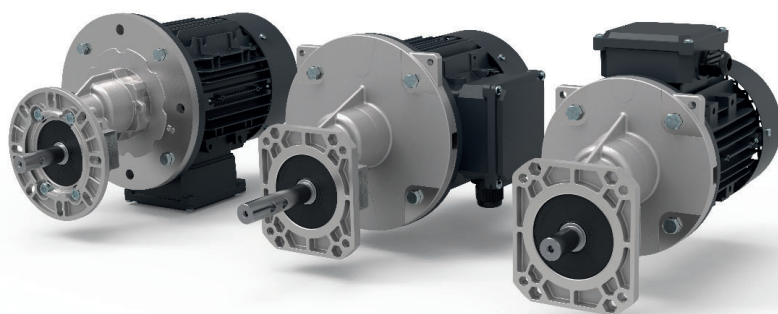


# FRP680 CATALOGUE





## Experience at the service of innovation

EN

The Varvel Group has been designing and producing power transmission systems for numerous areas of industry since 1955. "Know-how to do it": Varvel has the know-how needed to satisfy customers' requests in the best way possible. Thanks to over sixty years of accumulated experience, Varvel can offer customers a vast range of standard solutions and customise products for specific needs. The entire product range is designed and made in Italy and sold worldwide through two subsidiaries (in the USA and India) and a global network of over 100 commercial partners.

UNI EN ISO 9001:2015  
UNI EN ISO 14001:2015  
BS OHSAS 18001:2007



EC DIRECTIVE 2014/34/EC (ATEX)



# FRP680

## HELICAL GEARBOXES

- for feeding systems
- single stage
- IEC and NEMA motor coupling



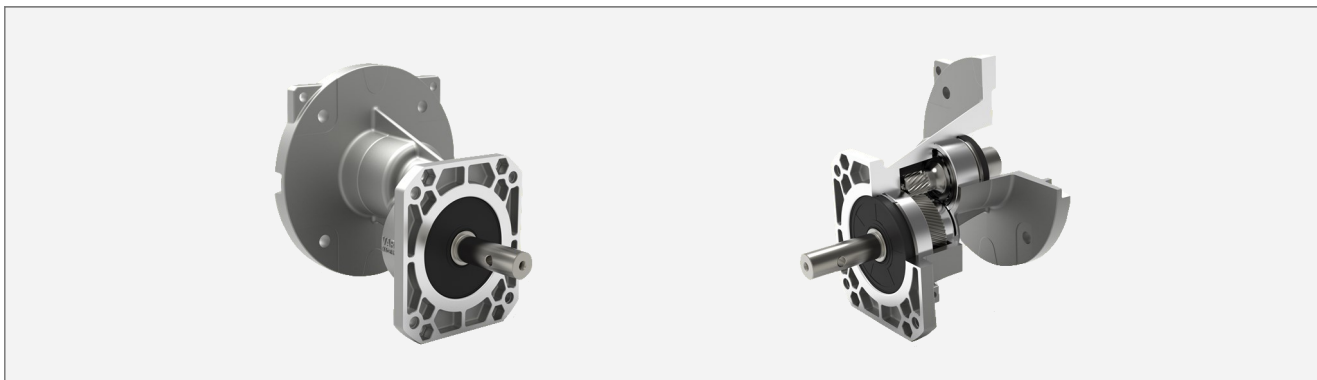
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**Description, Designation**



The gearbox FRP680 is expressly designed to be fitted on screw conveyor feeding systems; the gearbox output does not match specific standard but a wide range of feeders with adapters and shafts to the customer's needs.

Input is provided with clamp coupling or traditional bore/keyway system and adapter for IEC or NEMA motor fitting.

The one-piece aluminium die-cast body is abundantly sized to avoid any harmful vibration to the feeding system and to withstand heavy operations.

Helical gears - made of alloy steel, casehardened, tempered and shaved - are designed and verified according to ISO 6336 and DIN 3990.

Bearings are calculated for at least 10,000 running hour average lifetime.

Keyways according to DIN 6884.

The gearboxes are delivered filled with synthetic long-life oil (without plugs), in the appropriate quantity to install them in any mounting position without any prior specification.

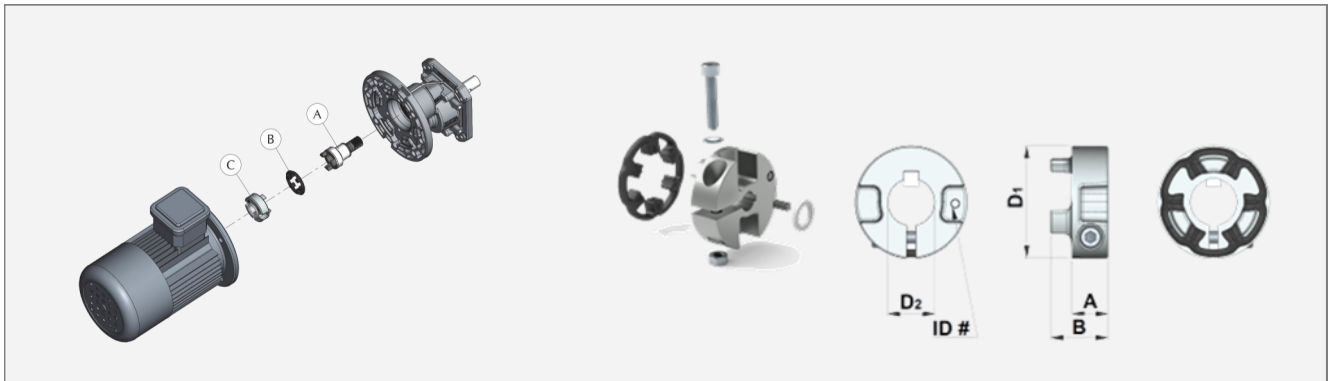
**GEARBOX DESIGNATION**

<b>F</b>	<b>RP-G</b>	<b>680</b>	<b>SQ</b> (□ 10)	<b>3.94</b> (□ 5-6)	<b>IEC80</b> (□ 7)	<b>B14</b> (□ 7)	<b>680.01. ...</b> (□ 11)
M	RP-G	680	SQ	2.52	IEC71-80-90 NEMA56C-140TC	B5	Output shaft
F			SQ/1	...		B14	
S			B5	7.91	Motor size	Motor mounting	
			B5/1				
	B5/140		Reduction ratio				
	B5/160		Output flange type				
		Gearbox size					
		Gearbox type					

**M** = Geared motor  
**F** = with input flange  
**S** = without input flange

## Coupling, Service factor

## RP680



### Advantages:

- IEC/NEMA adapters and couplings to fit on already assembled and greased gearbox
- Elimination of fretting corrosion between key and keyway
- Gearbox/motor connection with zero backlash
- Allowed angular misalignment 1° max.
- High torsional rigidity

G Type	Motor	Kit Part No.	RP	Mt	Mt <sub>1</sub>	Mt <sub>2</sub>	A	B	D <sub>1</sub>	D <sub>2</sub>	ID#
				[Nm]	[Nm]	[Nm]	[mm]	[mm]	[mm]	[mm]	
G5	IEC	KG5.014 KG5.019 KG5.024	680 680 680	8.9 - 10	30 40 70	12 - 17 20 - 25 30 - 40	14.5	23	45 45 52	14 19 24	514 519 524
				[in-lb]	[in-lb]	[in-lb]	[in]	[in]	[in]	[in]	
G5	NEMA	KG5.N56 KG5.N140	680 680	79 - 89	398 531	266 - 310 354 - 398	0.57	0.91	1.77 2.05	5/8 7/8	5N56 5N140

### SERVICE FACTOR of the gearbox

Service factor FS1.0 is meant as typical of 8-10 hours/day operation, with uniform load and starts/ stops lower than 6 per hour and ambient temperature between 15 and 35 Celsius.

Should other operation conditions occur, the service factors of the two tables have to be multiplied.

The ratio between the drive's maximum output torque  $M_2$  and application torque  $M_{(app)}$  defines the drive's Duty Factor that must be equal or bigger than the Service Factor SF.

For max. ambient temperature exceeding 40 °C or below 0 °C, please ask our Pre-sales Service.

hours	Charge Type			Start-Stops per hour		SF = SF <sub>1</sub> x SF <sub>2</sub>
	uniform SF <sub>1</sub>	variable SF <sub>1</sub>	with shocks SF <sub>1</sub>	number	SF <sub>2</sub>	
8	1.0	1.2	1.4	6	1.0	
16	1.2	1.4	1.6	60	1.1	
24	1.4	1.6	1.8	120	1.2	



Versions

**FRP-G 680 SQ - FRP-G 680 SQ/1**

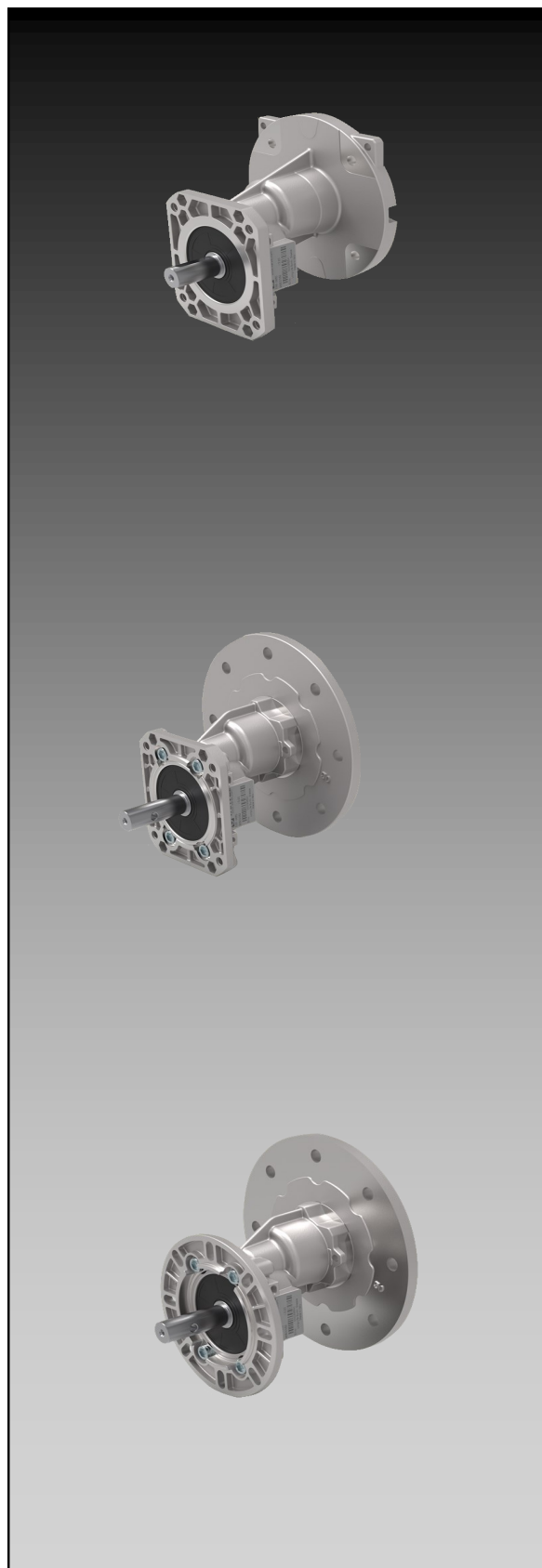
Helical gearboxes with one gear set  
SQ - Square output flange, 127 mm PCD  
spigot fixing  
SQ/1 - Flange as above but without spigot

**FRP-G 680 B5 - FRP-G 680 B5/1**

Helical gearboxes with one gear set  
B5 - Square output flange, 100 mm PCD  
spigot fixing  
B5/1 - Flange as above but without spigot

**FRP-G 680 B5/140 - FRP-G 680 B5/160**

Helical gearboxes with one gear set  
B5/140 - Output flange with IEC63-B5 dimensions  
B5/160 - Output flange with IEC71-B5 dimensions





**Performances, Weights, Lubrication**

**RP680**

**MRP680 - 1400 rpm - 50 Hz**

kW	in	ir	rpm	Nm	SF	kW	in	ir	rpm	Nm	SF	
0.25	2.5	2.54	551	4.2	>3.0	0.55	5.1	5.07	276	18.6	2.1	
	3.0	2.95	475	4.9	>3.0		6.2	6.15	228	22.6	1.5	
	3.2	3.19	439	5.3	>3.0		6.7	6.67	210	24.5	1.3	
	3.5	3.50	400	5.8	>3.0		8.1	8.10	173	29.8	0.9	
	3.9	3.94	355	6.6	>3.0	0.75	2.5	2.54	551	12.7	>3.0	
	4.2	4.17	336	7.0	>3.0		3.0	2.95	475	14.8	>3.0	
	4.7	4.69	299	7.8	>3.0		3.2	3.19	439	16.0	2.9	
	5.1	5.07	276	8.5	>3.0		3.5	3.50	400	17.5	2.6	
	6.2	6.15	228	10.3	>3.0		3.9	3.94	355	19.8	2.2	
	6.7	6.67	210	11.1	2.9		4.2	4.17	336	20.9	2.1	
8.1	8.10	173	13.5	2.0	4.7		4.69	299	23.5	1.7		
0.37	2.5	2.54	551	6.3	>3.0		5.1	5.07	276	25.4	1.5	
	3.0	2.95	475	7.3	>3.0		6.2	6.15	228	30.8	1.1	
	3.2	3.19	439	7.9	>3.0		6.7	6.67	210	33.4	1.0	
	3.5	3.50	400	8.7	>3.0	1.1	2.5	2.54	551	18.7	2.6	
	3.9	3.94	355	9.7	>3.0		3.0	2.95	475	21.7	2.3	
	4.2	4.17	336	10.3	>3.0		3.2	3.19	439	23.5	2.0	
	4.7	4.69	299	11.6	>3.0		3.5	3.50	400	25.7	1.8	
	5.1	5.07	276	12.5	>3.0		3.9	3.94	355	29.0	1.5	
	6.2	6.15	228	15.2	2.3		4.2	4.17	336	30.7	1.4	
	6.7	6.67	210	16.5	2.0		4.7	4.69	299	34.5	1.2	
8.1	8.10	173	20.0	1.3	5.1		5.07	276	37.3	1.0		
0.55	2.5	2.54	551	9.3	>3.0		1.5	2.5	2.54	551	25.5	1.9
	3.0	2.95	475	10.8	>3.0			3.0	2.95	475	29.6	1.7
	3.2	3.19	439	11.7	>3.0	3.2		3.19	439	32.0	1.4	
	3.5	3.50	400	12.9	>3.0	3.5		3.50	400	35.1	1.3	
	3.9	3.94	355	14.5	>3.0	3.9		3.94	355	39.5	1.1	
	4.2	4.17	336	15.3	2.8	4.2		4.17	336	41.8	1.0	
	4.7	4.69	299	17.2	2.4							

in - nominal reduction ratio  
ir - real reduction ratio

Weights [kg]	FRP680	SQ-SQ/1	B5-B5/1	B5/140	B5/160	Oil [litres]	FRP680
	IEC71	2.3	2.3	2.4	2.5		0.04 Shell Omala S4 WE 320
	IEC80-90	2.5	2.5	2.6	2.7		
	NEMA 56	2.3	2.3	2.4	2.5		
	NEMA 140	2.3	2.3	2.4	2.5		



**Performances**

**MRP680 - 1750 rpm - 60 Hz**

kW	in	ir	rpm	Nm	SF	kW	in	ir	rpm	Nm	SF
0.25	2.5	2.54	689	3.4	>3.0	0.55	5.1	5.07	345	14.9	2.1
	3.0	2.95	593	3.9	>3.0		6.2	6.15	285	18.1	1.6
	3.2	3.19	549	4.3	>3.0		6.7	6.67	262	19.6	1.3
	3.5	3.50	500	4.7	>3.0		8.1	8.10	216	23.8	0.9
	3.9	3.94	444	5.3	>3.0	0.75	2.5	2.54	689	10.2	>3.0
	4.2	4.17	420	5.6	>3.0		3.0	2.95	593	11.8	>3.0
	4.7	4.69	373	6.3	>3.0		3.2	3.19	549	12.8	2.9
	5.1	5.07	345	6.8	>3.0		3.5	3.50	500	14.0	2.7
	6.2	6.15	285	8.2	>3.0		3.9	3.94	444	15.8	2.2
	6.7	6.67	262	8.9	2.9		4.2	4.17	420	16.7	2.1
8.1	8.10	216	10.8	2.0	4.7	4.69	373	18.8	1.7		
0.37	2.5	2.54	689	5.0	>3.0	5.1	5.07	345	20.3	1.5	
	3.0	2.95	593	5.8	>3.0	6.2	6.15	285	24.7	1.1	
	3.2	3.19	549	6.3	>3.0	6.7	6.67	262	26.8	1.0	
	3.5	3.50	500	6.9	>3.0	1.1	2.5	2.54	689	14.9	2.6
	3.9	3.94	444	7.8	>3.0		3.0	2.95	593	17.4	2.3
	4.2	4.17	420	8.3	>3.0		3.2	3.19	549	18.8	2.0
	4.7	4.69	373	9.3	>3.0		3.5	3.50	500	20.6	1.8
	5.1	5.07	345	10.0	>3.0		3.9	3.94	444	23.2	1.5
	6.2	6.15	285	12.2	2.3		4.2	4.17	420	24.5	1.4
	6.7	6.67	262	13.2	2.0	4.7	4.69	373	27.6	1.2	
8.1	8.10	216	16.0	1.3	5.1	5.07	345	29.8	1.0		
0.55	2.5	2.54	689	7.5	>3.0	1.5	2.5	2.54	689	20.4	1.9
	3.0	2.95	593	8.7	>3.0		3.0	2.95	593	23.7	1.7
	3.2	3.19	549	9.4	>3.0		3.2	3.19	549	25.6	1.4
	3.5	3.50	500	10.3	>3.0		3.5	3.50	500	28.1	1.3
	3.9	3.94	444	11.6	>3.0		3.9	3.94	444	31.6	1.1
	4.2	4.17	420	12.3	2.8		4.2	4.17	420	33.5	1.0
	4.7	4.69	373	13.8	2.4						

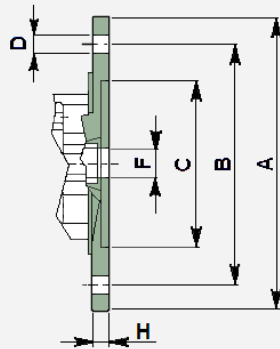
in - nominal reduction ratio  
 ir - real reduction ratio



**Input flanges**

**RP680**

**IEC - NEMA**



①	IEC						NEMA		
	71-B5	71-B14	80-B5	80-B14	90-B5	90-B14	56C	140TC	
A	160	105	200	120	200	140	165.10	165.10	
B	130	85	165	100	165	115	149.35	149.35	
C	110	70	130	80	130	95	114.30	114.30	
D	10	7	11	70	11	10	10.92	10.92	
F	14	14	19	19	24	24	16	22.35	
H	11.5	10.5	11.5	10	11.5	11	12.95	12.95	

②	NEMA		IEC						
	NEMA 56C	NEMA 140TC	IEC 71-B5	IEC 71-B14	IEC 80-B5	IEC 80-B14	IEC 90-B5	IEC 90-B14	
A	6.50	6.50	6.30	4.13	7.87	4.72	7.87	5.51	
B	5.88	5.88	5.12	3.35	6.50	3.94	6.50	4.53	
C	4.50	4.50	4.33	2.76	5.12	3.15	5.12	3.74	
D	0.43	0.43	0.39	0.28	0.43	0.28	0.43	0.39	
F	0.63	0.88	0.55	0.55	0.75	0.75	0.94	0.94	
H	0.51	0.51	0.45	0.41	0.45	0.39	0.45	0.43	

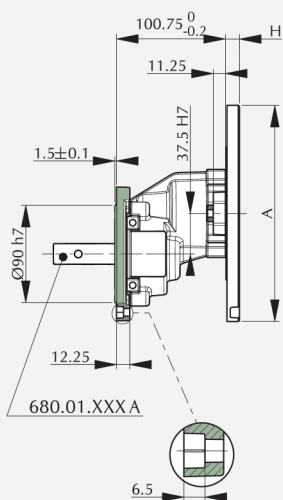
- ① - Dimensions in mm
- ② - Dimensions in inches

Not binding dimensions and weights

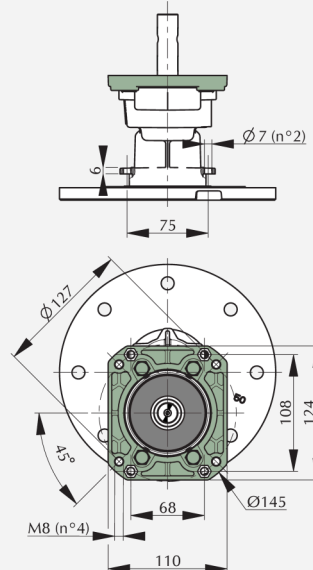
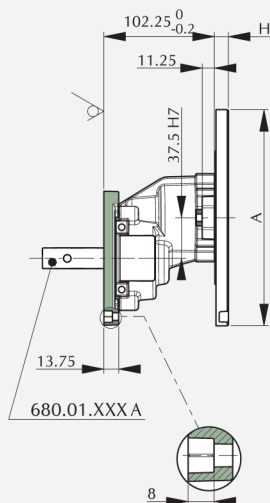


FRP680 - SQ - SQ/1 - B5 - B5/1

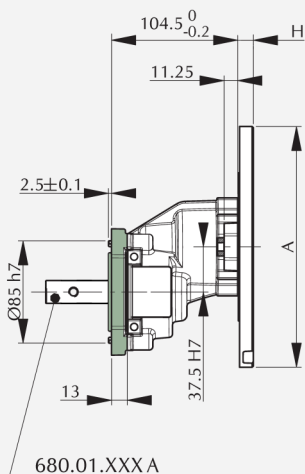
FRP-G 680 SQ



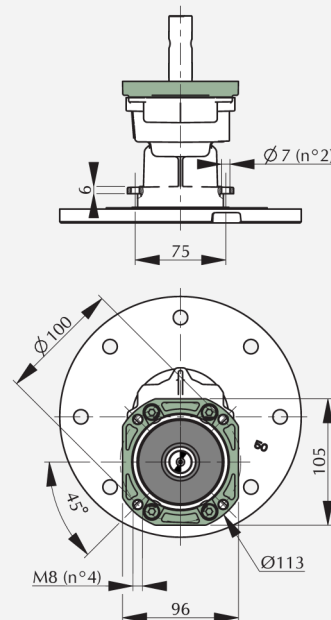
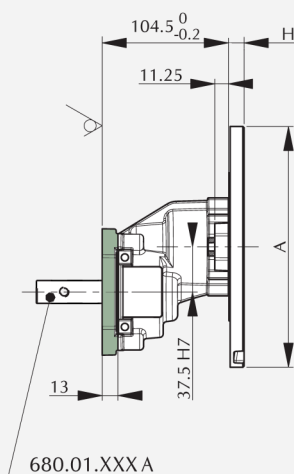
FRP-G 680 SQ/1



FRP-G 680 B5



FRP-G 680 B5/1

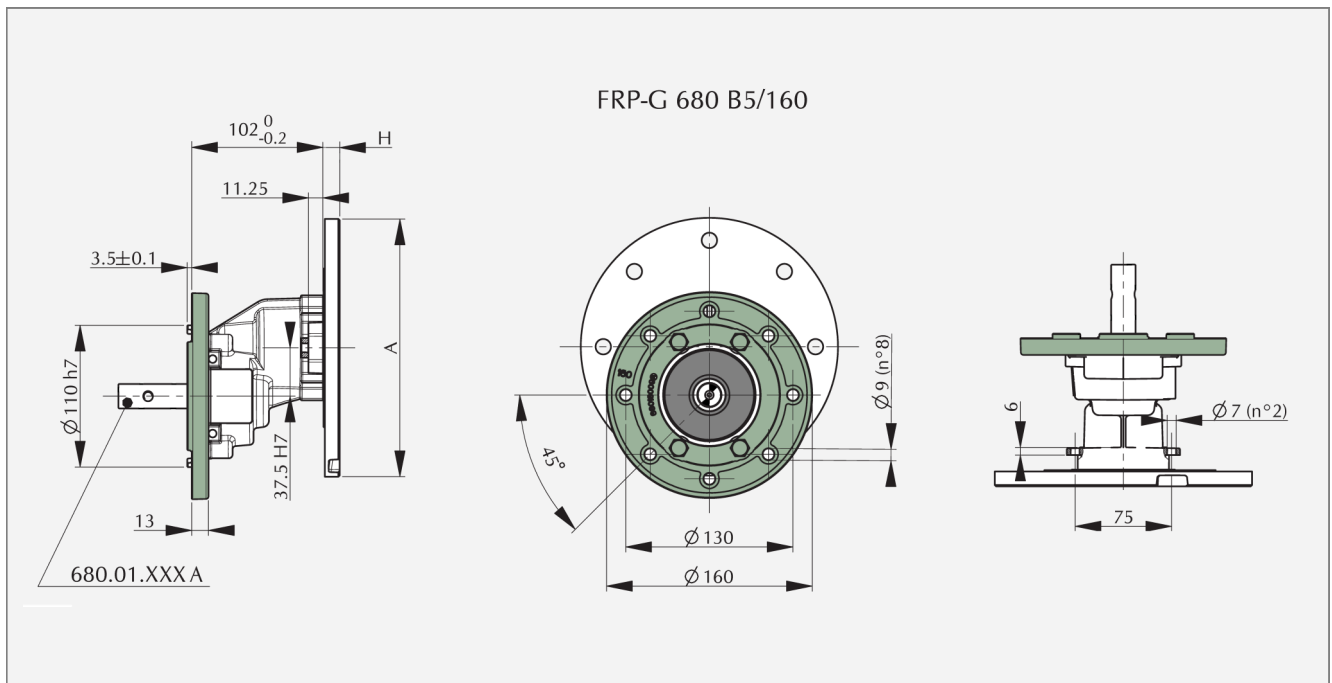
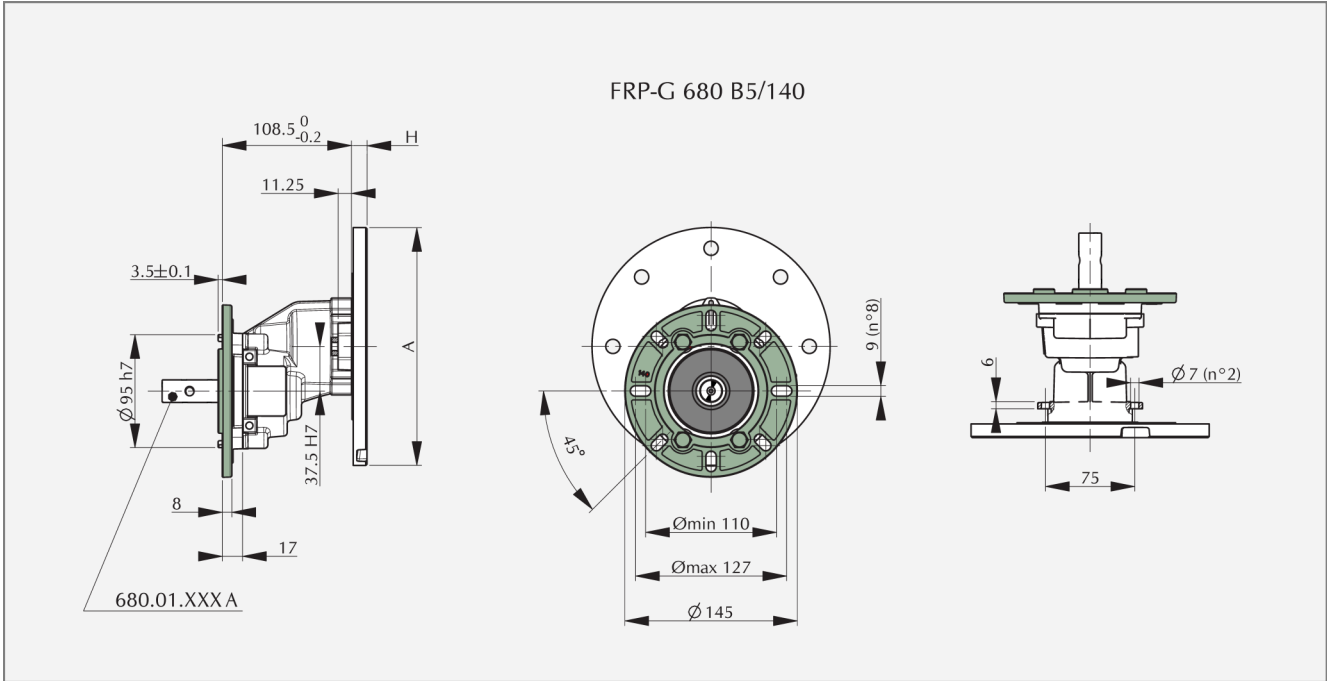


Dimensions A and H: see page 9  
Dimensions 680.01.XYZ: see pages 10 and 11  
Not binding dimensions and weights

Dimensions

RP680

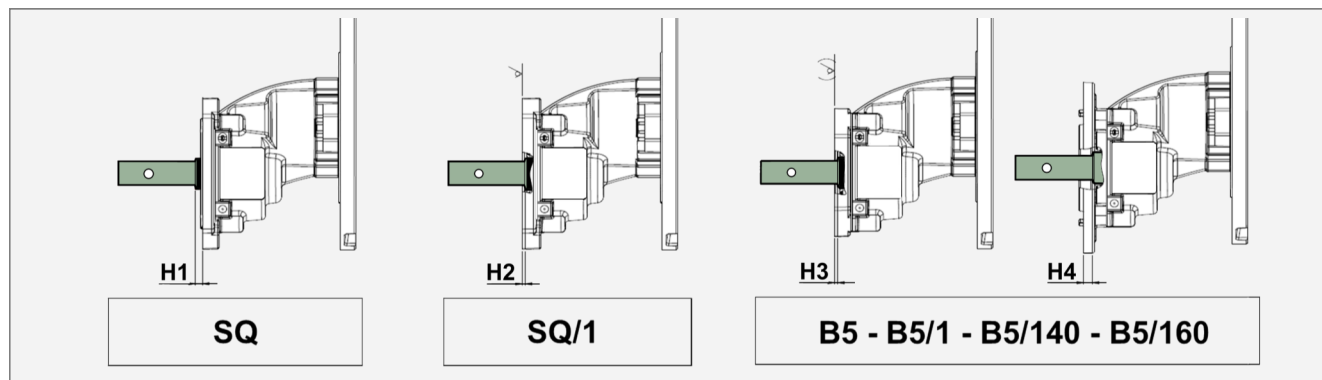
FRP680 - B5/140 - B5/160



Dimensions A and H: see page 9  
 Dimensions 680.01.XYZ: see pages 10 and 11  
 Not binding dimensions and weights



**Output shaft selection**



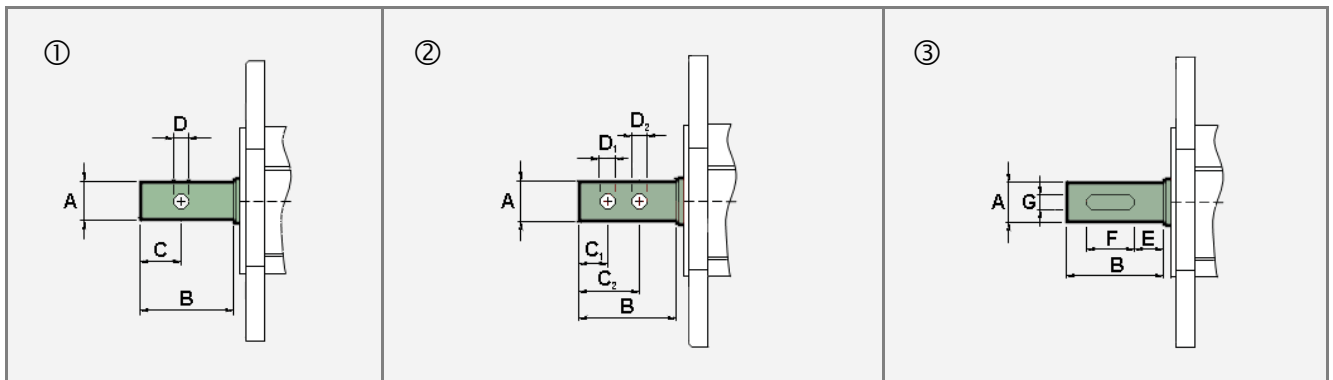
Shaft ID	SQ SQ/1	B5 B5/1	B5/140	B5/160	H1		H2		H3	H4		
					F1	F2	F1	F2		B5	140	160
680 01 001A	*				1.25	2.5	0.25	0				
680 01 002A	*				1.25	2.5	0.25	0				
680 01 003A			*	*							6.5	0
680 01 005A	*				1.25	2.5	0.25	0				
680 01 006A	*				1.25	2.5	0.25	0				
680 01 007A			*	*							6.5	0
680 01 009A			*	*							6.5	0
680 01 010A			*	*							6.5	0
680 01 011A			*	*							6.5	0
680 01 012A	*				1.25	2.5	0.25	0				
680 01 015A	*	*			1.25	2.5	0.25	0	2.5	2.5		
680 01 016A	*				1.25	2.5	0.25	0				
680 01 017A	*				1.25	2.5	0.25	0				
680 01 019A			*	*							6.5	0
680 01 020A			*	*							6.5	0
680 01 021A			*	*	1.25	2.5	0.25	0			6.5	0
680 01 022A	*				1.25	2.5	0.25	0				
680 01 023A	*				1.25	2.5	0.25	0				
680 01 024A	*				1.25	2.5	0.25	0				
680 01 025A	*	*			1.25	2.5	0.25	0	2.5	2.5		

F1 - Bolted flange execution  
 F2 - Cast flange execution

Other shaft ends on demand  
 Not binding dimensions and weights

### Output shaft dimensions

### RP680



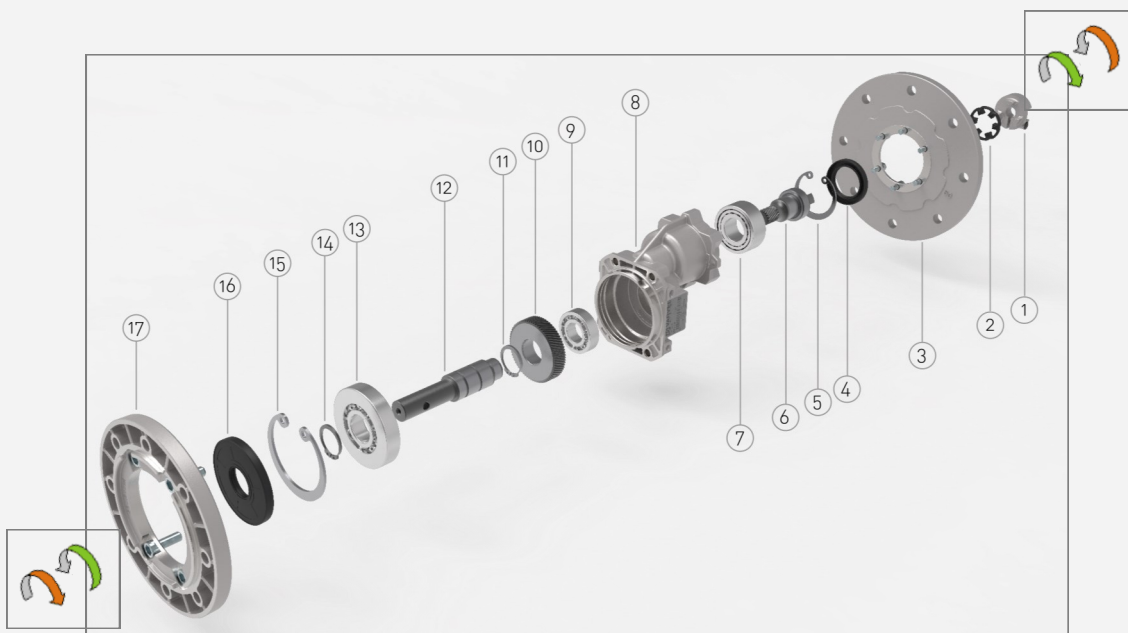
①	A	B	C	D	②	A	B	C <sub>1</sub>	C <sub>2</sub>	D <sub>1</sub>	D <sub>2</sub>	③	A	B	E	F	G
680 01 005A	16	50	21	7	680 01 016A	19	57	23	38	8.5	8.5	680 01 003A	19	40	5	30	6
680 01 010A	18.8	80	15	8.5	680 01 017A	19	57	23	38	6.5	6.5						
680 01 012A	19	40	14	6.5	680 01 015A	19.7	100	30	50	6	6						
680 01 001A	19	57	23	6.5	680 01 024A	20	57	23	38	6.5	6.5						
680 01 021A	19	77	38.5	6	680 01 024A	20	75	36.5	52.5	7	7						
680 01 009A	19.7	100	50	6	680 01 025A	22	52	23	38	6.5	6.5						
680 01 019A	20	52	23	6.5													
680 01 011A	20	84	30	6													
680 01 007A	21	52	23	6													
680 01 006A	21	57	23	6													
680 01 022A	22	54	20	8													
680 01 002A	22	57	23	8.5													
680 01 020A	22	80	15	8.5													

Not binding dimensions and weights



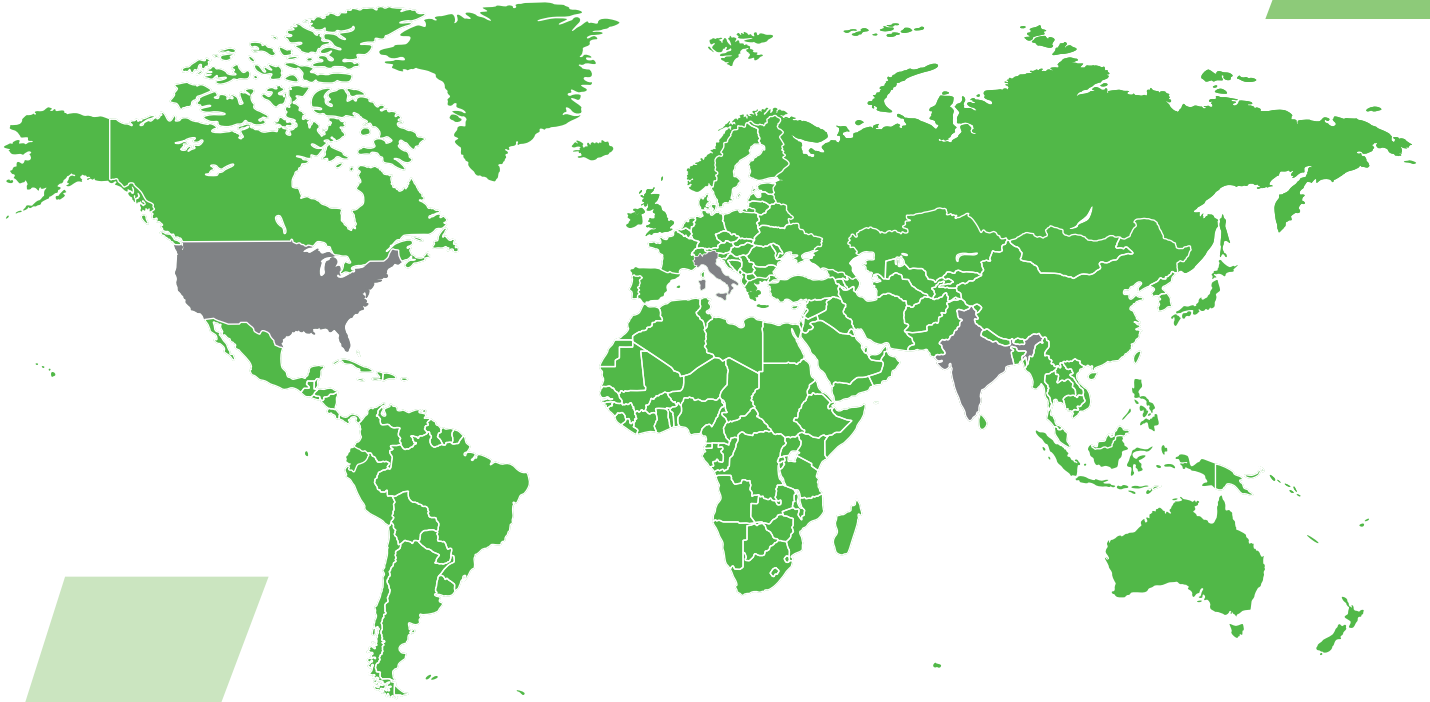
Rotation and Component Parts

RP680



Item	Description
01	Motor coupling
02	Spider
03	Input flange
04	Input oil seal
05	Circlip
06	Pinion
07	Bearing
08	Body
09	Bearing

Pos.	Description
10	Gear
11	Circlip
12	Output shaft
13	Bearing
14	Circlip
15	Circlip
16	Output oil seal
17	Output flange



**2** Foreign subsidiaries, one in India, one in the USA



**60** Over 60 years of history and international success



**100** A global network with over 100 commercial partners

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