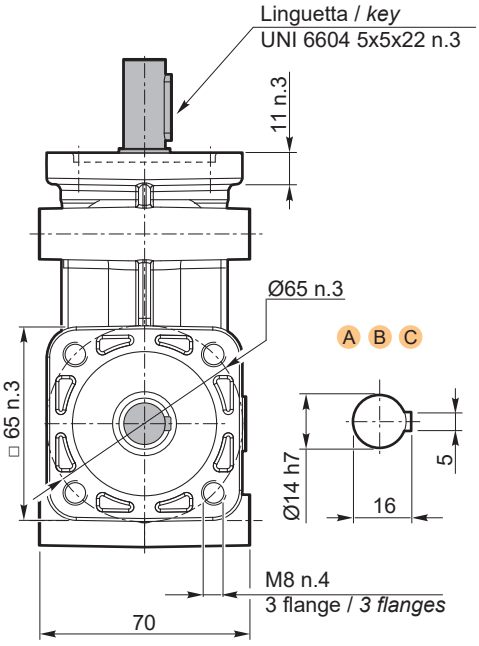
i	Code	Kg
1	ZP 10 FS 4P AC	0.6
2	ZP 12 FS 4P AC	



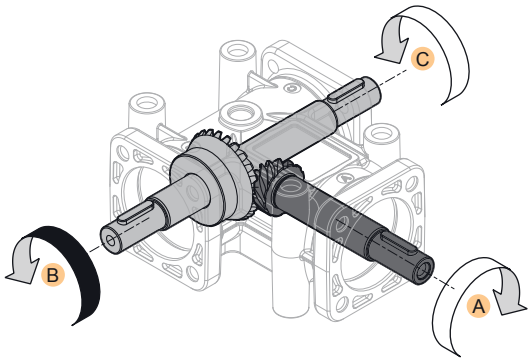
Dimensioni ***Dimensions***

ZP 2... 4P ...



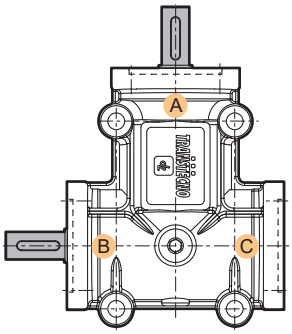


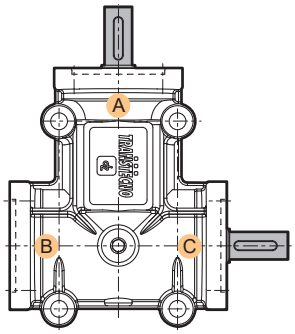
i	Code	Kg
1	ZP 21 4P ABC	2.0
2	ZP 23 4P ABC	
3	ZP 25 4P ABC	



Le sedi linguetta negli alberi cavi come negli alberi maschi possono assumere qualsiasi posizione angolare.

The keyway in hollow shafts as in solid shafts can assume any angular position.



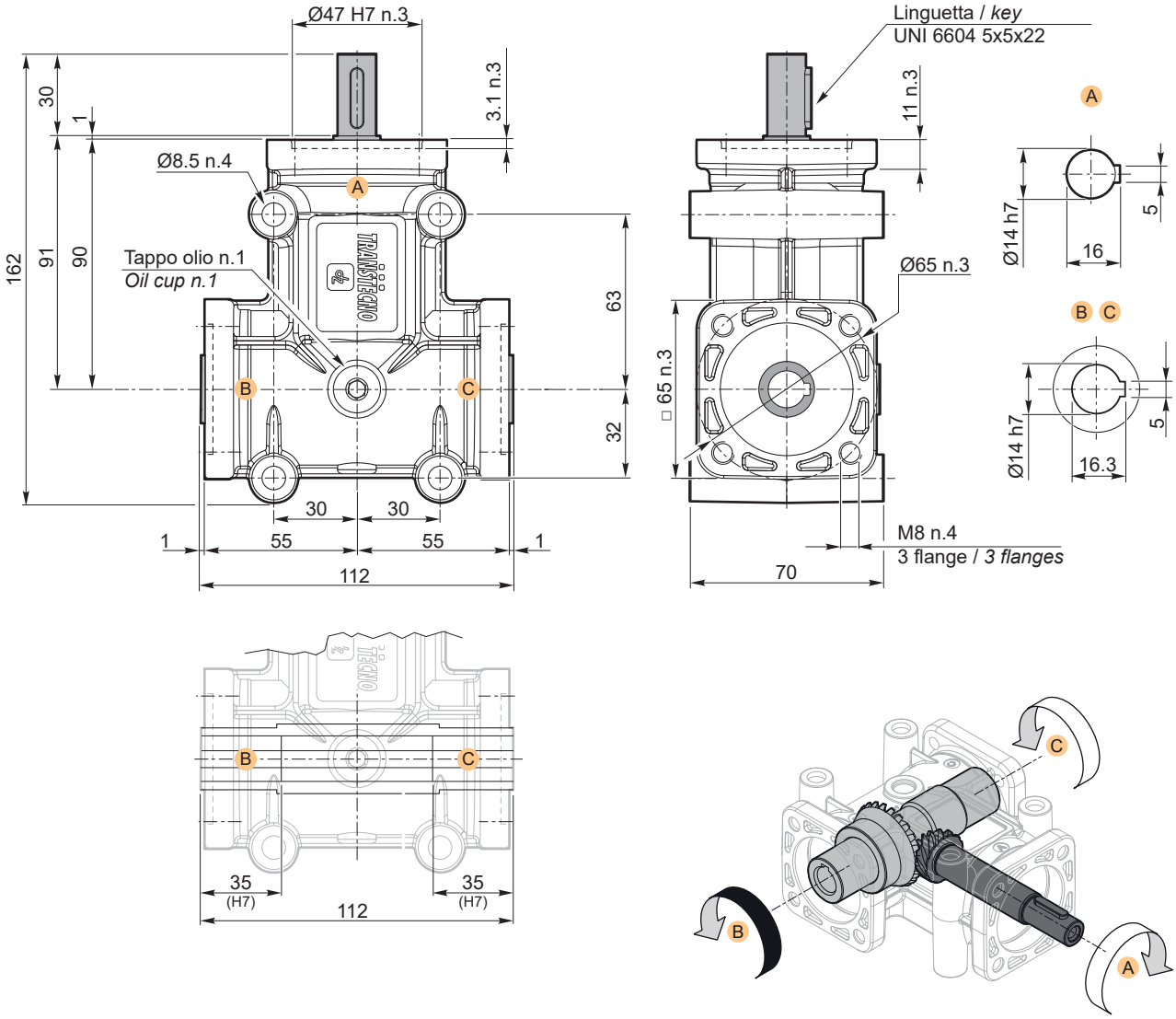


i	Code	Kg
1	ZP 20 S 4P AB	2.0
2	ZP 22 S 4P AB	
3	ZP 24 S 4P AB	

i	Code	Kg
1	ZP 20 FS 4P AC	2.0
2	ZP 22 FS 4P AC	
3	ZP 24 FS 4P AC	

Dimensioni ***Dimensions***

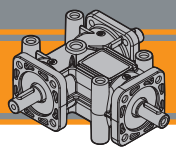
ZP 21... 4P 3V



i	Code	Kg
1	ZP 211 4P 3V	2.0
2	ZP 213 4P 3V	
3	ZP 215 4P 3V	

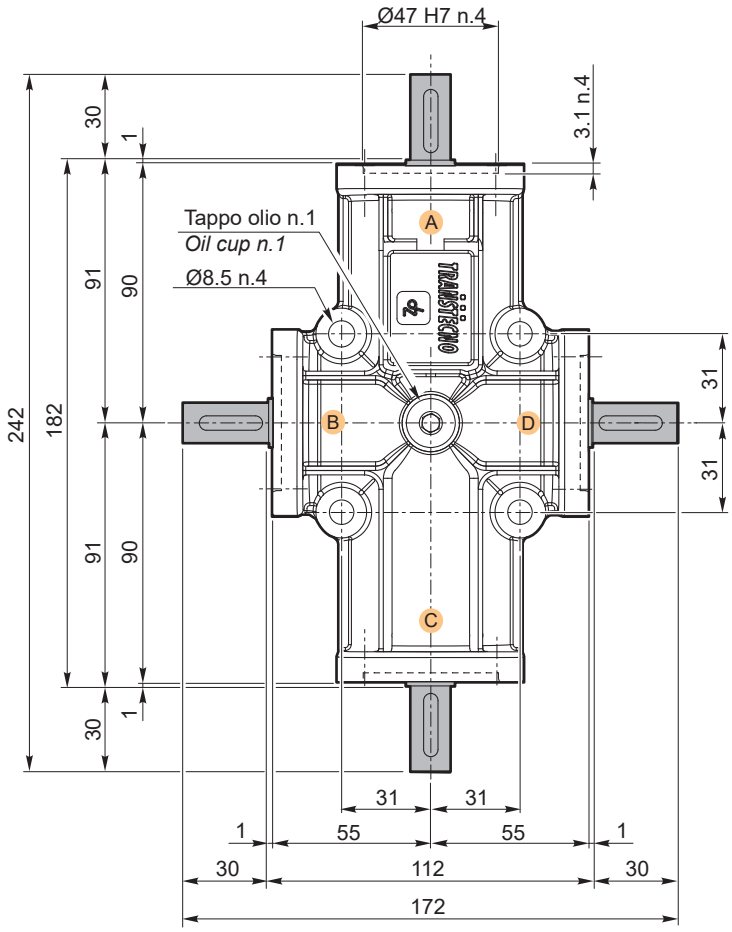
Le sedi linguetta negli alberi cavi come negli alberi maschi possono assumere qualsiasi posizione angolare.

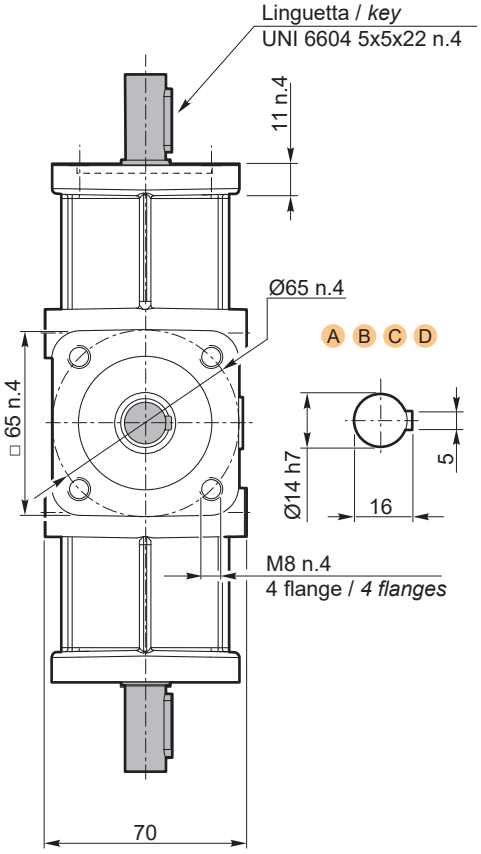
The keyway in hollow shafts as in solid shafts can assume any angular position.

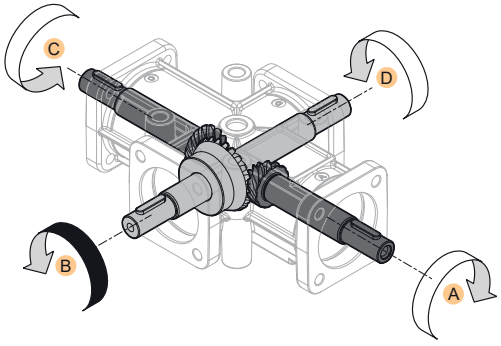


Dimensioni ***Dimensions***

ZP 2 ... 4P ...



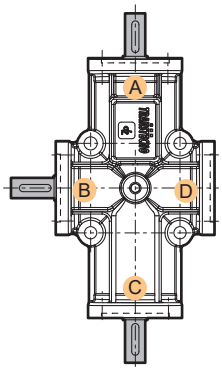




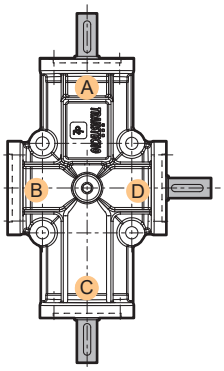
i	Code	Kg
1	ZP 211 4P ABCD	3.2
2	ZP 213 4P ABCD	
3	ZP 215 4P ABCD	

Le sedi linguetta negli alberi cavi come negli alberi maschi possono assumere qualsiasi posizione angolare.

The keyway in hollow shafts as in solid shafts can assume any angular position.



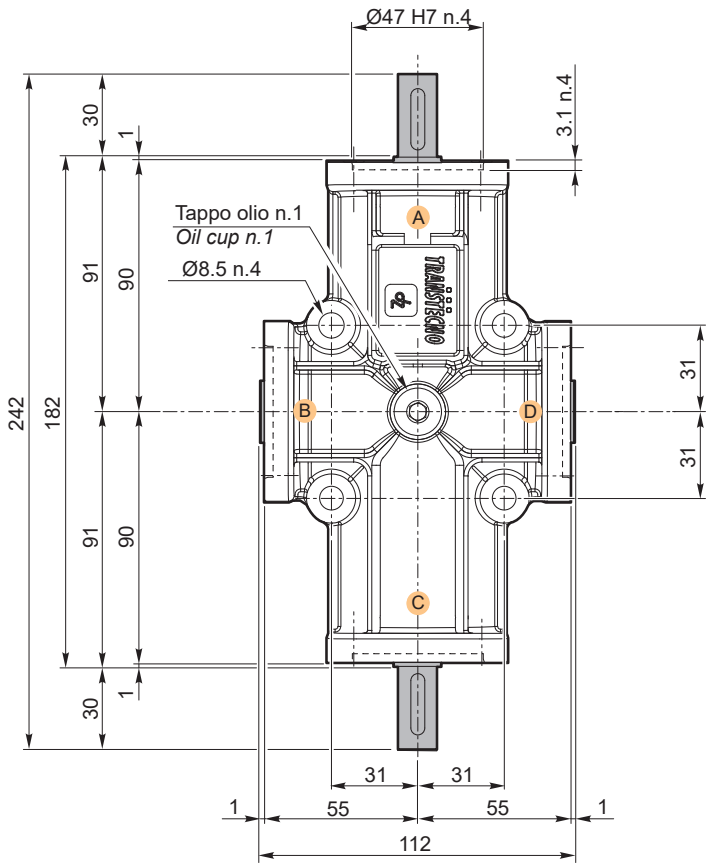
i	Code	Kg
1	ZP 220 S 4P ABC	3.2
2	ZP 222 S 4P ABC	
3	ZP 224 S 4P ABC	

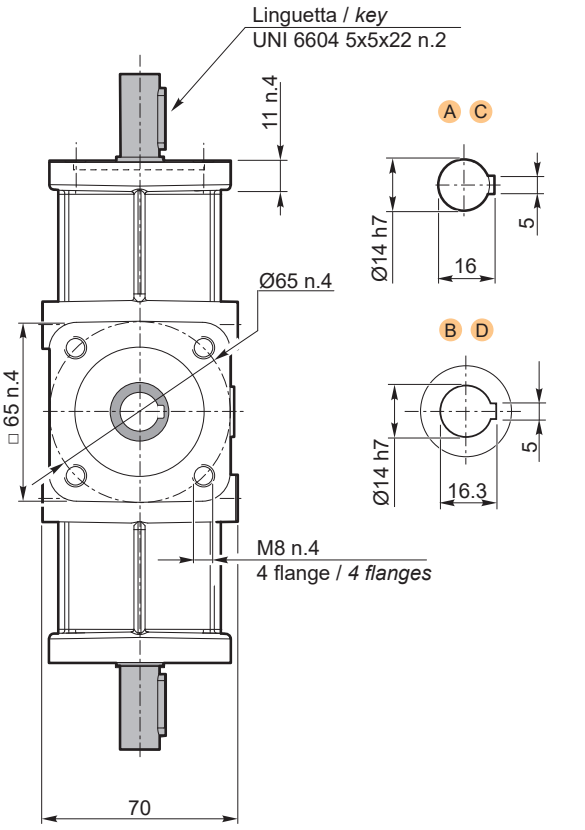


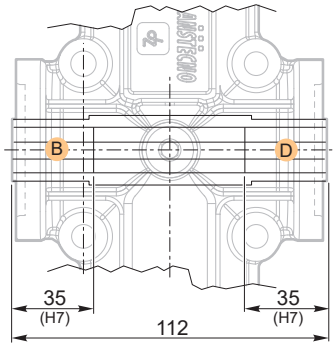
i	Code	Kg
1	ZP 220 FS 4P ACD	3.2
2	ZP 222 FS 4P ACD	
3	ZP 224 FS 4P ACD	

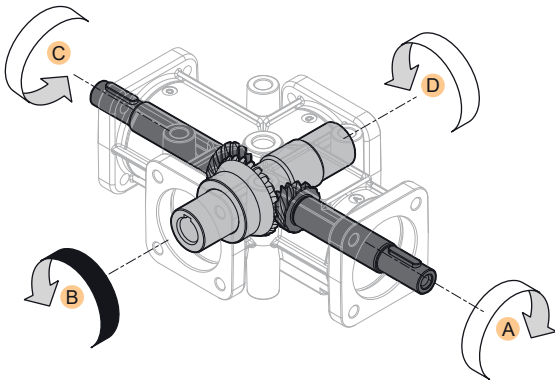
Dimensioni ***Dimensions***

ZP 21 4P 4V





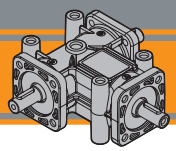




i	Code	Kg
1	ZP 211 4P 4V	3.0
2	ZP 213 4P 4V	
3	ZP 215 4P 4V	

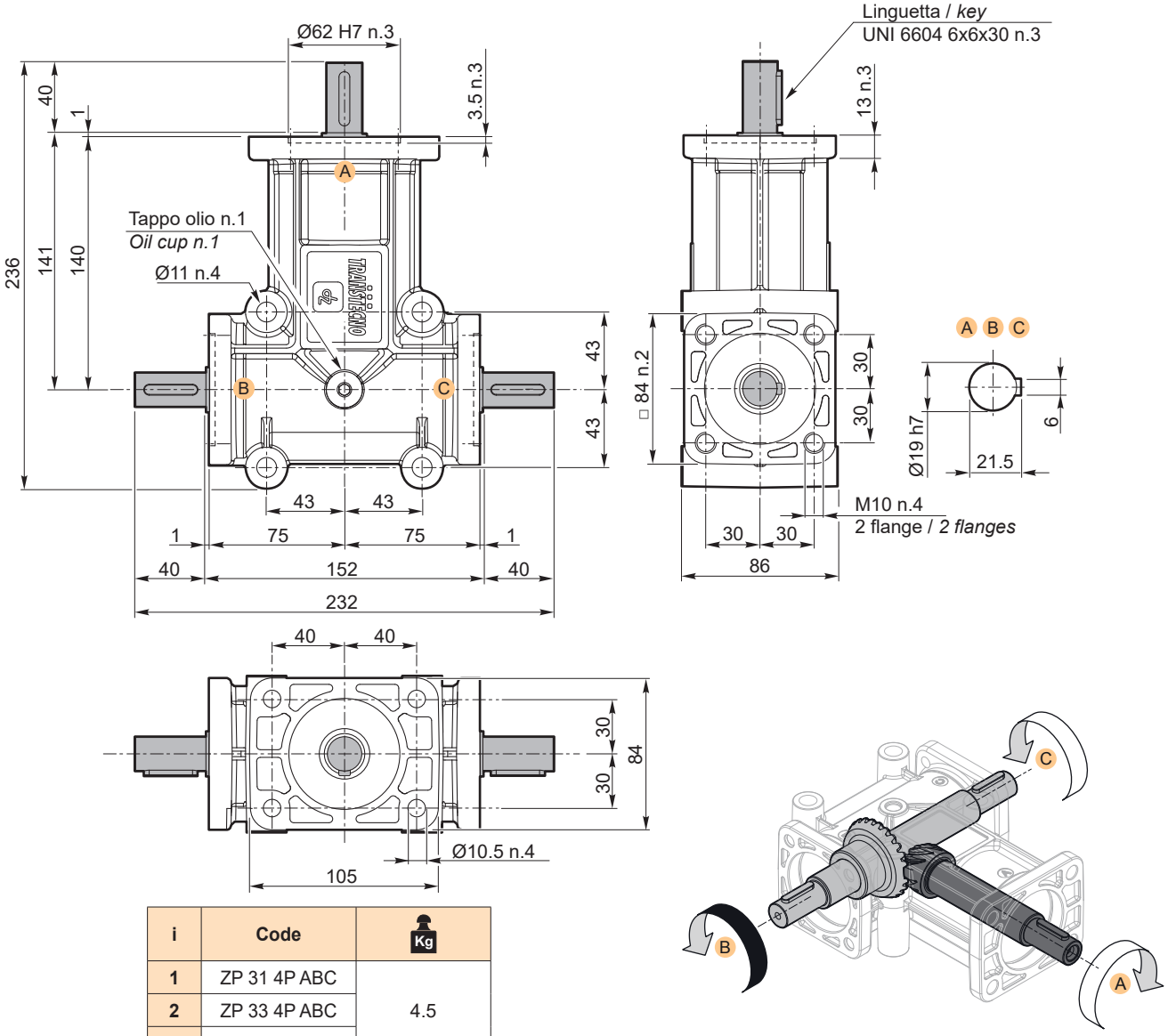
Le sedi linguetta negli alberi cavi come negli alberi maschi possono assumere qualsiasi posizione angolare.

The keyway in hollow shafts as in solid shafts can assume any angular position.



Dimensioni ***Dimensions***

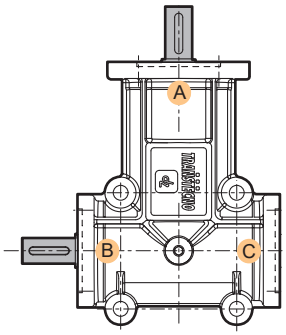
ZP 31 4P 3V



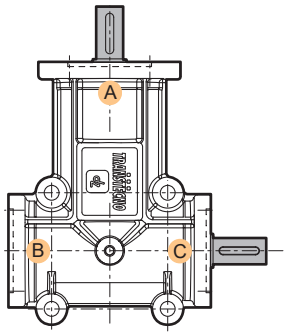
i	Code	Kg
1	ZP 31 4P ABC	4.5
2	ZP 33 4P ABC	
3	ZP 35 4P ABC	

Le sedi linguetta negli alberi cavi come negli alberi maschi possono assumere qualsiasi posizione angolare.

The keyway in hollow shafts as in solid shafts can assume any angular position.



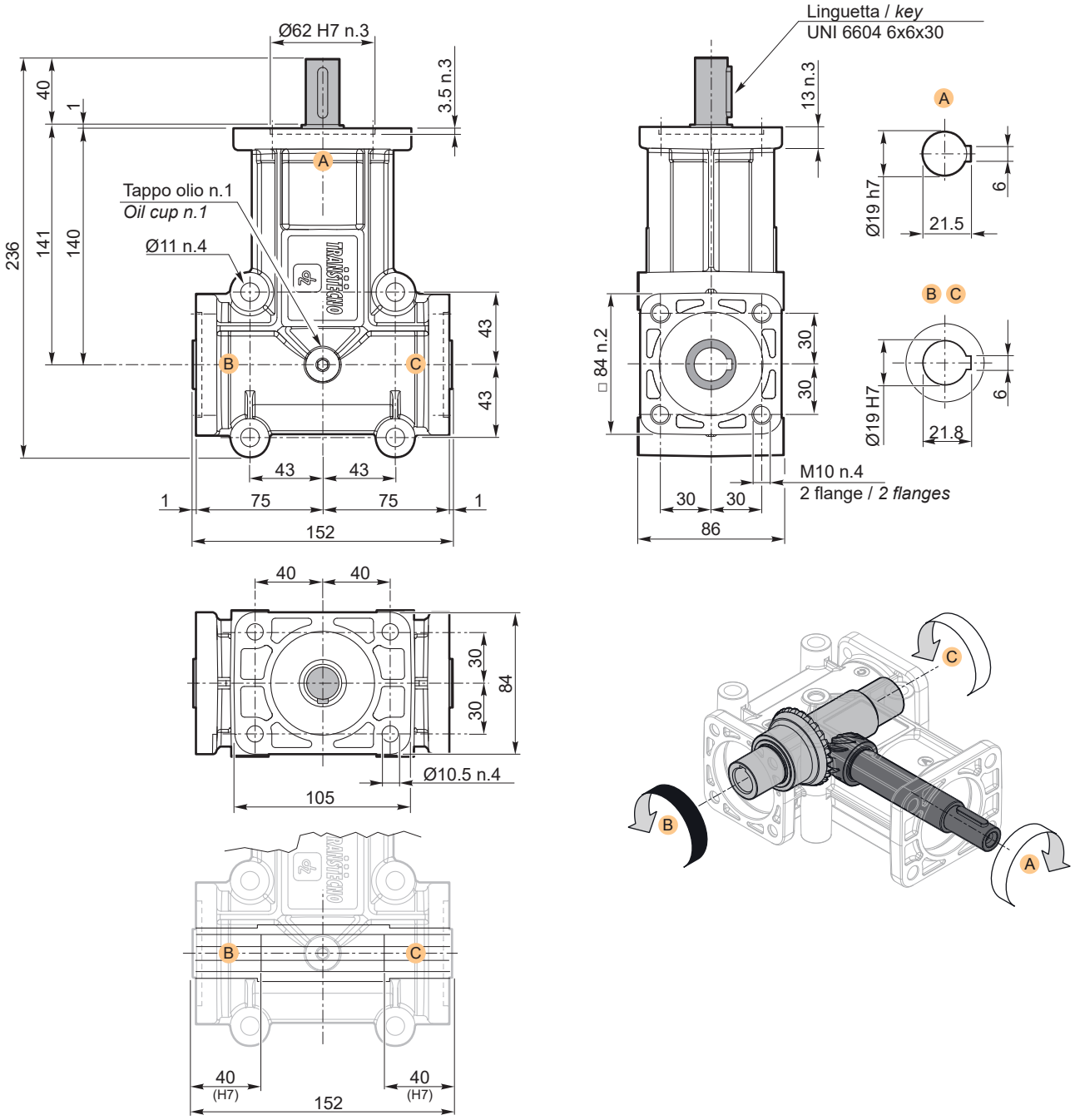
i	Code	Kg
1	ZP 30 S 4P AB	4.5
2	ZP 32 S 4P AB	
3	ZP 34 S 4P AB	



i	Code	Kg
1	ZP 30 FS 4P AC	4.5
2	ZP 32 FS 4P AC	
3	ZP 34 FS 4P AC	

Dimensioni ***Dimensions***

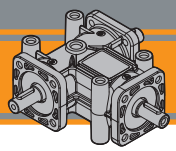
ZP 3 ... 4P ...



i	Code	Kg
1	ZP 311 4P 3V	4.5
2	ZP 313 4P 3V	
3	ZP 315 4P 3V	

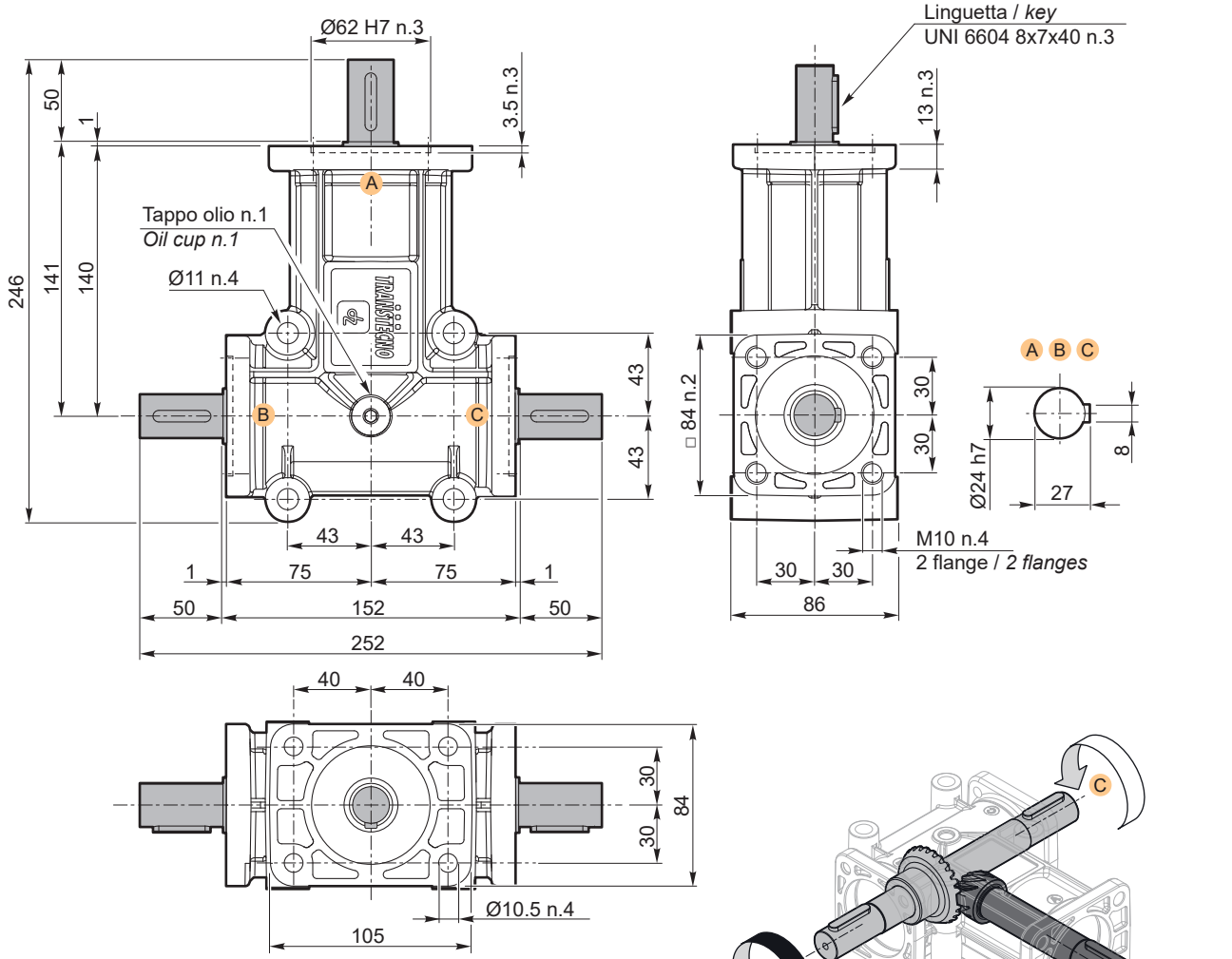
Le sedi linguetta negli alberi cavi come negli alberi maschi possono assumere qualsiasi posizione angolare.

The keyway in hollow shafts as in solid shafts can assume any angular position.



Dimensioni ***Dimensions***

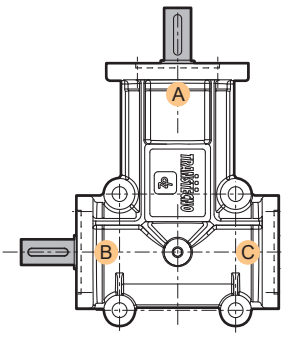
ZP 4... 4P ...



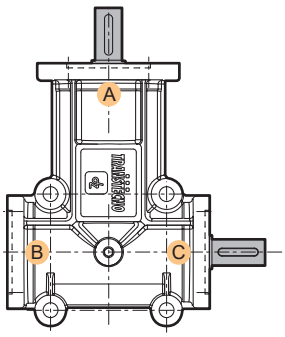
i	Code	Kg
1	ZP 41 4P ABC	4.5
2	ZP 43 4P ABC	
3	ZP 45 4P ABC	

Le sedi linguetta negli alberi cavi come negli alberi maschi possono assumere qualsiasi posizione angolare.

The keyway in hollow shafts as in solid shafts can assume any angular position.



i	Code	Kg
1	ZP 40 S 4P AB	4.5
2	ZP 42 S 4P AB	
3	ZP 44 S 4P AB	



i	Code	Kg
1	ZP 40 FS 4P AC	4.5
2	ZP 42 FS 4P AC	
3	ZP 44 FS 4P AC	

Note/*Notes*