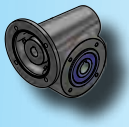
DERTEC

Stainless Steel Wormgearboxes



FV Series Worm Gearboxes

FV Series Stainless Steel worm gearboxes are being designed to meet the latest standards for highly demanding environments in the food industry.

The organic round and smooth design makes the gearboxes extremely applicable in the foodindustry.
The FV wormgearboxes are a new generation wormgearbox using the latest standards in worm gears and hygienic design.

The footprint and shaft sizes are similar to common used standards in the market.

The main features are:
Made of high quality carefully electro polished Stainless Steel AISI 316. (Mirror Polished on request)
The smooth design gives the gearbox a nice appearance, ready to suit all kinds of stainless steel machineries for the food industry.

All hollow shafts are produced in Duplex Stainless Steel 2205.
The special PNS surface treatment ensures enough hardness to collaborate with our Special High Temperature Resistant Blue Shaft Seals.
The PNS treatment increases the lifetime of shaft / seal collaboration and helps to reduce wear on the shaft surface.
By this, the gearbox obtains a longer drip free operation compared to standard shaft / seal combinations made of AISI304 or AISI316 with NBR or FKM.

The use of above combination offers all the positive characteristics of stainless steel and the surface hardness of a hardened shaft.

Our high performance engineered shaft seals have a Blue colour.
It is a well overthought feature for food industry applications.
It might be clear that the colour "Blue" is a not existing organic colour.
In the context of food safety it is a common use to embed blue colours as these are very visible and easily to be recognised by vision scanning systems.

All gearboxes are standard equipped with NSH H1 certified Synthetic Foodgrade lubrication.
On request it can be supplied with a Halal, Kosher or Nut Free certification.

To avoid dirt traps under the commonly used motor identification tagplate, all our motors and gearboxes are being equipped with a laser engraved tagplate.

Besides food safety this also prevents against possible lost of information because of taking away the tagplate or loosing the tagplate from the driveparts.

As a part of our standard procedure every drive is tested in our production facility in the Netherlands to ensure correct functioning.
Standard tests are : overpressure test to check for airholes or leakage,
Ratio / Secundary Speed check and visual inspection.

Properties and features :

Standard ratio's 7,5 : 1 to 100 : 1 with IEC motor adaption.

Extra hygienic optional shaft covers. (open and closed version)

Easy clean torque arm with built in elastic element to reduce alignment mistakes allows easy assembling of the gearbox on the machine shaft.
There is no need to laser cut and bend your own torque arm.
The Easy clean torque arm has a very open design. This design offers better cleanability during the standard cleaning cycle.

For flange mounted applications we offer several types of secondary output flanges in Electro Polished SS316.

As a problem solver we are happy to investigate the best possible solutions for our customers that fits their budget.

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**Note: Unless otherwise stated all sizes are in millimeters.*

Catalogue SS2018.001

FV 030		FV 040	
Ratio's	7.5: to 80:1	Ratio's	7.5: to 100:1
Standard shaft	14 mm	Standard shaft	18 mm
Torque	Max. 20 Nm	Torque	Max. 40 Nm
Power	Max. 0.25 kW	Power	Max. 0.55 kW
FV 050		**FV 063**	
Ratio's	7.5: to 100:1	Ratio's	7.5: to 100:1
Standard shaft	25 mm	Standard shaft	25 mm
Torque	Max. 75 Nm	Torque	Max. 140 Nm
Power	Max. 1,1 kW	Power	Max. 2,2 kW

Easy Clean Closed Cover

FV 030	SS065 CC
FV 040	SS075 CC
FV 050	SS085 CC
FV 063	SS095 CC

Easy Clean Open Cover

FV 030	SS065 CO14
FV 040	SS075 CO18
FV 050	SS085 CO25
FV 063	SS095 CO25

Foot Plates

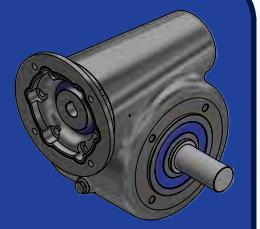
FV 030	SS 065 VP
FV 040	SS 075 VP
FV 050	SS 085 VP
FV 063	SS 095 VP

Torque Arms

FV 030	SS 065 MS
FV 040	SS 075 MS
FV 050	SS 085 MS
FV 063	SS 095 MS

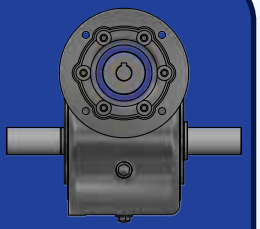
Output Flanges

FV 030	SS 065 FL80
FV 040	SS 075 FL110
	SS 075 FL140
FV 050	SS 085 FL120
	SS 085 FL125
FV 063	SS 095 FL160
	SS 095 FL180



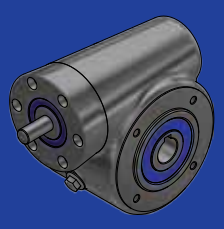
Single Sided Output Shaft

FV 030	FV 030 SA
FV 040	FV 040 SA
FV 050	FV 050 SA
FV 063	FV 063 SA



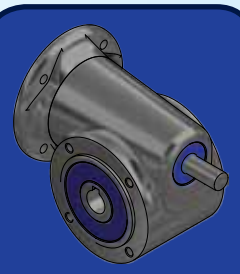
Double Sided Output Shaft

FV 030	FV 030 DSA
FV 040	FV 040 DSA
FV 050	FV 050 DSA
FV 063	FV 063 DSA



Solid Input Shaft

FV 030	Under development
FV 040	Under development
FV 050	Under development
FV 063	Under development



Fast Wormshaft

FV 030	Under development
FV 040	Under development
FV 050	Under development
FV 063	Under development

Power P

This parameter can be found in the gearbox selection tables and represents the amount kW that can be safely transmitted into the gearbox

$$P_1 = \frac{P_2}{\eta}[kW]$$

$$P_{1n} \geq P_1 \cdot f_s[kW]$$

P_1 *Input Power (kW)*
P_2 *Output Power (kW)*
P_{1n} *Rated Input Power (kW)*
f_s *Service Factor*
η *Transmission Efficiency %*

Rotation Speed n

n_1 *Gear Units Input Speed*
n_2 *Gear Units Output Speed*

All stated values are based on an input speed of 1500 min^{-1}.
We strongly advise , to obtain the expected lifetime, not to exceed the maximum input speed.
In case of a lower input speed the maximum input torque should be taken in consideration too.

Transmission ratio i

$$i = \frac{n_1}{n_2}$$

Torque M

$$M_2 = \frac{9550 \cdot P_1 \cdot \eta}{n_2}[Nm]$$

$$M_{2n} \geq M_2 \cdot f_s[Nm]$$

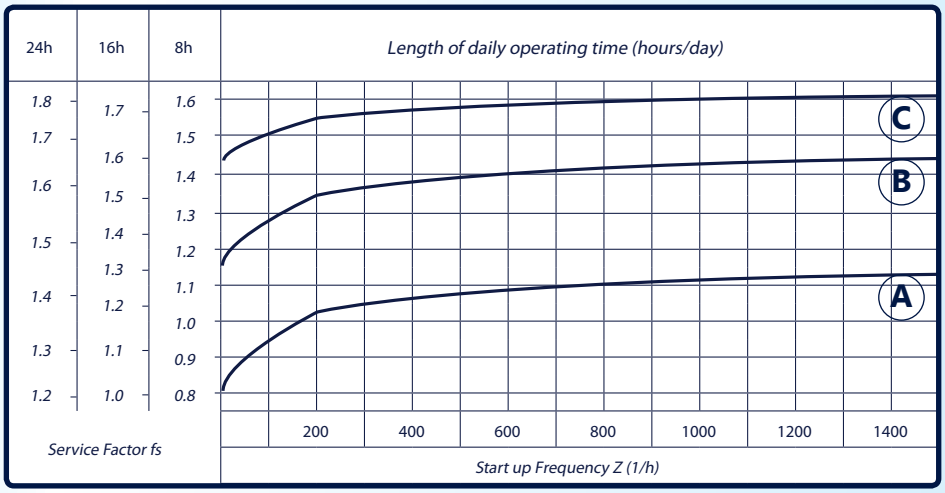
M_2 *= Output Torque (Nm)*
M_{2n} *= Selected Output Torque (Nm)*
P_1 *= Input Power (kW)*
η *= Transmission Efficiency %*
f_s *= Service Factor*

Efficiency of gear units

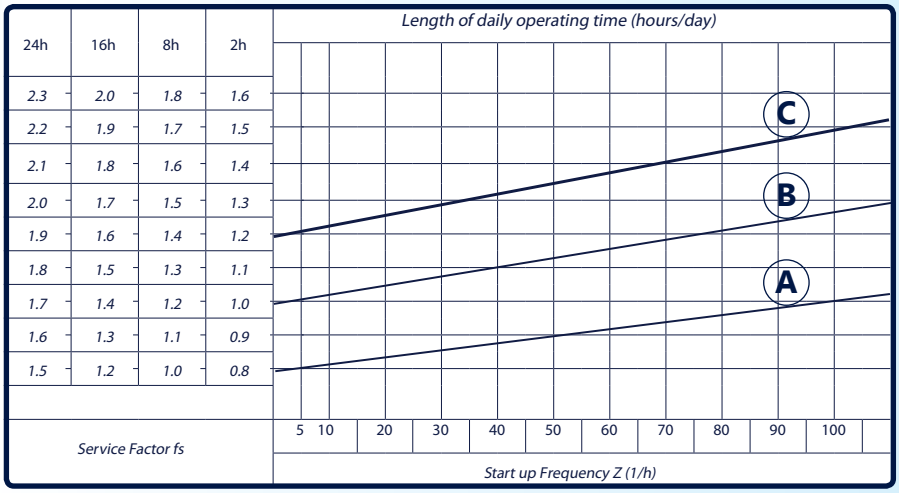
The efficiency of gear units is mainly determined by the gearing and bearing friction. Keep in mind that the starting efficiency of a gear unit is always less than its efficiency at operating speed. This factor is particularly distinctive for worm & helical worm gear boxes.
The gearing in helical worm & worm gearboxes produces a high proportion of sliding friction.
As a result these gearboxes have higher gear efficiency losses than other gearboxes and therefore have a lower total efficiency.
A secondary result is that the surface temperature of these gearboxes will be higher than other gearboxes.
The efficiency of the Dertec Strainless Steel gearboxes can be found in the possible geometrical combinations page's of each gearbox serie.

Service Factor

The effect of the driven machine on the gearbox is taken into account to a sufficient level of accuracy using the Service Factor f_S .
The Service Factor is determined according to the daily operating time and the starting frequency ***Z****.*
Three load classifications are considered depending on the mass acceleration factor.
You can read of the service factor applicable to your application in the figure below.
The service factor selected using this figure must be less than or equal to the service factor as given in the gearbox selection table.



Service Factor for wormgearboxes



Ambient temperature influence on the service factor for wormgearboxes

Service factor fs should be adjusted as following
ambient temperature = 30 ~ 40 : Fs x 1.1 ~1.2
ambient temperature = 40 ~ 50 : Fs x 1.3 ~1.4
ambient temperature = 50 ~ 60 : Fs x 1.5 ~1.6
ambient temperature = > 60, please contact Dertec.

Type of load:

A

Uniform load Permitted mass acceleration factor ***(f_a)≤ 0.3***
Screw feeders for light materials, fans, assembly lines, conveyor belts for light materials, small mixers, lifts, cleaning machines, fillers, control machines.

B

Moderate shock load Permitted mass acceleration factor ***(f_a)≤ 3***
Winding devices, woodworking machine feeders, goods lifts, balancers, threading machines, medium mixers, conveyor belts for heavy materials, winches, sliding doors, fertilizer scrapers, packing machines, concrete mixers, crane mechanism, milling cutters, folding machines, gear pumps.

C

Heavy Shock Load Permitted mass acceleration factor ***(f_a)≤ 10***
Mixers for heavy materials, shears, presses, centrifuges, rotating supports, winches and lifts for heavy materials, grinding lathes, stone mills, bucket elevators, drilling machines, hammer mills, cam presses, folding machines, turntables, tumbling barrels, vibrators, shredders.

To maintain the service life of the gear units,
the Service Factor mentioned in the gearbox selection table must be equal or slightly higher than the calculated service factor.

Mass Acceleration Factor

The Mass acceleration factor is calculated as follows:

$$f_a \frac{Jc}{Jm}$$

f_a = *Mass Acceleration Factor*

Jc = *All External Mass Moments Of Inertia [Kgm²]*

Jm = *Mass Moment Of Inertia on the Motor End [Kgm²]*

If the mass acceleration factor is $f_a > 10$, *please contact us.*

Overhung and axial loads

Determining overhung loads

An important factor for determining the resulting overhung load is the type of transmission element mounted to the shaft end. The following transmission element factors f_z *have to be considered for various transmission elements.*

Transmission Element	Transmission Element Factor Fz	Comments
Gears	1.00	≥ 17 Teeth
	1.15	< 17 Teeth
Chain Sprockets	1.00	≥ 20 Teeth
	1.25	< 20 Teeth
	1.40	< 13 Teeth
Narrow V-belt pulleys	1.75	Influence of the tensile force
Flat Belt Pulleys	2.50	Influence of the tensile force
Toothed Belt Pulleys	2.50	Influence of the tensile force

The overhung load exerted on the motor or gearshaft is calculated as follows

$$F_r = \frac{M \cdot 2000}{d_0} \cdot f_z$$

F_r = *Overhung load in N*

M = *Torque in Nm*

d_0 = *Mean Diameter of the mounted transmission element in mm*

f_z = *Transmission element factor*

Permitted overhung load

The basis for determining the permitted overhung loads is the calculation of the rated bearing service life L_{10h} *of the roller bearings (according ISO281)*

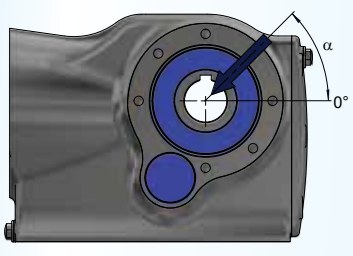
For special operating conditions, the permitted overhung loads can be determined with regard to the modified service life on request.

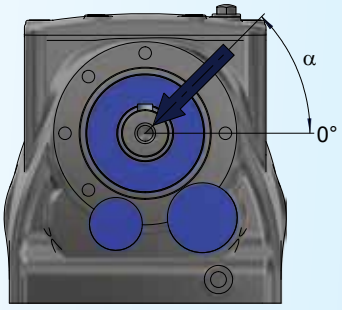
The values refer to force applied to the center of the shaft end (in right angle gear units as viewed onto drive end)

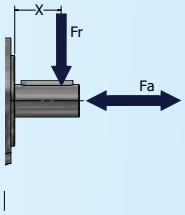
The values for the force application angle α and direction of rotation are based on the most unfavorable conditions.

Definition of force application

The force application is defined according to the following figure.







Fx = Permitted overhung load at point x [N]

Fa = Permitted axial load [N]

Permitted axial forces
If there is no overhung load, than an axial force Fa (Tension or Compression) amounting to 50% of the overhung load given in the selection tables is permitted.

Overhung load conversion for off-center force application
The permitted overhung loads must be calculated according to the selection tables using the following formula in the event that force is not applied at the center of the shaft end. Note that the calculations apply to M2max.

Fxl based on bearing life:

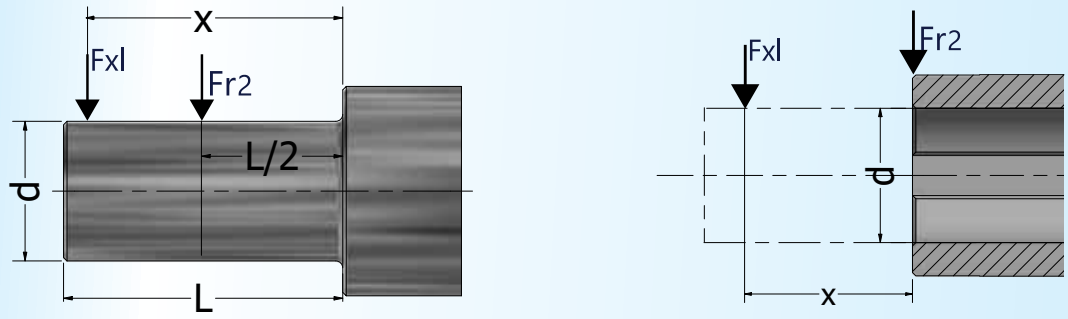
$$Fxl = F_{r2} \cdot \frac{a}{b + x} [N]$$

Fr2 = *Permitted overhung load (x = L/2) for foot mounted gear units according to the selection tables in [N]*

x = *Distance from the shaft shoulder to the force application point in [mm]*

a, b, = *Gear unit constant for overhung load conversions [mm]*

The following figure shows the overhung load Fr with increased distance X to the gear unit.



Values of a & b in mm are given in the following table

FV	a	b	FR	a	b
FV 030	65	50	FR 38	118	93
FV 040	84	64	FR 48	137	107
FV 050	101	76	FR 68	168.5	133.5
FV 063	12	95			
FK	**a**	**b**	**FS(A)**	**a**	**b**
FK 28 B/C	104	78	FS(A) 38	118.5	98.5
FK 38 B/C	118	93	FS(A) 48	130	105
FK 48 B/C	131	101	FS(A) 58	150	120
FK 58 B/C	159	119	FS(A) 68	184	149
FRC	**a**	**b**	**FKA**	**a**	**b**
FRC 01	103	83	FKA 38	123.5	98.5
FRC 02	116.5	91.5	FKA 48	153.5	123.5
FRC 03	130	100	FKA 68	181.3	141.3
FFA	**a**	**b**	FKA 78	215.8	165.8
FFA 38	123.5	98.5	FKA 88	252	192
FFA 48	153.5	123.5			
FFA 68	181.3	141.3			
FFA 78	215.8	165.8			

Efficiency & Irreversibility Characteristics

Efficiency is an important parameter of a wormgear reducer.
Efficiency η depends on the following parameters:

1) Helix angle of gearing
2) Driving speed
3) Running in of gearing
4) The performance of the Lubricant, Oil Seals and Bearings.

The Mesh table shows the dynamic effiency (n_1=1400) and static efficiency values.
Remember that these values are only achieved after the unit has been operating for ca. 24 hours. "Run in period"
Torque values M_{2n} indicated in the gearbox selection tables are calculated by considering the steady state performance of the gearboxes.
The actual values mentioned could have deflection.

Dynamic Irreversibility
Dynamic Irreversibility is achieved when the output shaft stops instantly when power is no longer transmitted through the wormshaft.
This condition requires a dynamic efficiency of η_d<0.4. See mesh table.

η_d	> 0.6	0.5 ~ 0.6	0.4 ~0.5	<0.4
Dynamic irreversibility	Dynamic reversibility	Low Dynamic reversibility	Good Dynamic irreversibility	Dynamic irreversibility

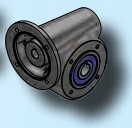
Static Irreversibility
Static Irreversibility is achieved when, at a standstill, the application of a load to the output shaft can't drive the wormshaft of the gear reducer.
This condition requires a static efficiency of η_s <0.5, See mesh table.

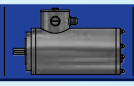
η_s	> 0.55	0.5 ~ 0.55	< 0.5
Static irreversibility	Static reversibility	Low Static reversibility	Static irreversibility

The table shows approximate irreversibility classes. Vibrations and shocks can effect a gear reducers irreversibility.
As it is virtual impossible to provide and guarantee total non reversing, we recommend the use of an external brake with suffficient capability to prevent vibrations in duced starting, where these circumstances are required.
For the irreversibility conditions of a combined geared unit one must consider that the efficiency of the group is given by the product of the efficiencies of each single reducer, i.e.: Ntot = N1 x N2

Mesh Data

	i	7,5	10	15	20	25	30	40	50	60	80	100
FV 030	**z1**	4	3	2	2	1	1	1	1	1	1	
	Mn	1.36	1.39	1.42	1.09	1.69	1.43	1.10	0.89	0.74	0.56	
	Y	18°55′	14°25′	9°44′	7°50′	5°33′	4°54′	3°56′	3°17′	2°43′	2°7′	
	η_d	0.84	0.81	0.76	0.72	0.66	0.64	0.59	0.54	0.50	0.44	
	η_s	0.66	0.62	0.54	0.49	0.41	0.38	0.33	0.29	0.26	0.21	
FV 040	**z1**	4	3	2	2	2	1	1	1	1	1	1
	Mn	1.87	1.95	2.00	1.54	1.26	2.04	1.55	1.27	1.06	0.80	0.65
	Y	23°54′	18°23′	12°30′	10°3′	8°45′	6°19′	5°4′	4°24′	3°42′	2°52′	2°29′
	η_d	0.86	0.84	0.80	0.77	0.74	0.69	0.65	0.61	0.57	0.51	0.47
	η_s	0.70	0.66	0.59	0.54	0.51	0.44	0.39	0.36	0.32	0.27	0.24
FV 050	**z1**	4	3	2	2	2	1	1	1	1	1	1
	Mn	2.34	2.43	2.50	1.92	1.56	2.54	1.94	1.58	1.32	1.00	0.80
	Y	23°49′	18°19′	12°27′	10°3′	8°33′	6°18′	5°4′	4°18′	3°38′	2°52′	2°17′
	η_d	0.87	0.85	0.81	0.78	0.75	0.71	0.67	0.63	0.59	0.53	0.48
	η_s	0.70	0.66	0.59	0.54	0.51	0.44	0.39	0.36	0.32	0.27	0.24
FV 063	**z1**	4	3	2	2	2	1	1	1	1	1	1
	Mn	2.96	3.08	3.17	2.44	1.98	3.23	2.47	1.99	1.68	1.27	1.02
	Y	24°31′	18°53′	12°51′	10°29′	8°45′	6°30′	5°17′	4°24′	3°49′	2°59′	2°26′
	η_d	0.88	0.86	0.82	0.80	0.77	0.73	0.69	0.65	0.62	0.56	0.51
	η_s	0.70	0.66	0.59	0.55	0.51	0.44	0.40	0.36	0.33	0.28	0.24



P_{1n} [kW]	N_2 min^{-1}	M_{2n} [Nm]	i	F_{r2} [N]	f_s		

= Combination with the motor in the header row is not possible

= Combination with the motor in the header row is possible

P_{1n} [kW] = Rated Motor Power [kW]

N_2 min^{-1} = Output Speed [min^{-1}]

M_{2n} [Nm] = Rated Output torque [Nm]

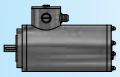
M2Max = Maximum permissible output torque [Nm]

F_{r2} [N] = Permitted Overhung Load Output Side [N]

i = Gear unit Ratio

f_s = Service Factor

 = Gear unit type

 = Motor Type

FV 030

Maximum Torque = 20 Nm @ N1 = 1400r/min

N_2 min^{-1}	M2max [Nm]	F_{r2} [N]	i	η %	IEC56 B14a	IEC63 B14a
186.7	16	683	7,5	84		
140	17	752	10	81		
93.3	17	861	15	76		
70	17	948	20	72		
56	19	1021	25	66		
46.7	20	1085	30	64		
35	19	1194	40	59		
28	17	1286	50	54		
23.3	16	1367	60	50		
17.5	11	1504	80	44		
14	9	1618	100			

FV 040

Maximum Torque = 40 Nm @ N1 = 1400r/min

N_2 min^{-1}	M2max [Nm]	F_{r2} [N]	i	η %	IEC63 B14a	IEC71 B14a
186.7	37	1315	7,5	86		
140	40	1447	10	84		
93.3	40	1657	15	80		
70	39	1824	20	77		
56	36	1964	25	74		
46.7	40	2087	30	69		
35	40	2298	40	65		
28	39	2475	50	61		
23.3	36	2630	60	57		
17.5	30	2995	80	51		
14	28	3118	100	47		

FV 050

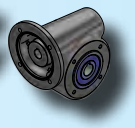
Maximum Torque = 75 Nm @ N1 = 1400r/min

N2 min^{-1}	M2max [Nm]	Fr2 [N]	i	η %	IEC63B14a	IEC71 B14a	IEC80 B14a
186.7	67	1805	7,5	87			
140	71	1987	10	85			
93.3	75	2274	15	81			
70	74	2503	20	78			
56	64	2696	25	75			
46.7	75	2865	30	71			
35	75	3153	40	67			
28	69	3397	50	63			
23.3	67	3610	60	59			
17.5	60	3973	80	53			
14	57	4280	100	48			

FV 063

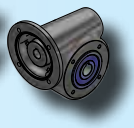
Maximum Torque = 140 Nm @ N1 = 1400r/min

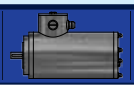
N2 min^{-1}	M2max [Nm]	Fr2 [N]	i	η %	IEC71 B14a	IEC80 B14a	IEC90 B14a
186.7	120	2359	7,5	88			
140	112	2597	10	86			
93.3	120	2973	15	82			
70	112	3272	20	80			
56	126	3524	25	77			
46.7	139	3745	30	73			
35	131	4122	40	69			
28	122	4440	50	65			
23.3	114	4719	60	62			
17.5	104	5193	80	56			
14	96	5595	100	51			



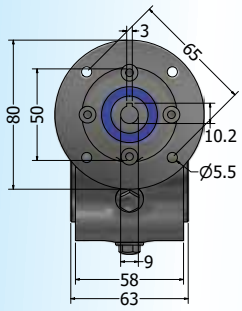
P_{1n} [kW]	N_2 min^{-1}	M_{2n} [Nm]	i	F_{r2} [N]	f_s		
0.09	186.7	3.9	7.5	683	4.7	FV030 IEC56	562-4 B14a
	140	5.0	10	752	3.6		
	93.3	7.0	15	861	2.6		
	70	8.8	20	948	2.0		
	56	10	25	1021	2.1		
	46.7	12	30	1085	1.7		
	35	14	40	1194	1.2		
	28	17	50	1286	1.0		
0.12	186.7	5.2	7.5	683	3.5	FV030 IEC63	631-4 B14a
	140	6.6	10	752	2.7		
	93.3	9.3	15	861	1.9		
	70	12	20	948	1.5		
	56	14	25	1021	1.6		
	46.7	16	30	1085	1.3		
	46.7	17	30	2087	2.70	FV040 IEC63	631-4 B14a
	35	21	40	2298	1.90		
	28	25	50	2475	1.60		
	23.3	28	60	2630	1.30		
	17.5	33	80	2895	1.00		
	23.3	29	60	3610	2.30	FV050 IEC63	631-4 B14a
	17.5	35	80	3973	1.90		
	14	39	100	4280	1.40		
0.18	186.7	7.7	7.5	683	2.3	FV030 IEC63	632-4 B14a
	140	10	10	752	1.8		
	93.3	14	15	861	1.3		
	70	18	20	948	1.0		
	56	20	25	1021	1.0		
	70	19	20	1824	2.10	FV040 IEC63	632-4 B14a
	56	23	25	1964	1.70		
	46.7	25	30	2087	1.80		
	35	32	40	2298	1.30		
	28	37	50	2475	1.00		
	45	28	20	2113	1.60	FV040 IEC71	711-6 B14a
	36	34	25	2276	1.30		
	30	38	30	2419	1.30		
	22.5	47	40	2662	1.00		
	35	33	40	3153	2.30	FV050 IEC63	632-4 B14a
	28	39	50	3397	1.90		
	23.3	43	60	3610	1.60		
	17.5	52	80	3973	1.20		
	18	56	50	3936	1.40	FV050 IEC71	711-6 B14a
	15	63	60	4183	1.10		
	15	66	60	5467	2.10	FV063 IEC71	711-6 B14a
	11.3	79	80	6018	1.60		
	9	90	100	6270	1.40		

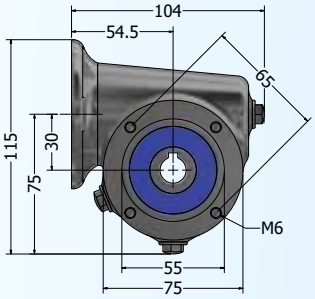
P_{1n} [kW]	N_2 min^{-1}	M_{2n} [Nm]	i	F_{r2} [N]	f_s		
0.25	186.7	11	7.5	1315	3.60	FV040 IEC71	711-4 B14a
	140	14	10	1447	2.80		
	93.3	20	15	1657	2.00		
	70	26	20	1824	1.50		
	56	32	25	1964	1.20		
	46.7	35	30	2087	1.30		
	120	17	7.5	1524	2.60	FV040 IEC71	712-6 B14a
	90	22	10	1677	2.00		
	60	31	15	1920	1.40		
	45	39	20	2113	1.10		
	70	27	20	2503	2.70	FV050 IEC71	711-4 B14a
	56	32	25	2696	2.20		
	46.7	36	30	2865	2.30		
	35	46	40	3153	1.70		
	28	54	50	3397	1.40		
	23.3	60	60	3610	1.10		
	45	40	20	2900	1.90	FV050 IEC71	712-6 B14a
	36	48	25	3124	1.50		
	30	54	30	3320	1.70		
	22.5	67	40	3654	1.20		
	18	78	50	3936	1.00		
	28	55	50	4440	2.40	FV063 IEC71	711-4 B14a
	23.3	63	60	4719	2.00		
	17.5	76	80	5193	1.60		
	14	87	100	5595	1.40		
	18	81	50	5145	1.80	FV063 IEC71	712-6 B14a
	15	92	60	5467	1.50		
	11.3	110	80	6018	1.20		
	9	125	100	6270	1.00		
0.37	186.7	16	7.5	1315	2.50	FV040 IEC71	712-4 B14a
	140	21	10	1447	1.90		
	93.3	30	15	1657	1.30		
	70	39	20	1824	1.00		
	140	21	10	1987	3.40	FV050 IEC71	712-4 B14a
	93.3	31	15	2274	2.40		
	70	39	20	2503	1.90		
	56	47	25	2696	1.50		
	46.7	54	30	2865	1.60		
	35	68	40	3153	1.10		
	120	25	7.5	2091	3.40	FV050 IEC80	801-6 B14a
	90	33	10	2302	2.60		
	60	47	15	2635	1.80		
	45	59	20	2900	1.30		
	36	72	25	3124	1.00		
	30	80	30	3320	1.10		
	35	70	40	4122	2.10	FV063 IEC71	712-4 B14a
	28	82	50	4440	1.60		
	23.3	94	60	4719	1.40		
	17.5	113	80	5193	1.10		

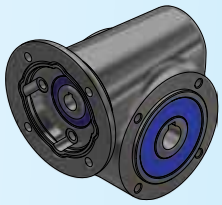


P_{1n} [kW]	N_2 min^{-1}	M_{2n} [Nm]	i	F_{r2} [N]	f_s		
0.37	45	60	20	3791	2.40	FV063 IEC80	801-6 B14a
	36	73	25	4084	1.90		
	30	82	30	4339	2.10		
	22.5	102	40	4776	1.60		
	18	120	50	5145	1.20		
	15	137	60	5467	1.00		
0.55	186.7	24	7.5	1805	2.90	FV050 IEC80	801-4 B14a
	140	32	10	1987	2.30		
	93.3	46	15	2274	1.60		
	70	59	20	2503	1.20		
	56	70	25	2696	1.00		
	46.7	80	30	2865	1.10		
	120	37	7.5	2091	2.30	FV050 IEC80	802-6 B14a
	90	48	10	2302	1.70		
	60	69	15	2635	1.20		
	70	60	20	3272	2.20	FV063 IEC80	801-4 B14a
	56	72	25	3524	1.80		
	46.7	82	30	3745	1.90		
	35	104	40	4122	1.40		
	28	122	50	4440	1.10		
	60	70	15	3444	2.20	FV063 IEC80	802-6 B14a
	45	90	20	3791	1.60		
	36	108	25	4084	1.30		
	30	123	30	4339	1.40		
	22.5	152	40	4776	1.10		
0.75	186.7	33	7.5	1805	2.10	FV050 IEC80	802-4 B14a
	140	43	10	1987	1.70		
	93.3	62	15	2274	1.20		
	93.3	63	15	2973	2.20	FV063 IEC80	802-4 B14a
	70	82	20	3272	1.60		
	56	98	25	3524	1.30		
	46.7	112	30	3745	1.40		
	35	141	40	4122	1.00		
	120	51	7.5	2734	2.90	FV063 IEC90	90S-6 B14a
	90	67	10	3009	2.30		
	60	96	15	3444	1.60		
	45	123	20	3791	1.20		
1.1	186.7	50	7.5	2359	2.60	FV063 IEC90	90S-4 B14a
	140	65	10	2597	2.00		
	93.3	92	15	2973	1.50		
	70	120	20	3272	1.10		
	120	75	7.5	2734	2.00	FV063 IEC90	90L-6 B14a
	90	98	10	3009	1.60		
	60	140	15	3444	1.10		
1.5	186.7	68	7.5	2359	1.90	FV063 IEC90	90L-4 B14a
	140	88	10	2597	1.50		
	93.3	126	15	2973	1.10		

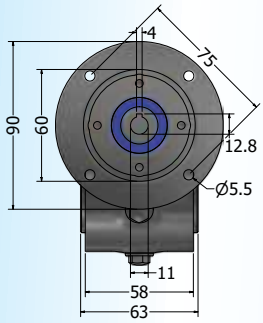
FV 030 IEC56 B14A

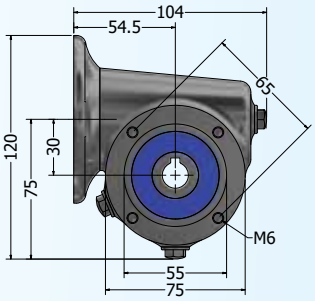


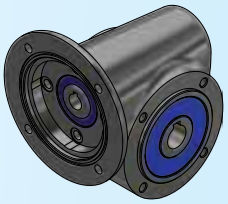




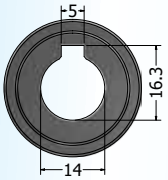
FV 030 IEC63 B14A

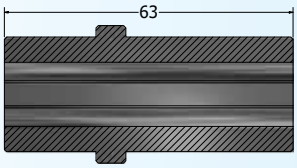






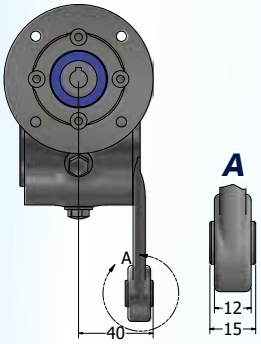
Hollow Shaft Dimensions HA14

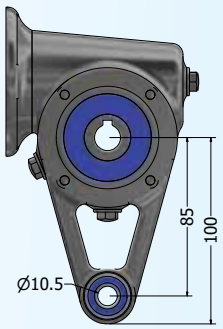


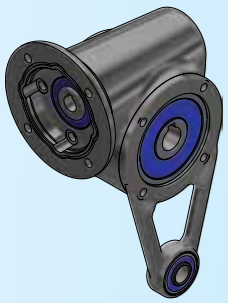


The standard hollow shaft diameter for a FV030 is 14mm
Different hollow shaft diameters on request

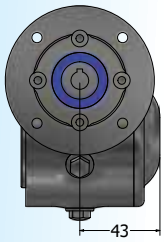
Torque Arm SS065 MS

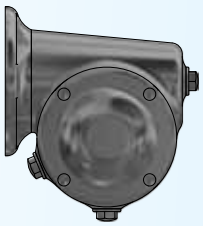


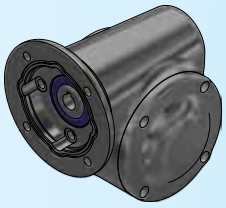




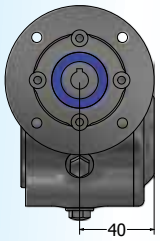
Closed Safety Cap SS065 CC

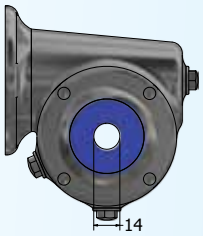


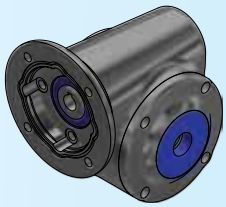




Open Safety Cap SS065 CO14

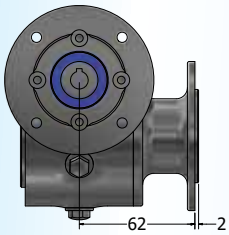


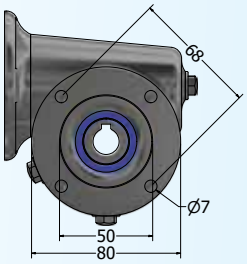


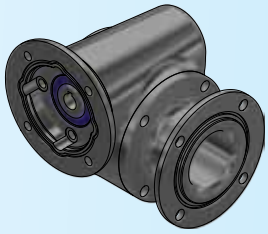


The standard shaft diameter for a SS065 CO is 14mm
Different diameters on request

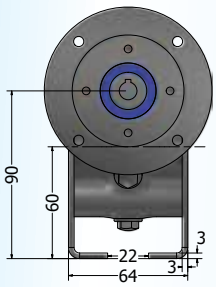
Output Flange SS065 FL80

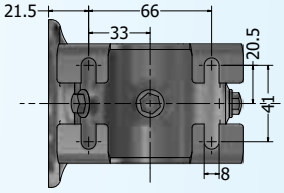


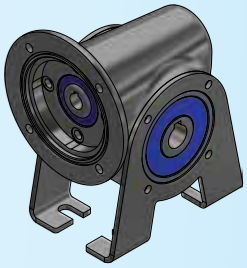




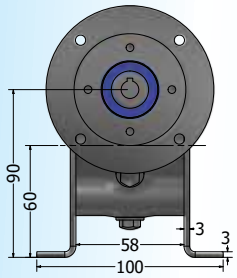
Mounting Feet SS 065 VP (mounted inwards)

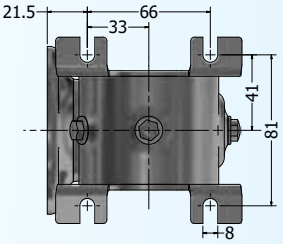


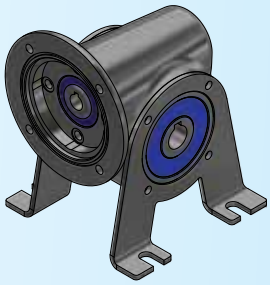




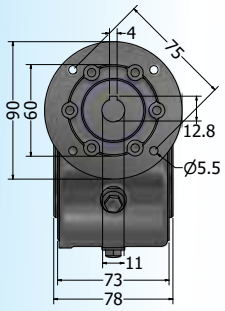
Mounting Feet SS 065 VP (mounted outwards)

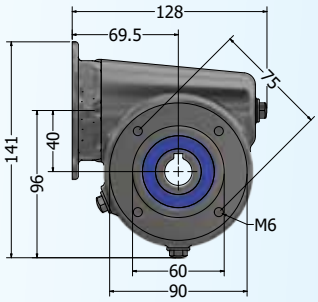


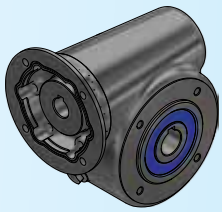




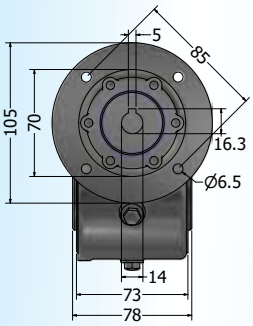
FV 040 IEC63 B14A

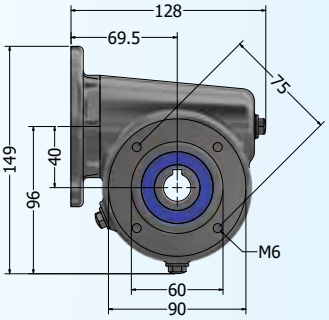


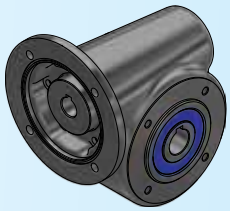




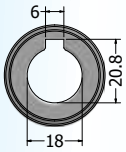
FV 040 IEC71 B14A

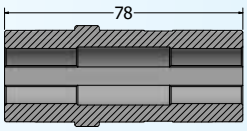






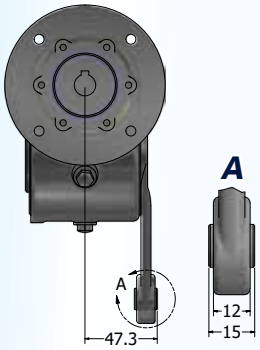
Hollow Shaft Dimensions HA18

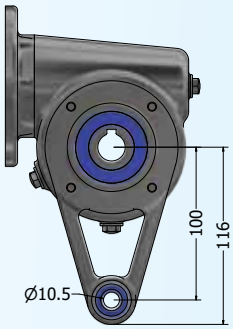


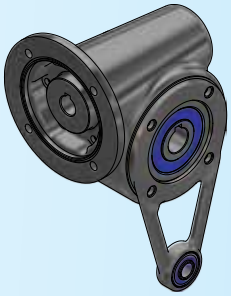


The standard hollow shaft diameter for a FV040 is 18mm
Different hollow shaft diameters on request

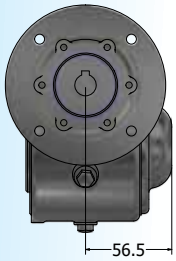
Torque Arm SS075 MS

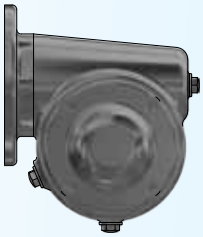


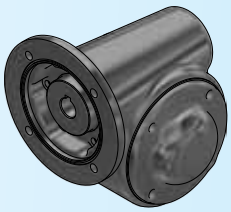




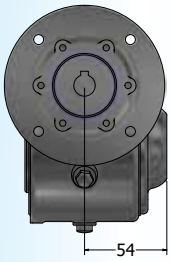
Closed Safety Cap SS075 CC

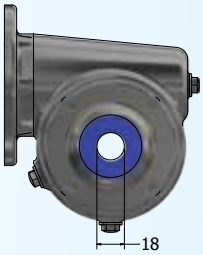


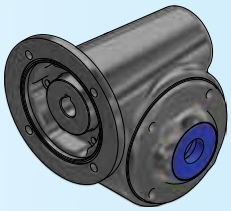




Open Safety Cap SS075 CO18

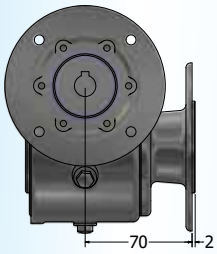


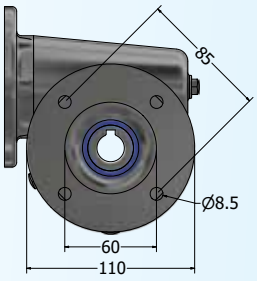


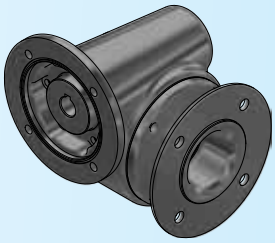


The standard shaft diameter for a SS075CO is 18mm
Different diameters on request

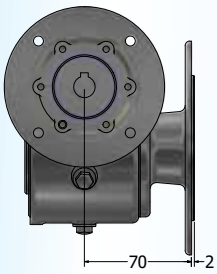
Output Flange SS075 FL110

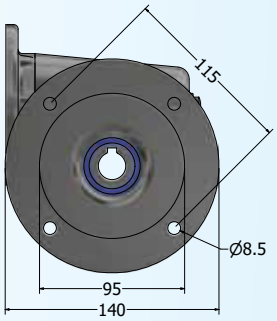


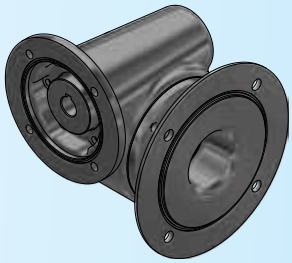




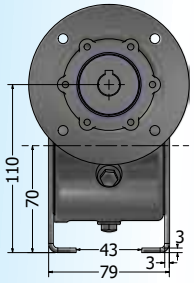
Output Flange SS075 FL140

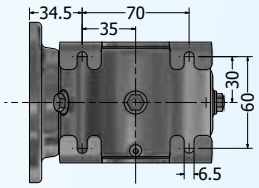


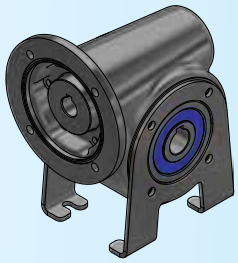




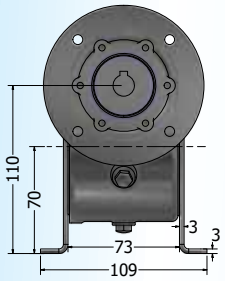
Mounting Feet SS 075 VP (mounted inwards)

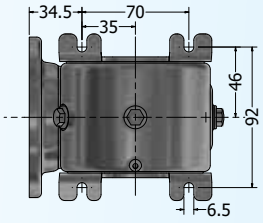


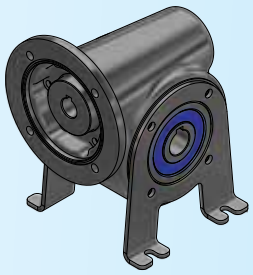




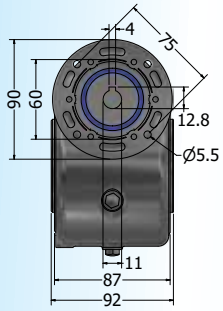
Mounting Feet SS 075 VP (mounted outwards)

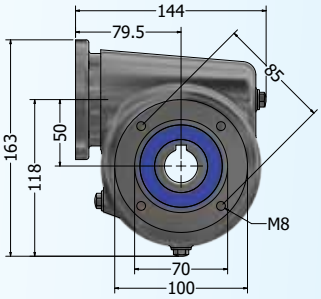


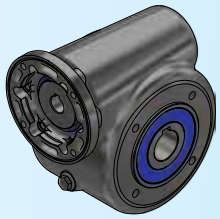




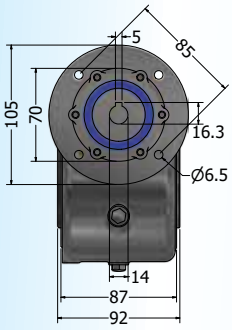
FV 050 IEC63 B14A

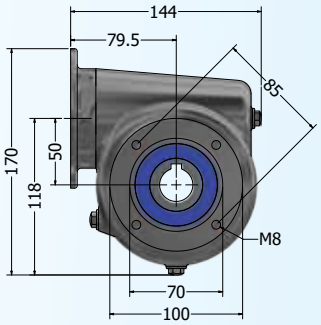


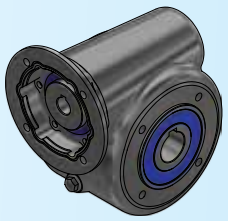




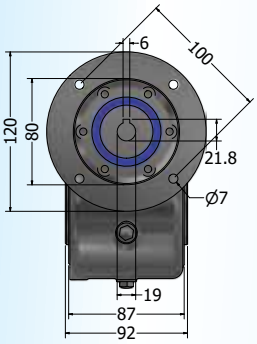
FV 050 IEC71 B14A

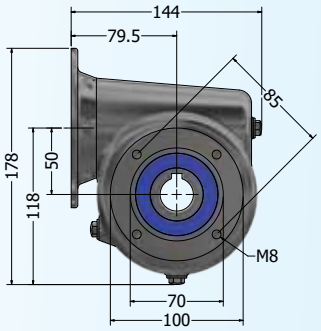


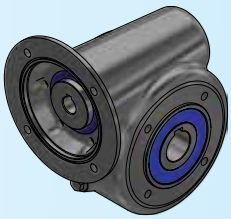




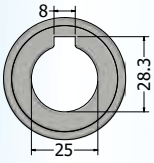
FV 050 IEC80 B14A

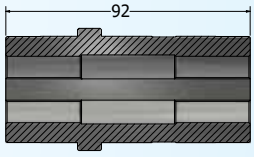






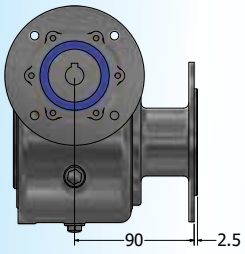
Hollow Shaft Dimensions HA25

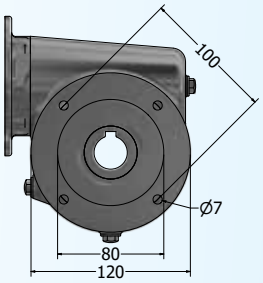


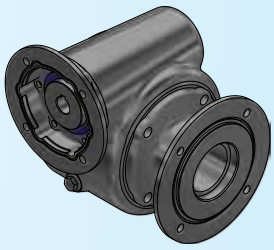


The standard hollow shaft diameter for a FV050 is 25mm
Different hollow shaft diameters on request

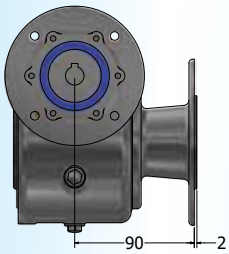
Output Flange SS085 FL120

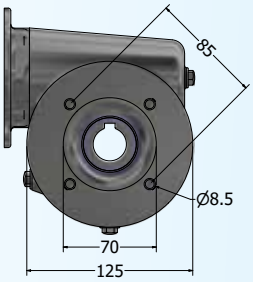


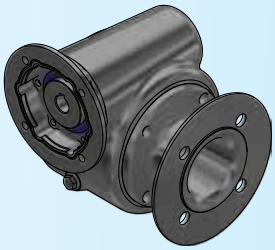




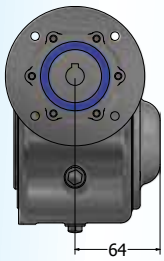
Output Flange SS085 FL125

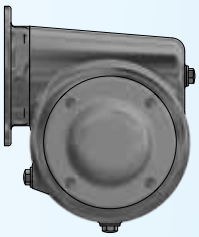


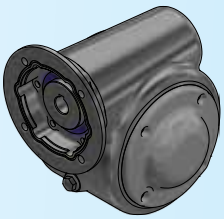




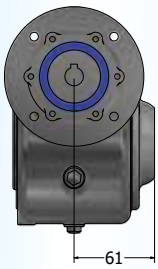
Closed Safety Cap SS085 CC

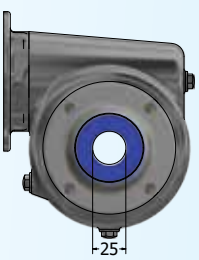


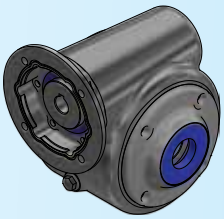




Open Safety Cap SS085 CO25

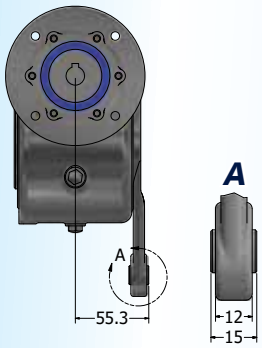


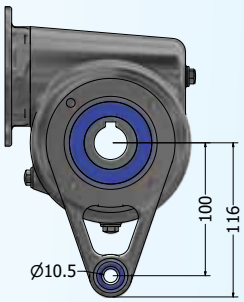


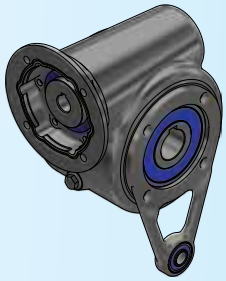


The standard shaft diameter for a SS085 CO is 25mm
Different diameters on request

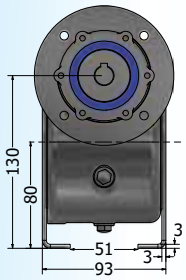
Torque Arm SS085 MS

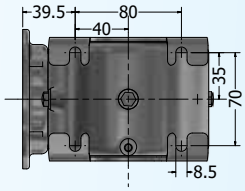


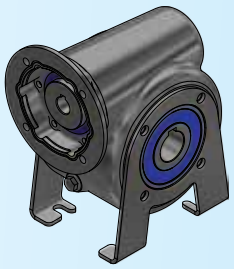




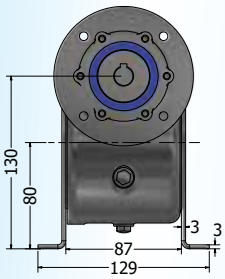
Mounting Feet SS 085 VP (mounted inwards)

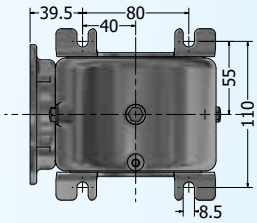


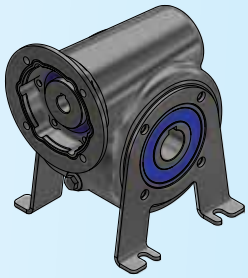




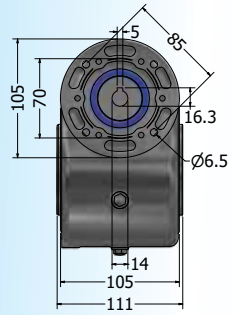
Mounting Feet SS 085 VP (mounted outwards)

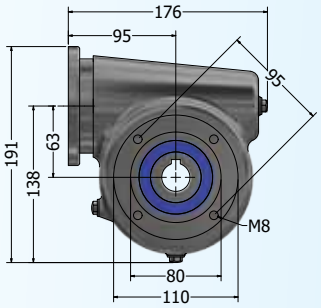


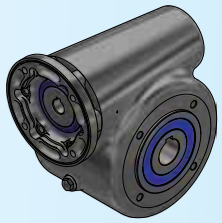




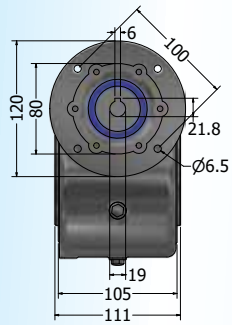
FV 063 IEC71 B14A

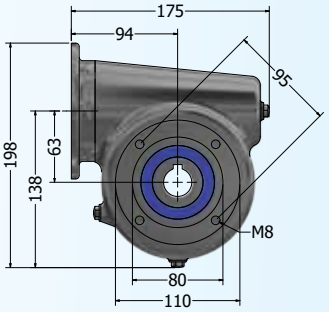


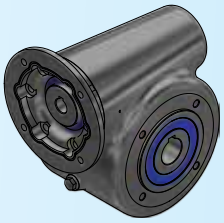




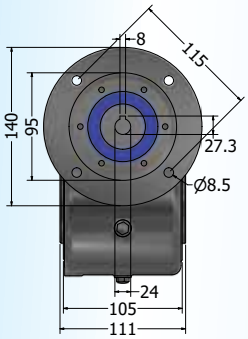
FV 063 IEC80 B14A

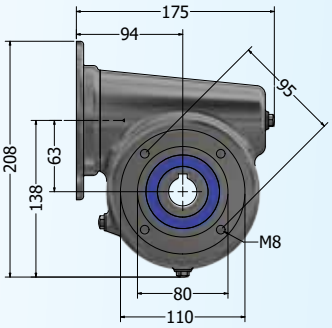


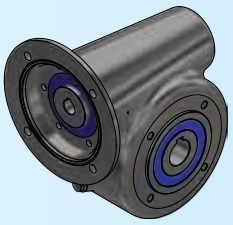




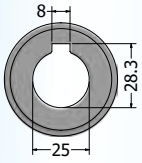
FV 063 IEC90 B14A

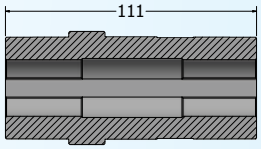






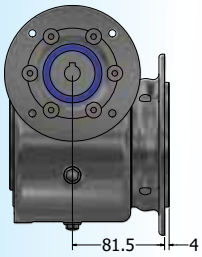
Hollow Shaft Dimensions HA25

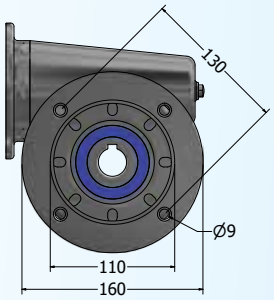


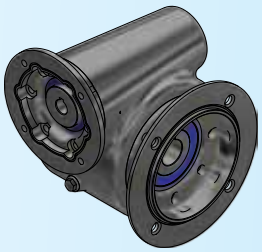


The standard hollow shaft diameter for a FV063 is 25mm
Different hollow shaft diameters on request

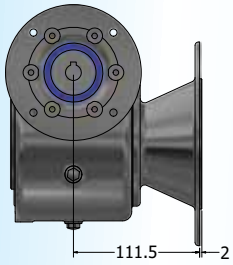
Output Flange SS095 FL160

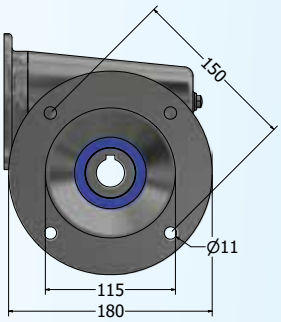


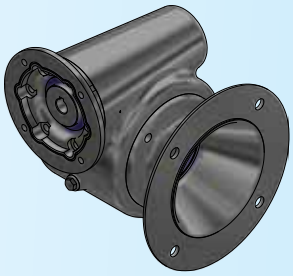




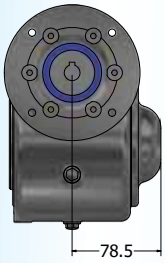
Output Flange SS095 FL180

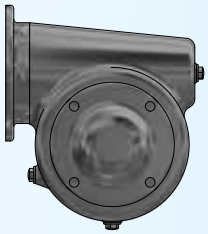


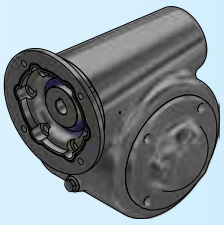




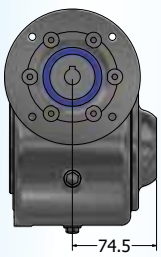
Closed Safety Cap SS095 CC

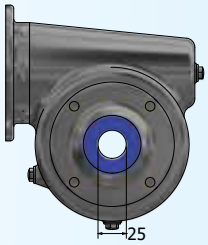


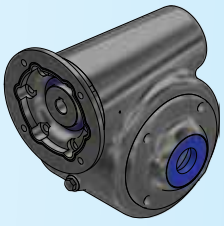




Open Safety Cap SS095 CO25

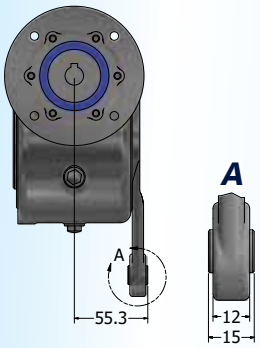


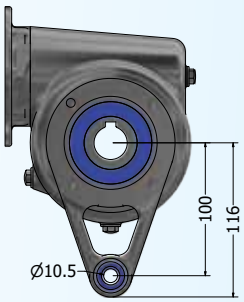


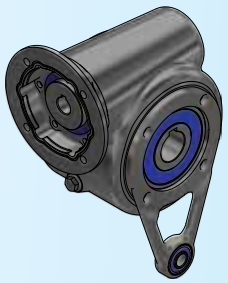


The standard shaft diameter for a SS095 CO is 25mm
Different diameters on request

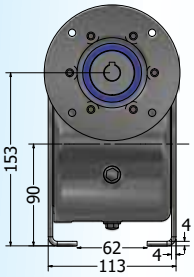
Torque Arm SS095 MS

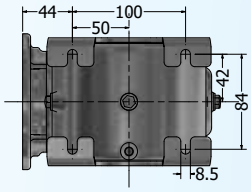


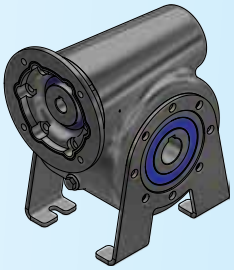




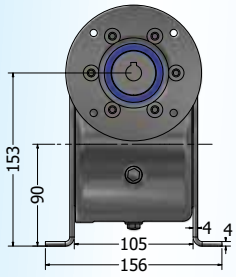
Mounting Feet SS 095 VP (mounted inwards)

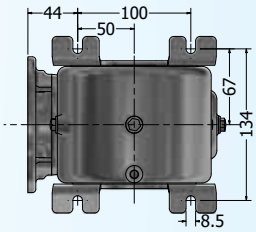


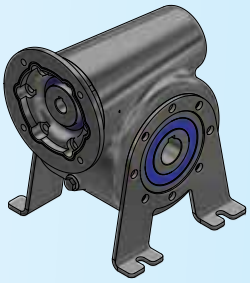




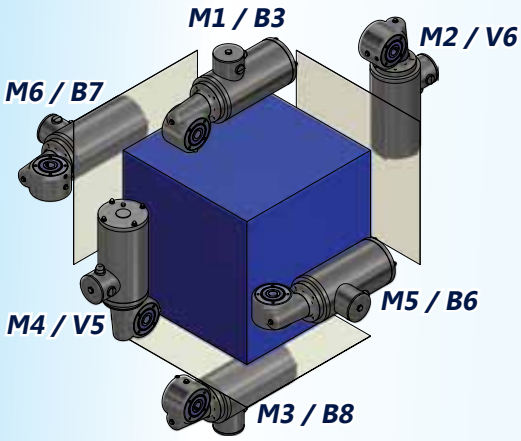
Mounting Feet SS 095 VP (mounted outwards)



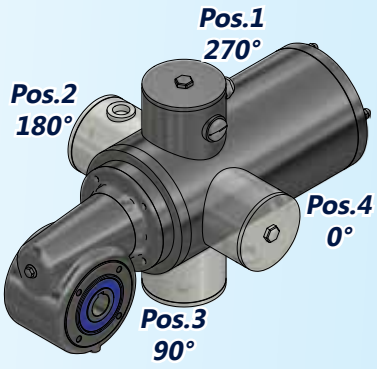




Mounting Positions



Terminal Box Positions



Lubrication Quantity

Oil Quantity in ML.	Mounting Position					
Gearbox	M1 (B3)	M3 (B8)	M6 (B7)	M5 (B6)	M4 (V5)	M2 (V6)
FV 030	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
FV 040	140	140	140	140	140	140
FV 050	240	240	240	240	240	240
FV 063	500	500	500	500	500	500

Lubrication Type

Gearbox	Oil Type	Temp. Range
FV 030 FV 040 FV 050 FV 063	Matrix Foodmax 460	-20˚C ~ +40˚C
	Castrol Optileb GT 460	-20˚C ~ +40˚C
	Bechem Berusynth 460 H1	-20˚C ~ +40˚C
	Shell Casida Fluid GL460	-20˚C ~ +40˚C
	Mobil SHC Cibus 460	-20˚C ~ +40˚C

Weight

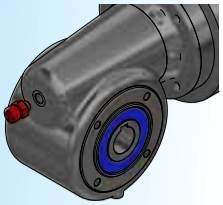
Gearbox	Weight
FV 030	N.A.
FV 040	3.7 Kg.
FV 050	5.7 Kg.
FV 063	8.9 Kg.

Maintenance

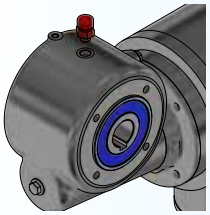
For maintenance instructions
please see our maintenance manual on page .....

Positioning of the debreather

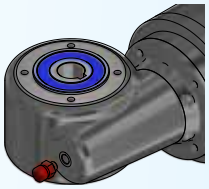
M1 / B3



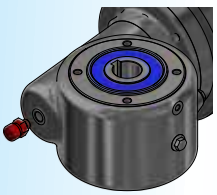
M3 / B8



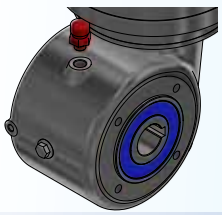
M5 / B6



M6 / B7



M4 / V5



M2 / V6