

Realized maximum noise reduction that could not be obtained from existing reducers

Realized noise reduction by 10% or more compared to existing products

(According to our survey)

65dB (A)

60dB (A)



* The helical gear, as shown in the above figure, is tilted to the shaft of the engaging gear (contrary to parallel for existing gears). It makes engagement of a gear smoother compared to previous parallel gears, realizing noise reduction.

※ All of helical gears are being adopted in type number (A/B/C/D/E).

Previous product **New product** Representative type no. (VRSF-S9B-100)

High precision type of 0.05° (3 min) or less of backlash, low-backlash 0.08° (5 min) into series

This reducer is characterized by a high-precision servo motor with a merit of precision positioning

Smooth rotation with little shaking

This reducer is characterized by a high-precision servo motor with a merit of precision positioning.

The difference is 22mm (for D type): Compact (small size) design according to designer's demand

Compact size of 98mm (120mm for the same model of a rival company)
This is compact design coping with a servo motor of compact and light-weight design.

Offers high-quality products in excellent assembling conditions

Products are assembled in clean room.
This assembling condition guarantees high-quality products.

Maintenance free & free jointing

No need for replacement by using long-life high grade grease as lubricant. In addition, it is seal-filled and thus the jointing and attaching position is free changeable.

Complete measure against a lubricant leak

Out-and-out measures against a leak, e.g. impregnation of a case, air-leak test, etc.

IP65-compatible (option)

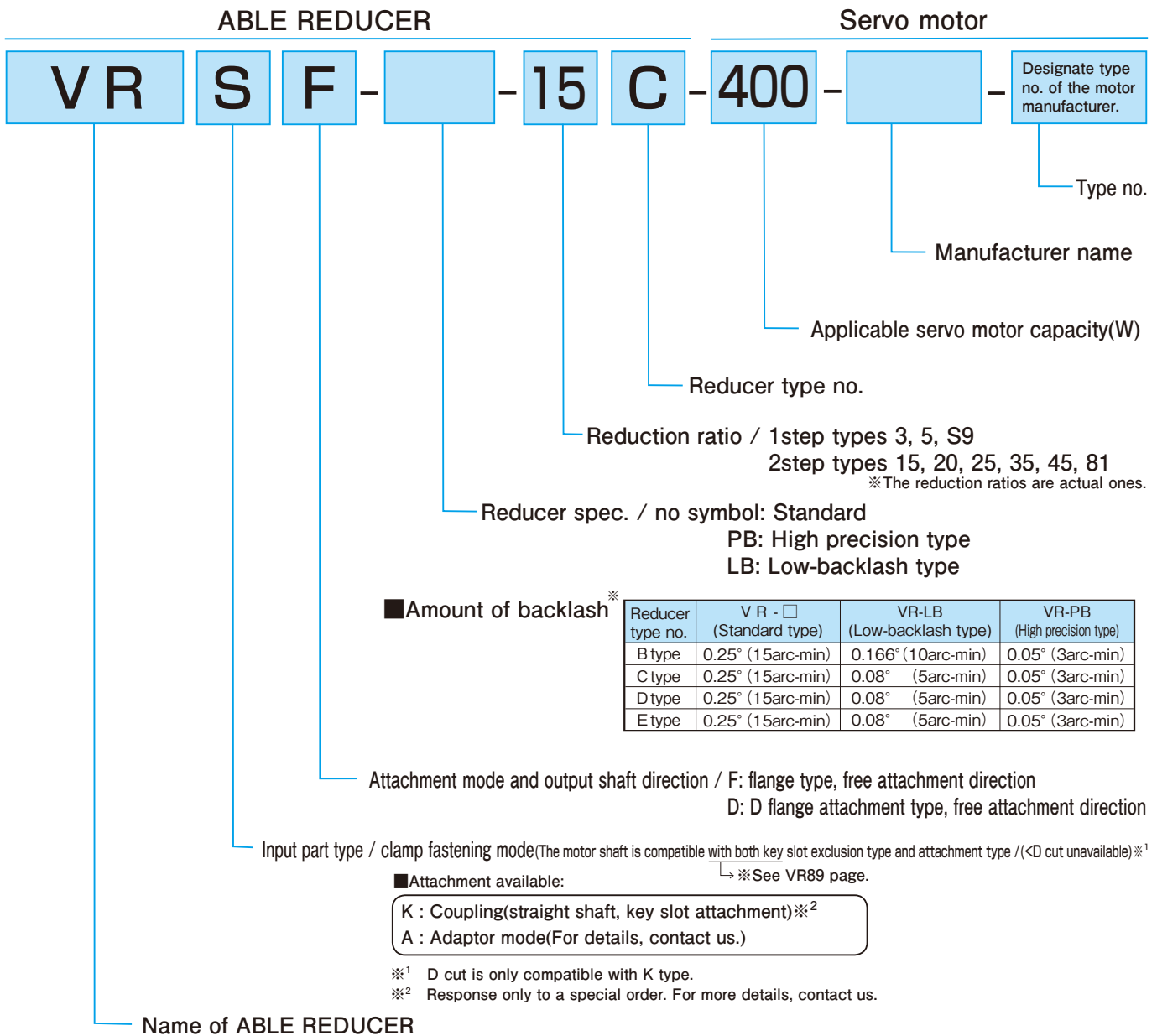
Reducer performance is fully exercised even in various conditions with waterproof function. (※ optional)

Combinable to compact servo motors of each supplier

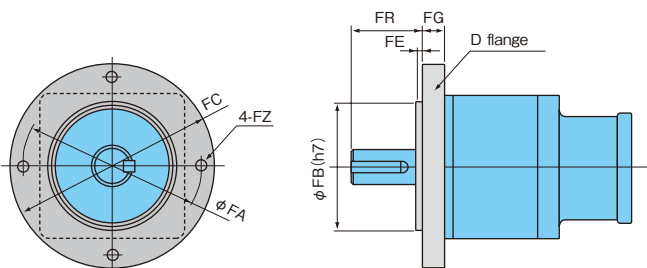
Attachable to servo motors of the following makers:

- PANASONIC ● FANUC ● NIKKI DENKO ● YASKAWA ELECTRIC ● SHIMPONIA TECHNOLOGY
- MIKI FULLEY ● MITSUBISHI ELECTRIC ● TOSHIBA MACHINE ● HITACHI INDUSTRIAL EQUIPMENT SYSTEMS
- OMRON ● SANYO DENKI ● DELTA ● ALLEN-BRADLEY
- KEYENCE ● TAMAGAWA SEIKI ● FUJI ELECTRIC SYSTEMS ● SANMEI ● NIDEC SANKYO

Model & type symbol

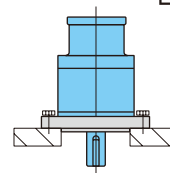


■ Dimensional drawing of D flange attachment type



(Unit: mm)

Type no.	FG	FR	FE	FB	FC	FA	FZ
B	8	24	3	50	75	65	6
C	12	33.5	3	72	110	95	7
D	13	48	5	90	134	115	8.8



※In case of attachment as mentioned in the above figure, designate D flange(separate selling) attachment. Also, the D flange may be attached later.

■ Processing of output shaft tab (option)

B type : M5×10 C type : M6×12(or M8×16) D type : M8×16(or M6×12) E type : M10×20

Reduction ratio & type no.

■ When input speed is 3000rpm

Reduction ratio Motor cap.(W)	1step reduction			2step reduction					
	1/3	1/5	1/9	1/15	1/20	1/25	1/35	1/45	1/81
50W	B			B			D		
100W									
200W	C			C			D		
400W									
750W	D			D			E		
1000W									
1500W	E			E			-		
2000W									
2500W	E			-			-		
3000W									
3500W	-			-			-		
4000W									
4500W	-			-			-		
5000W									

Note 1) All corresponding to the gear

■ When input speed is 2000rpm

Reduction ratio Motor cap.(W)	1step reduction			2step reduction					
	1/3	1/5	1/9	1/15	1/20	1/25	1/35	1/45	1/81
50W	B			B			C		
100W									
200W	C			C			D		
400W									
750W	D			D			-		
1000W									
1500W	E			E			-		
2000W									
2500W	-			-			-		
3000W									
3500W	-			-			-		

Note 1) All corresponding to the gear

※Torque is limited to the following types:

B type : 1/5 reduction (100W)

C type : 1/81 reduction (50W)

D type : 1/3 reduction (1500W) · 1/45 reduction (200W) · 1/81 reduction (100W)

E type : 1/3 reduction (3500W) · 1/25 reduction (250W)

■ About lubricant

- Lubrication: Grease
- Replacement: Not available

The same specification applies to all of standard type, LB(low backlash), and PB(high precision type).

Reduction ratio	Type				Output shaft speed (rpm)	Standard output torque (N · m)	Instantaneous max. output torque (N · m)	Permissible radial load (N)	Permissible thrust load (N)	Internal moment of inertia of input shaft conversion ($\times 10^{-4}$ kg · m ²)	Permissible output torque (N · m)	Instantaneous max. permissible output torque (N · m)
	Model	Reduction ratio	Type no.	Motor cap.								
1/3	VR □ F	-3	B	-50	1000	0.255	0.784	392	196	0.0575	3.43	10.3
	VR □ F	-3	B	-100	1000	0.715	2.06	392	196	0.0575	3.43	10.3
	VR □ F	-3	B	-200	1000	1.47	4.51	392	196	0.135	3.43	10.3
	VR □ F	-3	B	-400	1000	3.43	10.3	392	196	0.145	3.43	10.3
	VR □ F	-3	C	-750	1000	6.37	19.3	784	392	0.913	6.86	20.6
	VR □ F	-3	D	-1000	1000	7.55	22.8	882	441	2.43	18.3	54.9
	VR □ F	-3	D	-1500	1000	12.3	37.1	882	441	2.43	18.3	54.9
	VR □ F	-3	D	-2000	1000	17.2	51.5	882	441	2.43	18.3	54.9
	VR □ F	-3	E	-2500	1000	19.0	57.2	1370	686	5.55	44.1	132
	VR □ F	-3	E	-3000	1000	23.7	71.2	1370	686	5.50	44.1	132
	VR □ F	-3	E	-3500	1000	28.3	85.2	1370	686	5.50	44.1	132
	VR □ F	-3	E	-4000	1000	33.1	99.0	1370	686	5.78	44.1	132
1/5	VR □ F	-5	B	-50	600	0.510	1.47	490	245	0.0400	1.57	4.70
	VR □ F	-5	B	-100	600	1.18	3.72	490	245	0.0400	1.57	4.70
	VR □ F	-5	B	-200	600	2.65	8.04	490	245	0.118	2.84	8.53
	VR □ F	-5	C	-400	600	5.39	16.2	980	490	0.363	6.57	19.7
	VR □ F	-5	C	-750	600	10.7	32.1	980	490	0.713	11.5	34.3
	VR □ F	-5	D	-1000	600	13.4	40.5	1080	539	1.85	23.5	70.6
	VR □ F	-5	D	-1500	600	21.5	64.4	1080	539	1.85	23.5	70.6
	VR □ F	-5	E	-2000	600	23.8	71.5	1670	833	3.50	56.8	171
	VR □ F	-5	E	-2500	600	31.8	95.5	1670	833	3.50	56.8	171
	VR □ F	-5	E	-3000	600	39.6	119	1670	833	3.48	56.8	171
	VR □ F	-5	E	-3500	600	47.2	141	1670	833	3.48	56.8	171
	VR □ F	-5	E	-4000	600	55.3	166	1670	833	3.75	56.8	171
1/9	VR □ F	-S9	B	-50	333	0.921	2.74	588	294	0.0350	2.35	7.25
	VR □ F	-S9	B	-100	333	2.25	6.86	588	294	0.0350	2.35	7.25
	VR □ F	-S9	C	-200	333	3.72	11.3	1180	588	0.275	9.70	29.2
	VR □ F	-S9	C	-400	333	9.51	28.5	1180	588	0.275	9.70	29.2
	VR □ F	-S9	D	-750	333	18.2	54.7	1470	735	0.650	18.2	54.7
	VR □ F	-S9	E	-1000	333	20.0	60.1	1960	980	2.81	73.5	221
	VR □ F	-S9	E	-1500	333	34.3	103	1960	980	2.81	73.5	221
	VR □ F	-S9	E	-2000	333	48.6	146	1960	980	2.81	73.5	221
1/15	VR □ F	-S9	E	-2500	333	60.8	182	1960	980	2.81	73.5	221
	VR □ F	-S9	E	-3000	333	73.0	219	1960	980	2.77	73.5	221
	VR □ F	-15	B	-50	200	1.67	5.00	784	392	0.0350	4.02	12.2
	VR □ F	-15	B	-100	200	3.72	11.4	784	392	0.0350	4.02	12.2
	VR □ F	-15	C	-200	200	6.27	18.8	1470	735	0.300	16.2	48.6
	VR □ F	-15	C	-400	200	15.8	47.5	1470	735	0.300	16.2	48.6
	VR □ F	-15	D	-750	200	30.4	91.2	1760	882	0.700	30.4	91.2
	VR □ F	-15	E	-1000	200	33.3	100	2350	1180	2.80	91.4	274
1/20	VR □ F	-15	E	-1500	200	57.2	172	2350	1180	2.80	91.4	274
	VR □ F	-15	E	-2000	200	81.0	243	2350	1180	2.80	91.4	274
	VR □ F	-20	B	-50	150	2.21	6.63	804	402	0.0340	5.00	15.0
	VR □ F	-20	B	-100	150	5.00	15.0	804	402	0.0340	5.00	15.0
	VR □ F	-20	C	-200	150	8.69	26.1	1570	785	0.294	21.1	63.3
	VR □ F	-20	C	-400	150	21.1	63.3	1570	785	0.294	21.1	63.3
1/25	VR □ F	-20	D	-750	150	40.6	122	1910	955	0.690	40.6	122
	VR □ F	-20	E	-1000	150	44.5	134	2500	1250	2.72	78.4	235
	VR □ F	-25	B	-50	120	2.74	8.33	882	441	0.0325	4.02	12.2
	VR □ F	-25	B	-100	120	6.27	19.0	882	441	0.0325	6.27	19.0
	VR □ F	-25	C	-200	120	11.1	33.3	1670	833	0.288	21.7	64.9
	VR □ F	-25	C	-400	120	26.4	79.2	1670	833	0.288	26.4	79.2
1/35	VR □ F	-25	D	-750	120	50.7	152	2060	1030	0.680	50.7	152
	VR □ F	-25	E	-1000	120	55.7	167	2650	1320	2.71	65.4	196
	VR □ F	-35	B	-50	85	3.84	11.5	882	441	0.0300	3.84	11.5
	VR □ F	-35	C	-100	85	7.24	21.7	1670	833	0.0650	13.9	41.7
	VR □ F	-35	C	-200	85	15.5	46.6	1670	833	0.262	15.5	46.6
1/45	VR □ F	-35	D	-400	85	37.0	111	2060	1030	0.269	37.0	111
	VR □ F	-35	E	-750	85	71.0	213	3430	1715	0.473	71.0	213
	VR □ F	-45	C	-50	66	3.86	11.6	1670	833	0.0285	9.50	28.6
	VR □ F	-45	C	-100	66	9.31	28.0	1670	833	0.0285	9.50	28.6
	VR □ F	-45	D	-200	66	21.1	63.5	2060	1030	0.0256	28.3	85.2
1/81	VR □ F	-45	E	-400	66	47.5	142.5	3520	1760	0.245	57.0	171
	VR □ F	-45	E	-750	66	91.3	274	3520	1760	1.77	91.3	274
	VR □ F	-81	C	-50	37	7.02	20.8	1670	833	0.0270	9.70	29.2
	VR □ F	-81	D	-100	37	14.0	42.0	2060	1030	0.0300	17.8	53.5
1/81	VR □ F	-81	E	-200	37	36.1	108.3	3530	1765	0.240	43.3	129.9

Note 1) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.

Note 2) The max. input speed is 5000rpm. Usually set to 3000rpm or less.

Note 3) The permissible radial load is indicated on the center of the output shaft.

Note 4) All numerical values are within the range corresponding to the gear.

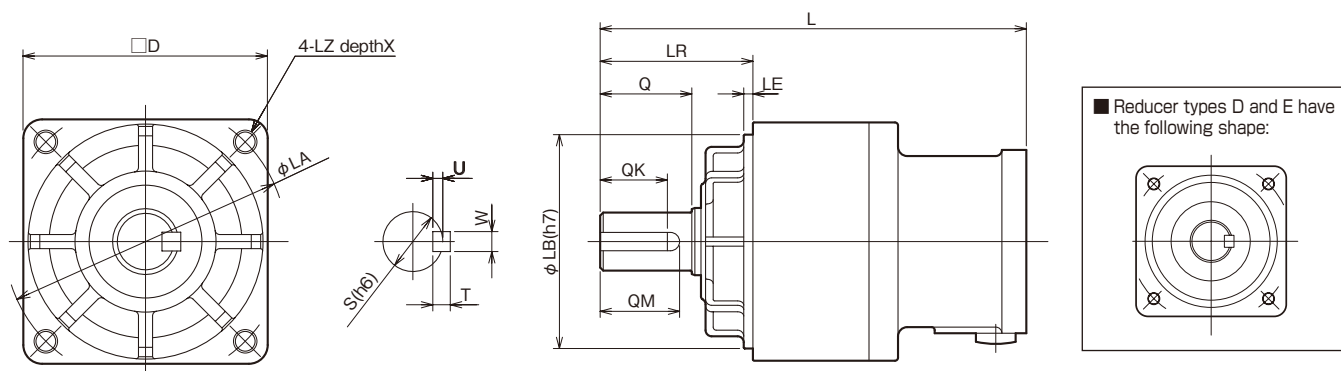
The same specification applies to all of standard type, LB(low backlash), and PB(high precision type).

Reduction ratio	Type				Output shaft speed (rpm)	Standard output torque (N · m)	Instantaneous max. output torque (N · m)	Permissible radial load (N)	Permissible thrust load (N)	Internal moment of inertia of input shaft conversion ($\times 10^{-4}$ kg·m ²)	Permissible output torque (N · m)	Instantaneous max. permissible output torque (N · m)
	Model	Reduction ratio	Type no.	Motor cap.								
1/3	VR □ F	-3	B	-50	666	0.477	1.43	450	225	0.0575	3.43	10.3
	VR □ F	-3	B	-100	666	1.05	3.15	450	225	0.135	3.43	10.3
	VR □ F	-3	B	-200	666	2.48	7.45	450	225	0.145	3.43	10.3
	VR □ F	-3	C	-400	666	5.01	15.0	900	450	0.913	6.86	20.6
	VR □ F	-3	D	-750	666	8.73	26.2	1010	505	2.43	18.3	54.9
	VR □ F	-3	D	-1000	666	12.3	37.1	1010	505	2.43	18.3	54.9
	VR □ F	-3	D	-1500	666	18.3	54.9	1010	505	2.43	18.3	54.9
	VR □ F	-3	E	-2000	666	23.7	71.2	1570	785	5.50	44.1	132
	VR □ F	-3	E	-2500	666	30.8	92.5	1570	785	5.50	44.1	132
1/5	VR □ F	-3	E	-3000	666	37.7	113	1570	785	5.50	44.1	132
	VR □ F	-3	E	-3500	666	44.1	132	1570	785	5.78	44.1	132
	VR □ F	-5	B	-50	400	0.795	2.39	560	280	0.0400	1.57	4.70
	VR □ F	-5	B	-100	400	1.57	4.70	560	280	0.118	1.57	4.70
	VR □ F	-5	C	-200	400	3.82	11.5	1120	560	0.363	6.57	19.7
	VR □ F	-5	C	-400	400	8.35	25.1	1120	560	0.713	11.5	34.3
	VR □ F	-5	D	-750	400	15.5	46.5	1230	615	1.85	23.5	70.6
	VR □ F	-5	D	-1000	400	21.5	64.4	1230	615	1.85	23.5	70.6
	VR □ F	-5	E	-1500	400	27.8	83.5	1900	950	3.50	56.8	171
1/9	VR □ F	-5	E	-2000	400	39.6	119	1900	950	3.48	56.8	171
	VR □ F	-5	E	-2500	400	51.4	154	1900	950	3.75	56.8	171
	VR □ F	-S9	B	-50	222	1.57	4.72	670	335	0.0350	2.35	7.25
	VR □ F	-S9	C	-100	222	2.35	7.04	1340	670	0.275	9.70	29.2
	VR □ F	-S9	C	-200	222	6.64	19.9	1340	670	0.275	9.70	29.2
	VR □ F	-S9	D	-400	222	14.0	41.9	1680	840	0.650	18.2	54.7
	VR □ F	-S9	E	-750	222	23.6	70.9	2240	1120	2.81	73.5	221
	VR □ F	-S9	E	-1000	222	34.3	103	2240	1120	2.81	73.5	221
	VR □ F	-S9	E	-1500	222	53.7	161	2240	1120	2.81	73.5	221
1/15	VR □ F	-S9	E	-2000	222	73.0	219	2240	1120	2.77	73.5	221
	VR □ F	-15	B	-50	133	2.62	7.87	882	441	0.0350	4.02	12.2
	VR □ F	-15	C	-100	133	3.91	11.7	1670	833	0.300	16.2	48.6
	VR □ F	-15	C	-200	133	11.1	33.2	1670	833	0.300	16.2	48.6
	VR □ F	-15	D	-400	133	23.3	69.8	2020	1010	0.700	30.4	91.2
	VR □ F	-15	E	-750	133	39.4	118	2650	1320	2.80	91.4	274
	VR □ F	-15	E	-1000	133	57.2	172	2650	1320	2.80	91.4	274
1/20	VR □ F	-15	E	-1500	133	91.3	274	2650	1320	2.80	91.4	274
	VR □ F	-20	B	-50	100	3.50	10.5	910	455	0.0340	5.00	15.0
	VR □ F	-20	C	-100	100	5.73	17.2	1790	895	0.294	21.1	63.3
	VR □ F	-20	C	-200	100	14.8	44.4	1790	895	0.294	21.1	63.3
	VR □ F	-20	D	-400	100	31.0	93.1	2180	1090	0.690	40.6	122
	VR □ F	-20	E	-750	100	52.4	157	2650	1320	2.72	78.4	235
1/25	VR □ F	-25	B	-50	80.0	4.37	13.1	882	441	0.0325	6.27	19.0
	VR □ F	-25	C	-100	80.0	7.16	21.5	1670	833	0.288	21.7	64.9
	VR □ F	-25	C	-200	80.0	18.5	55.4	1670	833	0.288	21.7	64.9
	VR □ F	-25	D	-400	80.0	38.8	116	2060	1030	0.680	50.7	152
	VR □ F	-25	E	-750	80.0	65.4	196	2650	1320	2.71	65.4	196
1/35	VR □ F	-35	C	-50	57	4.43	13.3	1900	950	0.262	15.5	46.6
	VR □ F	-35	C	-100	57	12.7	38.1	1900	950	0.262	15.5	46.6
	VR □ F	-35	D	-200	57	22.0	66.0	2340	1170	0.269	37.0	111
1/45	VR □ F	-45	C	-50	44.4	5.80	17.4	1670	833	0.0285	9.50	28.6
	VR □ F	-45	D	-100	44.4	14.0	42.1	2060	1030	0.0285	28.3	85.2
	VR □ F	-45	D	-200	44.4	28.3	85.2	2060	1030	0.0285	28.3	85.2
1/81	VR □ F	-81	C	-50	24.6	9.70	29.2	1670	833	0.0270	9.70	29.2
	VR □ F	-81	D	-100	24.6	17.8	53.5	2060	1030	0.0300	17.8	53.5

Note 1) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.

Note 2) The max. input speed is 5000rpm. Usually set to 3000rpm or less.

Note 3) All numerical values are within the range corresponding to the gear.



Able Reducer coaxial type dimensional table

(Unit: mm)

Type				Total length L			Output shaft							Flange					
Model	Reduction ratio	Type no.	Motor cap.	Panasonic-made MSMA	Yaskawa-made SGMASH SGMASH	Mitsubishi-made HC-KFS HC-RFS	LR	S	Q	QM	QK	W×U	T	D	LB	LE	LA	LZ	X
VRSF	3 · 5 · S9	B	50		99.5		32	12	20	18	16	4×2.5	4	52	50	3	60	M5	12
VRSF	15 · 20 · 25 · 35	B	50		110														
VRSF	3 · 5 · S9	B	100		99.5														
VRSF	15 · 20 · 25	B	100		110														
VRSF	3 · 5	B	200		104.5														
VRSF	3	B	400				50	19	30	26	22	6×3.5	6	78	70	3	90	M6	20
VRSF	45 · 81	C	50		142														
VRSF	35	C	100		150														
VRSF	45	C	100		142														
VRSF	S9	C	200		139.5														
VRSF	15 · 20 · 25 · 35	C	200		150														
VRSF	5 · S9	C	400		139.5														
VRSF	15 · 20 · 25	C	400		150														
VRSF	3 · 5	C	750		143.5														
VRSF	81	D	100		158		61	24	40	35	30	8×4	7	98	90	5	115	M8	20
VRSF	45	D	200		165														
VRSF	35	D	400																
VRSF	S9	D	750		158.5														
VRSF	15 · 20 · 25	D	750		171														
VRSF	3 · 5	D	1000																
VRSF	3 · 5	D	1500		177														
VRSF	3	D	2000				75	32	55	52	45	10×5	8	125	110	5	135	M10	20
VRSF	81	E	200		210														
VRSF	45	E	400																
VRSF	35	E	750																
VRSF	45	E	750		235														
VRSF	S9	E	1000		215														
VRSF	15 · 25	E	1000		235														
VRSF	S9	E	1500		215														
VRSF	15	E	1500		235														
VRSF	5 · S9	E	2000		215														
VRSF	15	E	2000		235														
VRSF	3 · 5 · S9	E	2500	215	—	—													
VRSF	3 · 5 · S9	E	3000	215	225	—													
VRSF	3 · 5	E	3500	215	—	225													
VRSF	3 · 5	E	4000	225	—	—													
VRSF	3	E	4500	225	—	—													
VRSF	3	E	5000	225	225	—													

Note 1) If a motor beyond the standard models (motor matching series) is attached, contact us. (How to measure dimensions of the motor-attached flange may be changed in some cases.)

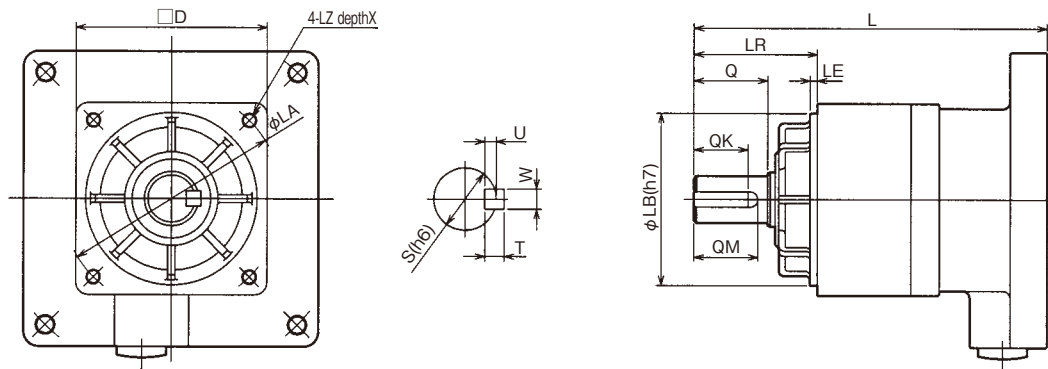
Note 2) Rotation of the output shaft is in the same direction as that of motor input.

Note 3) All numerical values are within the range corresponding to the gear.

Dimensional Drawing & Table

<Flat type-matched VRSF series>

Coaxial Shaft
VR series



Yaskawa-made (SGMPS3000rpm) (SGMP, SGMPH3000rpm)

(Unit: mm)

Type				Total length	Output shaft							Flange					
Model	Reduction ratio	Type no.	Motor cap.	L	LR	S	Q	QM	QK	W×U	T	D	LB	LE	LA	LZ	X
VRSF	3 · 5 · S9	B	100	104.5	32	12	20	18	16	4×2.5	4	52	50	3	60	M5	12
VRSF	15 · 20 · 25	B	100	110													
VRSF	3 · 5	B	200	104.5													
VRSF	3	B	400	104.5													
VRSF	35	C	100	150	50	19	30	26	22	6×3.5	6	78	70	3	90	M6	20
VRSF	45	C	100	142													
VRSF	S9	C	200	139.5													
VRSF	15 · 20 · 25 · 35	C	200	150													
VRSF	5 · S9	C	400	139.5													
VRSF	15 · 20 · 25	C	400	150													
VRSF	3 · 5	C	750	143.5	61	24	40	35	30	8×4	7	98	90	5	115	M8	20
VRSF	81	D	100	158													
VRSF	45	D	200	165													
VRSF	35	D	400	165													
VRSF	S9	D	750	158.5													
VRSF	15 · 20 · 25	D	750	171													
VRSF	3 · 5	D	1500	177	75	32	55	52	45	10×5	8	125	110	5	135	M10	20
VRSF	81	E	200	210													
VRSF	45	E	400	210													
VRSF	35	E	750	230													
VRSF	45	E	750	235													
VRSF	S9	E	1500	215													
VRSF	15	E	1500	235													

Mitsubishi Electric-made (HC-SFS2000rpm) (HF-SP2000rpm)

(Unit: mm)

Type				Total length	Output shaft							Flange					
Model	Reduction ratio	Type no.	Motor cap.	L	LR	S	Q	QM	QK	W×U	T	D	LB	LE	LA	LZ	X
VRSF	3 · 5	D	500	177	61	24	40	35	30	8×4	7	98	90	5	115	M8	20
VRSF	S9	D	500	178.5													
VRSF	15 · 20 · 25	D	500	191													
VRSF	3 · 5	D	1000	177													
VRSF	3	D	1500	177	75	32	55	52	45	10×5	8	125	110	5	135	M10	20
VRSF	35	E	500	230													
VRSF	45	E	500	235													
VRSF	S9	E	1000	215													
VRSF	15	E	1000	235													
VRSF	5 · S9	E	1500	215													
VRSF	15	E	1500	235													
VRSF	3 · 5 · S9	E	2000	245													
VRSF	3	E	3500	245													

Note 1) Rotation of the output shaft is in the same direction as that of motor input.

Note 2) All numerical values are within the range corresponding to the gear.

■ Performance Table 50W

If input speed is 3000rpm:

Rated input motor cap.	Reduction ratio	Type				Output shaft speed (rpm)	Standard output torque (N · m)	Instantaneous max. output torque (N · m)	Permissible radial load (N)	Permissible thrust load (N)	Internal moment of inertia of input shaft conversion (10 ⁻⁴ × kg · m ²)	Permissible output torque (N · m)	Instantaneous max. permissible output torque (N · m)
		Model	Reduction ratio	Type no.	Motor cap.								
50W	1/3	VRSF	3	B	50	1000	0.255	0.784	392	196	0.0575	3.43	10.3
	1/5	VRSF	5	B	50	600	0.510	1.47	490	245	0.0400	1.57	4.70
	1/9	VRSF	S9	B	50	333	0.921	2.74	588	294	0.0350	2.35	7.25
	1/15	VRSF	15	B	50	200	1.67	5.00	784	392	0.0350	4.02	12.2
	1/20	VRSF	20	B	50	150	2.21	6.63	804	402	0.0340	5.00	15.0
	1/25	VRSF	25	B	50	120	2.74	8.33	882	441	0.0325	4.02	12.2
	1/35	VRSF	35	B	50	85	3.84	11.5	882	441	0.0300	3.84	11.5
	1/45	VRSF	45	C	50	66	3.86	11.6	1670	833	0.0285	9.50	28.6
	1/81	VRSF	81	C	50	37	7.02	20.8	1670	833	0.0270	9.70	29.2

Note 1) In case of attachment to a motor beyond the standard models (motor matching series), contact us. (How to measure dimensions of the flange may be changed in some cases.)

Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.

Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.

Note 4) The permissible radial load is indicated on the center of the output shaft.

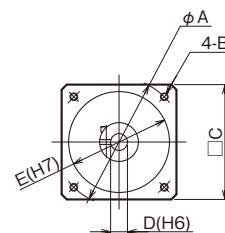
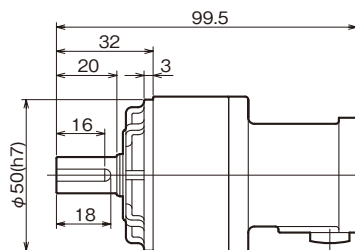
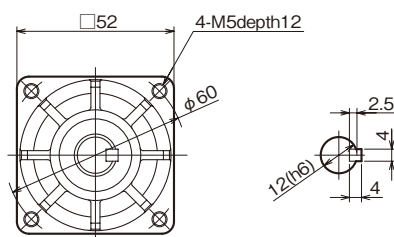
Note 5) All numerical values are within the range corresponding to the gear.

Note 6) For motor attachment procedure, see VR38 page.

Note 7) Rotation of the output shaft is in the same direction as that of motor input.

VRSF-3B · 5B · S9B-50

■ Rough weight 0.55kg ■ CAD data no. <VSB1A5□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of
TYPE1~3, see
VR31 page.

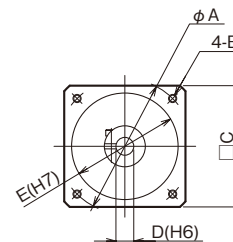
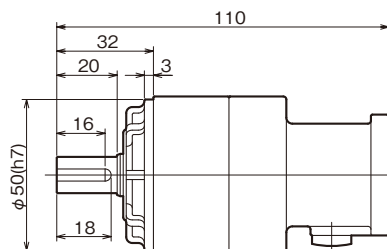
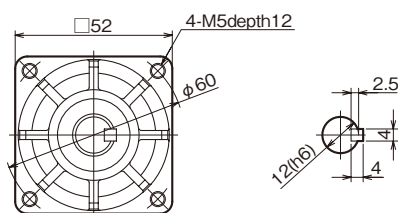
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	45	M3	38	8	30
TYPE2	46	M4	40	6	30
TYPE3	46	M4	40	8	30

※CAD data can be downloaded in the homepage.

VRSF-15B · 20B · 25B · 35B-50

■ Rough weight 0.7kg ■ CAD data no. <VSB2A5□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of
TYPE1~3, see
VR31 page.

■ Detailed flange dimensions table (Unit mm)

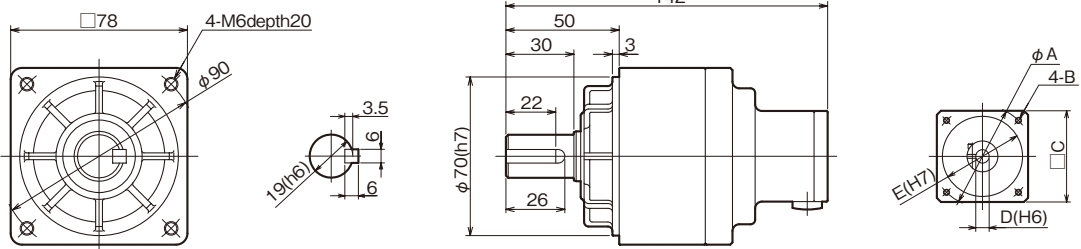
Motor type	A	B	C	D	E
TYPE1	45	M3	38	8	30
TYPE2	46	M4	40	6	30
TYPE3	46	M4	40	8	30

※CAD data can be downloaded in the homepage.

VRSF-45C · 81C-50

■ Rough weight 1.7kg ■ CAD data no.<VSC2A5□1>

P : TYPE1
Y : TYPE2
M : TYPE3
For details of
TYPE1~3, see
VR31 page.



■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	45	M3	38	8	30
TYPE2	46	M4	40	6	30
TYPE3	46	M4	40	8	30

※CAD data can be downloaded in the homepage.

Performance Table 100W

If input speed is 3000rpm:

Rated input motor cap.	Reduction ratio	Type				Output shaft speed (rpm)	Standard output torque (N · m)	Instantaneous max. output torque (N · m)	Permissible radial load (N)	Permissible thrust load (N)	Internal moment of inertia of input shaft conversion (10 ⁻⁴ × kg · m ²)	Permissible output torque (N · m)	Instantaneous max. permissible output torque (N · m)
		Model	Reduction ratio	Type no.	Motor cap.								
100W	1/3	VRSF	3	B	100	1000	0.715	2.06	392	196	0.0575	3.43	10.3
	1/5	VRSF	5	B	100	600	1.18	3.72	490	245	0.0400	1.57	4.70
	1/9	VRSF	S9	B	100	333	2.25	6.86	588	294	0.0350	2.35	7.25
	1/15	VRSF	15	B	100	200	3.72	11.4	784	392	0.0350	4.02	12.2
	1/20	VRSF	20	B	100	150	5.00	15.0	804	402	0.0340	5.00	15.0
	1/25	VRSF	25	B	100	120	6.27	19.0	882	441	0.0325	6.27	19.0
	1/35	VRSF	35	C	100	85	7.24	21.7	1670	833	0.0650	13.9	41.7
	1/45	VRSF	45	C	100	66	9.31	28.0	1670	833	0.0285	9.50	28.6
	1/81	VRSF	81	D	100	37	14.0	42.0	2060	1030	0.0300	17.8	53.5

Note 1) In case of attachment to a motor beyond the standard models (motor matching series), contact us. (How to measure dimensions of the flange may be changed in some cases.)

Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.

Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.

Note 4) The permissible radial load is indicated on the center of the output shaft.

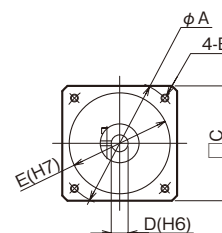
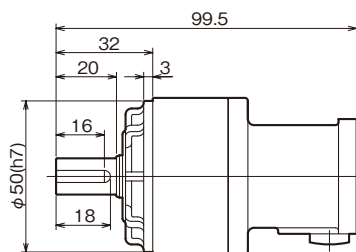
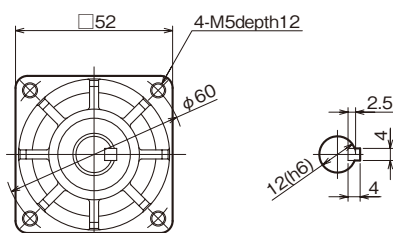
Note 5) All numerical values are within the range corresponding to the gear.

Note 6) For motor attachment procedure, see VR38 page.

Note 7) Rotation of the output shaft is in the same direction as that of motor input.

VRSF-3B · 5B · S9B-100

■ Rough weight 0.55kg ■ CAD data no. <VSB101□1>



P : TYPE1
Y : TYPE2
M : TYPE3

For details of TYPE1~3, see VR31 page.

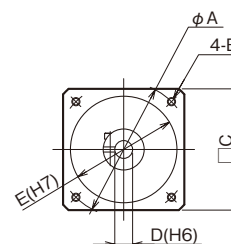
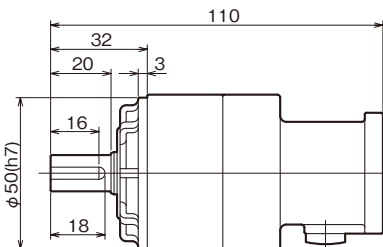
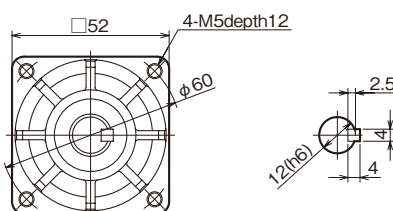
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	45	M3	38	8	30
TYPE2	46	M4	40	8	30
TYPE3	46	M4	40	8	30

※CAD data can be downloaded in the homepage.

VRSF-15B · 20B · 25B-100

■ Rough weight 0.7kg ■ CAD data no. <VSB201□1>



P : TYPE1
Y : TYPE2
M : TYPE3

For details of TYPE1~3, see VR31 page.

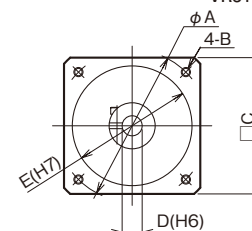
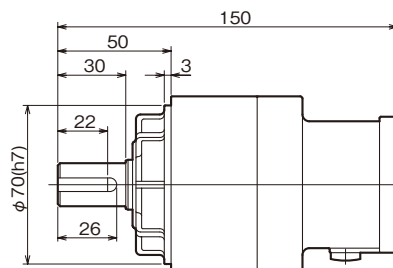
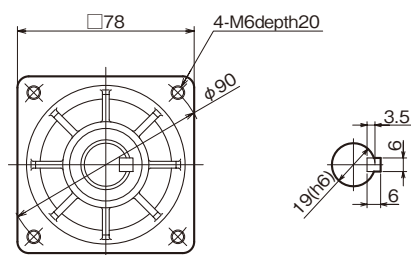
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	45	M3	38	8	30
TYPE2	46	M4	40	8	30
TYPE3	46	M4	40	8	30

※CAD data can be downloaded in the homepage.

VRSF-35C-100

■ Rough weight 2.0kg ■ CAD data no.<VSC201□1S>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of
TYPE1~3, see
VR31 page.

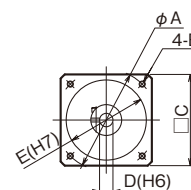
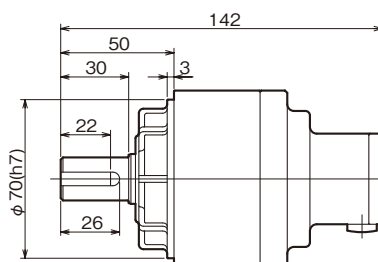
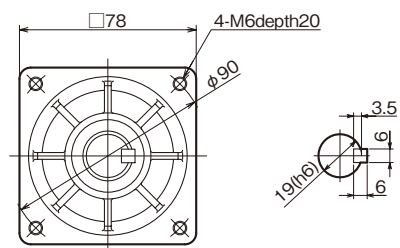
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	45	M3	38	8	30
TYPE2	46	M4	40	8	30
TYPE3	46	M4	40	8	30

※CAD data can be downloaded in the homepage.

VRSF-45C-100

■ Rough weight 1.7kg ■ CAD data no.<VSC201□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of
TYPE1~3, see
VR31 page.

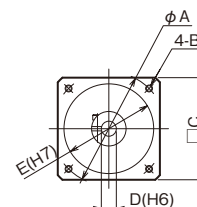
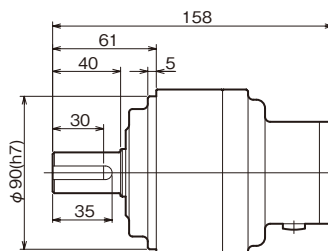
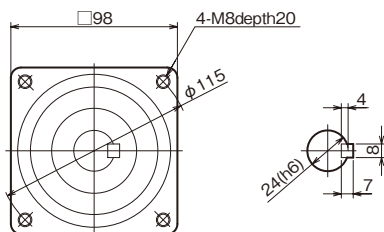
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	45	M3	38	8	30
TYPE2	46	M4	40	8	30
TYPE3	46	M4	40	8	30

※CAD data can be downloaded in the homepage.

VRSF-81D-100

■ Rough weight 3.0kg ■ CAD data no.<VSD201□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of
TYPE1~3, see
VR31 page.

■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	45	M3	38	8	30
TYPE2	46	M4	40	8	30
TYPE3	46	M4	40	8	30

※CAD data can be downloaded in the homepage.

■ Performance Table 200W

If input speed is 3000rpm:

Rated input motor cap.	Reduction ratio	Type				Output shaft speed (rpm)	Standard output torque (N · m)	Instantaneous max. output torque (N · m)	Permissible radial load (N)	Permissible thrust load (N)	Internal moment of inertia of input shaft conversion (10 ⁻⁴ × kg · m ²)	Permissible output torque (N · m)	Instantaneous max. permissible output torque (N · m)
		Model	Reduction ratio	Type no.	Motor cap.								
200W	1/3	VRSF	3	B	200	1000	1.47	4.51	392	196	0.135	3.43	10.3
	1/5	VRSF	5	B	200	600	2.65	8.04	490	245	0.118	2.84	8.53
	1/9	VRSF	S9	C	200	333	3.72	11.3	1180	588	0.275	9.70	29.2
	1/15	VRSF	15	C	200	200	6.27	18.8	1470	735	0.300	16.2	48.6
	1/20	VRSF	20	C	200	150	8.69	26.1	1570	785	0.294	21.1	63.3
	1/25	VRSF	25	C	200	120	11.1	33.3	1670	833	0.288	21.7	64.9
	1/35	VRSF	35	C	200	85	15.5	46.6	1670	833	0.262	15.5	46.6
	1/45	VRSF	45	D	200	66	21.1	63.5	2060	1030	0.0256	28.3	85.2
	1/81	VRSF	81	E	200	37	36.1	108.3	3530	1765	0.240	43.3	129.9

Note 1) In case of attachment to a motor beyond the standard models (motor matching series), contact us. (How to measure dimensions of the flange may be changed in some cases.)

Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.

Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.

Note 4) The permissible radial load is indicated on the center of the output shaft.

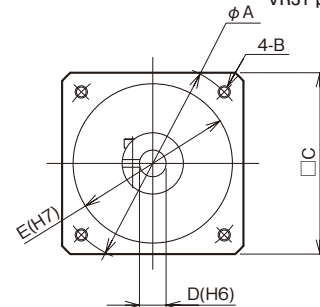
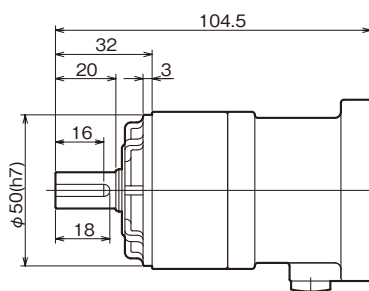
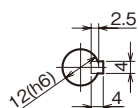
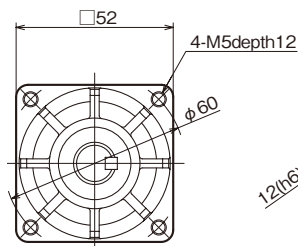
Note 5) All numerical values are within the range corresponding to the gear.

Note 6) For motor attachment procedure, see VR38 page.

Note 7) Rotation of the output shaft is in the same direction as that of motor input.

VRSF-3B · 5B-200

■ Rough weight 0.72kg ■ CAD data no. <VSB102□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of TYPE1~3, see VR31 page.

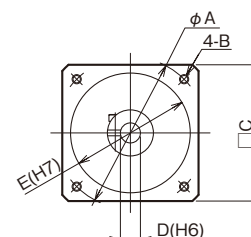
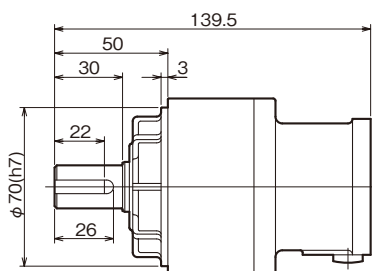
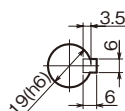
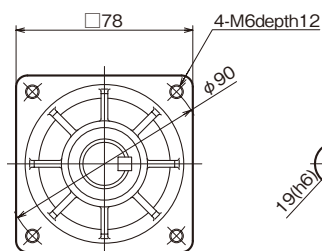
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	70	M4	60	11	50
TYPE2	70	M5	60	14	50
TYPE3	70	M5	60	14	50

※CAD data can be downloaded in the homepage.

VRSF-S9C-200

■ Rough weight 1.7kg ■ CAD data no. <VSC102□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of TYPE1~3, see VR31 page.

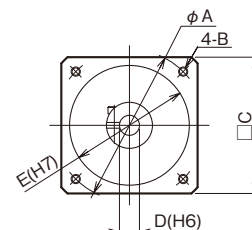
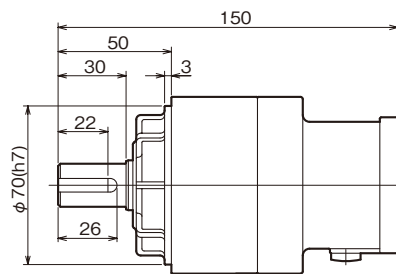
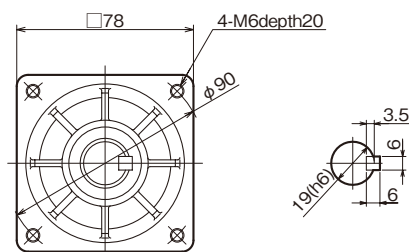
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	70	M4	60	11	50
TYPE2	70	M5	60	14	50
TYPE3	70	M5	60	14	50

※CAD data can be downloaded in the homepage.

VRSF-15C · 20C · 25C · 35C-200

■ Rough weight 2.1kg ■ CAD data no.<VSC202□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of
TYPE1~3, see
VR31 page.

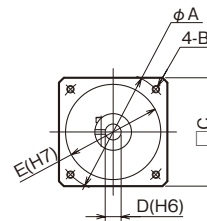
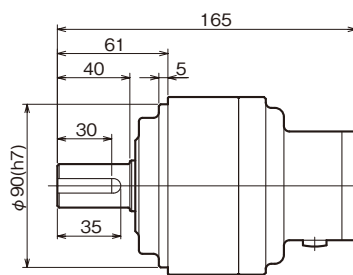
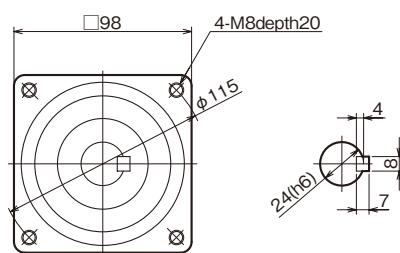
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	70	M4	60	11	50
TYPE2	70	M5	60	14	50
TYPE3	70	M5	60	14	50

※CAD data can be downloaded in the homepage.

VRSF-45D-200

■ Rough weight 3.2kg ■ CAD data no.<VSD202□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of
TYPE1~3, see
VR31 page.

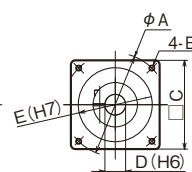
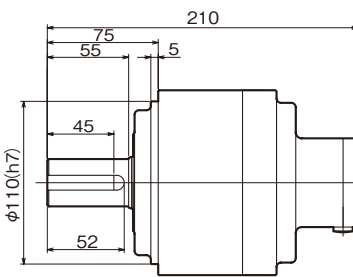
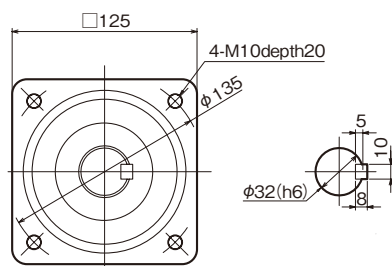
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	70	M4	60	11	50
TYPE2	70	M5	60	14	50
TYPE3	70	M5	60	14	50

※CAD data can be downloaded in the homepage.

VRSF-81E-200

■ Rough weight 7.2kg ■ CAD data no.<VSE202□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of
TYPE1~3, see
VR31 page.

■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	70	M4	60	11	50
TYPE2	70	M5	60	14	50
TYPE3	70	M5	60	14	50

※CAD data can be downloaded in the homepage.

■ Performance Table 400W

If input speed is 3000rpm:

Rated input motor cap.	Reduction ratio	Type				Output shaft speed (rpm)	Standard output torque (N · m)	Instantaneous max. output torque (N · m)	Permissible radial load (N)	Permissible thrust load (N)	Internal moment of inertia of input shaft conversion (10 ⁻⁴ × kg · m ²)	Permissible output torque (N · m)	Instantaneous max. permissible output torque (N · m)
		Model	Reduction ratio	Type no.	Motor cap.								
400W	1/3	VRSF	3	B	400	1000	3.43	10.3	392	196	0.145	3.43	10.3
	1/5	VRSF	5	C	400	600	5.39	16.2	980	490	0.363	6.57	19.7
	1/9	VRSF	S9	C	400	333	9.51	28.5	1180	588	0.275	9.70	29.2
	1/15	VRSF	15	C	400	200	15.8	47.5	1470	735	0.300	16.2	48.6
	1/20	VRSF	20	C	400	150	21.1	63.3	1570	785	0.294	21.1	63.3
	1/25	VRSF	25	C	400	120	26.4	79.2	1670	833	0.288	26.4	79.2
	1/35	VRSF	35	D	400	85	37.0	111	2060	1030	0.269	37.0	111
	1/45	VRSF	45	E	400	66	47.5	142.5	3520	1760	0.245	57	171

Note 1) In case of attachment to a motor beyond the standard models (motor matching series), contact us. (How to measure dimensions of the flange may be changed in some cases.)

Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.

Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.

Note 4) The permissible radial load is indicated on the center of the output shaft.

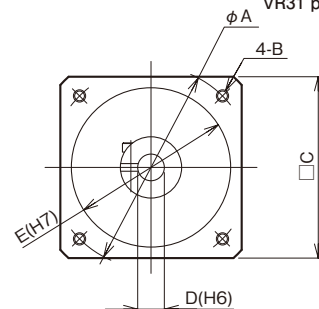
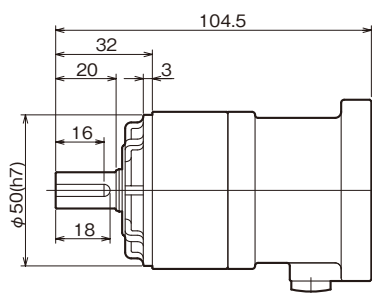
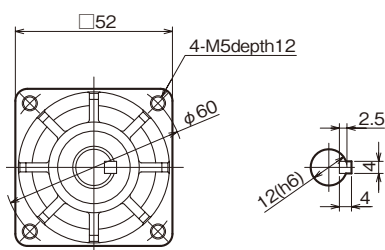
Note 5) All numerical values are within the range corresponding to the gear.

Note 6) For motor attachment procedure, see VR38 page.

Note 7) Rotation of the output shaft is in the same direction as that of motor input.

VRSF-3B-400

■ Rough weight 0.71kg ■ CAD data no. <VSB104□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of TYPE1~3, see VR31 page.

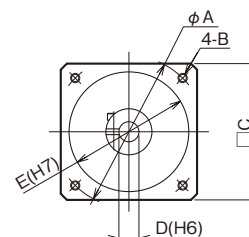
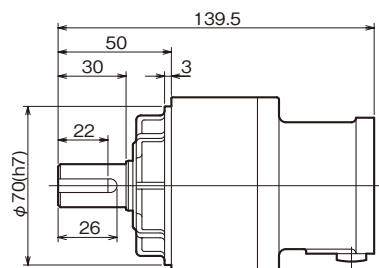
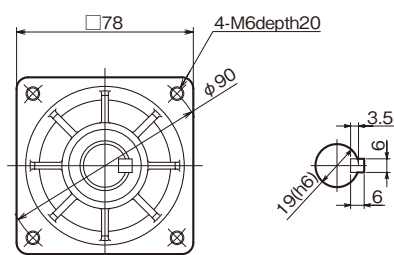
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	70	M4	60	14	50
TYPE2	70	M5	60	14	50
TYPE3	70	M5	60	14	50

※CAD data can be downloaded in the homepage.

VRSF-5C · S9C-400

■ Rough weight 1.7kg ■ CAD data no. <VSC104□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of TYPE1~3, see VR31 page.

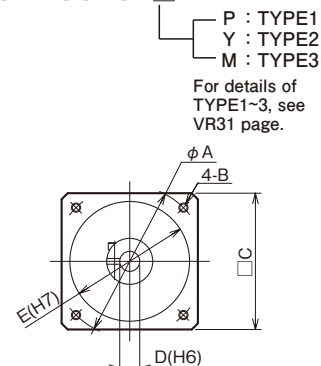
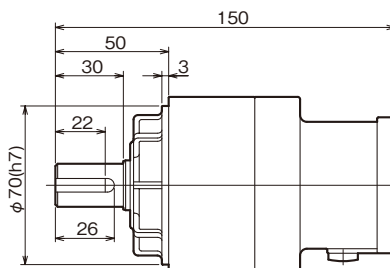
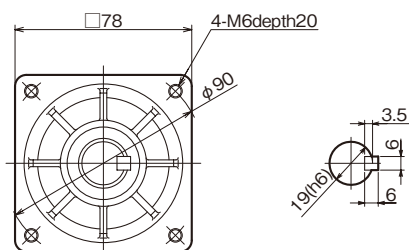
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	70	M4	60	14	50
TYPE2	70	M5	60	14	50
TYPE3	70	M5	60	14	50

※CAD data can be downloaded in the homepage.

VRSF-15C · 20C · 25C-400

■ Rough weight 2.1kg ■ CAD data no.<VSC204□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of TYPE1~3, see VR31 page.

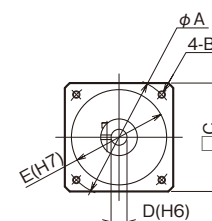
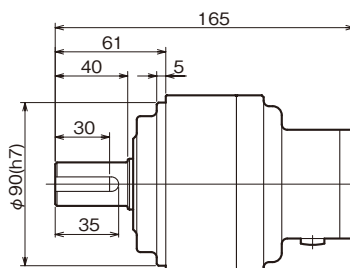
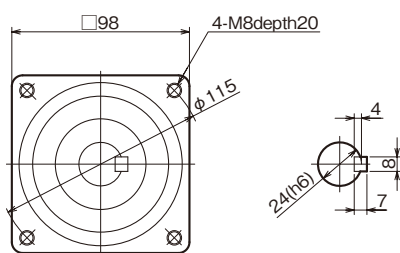
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	70	M4	60	14	50
TYPE2	70	M5	60	14	50
TYPE3	70	M5	60	14	50

※CAD data can be downloaded in the homepage.

VRSF-35D-400

■ Rough weight 3.2kg ■ CAD data no.<VSD204□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of TYPE1~3, see VR31 page.

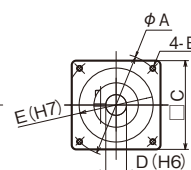
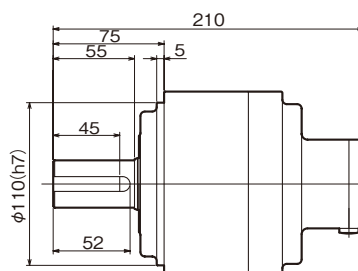
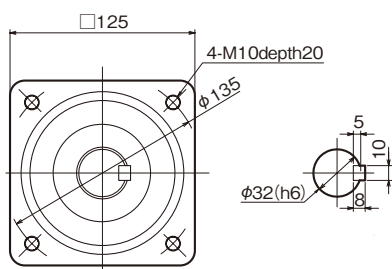
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	70	M4	60	14	50
TYPE2	70	M5	60	14	50
TYPE3	70	M5	60	14	50

※CAD data can be downloaded in the homepage.

VRSF-45E-400

■ Rough weight 7.2kg ■ CAD data no.<VSE204□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of TYPE1~3, see VR31 page.

■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	70	M4	60	14	50
TYPE2	70	M5	60	14	50
TYPE3	70	M5	60	14	50

※CAD data can be downloaded in the homepage.

■ Performance Table 750W

If input speed is 3000rpm:

Rated input motor cap.	Reduction ratio	Type				Output shaft speed (rpm)	Standard output torque (N · m)	Instantaneous max. output torque (N · m)	Permissible radial load (N)	Permissible thrust load (N)	Internal moment of inertia of input shaft conversion (10 ⁻⁴ × kg · m ²)	Permissible output torque (N · m)	Instantaneous max. permissible output torque (N · m)
		Model	Reduction ratio	Type no.	Motor cap.								
750W	1/3	VRSF	3	C	750	1000	6.37	19.3	784	392	0.913	6.86	20.6
	1/5	VRSF	5	C	750	600	10.7	32.1	980	490	0.713	11.5	34.3
	1/9	VRSF	S9	D	750	333	18.2	54.7	1470	735	0.650	18.2	54.7
	1/15	VRSF	15	D	750	200	30.4	91.2	1760	882	0.700	30.4	91.2
	1/20	VRSF	20	D	750	150	40.6	122	1910	955	0.690	40.6	122
	1/25	VRSF	25	D	750	120	50.7	152	2060	1030	0.680	50.7	152
	1/35	VRSF	35	E	750	85	71.0	213	3430	1715	0.473	71.0	213
	1/45	VRSF	45	E	750	66	91.3	274	3520	1760	1.77	91.3	274

Note 1) In case of attachment to a motor beyond the standard models (motor matching series), contact us. (How to measure dimensions of the flange may be changed in some cases.)

Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.

Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.

Note 4) The permissible radial load is indicated on the center of the output shaft.

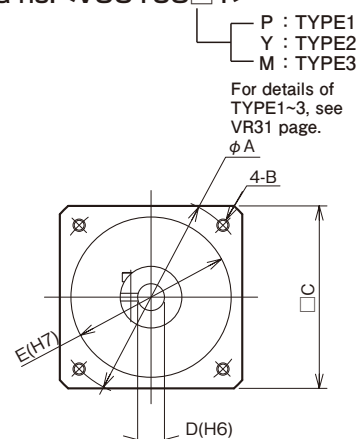
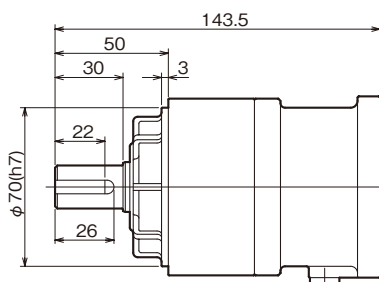
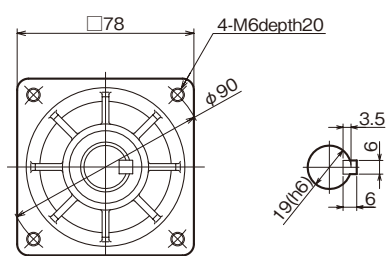
Note 5) All numerical values are within the range corresponding to the gear.

Note 6) For motor attachment procedure, see VR38 page.

Note 7) Rotation of the output shaft is in the same direction as that of motor input.

VRSF-3C · 5C-750

■ Rough weight 2.1kg ■ CAD data no. <VSC108□1>



P : TYPE1
Y : TYPE2
M : TYPE3

For details of TYPE1~3, see VR31 page.

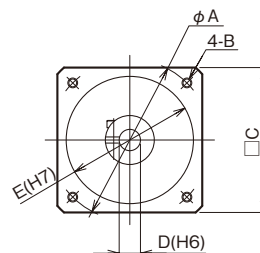
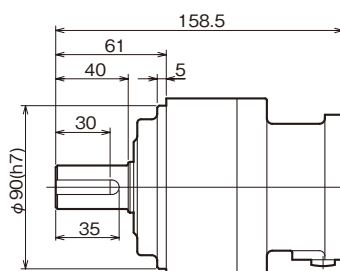
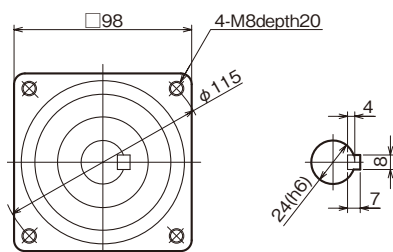
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	90	M5	80	19	70
TYPE2	90	M6	80	16	70
TYPE3	90	M6	80	19	70

※CAD data can be downloaded in the homepage.

VRSF-S9D-750

■ Rough weight 3.4kg ■ CAD data no. <VSD108□1>



P : TYPE1
Y : TYPE2
M : TYPE3

For details of TYPE1~3, see VR31 page.

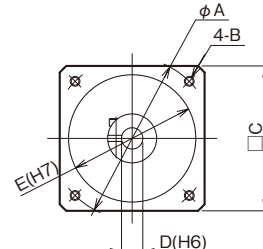
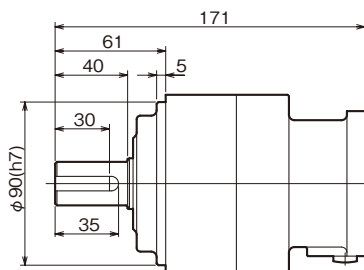
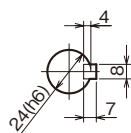
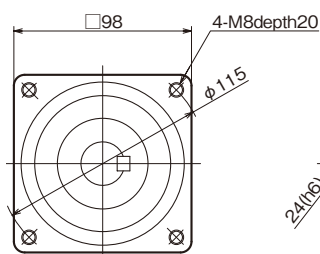
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	90	M5	80	19	70
TYPE2	90	M6	80	16	70
TYPE3	90	M6	80	19	70

※CAD data can be downloaded in the homepage.

VRSF-15D · 20D · 25D-750

■ Rough weight 3.8kg ■ CAD data no.<VSD208□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of
TYPE1~3, see
VR31 page.

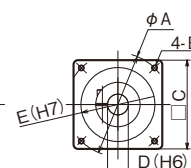
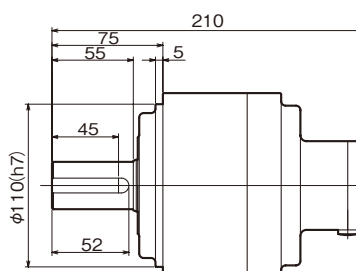
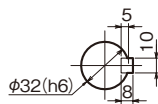
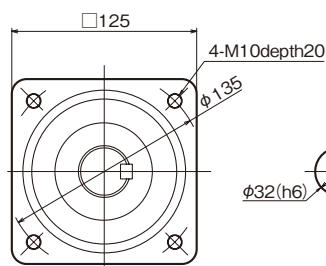
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	90	M5	80	19	70
TYPE2	90	M6	80	16	70
TYPE3	90	M6	80	19	70

※CAD data can be downloaded in the homepage.

VRSF-35E-750

■ Rough weight 7.2kg ■ CAD data no.<VSE208□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of
TYPE1~3, see
VR31 page.

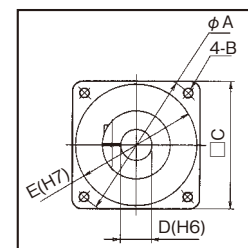
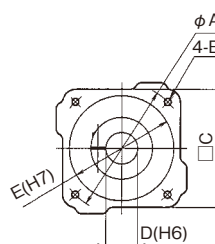
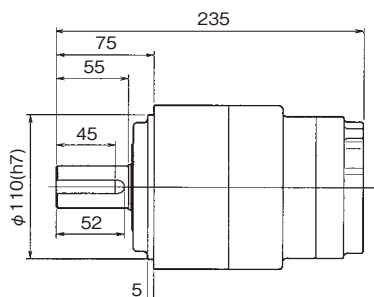
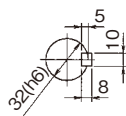
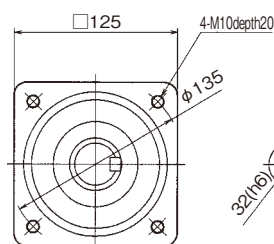
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	90	M5	80	19	70
TYPE2	90	M6	80	16	70
TYPE3	90	M6	80	19	70

※CAD data can be downloaded in the homepage.

VRSF-45E-750

■ Rough weight 12.0kg ■ CAD data no.<VSE208□1S>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of
TYPE1~3, see
VR31 page.

※ TYPE2 and 3 have the form as
shown in the above figure.

■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	90	M5	80	19	70
TYPE2	90	M6	80	16	70
TYPE3	90	M6	80	19	70

※CAD data can be downloaded in the homepage.

■ Performance Table 1000W

If input speed is 3000rpm:

Rated input motor cap.	Reduction ratio	Type				Output shaft speed (rpm)	Standard output torque (N · m)	Instantaneous max. output torque (N · m)	Permissible radial load (N)	Permissible thrust load (N)	Internal moment of inertia of input shaft conversion (10 ⁻⁴ × kg · m ²)	Permissible output torque (N · m)	Instantaneous max. permissible output torque (N · m)
		Model	Reduction ratio	Type no.	Motor cap.								
1000W	1/3	VRSF	3	D	1000	1000	7.55	22.8	882	441	2.43	18.3	54.9
	1/5	VRSF	5	D	1000	600	13.4	40.5	1080	539	1.85	23.5	70.6
	1/9	VRSF	S9	E	1000	333	20.0	60.1	1960	980	2.81	73.5	221
	1/15	VRSF	15	E	1000	200	33.3	100	2350	1180	1.95	91.4	274
	1/25	VRSF	25	E	1000	120	55.7	167	2650	1320	1.88	65.4	196

Note 1) In case of attachment to a motor beyond the standard models (motor matching series), contact us. (How to measure dimensions of the flange may be changed in some cases.)

Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.

Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.

Note 4) The permissible radial load is indicated on the center of the output shaft.

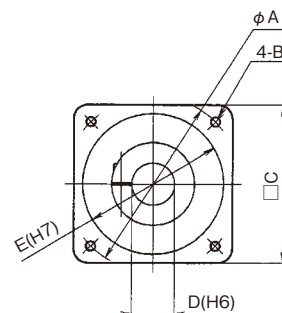
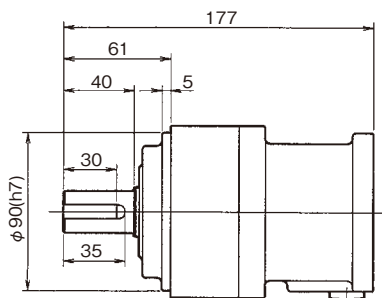
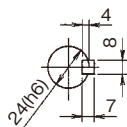
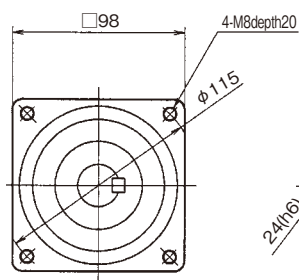
Note 5) All numerical values are within the range corresponding to the gear.

Note 6) For motor attachment procedure, see VR38 page.

Note 7) Rotation of the output shaft is in the same direction as that of motor input.

VRSF-3D · 5D-1000

■ Rough weight 3.9kg ■ CAD data no. <VSD110□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of TYPE1~3, see VR32 page.

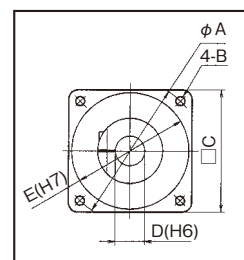
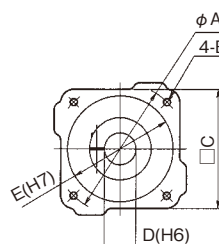
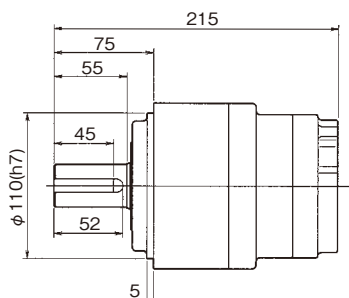
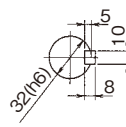
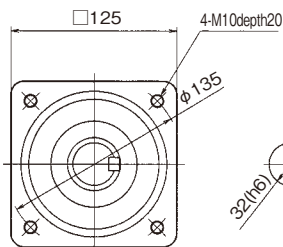
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	100	M6	90	19	80
TYPE2	115	M6	100	24	95
TYPE3	115	M8	100	24	95

※CAD data can be downloaded in the homepage.

VRSF-S9E-1000

■ Rough weight 11kg ■ CAD data no. <VSE110□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of TYPE1~3, see VR32 page.

※ TYPE2 and 3 have the form as shown in the above figure.

■ Detailed flange dimensions table (Unit mm)

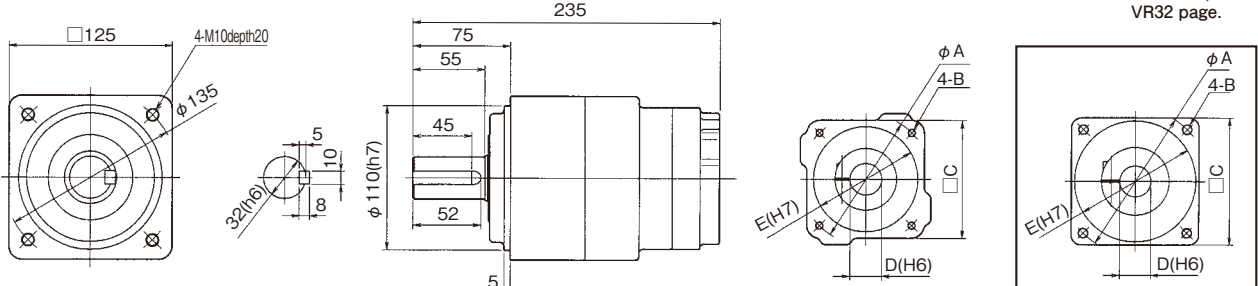
Motor type	A	B	C	D	E
TYPE1	100	M6	90	19	80
TYPE2	115	M6	100	24	95
TYPE3	115	M8	100	24	95

※CAD data can be downloaded in the homepage.

VRSF-15E・25E-1000

■ Rough weight 12kg ■ CAD data no.<VSE210□1>

P : TYPE1
Y : TYPE2
M : TYPE3
For details of
TYPE1~3, see
VR32 page.



※ TYPE2 and 3 have the form as
shown in the above figure.

■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	100	M6	90	19	80
TYPE2	115	M6	100	24	95
TYPE3	115	M8	100	24	95

※CAD data can be downloaded in the homepage.

Performance Table 1500W

If input speed is 3000rpm:

Rated input motor cap.	Reduction ratio	Type				Output shaft speed (rpm)	Standard output torque (N · m)	Instantaneous max. output torque (N · m)	Permissible radial load (N)	Permissible thrust load (N)	Internal moment of inertia of input shaft conversion (10 ⁻⁴ × kg · m ²)	Permissible output torque (N · m)	Instantaneous max. permissible output torque (N · m)
		Model	Reduction ratio	Type no.	Motor cap.								
1500W	1/3	VRSF	3	D	1500	1000	12.3	37.1	882	441	2.43	18.3	54.9
	1/5	VRSF	5	D	1500	600	21.5	64.4	1080	539	1.85	23.5	70.6
	1/9	VRSF	S9	E	1500	333	34.3	103	1960	980	2.81	73.5	221
	1/15	VRSF	15	E	1500	200	57.2	172	2350	1180	2.80	91.4	274

Note 1) In case of attachment to a motor beyond the standard models (motor matching series), contact us. (How to measure dimensions of the flange may be changed in some cases.)

Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.

Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.

Note 4) The permissible radial load is indicated on the center of the output shaft.

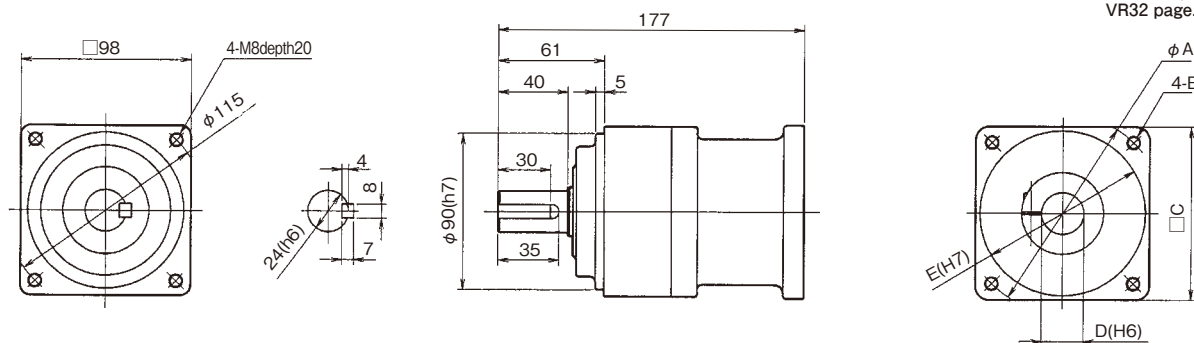
Note 5) All numerical values are within the range corresponding to the gear.

Note 6) For motor attachment procedure, see VR38 page.

Note 7) Rotation of the output shaft is in the same direction EF as that of motor input.

VRSF-3D · 5D-1500

■ Rough weight 3.9kg ■ CAD data no. <VSD115□1>



P : TYPE1
Y : TYPE2
M : TYPE3

For details of TYPE1~3, see VR32 page.

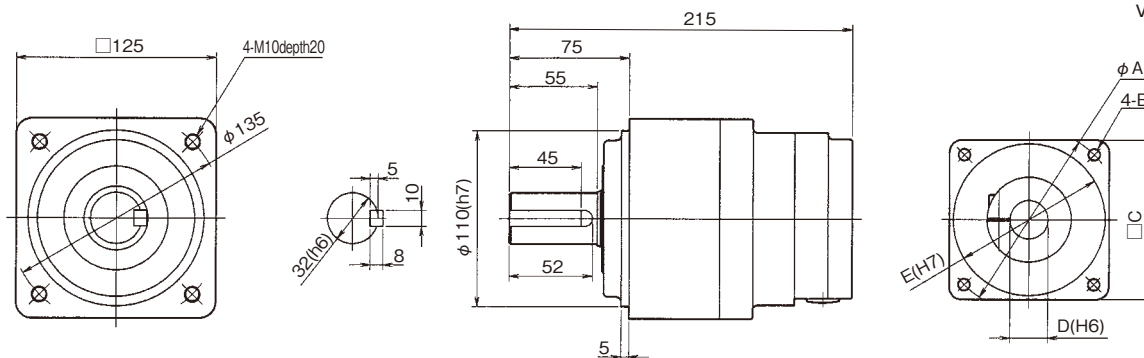
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	115	M8	100	19	95
TYPE2	115	M6	100	24	95
TYPE3	115	M8	100	24	95

※CAD data can be downloaded in the homepage.

VRSF-S9E-1500

■ Rough weight 11.5kg ■ CAD data no. <VSE115□1>



P : TYPE1
Y : TYPE2
M : TYPE3

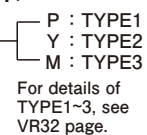
For details of TYPE1~3, see VR32 page..

■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	115	M8	100	19	95
TYPE2	115	M6	100	24	95
TYPE3	115	M8	100	24	95

※CAD data can be downloaded in the homepage.

■ Rough weight 12.5kg ■ CAD data no.<VSE215□1>



■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	115	M8	100	19	95
TYPE2	115	M6	100	24	95
TYPE3	115	M8	100	24	95

※CAD data can be downloaded in the homepage.

■ Performance Table 2000W

If input speed is 3000rpm:

Rated input motor cap.	Reduction ratio	Type				Output shaft speed (rpm)	Standard output torque (N · m)	Instantaneous max. output torque (N · m)	Permissible radial load (N)	Permissible thrust load (N)	Internal moment of inertia of input shaft conversion (10 ⁻⁴ × kg · m ²)	Permissible output torque (N · m)	Instantaneous max. permissible output torque (N · m)
		Model	Reduction ratio	Type no.	Motor cap.								
2000W	1/3	VRSF	3	D	2000	1000	17.2	51.5	882	441	2.43	18.3	54.9
	1/5	VRSF	5	E	2000	600	23.8	71.5	1670	833	3.50	56.8	171
	1/9	VRSF	S9	E	2000	333	48.6	146	1960	980	2.81	73.5	221
	1/15	VRSF	15	E	2000	200	81.0	243	2350	1180	2.80	91.4	274

Note 1) In case of attachment to a motor beyond the standard models (motor matching series), contact us. (How to measure dimensions of the flange may be changed in some cases.)

Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.

Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.

Note 4) The permissible radial load is indicated on the center of the output shaft.

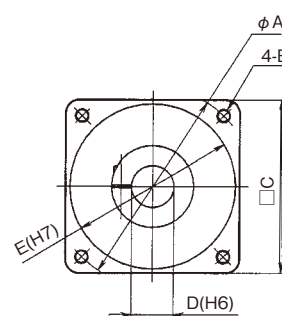
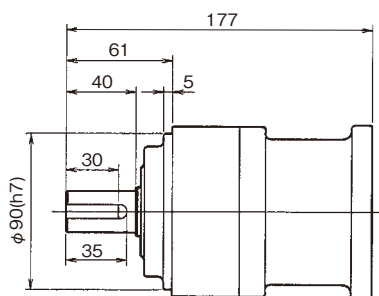
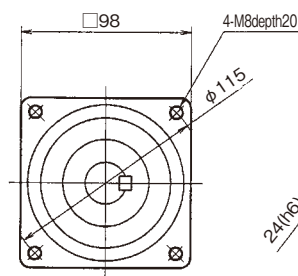
Note 5) All numerical values are within the range corresponding to the gear.

Note 6) For motor attachment procedure, see VR38 page.

Note 7) Rotation of the output shaft is in the same direction EF as that of motor input.

VRSF-3D-2000

■ Rough weight 3.9kg ■ CAD data no. <VSD120□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of TYPE1~3, see VR32 page.

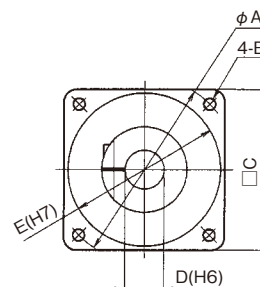
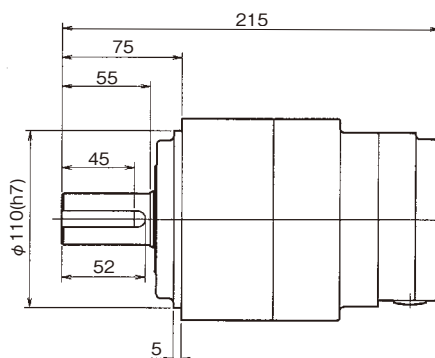
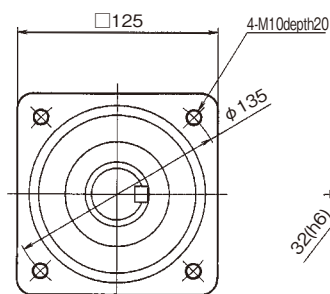
■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	115	M8	100	19	95
TYPE2	115	M6	100	24	95
TYPE3	115	M8	100	24	95

※CAD data can be downloaded in the homepage.

VRSF-5E · S9E-2000

■ Rough weight 11.5kg ■ CAD data no. <VSE120□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of TYPE1~3, see VR32 page.

■ Detailed flange dimensions table (Unit mm)

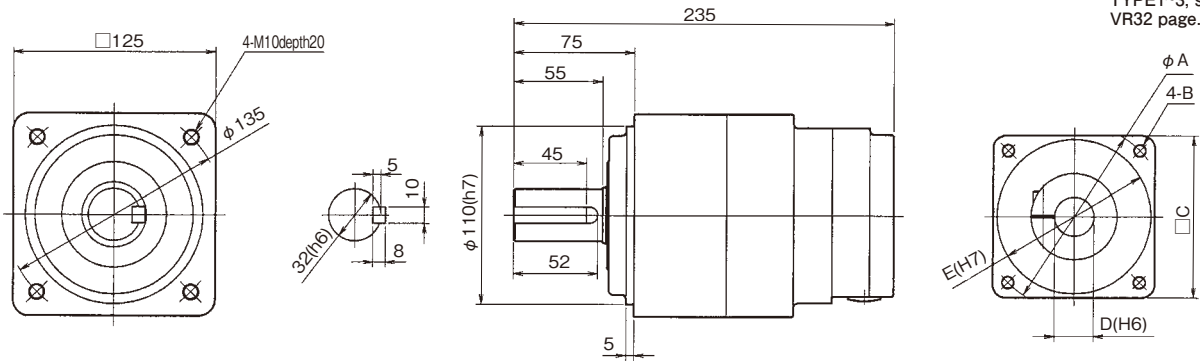
Motor type	A	B	C	D	E
TYPE1	115	M8	100	19	95
TYPE2	115	M6	100	24	95
TYPE3	115	M8	100	24	95

※CAD data can be downloaded in the homepage.

VRSF-15E-2000

■ Rough weight 12.5kg ■ CAD data no.<VSE22□1>

P : TYPE1
Y : TYPE2
M : TYPE3
For details of
TYPE1~3, see
VR32 page.



■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	115	M8	100	19	95
TYPE2	115	M6	100	24	95
TYPE3	115	M8	100	24	95

※CAD data can be downloaded in the homepage.

■ Performance Table 2500W

If input speed is 3000rpm:

Rated input motor cap.	Reduction ratio	Type				Output shaft speed (rpm)	Standard output torque (N · m)	Instantaneous max. output torque (N · m)	Permissible radial load (N)	Permissible thrust load (N)	Internal moment of inertia of input shaft conversion (10 ⁻⁴ × kg · m ²)	Permissible output torque (N · m)	Instantaneous max. permissible output torque (N · m)
		Model	Reduction ratio	Type no.	Motor cap.								
2500W	1/3	VRSF	3	E	2500	1000	19.0	57.2	1370	686	5.55	44.1	132
	1/5	VRSF	5	E	2500	600	31.8	95.5	1670	833	3.50	56.8	171
	1/9	VRSF	S9	E	2500	333	60.8	182	1960	980	2.81	73.5	221

Note 1) In case of attachment to a motor beyond the standard models (motor matching series), contact us. (How to measure dimensions of the flange may be changed in some cases.)

Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.

Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.

Note 4) The permissible radial load is indicated on the center of the output shaft.

Note 5) All numerical values are within the range corresponding to the gear.

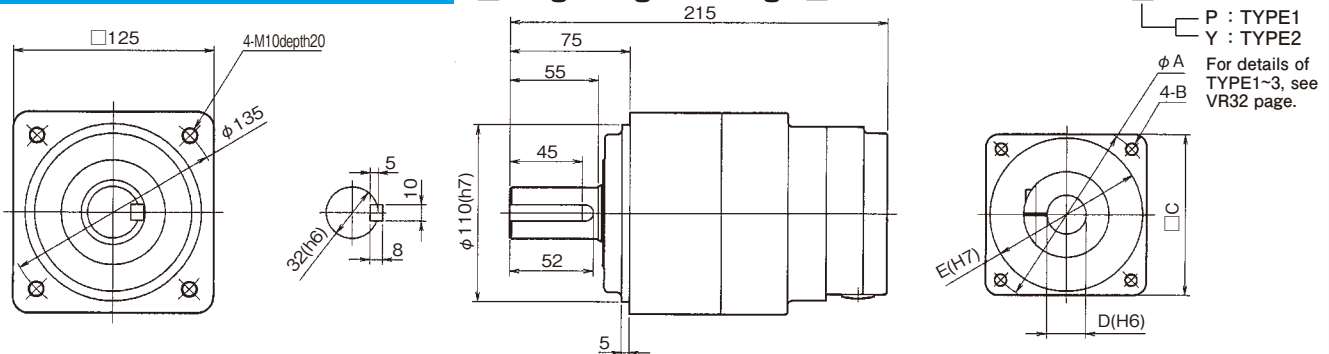
Note 6) For motor attachment procedure, see VR38 page.

Note 7) Rotation of the output shaft is in the same direction as that of motor input.

VRSF-3E · 5E · S9E-2500

■ Rough weight 11.5kg

■ CAD data no. <VSE125□1>



■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	115	M8	100	19	95
TYPE2	115	M6	100	24	95
TYPE3	—	—	—	—	—

※CAD data can be downloaded in the homepage.

■ Performance Table 3000W

If input speed is 3000rpm:

Rated input motor cap.	Reduction ratio	Type				Output shaft speed (rpm)	Standard output torque (N · m)	Instantaneous max. output torque (N · m)	Permissible radial load (N)	Permissible thrust load (N)	Internal moment of inertia of input shaft conversion (10 ⁻⁴ × kg · m ²)	Permissible output torque (N · m)	Instantaneous max. permissible output torque (N · m)
		Model	Reduction ratio	Type no.	Motor cap.								
3000W	1/3	VRSF	3	E	3000	1000	23.7	71.2	1370	686	5.50	44.1	132
	1/5	VRSF	5	E	3000	600	39.6	119	1670	833	3.48	56.8	171
	1/9	VRSF	S9	E	3000	333	73.0	219	1960	980	2.77	73.5	221

Note 1) In case of attachment to a motor beyond the standard models (motor matching series), contact us. (How to measure dimensions of the flange may be changed in some cases.)

Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.

Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.

Note 4) The permissible radial load is indicated on the center of the output shaft.

Note 5) All numerical values are within the range corresponding to the gear.

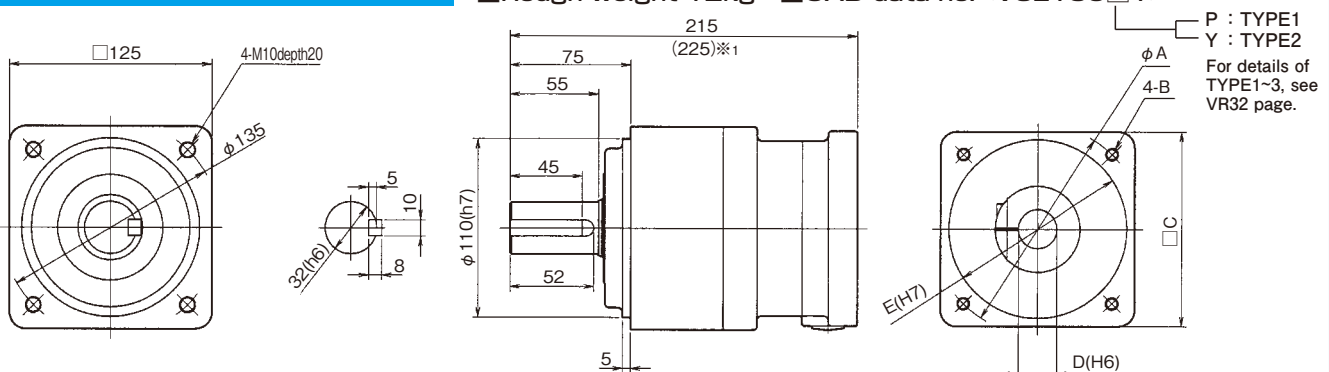
Note 6) For motor attachment procedure, see VR38 page.

Note 7) Rotation of the output shaft is in the same direction as that of motor input.

VRSF-3E · 5E · S9E-3000

■ Rough weight 12kg

■ CAD data no. <VSE130□1>



※1 TYPE2 has the numerical value indicated in ().

■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	130	M8	120	22	110
TYPE2	145	M8	130	28	110
TYPE3	—	—	—	—	—

※CAD data can be downloaded in the homepage.

Dimensional Drawing <3500 · 4000W> Performance Table <If input speed is 3000rpm>

Coaxial Shaft
VR series

■ Performance Table 3500W

If input speed is 3000rpm:

Rated input motor cap.	Reduction ratio	Type				Output shaft speed (rpm)	Standard output torque (N · m)	Instantaneous max. output torque (N · m)	Permissible radial load (N)	Permissible thrust load (N)	Internal moment of inertia of input shaft conversion (10 ⁻⁴ × kg · m ²)	Permissible output torque (N · m)	Instantaneous max. permissible output torque (N · m)
		Model	Reduction ratio	Type no.	Motor cap.								
3500W	1/3	VRSF	3	E	3500	1000	28.3	85.2	1370	686	5.55	44.1	132
	1/5	VRSF	5	E	3500	600	47.2	141	1670	833	3.48	56.8	171

Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)

Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.

Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.

Note 4) The permissible radial load is indicated on the center of the output shaft.

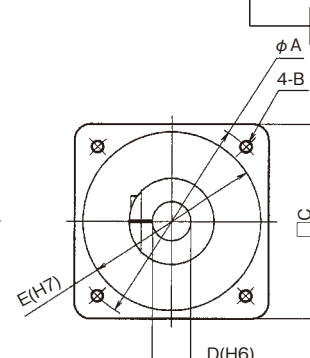
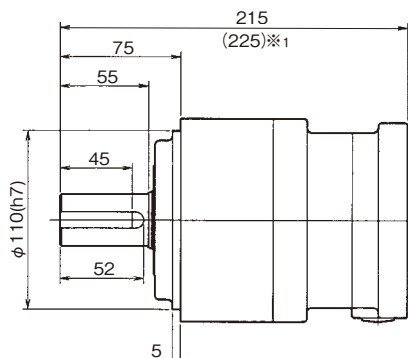
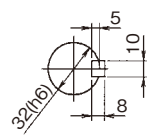
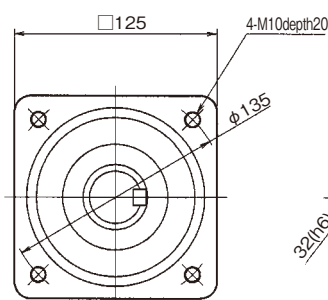
Note 5) All numerical values are within the range corresponding to the gear.

Note 6) For motor attachment procedure, see VR38 page.

Note 7) Rotation of the output shaft is in the same direction as that of motor input.

VRSF-3E · 5E-3500

■ Rough weight 12kg ■ CAD data no.<VSE135□1>



P : TYPE1
Y : TYPE2
M : TYPE3
For details of TYPE1~3, see VR32 page.

※1 TYPE2 has the numerical value indicated in ().

■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	130	M8	120	22	110
TYPE2	—	—	—	—	—
TYPE3	145	M8	130	28	110

※CAD data can be downloaded in the homepage.

■ Performance Table 4000W

If input speed is 3000rpm:

Rated input motor cap.	Reduction ratio	Type				Output shaft speed (rpm)	Standard output torque (N · m)	Instantaneous max. output torque (N · m)	Permissible radial load (N)	Permissible thrust load (N)	Internal moment of inertia of input shaft conversion (10 ⁻⁴ × kg · m ²)	Permissible output torque (N · m)	Instantaneous max. permissible output torque (N · m)
		Model	Reduction ratio	Type no.	Motor cap.								
4000W	1/3	VRSF	3	E	4000	1000	33.1	99.0	1370	686	5.78	44.1	132
	1/5	VRSF	5	E	4000	600	55.3	166	1670	833	3.75	56.8	171

Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)

Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.

Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.

Note 4) The permissible radial load is indicated on the center of the output shaft.

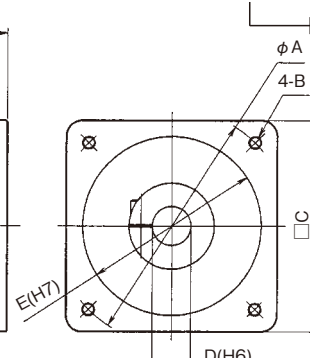
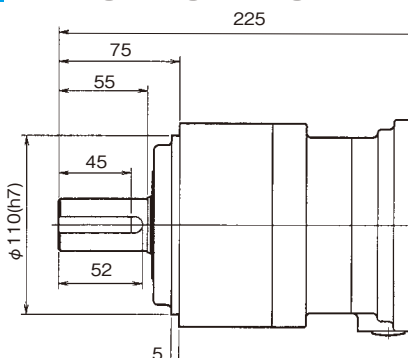
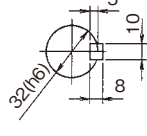
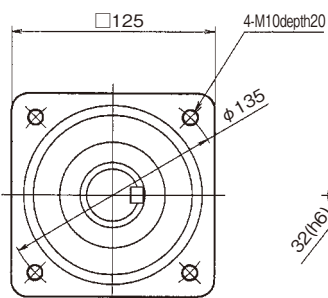
Note 5) All numerical values are within the range corresponding to the gear.

Note 6) For motor attachment procedure, see VR38 page.

Note 7) Rotation of the output shaft is in the same direction as that of motor input.

VRSF-3E · 5E-4000

■ Rough weight 13kg ■ CAD data no.<VSE140□1>



P : TYPE1
Y : TYPE2
For details of TYPE1~3, see VR32 page.

■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	145	M8	130	24	110
TYPE2	145	M8	130	28	110
TYPE3	—	—	—	—	—

※CAD data can be downloaded in the homepage.

■ Performance Table 4500W

If input speed is 3000rpm:

Rated input motor cap.	Reduction ratio	Type				Output shaft speed (rpm)	Standard output torque (N · m)	Instantaneous max. output torque (N · m)	Permissible radial load (N)	Permissible thrust load (N)	Internal moment of inertia of input shaft conversion (10 ⁻⁴ × kg · m ²)	Permissible output torque (N · m)	Instantaneous max. permissible output torque (N · m)
		Model	Reduction ratio	Type no.	Motor cap.								
4500W	1/3	VRSF	3	E	4500	1000	37.7	113	1370	686	5.78	44.1	132

Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)

Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.

Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.

Note 4) The permissible radial load is indicated on the center of the output shaft.

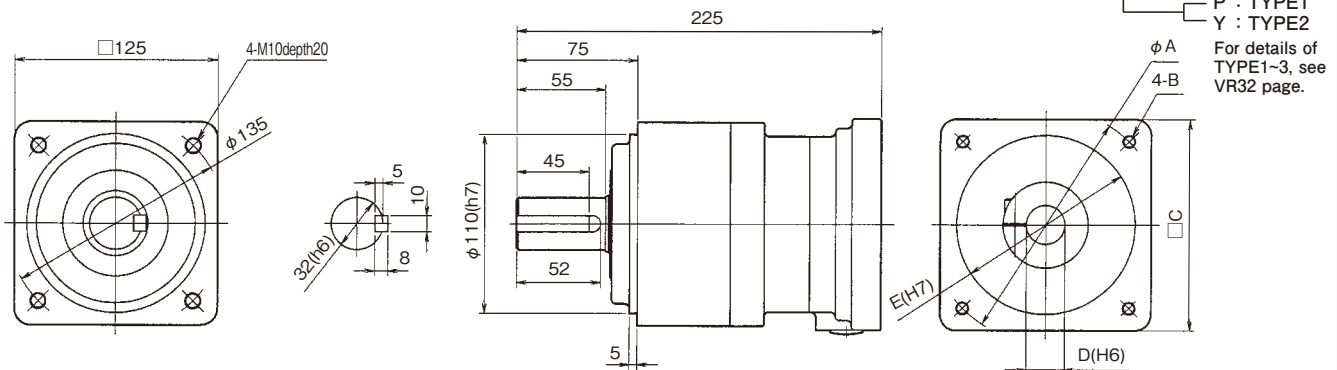
Note 5) All numerical values are within the range corresponding to the gear.

Note 6) For motor attachment procedure, see VR38 page.

Note 7) Rotation of the output shaft is in the same direction as that of motor input.

VRSF-3E-4500

■ Rough weight 13kg ■ CAD data no.<VSE145□1>



■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	145	M8	130	24	110
TYPE2	—	—	—	—	—
TYPE3	—	—	—	—	—

※CAD data can be downloaded in the homepage.

■ Performance Table 5000W

If input speed is 3000rpm:

Rated input motor cap.	Reduction ratio	Type				Output shaft speed (rpm)	Standard output torque (N · m)	Instantaneous max. output torque (N · m)	Permissible radial load (N)	Permissible thrust load (N)	Internal moment of inertia of input shaft conversion (10 ⁻⁴ × kg · m ²)	Permissible output torque (N · m)	Instantaneous max. permissible output torque (N · m)
		Model	Reduction ratio	Type no.	Motor cap.								
5000W	1/3	VRSF	3	E	5000	1000	42.9	128	1370	686	5.78	44.1	132

Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)

Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.

Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.

Note 4) The permissible radial load is indicated on the center of the output shaft.

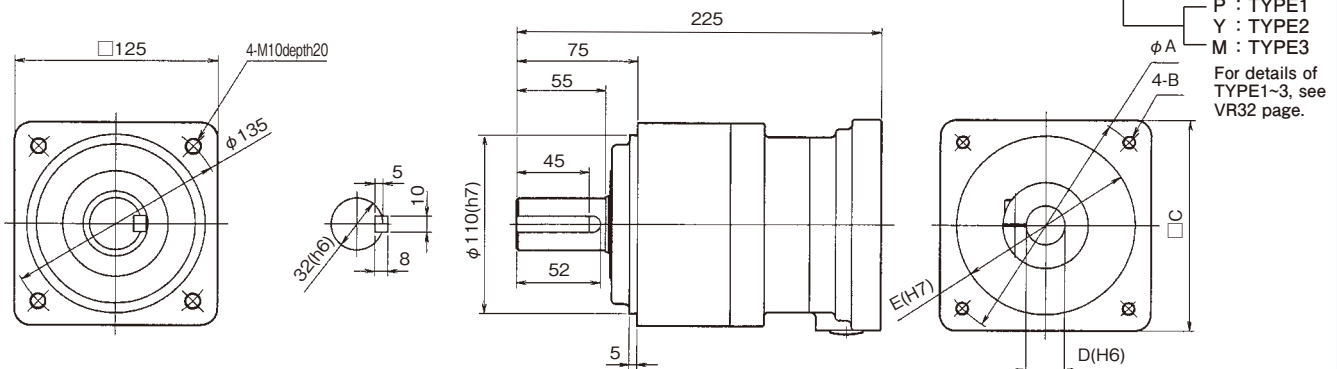
Note 5) All numerical values are within the range corresponding to the gear.

Note 6) For motor attachment procedure, see VR38 page.

Note 7) Rotation of the output shaft is in the same direction as that of motor input.

VRSF-3E-5000

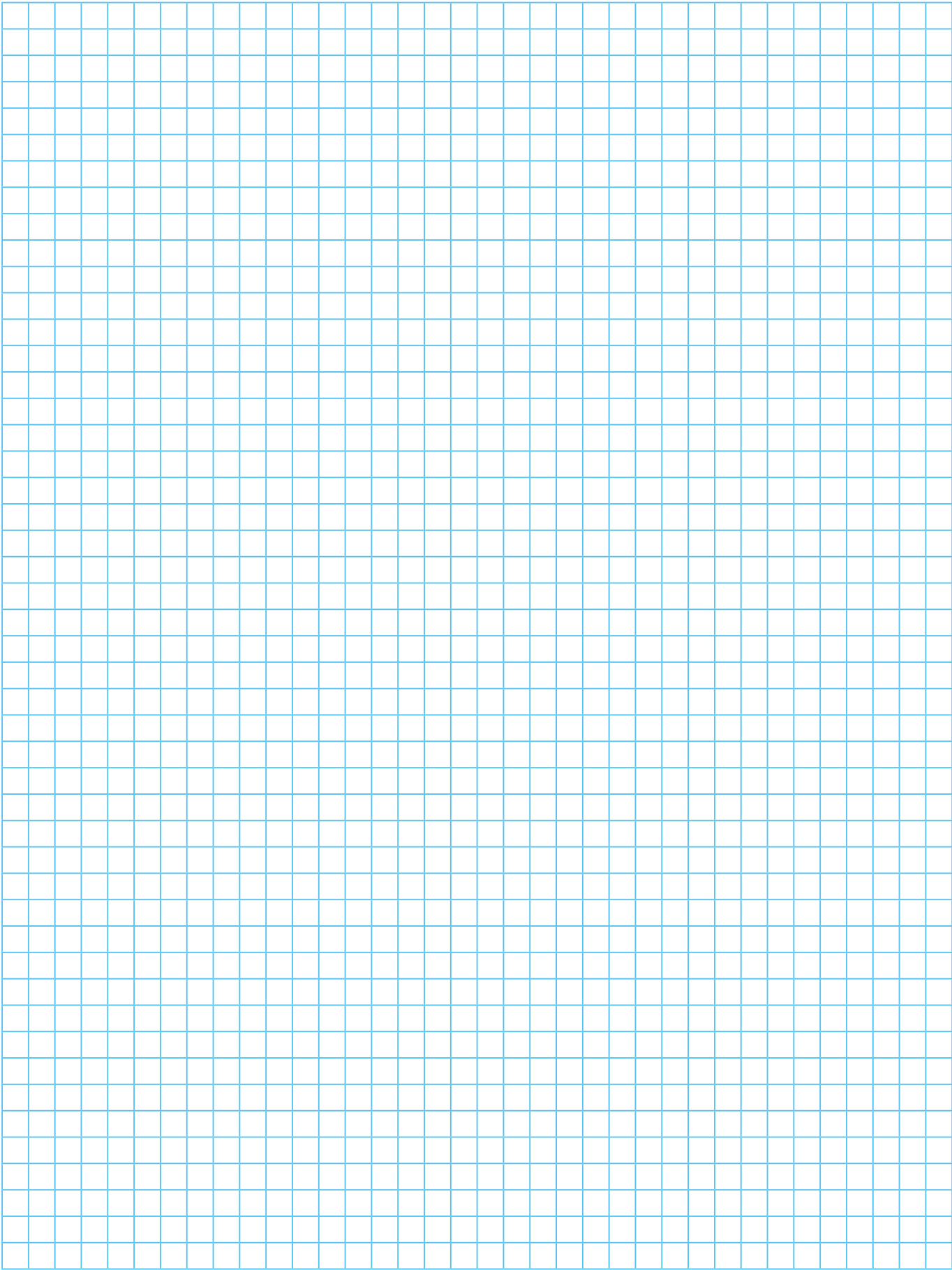
■ Rough weight 13kg ■ CAD data no.<VSE150□1>



■ Detailed flange dimensions table (Unit mm)

Motor type	A	B	C	D	E
TYPE1	145	M8	130	24	110
TYPE2	145	M8	130	28	110
TYPE3	145	M8	130	28	110

※CAD data can be downloaded in the homepage.



■ If input speed is 3000rpm

Motor manufacturer	Motor series	Motor capacity(W)				
		50W	100W	200W	400W	750W
Panasonic	MSME	TYPE1				
	MSMD	TYPE1				
	MSMA	TYPE1				
	MUMA	Out of standard	Out of standard	TYPE1		No subject
	MBMK	TYPE1	Out of standard	TYPE1		
Yaskawa Electric	SGMJV	TYPE3				
	SGMAV	TYPE3				
	SGMAS	TYPE2				
	SJME	No subject	TYPE2			
	SGMAH	TYPE2				
Mitsubishi Electric	HF-KP	TYPE3				
	HF-MP	TYPE3				
	HF-KN	TYPE3				
	HC-PQ	TYPE3				No subject
	HC-KQ	TYPE3				No subject
	HC-KFS	TYPE3				
	HC-MFS	TYPE3				
Omron	R88M-K	TYPE1				
	R88M-G	TYPE3		TYPE1		
	R88M-W	TYPE2				
	R7M-A	TYPE2				
	R7M-Z	No subject	TYPE2			
	R88M-U	TYPE2				
Fuji Electric Systems	GYS※	TYPE2				
Sanyo denki	P30B	TYPE3				TYPE2
	Q1	TYPE3				Out of standard
Keyence	SV	TYPE3				
	MV	TYPE3				Out of standard
Toshiba Machine	VLBSV-Z※	Out of standard		TYPE3		
	VLBSV-ZA※	Out of standard		TYPE3		
	VLBST	Out of standard		TYPE3		Out of standard
Tamagawa Seiki	TBL-i ※	TYPE3				No subject
	TBL-i II ※	TYPE3				Out of standard
Nikki denso	NA80※	TYPE3				Out of standard
	NA70 ※	TYPE3				No subject
	NA50	TYPE1				
Sanmei	TS※	TYPE3				Out of standard
	SS※	TYPE3				Out of standard
Hitachi Industrial Equipment Systems	ADMA	TYPE3				Out of standard
Miki Pulley	SA3	TYPE1				

Note 1) If an oil-seal is not present and the size is different, attachment of the oil-seal may correspond to a special order, in some cases.

Note 2) If the motor shaft is of D-cut and taper type, it corresponds to a special order.

Note 3) Note that thrust power arising out of instantaneous max. output torque by the combination of motor capacity(motor of the motor series table ※) and reduction ratio may exceed permissible thrust power of the servo motor. See the thrust load table on VR46 page.)

Note 4) Out-of-standard may correspond to a special order in some cases. For details, contact us.

Note 5)

VR reducers can attach to all brands of servo motors, including the following. Please contact our nearest sales branch or distributor.

Shimponia Technology Ltd.

NIDEC Sankyo

Allen-Bradley

Delta

etc.

Motor Matching Table

<If input speed is 3000rpm>

Coaxial shaft
VR series

■ If input speed is 3000rpm

Motor manufacturer	Motor series	Motor capacity(W)								
		1000W	1500W	2000W	2500W	3000W	3500W	4000W	4500W	5000W
Panasonic	MSME	Out of standard	TYPE1		No subject	TYPE1	No subject	TYPE1	No subject	TYPE1
	MSMA	TYPE1			No subject	TYPE1	No subject	TYPE1	No subject	TYPE1
Yaskawa Electric	SGMSV	TYPE2					No subject	TYPE2	No subject	TYPE2
	SGMSS	TYPE2					No subject	TYPE2	No subject	TYPE2
	SGMSH	TYPE2			No subject	TYPE2	No subject	TYPE2	No subject	TYPE2
Mitsubishi Electric	HC-RP	TYPE3			No subject		TYPE3	No subject		TYPE3
	HC-RFS	TYPE3			No subject		TYPE3	No subject		TYPE3
Omron	R88M-K	Out of standard	TYPE1		No subject	TYPE1	No subject	TYPE1	No subject	TYPE1
	R88M-G	TYPE1					No subject	TYPE1	No subject	TYPE1
	R88M-W	TYPE2			No subject	TYPE2	No subject	TYPE2	No subject	TYPE2
	R88M-U	TYPE2			No subject	TYPE2	No subject	TYPE2	No subject	TYPE2
Fuji Electric Systems	GYS	TYPE3			No subject	TYPE2	No subject	TYPE2	No subject	TYPE2

VR
ABLE REDUCER
EF
CORNET REDUCER FOR SERVO MOTOR

Standard compatibility with the following motor series

Motor manufacturer	Motor series	Motor capacity(W)
Mitsubishi Electric	HF-SP	500W · 1000W · 1500W · 2000W · 3500W
	HC-SFS ※	
Yaskawa Electric	SGMPS	100W · 200W · 400W · 750W · 1500W
	SGMPH	
Panasonic	MQMA	100W · 200W · 400W
Omron	R88M-WP	100W · 200W · 400W · 750W · 1500W
	R7M-AP	100W · 200W · 400W · 750W
Fuji Electric Systems	GYC	100W · 200W · 400W
Fanuc	β is ※	200W · 400W · 500W · 750W · 1200W

Note 1) If an oil-seal is not present and the size is different, attachment of the oil-seal may correspond to a special order, in some cases.

Note 2) If the motor shaft is of D-cut and taper type, it corresponds to a special order.

Note 3) Out-of-standard may correspond to a special order in some cases. For details, contact us.

Note 4) The motor in the above-mentioned motor series※ may correspond to both specifications of 3000rpm and 2000rpm in standards. For details, contact us.

VR reducers can attach to all brands of servo motors, including the following. Please contact our nearest sales branch or distributor.

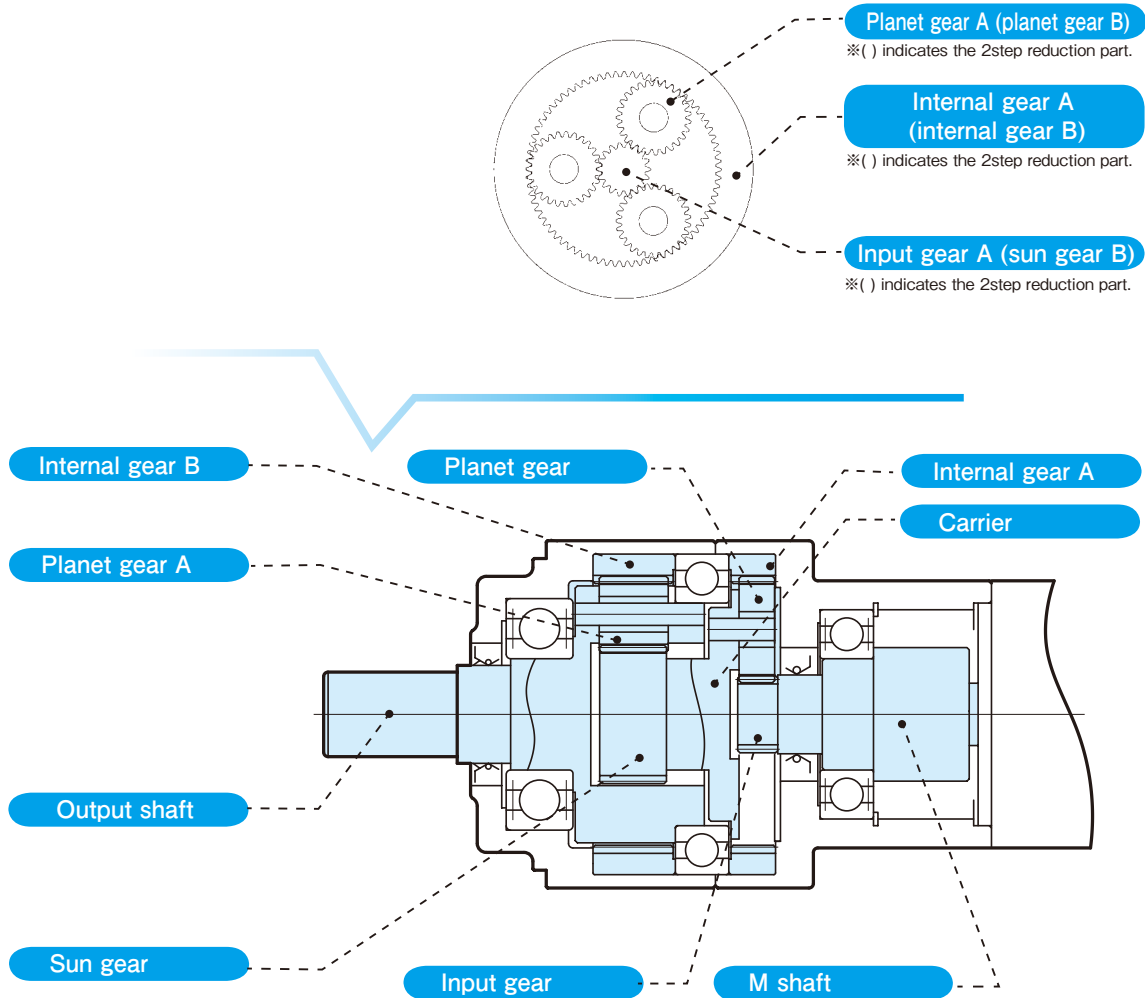
Shimponia Technology Ltd.

NIDEC Sankyo

Allen-Bradley

Delta

etc.



1 step reduction part

Motor~input gear~planet gear A~carrier

Rotation from the motor is delivered by the input gear attached to the M shaft. The input gear makes the planet gear A contacting the internal gear A go in gear. This transmits orbital motion to the planet gear A and rotates the 2step sun gear through the carrier.

The rotating direction is same as input rotation.

2step reduction part

Carrier~sun gear~planet gear B~output shaft

Rotation of the carrier is delivered by the sun gear attached to the carrier. This transmission delivers orbital motion to the planet gear B through a motion going in gear with the planet gear B contacting the internal gear B. The output shaft is rotated by this orbital movement.

The rotating direction is same as input rotation.

The above mention is explanation for the 2step reducer.
The 1step reducer runs only under the operating mechanism of the 2step reduction part.

Selection of type no.

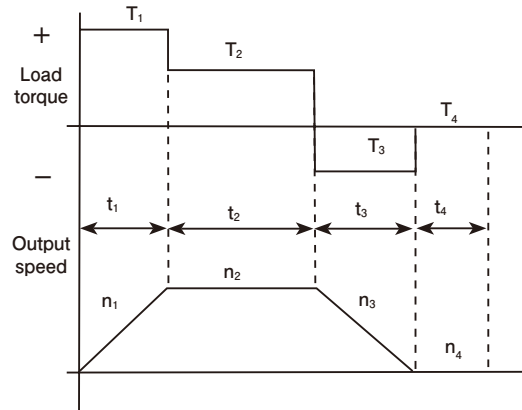
For ABLE REDUCER, once motor capacity and reduction ratio are fixed, reducer type may be simply selected according to the 'Reduction ratio & type no. table'. However, in case that combination out of the standard is made or detailed calculation is necessary, select applicable reducer type according to the equations as suggested below:

Checkup of load torque pattern

Check the load torque pattern to be given to the reducer.

Description of symbols

$T_1 \sim T_n$ (N · m) : Load torque
 $t_1 \sim t_n$ (N · m) : Time
 $n_1 \sim n_n$ (N · m) : Output speed (mean rpm upon acceleration & reduction)
 n_{OUT} : Max. output speed (rpm) $\geq n_1 \sim n_n$
 n_{IN} : Max. input speed (rpm) $\geq n_1 \times R \sim n_n \times R$
 R : Reduction ratio



Type selection procedure

Select the type according to the following procedure:

- 1 Calculate mean load torque given to the output shaft from the load torque pattern.

Mean load torque : T_a (N · m)

$$T_a = \sqrt[3]{\frac{n_1 t_1 |T_1|^3 + n_2 t_2 |T_2|^3 + \dots + n_n t_n |T_n|^3}{n_1 t_1 + n_2 t_2 + \dots + n_n t_n}}$$

Calculate mean output speed from the load torque pattern.

Output speed : n_{aOUT} (rpm)

$$n_{aOUT} = \frac{n_1 t_1 + n_2 t_2 + \dots + n_n t_n}{t_1 + t_2 + \dots + t_n}$$

OK

- 2 Provisionally select the type to meet the following equation.

$$T_a \leq \text{Permissible output torque}$$

(For permissible output torque of each type, see the performance table.)

OK

- 3 Decide reduction ratio (R) from max. output speed (n_{OUT}) and max. input speed (n_{IN}).

$$\frac{n_{IN}}{n_{OUT}} \geq R$$

(n_{IN} is limited by motors, etc.)

Calculate max. input speed from max. output speed (n_{OUT}) and reduction ratio (R).

$$n_{IN} = n_{OUT} R$$

OK

- 4 Calculate mean input speed n_{aIN} from mean output speed n_{aOUT} and reduction ratio (R).

$$n_{aIN} = n_{aOUT} R \leq 3,000 (\text{rpm})$$

OK

- 5 Ensure that max. input speed is less than the fixed max. input speed.

$$n_{IN} \leq 5,000 (\text{rpm})$$

OK

- 6 Ensure that T_1 and T_3 are within the numerical values of max. instant time permissible output torque in the performance table.

OK

Decision of type

※If there are values that do not fit within the maximum, examine it again as a stronger type, or reduce the specifications, e.g. load torque or speed.

Examples of type selection

1

[Operating pattern]
 At operation : $T_1=90(\text{Nm})$ $t_1=0.5(\text{sec})$ $n_1=90(\text{rpm})$
 At normal operation : $T_2=35(\text{Nm})$ $t_2=5(\text{sec})$ $n_2=180(\text{rpm})$
 At reduction : $T_3=70(\text{Nm})$ $t_3=1(\text{sec})$ $n_3=90(\text{rpm})$
 At stop : $T_4=0(\text{Nm})$ $t_4=10(\text{sec})$ $n_4=0(\text{rpm})$

[Max. number of rotations]
 Max. output speed : $n_{\text{OUT}}=180(\text{rpm})$
 Max. input speed : $n_{\text{IN}}=5000(\text{rpm})$ (limited by the motor)

OK

2

Calculate mean load torque given to the output shaft from the load torque pattern. Mean load torque : $T_a(\text{N} \cdot \text{m})$

$$T_a = \sqrt{\frac{3 \left(90 \times 0.5 \times |90|^3 + 180 \times 5 \times |35|^3 + 90 \times 1 \times |-70|^3 + 0 \right)}{90 \times 0.5 + 180 \times 5 + 90 \times 1 + 0}}$$

$$= 46.2 (\text{N} \cdot \text{m})$$

Calculate mean output speed from the load torque pattern.
 Mean output speed : $n_{\text{aOUT}}(\text{rpm})$

$$n_{\text{aOUT}} = \frac{90 \times 0.5 + 180 \times 5 + 90 \times 1 + 0}{0.5 + 5 + 1 + 10} = 62.7 (\text{rpm})$$

OK

3

Provisionally select the type.
 $46.2 \leq 50.7 (\text{Nm})$
 (Select 25D-750 from the performance table)

OK

4

Decide reduction ratio(R) from max. output speed(n_{OUT}) and max. input speed(n_{IN}).

$$\frac{5000}{180} = 27.8 \geq 25$$

Calculate max. input speed (n_{IN}) from max. output speed(n_{OUT}) and reduction ratio(R).

$$n_{\text{IN}} = 180 \times 25 = 4,500(\text{rpm})$$

OK

5

Calculate mean input speed n_{aIN} from mean output speed n_{aOUT} VR and reduction ratio(R).

$$n_{\text{aIN}} = 62.7 \times 25 = 1567.5 \leq 3,000 (\text{rpm})$$

OK

6

Ensure that max. input speed is less than the fixed max. input speed.

$$n_{\text{IN}} = 4,500 \leq 5,000 (\text{rpm})$$

OK

7

Ensure that T_1 and T_3 are within the numerical values of max. instant time permissible output torque in the performance table.

$$T_1 = 90 \leq 152 (\text{Nm})$$

$$T_3 = 70 \leq 152 (\text{Nm})$$

OK

Fixed to 25D-750

Thrust load (to motor)

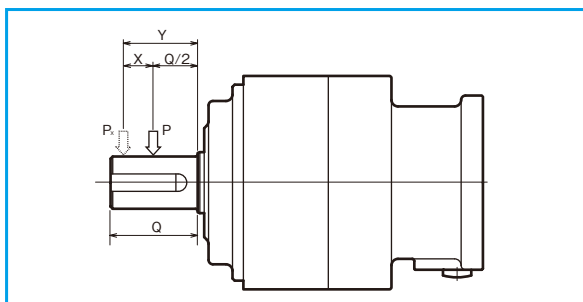
Thrust force acts in a shaft direction for units equipped with a helical gear. However, our ABLE REDUCER is designed to mitigate thrust force and thus does not influence a servo motor irrespective of backlash standard type, LB type, and PB type. For other motor series, see permissible thrust of each motor manufacturer.

Rated input motor capacity(W)	Type			ABLE REDUCER thrust force	Instantaneous time permissible thrust load of servo motor(N)		
	Model	Type no.	Motor capacity		PANASONIC MSMA series	YASKAWA ELECTRIC SGMAH series	mitsubishi electric HC-MF series
50W	VRSF	3 B	50	7	58	54	59
	VRSF	5 B	50	15			
	VRSF	S9 B	50	29			
	VRSF	15 B	50	15			
	VRSF	20 B	50	15			
	VRSF	25 B	50	15			
	VRSF	35 B	50	22			
	VRSF	45 C	50	29			
100W	VRSF	81 C	50	29	58	54	59
	VRSF	3 B	100	15			
	VRSF	5 B	100	29			
	VRSF	S9 B	100	46			
	VRSF	15 B	100	29			
	VRSF	20 B	100	29			
	VRSF	25 B	100	29			
	VRSF	35 C	100	16			
200W	VRSF	45 C	100	46	98	74	98
	VRSF	81 D	100	46			
	VRSF	3 B	200	22			
	VRSF	5 B	200	44			
	VRSF	S9 C	200	43			
	VRSF	15 C	200	21			
	VRSF	20 C	200	21			
	VRSF	25 C	200	21			
400W	VRSF	35 C	200	32	98	74	98
	VRSF	45 D	200	43			
	VRSF	81 E	200	17			
	VRSF	3 B	400	44			
	VRSF	5 C	400	43			
	VRSF	S9 C	400	64			
	VRSF	15 C	400	43			
	VRSF	20 C	400	43			
750W	VRSF	25 C	400	43	147	147	147
	VRSF	35 D	400	26			
	VRSF	45 E	400	34			
	VRSF	3 C	750	20			
	VRSF	5 C	750	40			
	VRSF	S9 D	750	64			
	VRSF	15 D	750	32			
	VRSF	20 D	750	32			
	VRSF	25 D	750	32			
	VRSF	35 E	750	48			

Note 1) Thrust force : Numerical value upon max. instantaneous output torque

Permissible radial load (to reducer)

Coaxial shaft radial



If radial load is out of the center of the output shaft, calculate using the following equations and positive numbers:

$$P_x = \{K / (K + X)\} \times P$$

$$X = Y - Q/2$$

P : Permissible radial load(N)

Q : Positive number

K : Positive number

X : Load point displacement distance(mm)

Y : Load point(mm)

P_x : Permissible shaft load(N)

Type no.	Positive number:Q	Positive number:K
B	20	46
C	30	70
D	40	79.5
E	55	104

Comparison of noise values



■ The measuring conditions in an internal survey are as mentioned below:

※ Reducer input speed : 3000rpm ※ Measurement spot : 50cm distant from the product ※ Noise value : Typical values chosen for noise values

※ Load : Reducer load rating ※ Reducer fixation : The reducer is fixed onto the L-type attachment plate so that it cannot move.

Jointing

1. Insertion into motor

If a customer personally assembles the servo motor and reducer please use the following tip. The reducer flange to which the servo motor is attached has different dimensions based on the motor specified. Therefore, assembly may be impossible for any other motor. Make sure the correct motor is specified before ordering the reducer.

[VRSF spec. in case of assembling a motor without key]

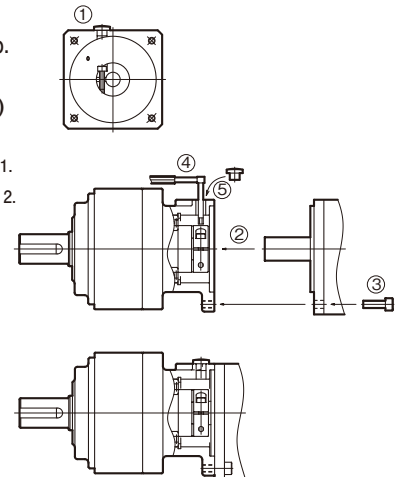
- ① Take off the rubber cap, turn the input shaft, and match the head of the bolt to the hole of the rubber cap. Make sure that the set bolt is loosened.
- ② Gradually put the motor shaft into the input shaft (Ensure that it is smoothly put in without jam.) Be careful not to be inserted with the motor tilted.
- ③ Attach the motor to the reducer and fasten the bolt with designated fastening torque. See Table 1.
- ④ Fasten the set bolt of the input shaft with designated fastening torque using torque wrench, etc. See Table 2.
- ⑤ Attach a rubber cap. It is the end of assembling.

■ Table 1

Motor combination bolt	Fastening torque	
	N · m	kgf · cm
M3	1.0	10
M4	2.9	30
M5	5.9	60
M6	9.8	100
M8	19.6	200
M10	39.2	400
M12	68.6	700
M16	162	1650

■ Table 2

Motor combination bolt	Fastening torque	
	N · m	kgf · cm
M3	1.5	15
M4	3.5	36
M5	7.1	72
M6	12	122
M8	30	306



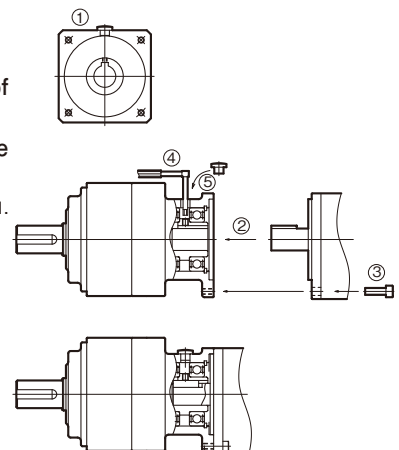
If the key of a key-attached motor is removed, motor assembling without the above-mentioned key may be followed. There is no risk of dislocation.

[VRSF spec. in case of assembling a motor with key]

- ① Take off the rubber cap, turn the input shaft, and match the head of the bolt to the hole of the rubber cap.
- ② Coat carbon formation inhibitors(molybdenum dioxide etc.) onto the motor shaft, match the key to the key slot, and gradually
- ③ Combine the motor with the reducer and fasten with the designated fastening bolt. See Table 1.
- ④ For set bolt of the input shaft, fasten using torque wrench with the designated fastening torque with the key firmly pressed. See Table 3.
- ⑤ Attach a rubber cap. The is the end.

■ Table 3

Motor combination bolt	Fastening torque	
	N · m	kgf · cm
M4	2.0	20
M5	4.3	44
M6	7.3	74
M8	16.8	171



2. Jointing with reducer

In case of jointing a reducer with the device, make sure that the combining side is plane without inconsistency, and fasten the bolt with designated fastening torque with torque wrench. See Table 4.

■ Table 4

Reducer combination bolt		Fastening torque	
		N · m	kgf · cm
B type	M5	5.8	60
C type	M6	9.8	100
D type	M8	19.6	200
E type	M10	39.2	400

3. Connection to the output shaft

- When attaching a coupling, free, etc. onto the output shaft, make sure that excessive thrust load not be given to the output shaft.
- In case of strongly hitting the shaft with a hammer, the shaft inlet or the inside of the reducer may be damaged, therefore it shall be prohibited.
- If the shaft or key of a coupling to be attached is large, it may cause carbonization, so be careful when assembling.
- For assembling of a coupling, fix the key with a set bolt.
- When connecting the shaft, ensure that the connecting shaft fully goes out.

