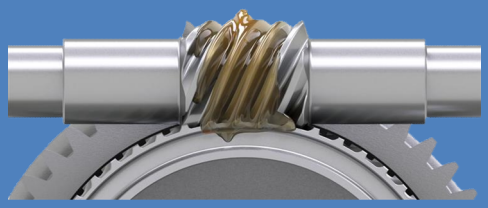
HUMMER
GEARREDUCER

NMRV

WORM GEAR MOTOR



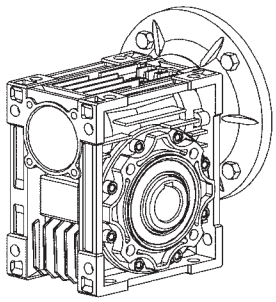
NRV

WORM GEAR REDUCERS

http : www.torsion.co.th

Contents

Versions



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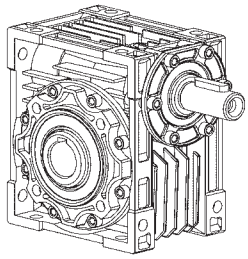

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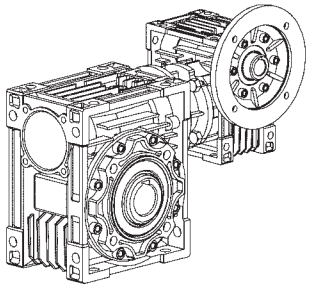

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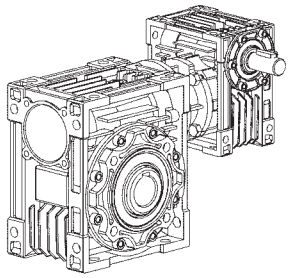
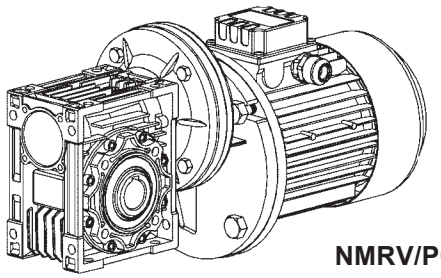
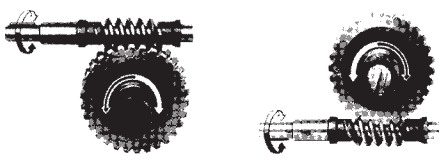


NMRV/NRV

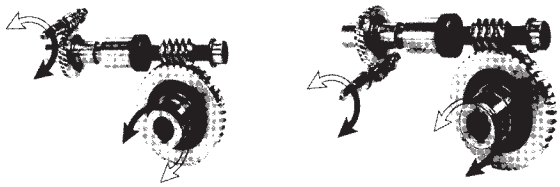


NMRV/PC

Direction of rotation



NRV



NMRV/NRV

The helix is right-handed.

Service factor

The service factor (f.s.) depends on the operating conditions the reduction unit is subjected to.
The parameters that need to be taken into consideration to select the most adequate service factor correctly comprise:
- type of load of the operated machine : **A - B - C**
- length of daily operating time: **hours/day (Δ)**
- start-up frequency: **starts/hour (*)**

TYPE OF LOAD:	**A** - uniform	fa ≤ 0.3
	B - moderate shocks	fa ≤ 3
	C - heavy shocks	fa ≤ 10

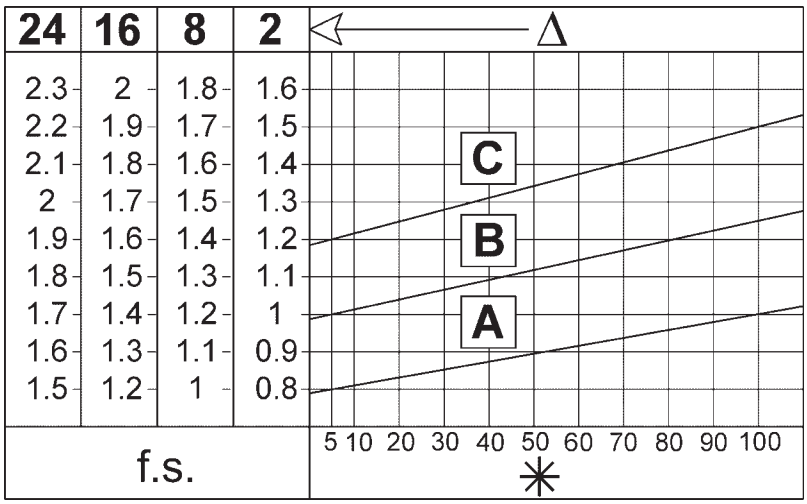
fa = Je/Jm
- Je (kgm^2) moment of reduced external inertia at the drive-shaft
- Jm (kgm^2) moment of inertia of motor

If fa > 10 call our Technical Service.

A -Screw feeders for light materials, fans, assembly lines, conveyor belts for light materials, small mixers, lifts, cleaning machines, fillers, control machines.

B -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 mechanisms, milling cutters, folding machines, gear pumps.

C -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.



Installation

To install the reduction unit it is necessary to note the following recommendations:
- The mounting on the machine must be stable to avoid any vibration.
- Check the correct direction of rotation of the reduction unit output shaft before fitting the unit to the machine.
- In the case of particularly lengthy periods of storage (4/6 months), if the oil seal is not immersed in the lubricant inside the unit, it is recommended to change it since the rubber could stick to the shaft or may even have lost the elasticity it needs to function properly.
- Whenever possible, protect the reduction unit against solar radiation and bad weather.
- Ensure the motor cools correctly by assuring good passage of air from the fan side.
- In the case of ambient temperatures < -5°C or > +40°C call the Technical Service.
- The various parts (pulleys, gear wheels, couplings, shafts, etc.) must be mounted on the solid or hollow shafts using special threaded holes or other systems that anyhow ensure correct operation without risking damage to the bearings or external parts of the units. Lubricate the surfaces in contact to avoid seizure or oxidation.
- Painting must definitely not go over rubber parts and the holes on the breather plugs, if any.
- For units equipped with oil plugs, replace the closed plug used for shipping with the special breather plug.
- Check the correct level of the lubricant through the indicator, if there is one.
- Starting must take place gradually, without immediately applying the maximum load.
- When there are parts, objects or materials under the motor drive that can be damaged by even limited spillage of oil, special protection should be fitted.

Critical applications

The performance given in the catalogue correspond to mounting position B3 or similar, ie. when the first stage is not entirely immersed in oil. For other mounting positions and/or particular input speeds, refer to the tables that highlight different critical situations for each size of reduction unit.
It is also necessary to take due consideration of and carefully assess the following applications by calling our Technical Service:

- As a speed increasing.
- Use in services that could be hazardous for people if the reduction unit fails.
- Applications with especially high inertia.
- Use as a lifting winch.
- Applications with high dynamic strain on the case of the reduction unit.
- In places with T° under -5°C or over 40°C.
- Use in chemically aggressive environments.
- Use in a salty environment.
- Monting positions not envisaged in the catalogue.
- Use in radioactive environments.
- Use in environments pressures other than atmospheric pressure.

Avoid applications where even partial immersion of the reduction unit is required.
The maximum torque (*) that the gear reducer can support must not exceed two times the nominal torque (f.s.=1) stated in the performance tables.
(*) intended for momentary overloads due to starting at full load, braking, shocks or other causes, particularly those that are dynamic.

NMRV	025	030	040	050	063	075	090	105	110	130	150
V5: 1500 < n1 < 3000	-	-	-	-	-	B	B	B	B	B	B
n1 > 3000	B	B	B	B	B	A	A	A	A	A	A
V6	B	B	B	B	B	B	B	B	B	B	B

A Application not recommended

B Check the application and/or call our technical service

Lubrication

In cases of ambient temperatures not envisaged in the table, call our Technical Service.
In the case of temperatures under -30°C or over 60°C it is necessary to use oil seals with special properties.
For operating ranges with temperatures under 0°C it is necessary to consider the following:
1- The motors need to be suitable for operation at the envisaged ambient temperature.
2- The power of the electric motor needs to be adequate for exceeding the higher starting torques required.
3- In the case of reduction units with a cast-iron case, pay attention to impact loads since cast iron may have problems of fragility at temperatures under -15°C.
4- During the early stages of service, problems of lubrication may arise due to the high level of viscosity taken on by the oil and so it is wise to have a few minutes of rotation under no load.
The oil needs to be changed after approximately 10,000 hours. This period depends on the type of service and the environment where the reduction unit works.

- The reduction units size 025-030-040-050-063-075-090-105 are supplied complete with lubricant for life, synthetic oil, AGIP TELIUM VSF and can therefore be mounted in any position envisaged in the catalogue. The only exceptions are 090 and 105 in pos. V5/V6 for which you should call our Technical Service to assess the conditions of use.
- The reduction units size 110-130 and 150 are supplied complete with lubricant, mineral oil, AGIP BLASIA 460.
- For sizes 110-130 and 150 it is necessary to specify the position, otherwise the reduction units are supplied with the quantity of oil relating to pos. B3.
- Only reduction units 110-130 and 150 are fitted with breather, level and oil drainage plugs. It is necessary, after installation, to replace the closed plug used for transportation with the breather plug supplied with the unit.
- The pre-stage helical modules are supplied complete with life-long lubricant, synthetic oil, AGIP TELIUM VSF, and can therefore be mounted in all the positions. Lubrication is separated from that of the worm reduction unit.

- Specifications of lubricants

	T°C - ISO...	AGIP	SHELL	ESSO	MOBIL	CASTROL	BP	
NMRV025÷105 PC063÷090	**(-25) ÷ (+50) ISO VG320**	TELIUM VSF320	TIVELA OIL SC320	S220	GLYGOYLE 30	ALPHASYN PG320	ENERGOL SG-XP320	Synthetic oil
NMRV110÷150	**(-5) ÷ (+40) ISO VG460**	BLASIA 460	OMALA OIL460	SPARTAN EP460	MOBILGEAR 634	ALPHA MAX 460	ENERGOL GR-XP460	Mineral oil
	(-15) ÷ (+25) ISO VG220	BLASIA 220	OMALA OIL220	SPARTAN EP220	MOBILGEAR 630	ALPHA MAX 220	ENERGOL GR-XP220	

- Quantity of oil in litres

NMRV	025	030	040	050	063	075	090	105	110	130	150	PC	063	071	080	090
B3	0.02	0.04	0.08	0.15	0.3	0.55	1	1.6	3	4.5	7		0.05	0.07	0.15	0.16
B8									2.2	3.3	5.1					
B6-B7									2.5	3.5	5.4					
V5									3	4.5	7					
V6									2.2	3.3	5.1					

Radial Loads

The radial load on the shaft is calculated with the following formula:

$$Fre = \frac{2000 \cdot M \cdot fz}{D} \leq Fr1 \text{ o } Fr2$$

Fre (N)
Resulting radial load
M (Nm)
Torque on the shaft
D (mm)
Diameter of the transmission member mounted on the shaft
Fr (N)
Value of the maximum admitted radial load (see relative tables)

fz = 1,1 gear pinion
1,4 chain wheel
1,7 v-pulley
2,5 flat pulley

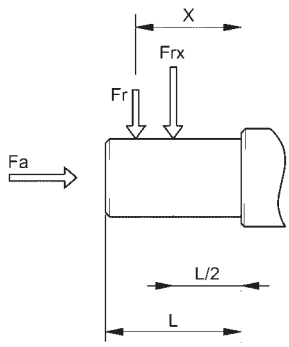
When the resulting radial load is not applied on the centre line of the shaft it is necessary to calculate the effective load with the following formula:

$$Fre \leq \frac{Fr \cdot a}{(b + x)} \leq Fr1max \text{ o } Fr2max$$

a , b , x = values given in the tables on page 5

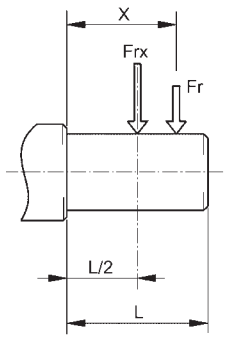
Radial Loads

OUTPUT SHAFTS



NMRV	025	030	040	050	063	075	090	105	110	130	150
a	50	65	84	101	120	131	162	176	176	188	215
b	38	50	64	76	95	101	122	136	136	148	174
Fr2 max	1350	1830	3490	4840	6270	7380	8180	12000	12000	13500	18000

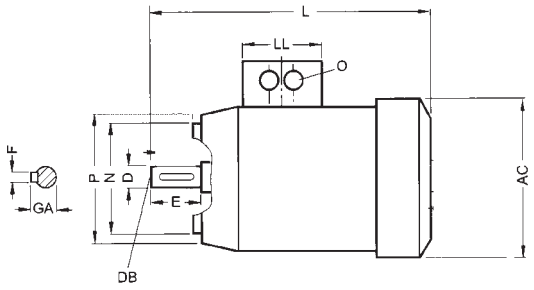
INPUT SHAFTS

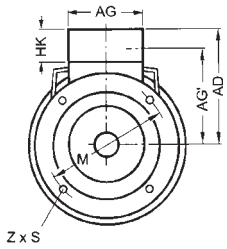


NRV	030	040	050	063	075	090	105	110	130	150
a	86	106	129	159	192	227	266	266	314	350
b	76	94,5	114	139	167	202	236	236	274	310
Fr1 max	210	350	490	700	980	1270	1700	1700	2100	2800

The values of the admissible radial loads are given on the pages relating to performance (Fr1, Fr2)

Motor Details

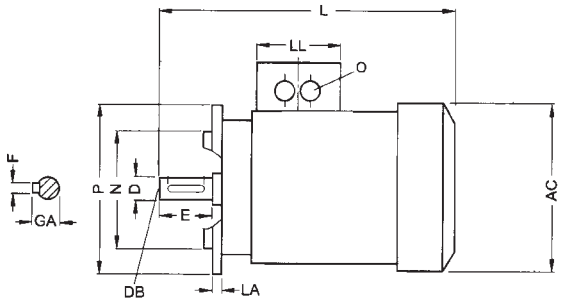


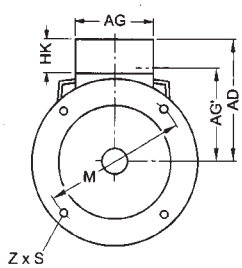


Z = Number of fixing holes

B 14 "C" FACE — **These dimemsions apply to Palawatr standard motors**

Motor Frame	Rated output	Dimension																	
		Standard Flange													Drive-End				
Size	kw	M	N	P	S	Z	AC	AD	AG	AG'	HK	L	LL	O	D	DB	E	F	GA
56B4	0.09	65	50	80	M5	4	116	101	75	77.5	39	169	75	M25x1.5	9	M3	20	3	10.2
63B4	0.18	75	60	90	M5	4	118	101	75	77.5	39	202.5	75	M25x1.5	11	M4	23	4	12.5
71A4	0.25	85	70	105	M6	4	145	111	75	87.5	39	240	75	M16x1.5	14	M5	30	5	16
	0.37													M25x1.5					
80A4	0.55	100	80	120	M6	4	162	120	75	97	39	274	75	M16x1.5	19	M6	40	6	21.5
	0.75											309		M25x1.5					
90S4	1.1	115	95	140	M8	4	181	128	75	105	39	332	75	M16x1.5	24	M8	50	8	27
90L4	1.5													M25x1.5					





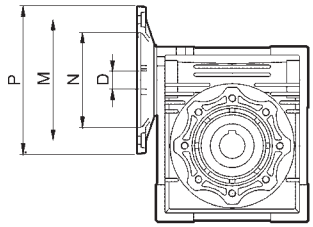
Z = Number of fixing holes

B5 "D" FLANGE — **These dimemsions apply to Palawatr standard motors**

Motor Frame	Rated output	Dimension																		
		Standard Flange														Drive-End				
Size	kw	M	N	P	S	Z	AC	AD	AG	AG'	HK	L	LA	LL	O	D	DB	E	F	GA
56B4	0.09	100	80	120	7	4	116	101	75	77.5	39	169	8	75	M25x1.5	9	M3	20	3	10.2
63B4	0.18	115	95	140	10	4	118	101	75	77.5	39	202.5	8	75	M25x1.5	11	M4	23	4	12.5
71A4	0.25	130	110	160	10	4	145	111	75	87.5	39	240	9	75	M16x1.5	14	M5	30	5	16
	0.37														M25x1.5					
80A4	0.55	165	130	200	12	4	162	120	75	96.5	39	274	10	75	M16x1.5	19	M6	40	6	21.5
	0.75											309			M25x1.5					
90S4	1.1	165	130	200	12	4	181	128	75	104.5	39	332	10	75	M16x1.5	24	M8	50	8	27
90L4	1.5														M25x1.5					
100LA4	2.2	215	180	250	14	4	202	135	120	78	35	373	11	120	M32x1.5	28	M10	60	8	31
112M4	4	215	180	250	14	4	227	148	120	91	35	394	11	120	M32x1.5	28	M10	60	8	31
132S4	5.5	265	230	300	14.5	4	266	167	140	107	36	453.5	12	140	M32x1.5	38	M12	80	10	41
132M4	7.5	265	230	300	14.5	4	266	167	140	107	36	453.5	12	140	M32x1.5	38	M12	80	10	41
160M4	11	300	250	350	18.5	4	319	197	165	127	42	588	13	165	M40x1.5	42	M16	110	12	45
160L4	15	300	250	350	18.5	4	319	197	165	127	42	588	13	165	M40x1.5	42	M16	110	12	45

Predisposition

(*) Low profile key supplied by TechnoDrive



NMRV	PAM IEC	N	M	P	D											
					5	7,5	10	15	20	25	30	40	50	60	80	100
025	56B14	50	65	80	9	9	9	9	9	-	9	9	9	9	-	-
030	63B5	95	115	140	11	11	11	11	11	11	11	11	11	-	-	-
	63B14	60	75	90												
	56B5	80	100	120	9	9	9	9	9	9	9	9	9	9	9	-
	56B14	50	65	80												
040	71B5	110	130	160	14	14	14	14	14	14	14	14	-	-	-	-
	71B14	70	85	105												
	63B5	95	115	140	11	11	11	11	11	11	11	11	11	11	11	11
	63B14	60	75	90												
	56B5	80	100	120	-	-	-	-	-	-	-	-	9	9	9	9
050	80B5	130	165	200	19	19	19	19	19	19	19	-	-	-	-	-
	80B14	80	100	120												
	71B5	110	130	160	14	14	14	14	14	14	14	14	14	14	14	-
	71B14	70	85	105												
	63B5	95	115	140	-	-	-	-	-	-	-	11	11	11	11	11
063	90B5	130	165	200	-	24	24	24	24	24	24	-	-	-	-	-
	90B14	95	115	140												
	80B5	130	165	200	-	19	19	19	19	19	19	19	19	19	-	-
	80B14	80	100	120												
	71B5	110	130	160	-	-	-	-	-	-	-	14	14	14	14	14
	71B14	70	85	105												
075	100/112B5	180	215	250	-	28	28	28	-	-	-	-	-	-	-	-
	100/112B14	110	130	160												
	90B5	130	165	200	-	24	24	24	24	24	24	24	-	-	-	-
	90B14	95	115	140												
	80B5	130	165	200	-	-	-	-	19	19	19	19	19	19	19	19
	80B14	80	100	120												
	71B5	110	130	160	-	-	-	-	-	-	-	-	14	14	14	14
090	100/112B5	180	215	250	-	28	28	28	28	28	28	-	-	-	-	-
	100/112B14	110	130	160												
	90B5	130	165	200	-	24	24	24	24	24	24	24	24	24	-	-
	90B14	95	115	140												
	80B5	130	165	200	-	-	-	-	-	-	-	19	19	19	19	19
	80B14	80	100	120												
105	132B5	230	265	300	-	38*	38*	38*	38*	-	-	-	-	-	-	-
	100/112B5	180	215	250	-	28	28	28	28	28	28	28	28	28	-	-
	90B5	130	165	200	-	-	-	-	-	24	24	24	24	24	24	24
	80B5	130	165	200	-	-	-	-	-	-	-	-	-	-	19	19
110	132B5	230	265	300	-	38*	38*	38*	38*	-	-	-	-	-	-	-
	100/112B5	180	215	250	-	28	28	28	28	28	28	28	28	28	-	-
	90B5	130	165	200	-	-	-	-	-	24	24	24	24	24	24	24
	80B5	130	165	200	-	-	-	-	-	-	-	-	-	-	19	19
130	132B5	230	265	300	-	38*	38*	38*	38*	38*	38*	38*	-	-	-	-
	100/112B5	180	215	250	-	-	-	-	-	28	28	28	28	28	28	28
	90B5	130	165	200	-	-	-	-	-	-	-	-	-	-	24	24
150	160B5	250	300	350	-	42	42	42	42	42	-	-	-	-	-	-
	132B5	230	265	300	-	-	-	-	38	38	38	38	38	38	-	-
	100/112B5	180	215	250	-	-	-	-	-	-	-	-	28	28	28	28

NMRV with PC (helical geared) Combinations

NMRV	i	PC 063		PC 071			PC 080		PC 090		
		105 / 11 i = 3	105 / 14 i = 3	120 / 14 i = 3	120 / 19 i = 3	160 / 19 i = 3	160 / 24 i = 3	160 / 28 i = 3	160 / 19 i = 2,42	160 / 24 i = 2,42	160 / 28 i = 2,42
040	25										
	30										
	40										
	50										
	60										
	80										
	100										
050	25										
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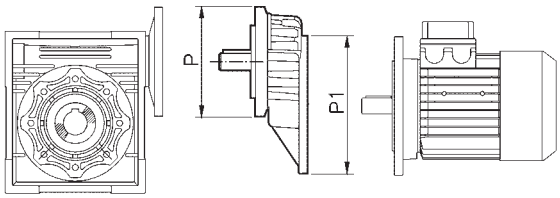
	50										
	60										
	80										
	100										
130	25										
	30										
	40										
	50										
	60										
	80										
	100										



	P1	P	(P)
PC 063	63B5 - 140 / 11	105 /11	(105 / 14)
PC 071	71B5 - 160 / 14	120 / 14	(120 / 19)
PC 080	80B5 - 200 / 19	160 / 19	(160 / 24) (160 / 28)
PC 090	90B5 - 200 / 24	160 / 24	(160 / 19) (160 / 28)

(..) Only on request

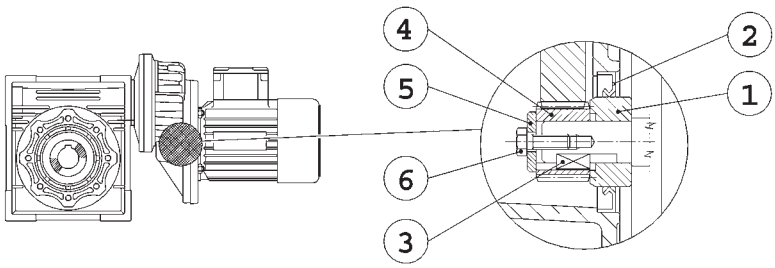
Design features (PC)

The PC construction is modular and therefore it can be supplied as a separate unit to be mounted on any type of fitted geared motor (PAM). In this connection, the various possibilities of flange/output shafts can be found on page 13.
Fitting the pre-stage helical module on the main reduction unit is easily done as for any motor of type B14.
The pre-stage unit cannot be used by itself, but only coupled with another reduction unit.

Materials
Case in aluminium alloy.
Gears in case hardened, hardened, tempered steel 20MnCr5 (UNI7846) accurately ground on the involute.

Coupling to electric motor

Correctly fitting the pinion on the electric motor shaft requires you keep to the following instructions:
a) Thoroughly clean the electric motor shaft.
b) Remove the motor key from its seat.
c) Fit the bush (1) to the drive shaft as shown in the diagram. To make this easier, you can heat the bush to approximately 70/80°C.
d) Fit the new key (3) provided in place of the one removed beforehand.
e) Fit the pinion (4) taking the same precautions as described in point (c).
f) Fit the washer (5) and tighten with the screw (6).
g) Remove the rubber cap mounted on the seat of the oil seal, taking care since the pre-stage unit is already complete with lubricant.
h) Fit the oil seal (2) and then the motor assembly, taking care not to damage the lip of the oil seal.
N.B. For correct operation, with no vibration or noise, it is recommended to use good quality motors.



Efficiency - Dynamic irreversibility - Static irreversibility

EFFICIENCY

Efficiency is a parameter which has a major influence on the sizing of certain applications, and basically depends on gear pair design elements.
The mesh data table on page 16shows dynamic efficiency (n1=1400) and static efficiency values. Remember that these values are only achieved after the unit has been run in.

DYNAMIC IRREVERSIBILITY

Dynamic irreversibility is achieved when the output shaft stops instantly when drive is no longer transmitted through the worm shaft. This condition requires a dynamic efficiency of $\eta d < 0.5$ (see table on page 11).

STATIC IRREVERSIBILITY

Static irreversibility is achieved when, with the gear reducer at a standstill, the application of a load to the output shaft does not set in motion the worm shaft. This condition requires a static efficiency of $\eta s < 0.5$ (see table on page 11).

ηd	DYNAMIC IRREVERSIBILITY
> 0.6	dynamic reversibility
0.5 ÷ 0.6	low dynamic reversibility
0.4 ÷ 0.5	good dynamic irreversibility
< 0.4	dynamic irreversibility

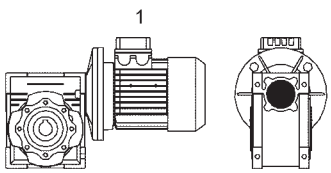
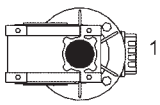
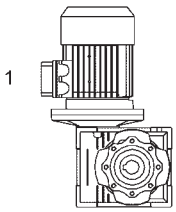
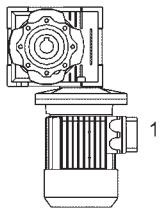
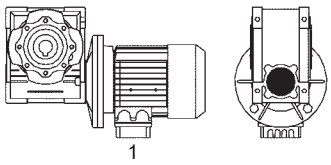
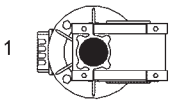
ηs	STATIC IRREVERSIBILITY
> 0.55	static reversibility
0.5 ÷ 0.55	low static reversibility
< 0.5	static irreversibility

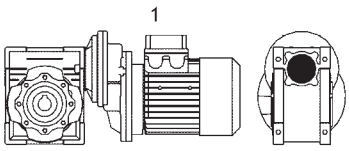
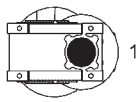
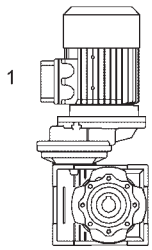
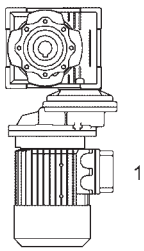
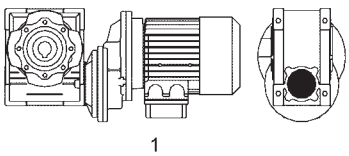
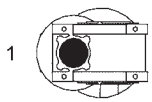
The table shows approximate irreversibility classes.
Vibrations and shocks can affect a gear reducer's irreversibility.
For the irreversibility conditions of a combined geared unit one must consider that the efficiency of the group is given by the product of the efficiencies of each single reducer, i.e.: $\eta tot = \eta 1 x \eta 2$

Mesh Data

NRV	i	5	7,5	10	15	20	25	30	40	50	60	80	100
025	Z1	6	4	3	2	2		1	1	1	1		
	γ	35°02'	25°03'	19°19'	13°09'	10°41'		6°40'	5°23'	4°31'	3°53'		
	Mx	1,3	1,3	1,3	1,3	0,995		1,3	0,995	0,8	0,67		
	ηd(1400)	0,87	0,85	0,83	0,79	0,75		0,67	0,62	0,58	0,55		
	ηs	0,72	0,71	0,68	0,61	0,56		0,46	0,41	0,36	0,34		
030	Z1	6	4	3	2	2	1	1	1	1	1	1	
	γ	27°04'	18°49'	14°20'	9°40'	7°42'	5°35'	4°52'	3°52'	3°12'	2°45'	2°07'	
	Mx	1,44	1,44	1,44	1,44	1,09	1,7	1,44	1,09	0,89	0,74	0,56	
	ηd(1400)	0,87	0,85	0,82	0,77	0,73	0,68	0,65	0,59	0,55	0,51	0,44	
	ηs	0,72	0,67	0,63	0,55	0,5	0,43	0,39	0,35	0,31	0,27	0,23	
040	Z1	6	4	3	2	2	2	1	1	1	1	1	1
	γ	34°19'	24°28'	18°51'	12°49'	10°23'	8°43'	6°29'	5°14'	4°23'	3°47'	2°57'	2°25'
	Mx	2,06	2,06	2,06	2,06	1,57	1,27	2,06	1,57	1,27	1,06	0,81	0,65
	ηd(1400)	0,89	0,87	0,85	0,82	0,78	0,75	0,7	0,65	0,62	0,58	0,52	0,47
	ηs	0,74	0,71	0,67	0,6	0,55	0,51	0,45	0,4	0,36	0,32	0,28	0,24
050	Z1	6	4	3	2	2	2	1	1	1	1	1	1
	γ	33°37'	23°54'	18°23'	12°30'	10°06'	8°29'	6°19'	5°06'	4°16'	3°40'	2°52'	2°21'
	Mx	2,56	2,56	2,56	2,56	1,95	1,58	2,56	1,95	1,58	1,32	1	0,8
	ηd(1400)	0,89	0,88	0,86	0,82	0,79	0,76	0,72	0,67	0,63	0,59	0,53	0,49
	ηs	0,74	0,7	0,66	0,59	0,55	0,51	0,44	0,39	0,35	0,32	0,27	0,23
063	Z1		4	3	2	2	2	1	1	1	1	1	1
	γ		24°31'	18°53'	12°51'	10°25'	8°45'	6°30'	5°15'	4°24'	3°47'	2°58'	2°26'
	Mx		3,25	3,25	3,25	2,48	2	3,25	2,48	2	1,68	1,27	1,02
	ηd(1400)		0,88	0,87	0,83	0,81	0,78	0,74	0,7	0,66	0,62	0,57	0,51
	ηs		0,71	0,67	0,6	0,55	0,51	0,45	0,4	0,36	0,33	0,28	0,24
075	Z1		4	3	2	2	2	1	1	1	1	1	1
	γ		26°17'	20°20'	13°52'	11°18'	9°32'	7°02'	5°42'	4°48'	4°08'	3°14'	2°40'
	Mx		3,94	3,94	3,94	3	2,42	3,94	3	2.42	2,03	1,54	1.24
	ηd(1400)		0,89	0,88	0,85	0,82	0,80	0,76	0,72	0,69	0,65	0,60	0,55
	ηs		0,71	0,68	0,61	0,57	0,53	0,46	0,42	0,38	0,35	0,29	0,26
090	Z1		4	3	2	2	2	1	1	1	1	1	1
	γ		29°11'	22°44'	15°36'	12°50'	10°54'	7°57'	6°30'	5°30'	4°46'	3°45'	3°06'
	Mx		4,84	4,84	4,84	3,69	2,98	4,84	3,69	2,98	2,5	1,89	1,52
	ηd(1400)		0,9	0,89	0,86	0,84	0,82	0,78	0,75	0,72	0,69	0,63	0,59
	ηs		0,73	0,7	0,64	0,6	0,56	0,49	0,45	0,41	0,38	0,32	0,28
105	Z1		4	3	2	2	2	1	1	1	1	1	1
	γ		28°15'	21°57'	15°02'	14°41'	12°34'	7°39'	7°28'	6°22'	5°32'	4°24'	3°39'
	Mx		5,875	5,875	5,875	4,62	3,73	5,875	4,62	3,73	3,13	2,37	1,91
	ηd(1400)		0,9	0,89	0,86	0,85	0,84	0,79	0,78	0,75	0,72	0,67	0,63
	ηs		0,72	0,69	0,63	0,62	0,59	0,48	0,48	0,44	0,41	0,36	0,32
110	Z1		4	3	2	2	2	1	1	1	1	1	1
	γ		28°15'	21°57'	15°02'	14°41'	12°34'	7°39'	7°28'	6°22'	5°32'	4°24'	3°39'
	Mx		5,875	5,875	5,875	4,62	3,73	5,875	4,62	3,73	3,13	2,37	1,91
	ηd(1400)		0,9	0,89	0,86	0,85	0,84	0,79	0,78	0,75	0,72	0,67	0,63
	ηs		0,72	0,69	0,63	0,62	0,59	0,48	0,48	0,44	0,41	0,36	0,32
130	Z1		4	3	2	2	2	1	1	1	1	1	1
	γ		28°41'	22°19'	15°18'	13°52'	11°49'	7°47'	7°02'	5°58'	5°11'	4°07'	3°24'
	Mx		6,97	6,97	6,97	5,4	4,37	6,97	5,4	4,37	3,67	2,77	2,23
	ηd(1400)		0,91	0,89	0,87	0,86	0,84	0,8	0,78	0,75	0,72	0,68	0,64
	ηs		0,72	0,69	0,63	0,61	0,58	0,49	0,46	0,43	0,39	0,34	0,3
150	Z1		6	4	3	2	2	2	1	1	1	1	1
	γ		32°09'	24°35'	17°27'	12°53'	11°19'	9°50'	6°32'	5°43'	4°57'	3°55'	3°14'
	Mx		5,5	6,155	5,5	6,155	5	4,193	6,155	5	4,193	3,17	2,55
	ηd(1400)		0,91	0,9	0,88	0,86	0,84	0,83	0,78	0,76	0,73	0,68	0,64
	ηs		0,73	0,71	0,66	0,6	0,57	0,54	0,45	0,42	0,39	0,33	0,29

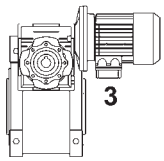
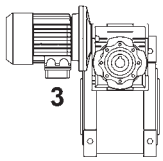
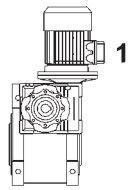
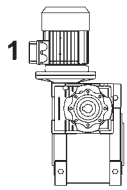
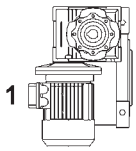
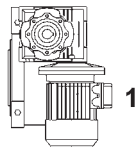
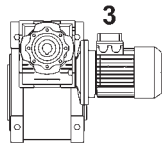
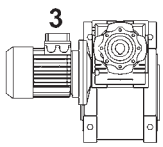
Mounting positions

NMRV - NRV			
NMRV...U - B3	B6	V5	V6
			
B8	B7		
			

NMRV/PC			
NMRV...U - B3	B6	V5	V6
			
B8	B7		
			

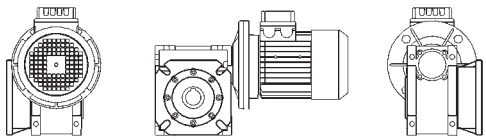
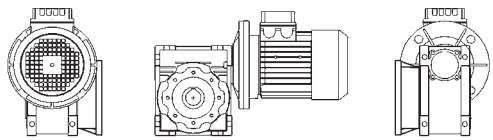
- "U" version is related to sizes from 025 to 075. For these sizes it is not necessary to specify mounting position.
- For vertical positions, check with pages 13
- Unless specified otherwise, the standard positions are B3.
- For positions not envisaged, it is necessary to call our Technical Service.

Execution

NMRV/NMRV OR NMRV/NRV			
AS1	AS2	VS1	VS2
			
PS1	PS2	BS1	BS2
			

- The position of the 1st reducer with respect to the 2nd gear reducer depend on the version. Unless otherwise specified at the time of order, combination groups are supplied in version BS2. The specified mounting position refers to the 2nd gear reducer. See page 12 for the possible mounting positions.

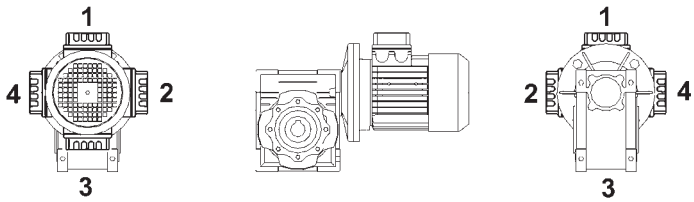
Flange F-FL

D	S
	

- Unless specified otherwise, the reduction unit is supplied with the flange in pos. D referred to position B3.

Position of terminal box

- In the case of specific requirements, when ordering, specify the position of the terminal box as shown in the diagram.



Selection Tables

P1 (kW)	n2 (1/min)	m2 (Nm)	f.s	i	Size	Frame size	Radial Load (N)	AxialLoad (N)
0,09	280,0	2,7	4,1	5	**NMRV025**	**56B4**	439	**307**
	186,7	3,9	2,8	7,5			503	
	140,0	5,1	2,4	10			553	
	93,3	7,3	1,6	15			633	
	70,0	9,2	1,3	20			697	
	46,7	12	1,1	30			798	
	35,0	15	0,9	40			878	
	280,0	2,7	6,7	5	**NMRV030**	**56B4**	597	**308**
	186,7	3,9	4,6	7,5			683	
	140,0	5,0	3,6	10			752	
	93,3	7,1	2,5	15			861	
	70,0	9,0	2,0	20			948	
	56,0	10	2,0	25			1021	
	46,7	12	1,7	30			1085	
	35,0	14	1,2	40			1194	
	28,0	17	1,0	50			1286	
	23,3	19	0,9	60			1367	
	28,8	19,0	2,0	50	**NMRV040**	**56B4**	2475	**310**
	23,3	21	1,7	60			2630	
	17,5	26	1,3	80			2895	
	14,0	29	1,0	100			3118	
	4,7	87,6	0,8	300	**NMRV040/030**	**56B4**	3490	**327**
	3,5	106,7	1,2	400	**NMRV050/030**	**56B4**	4840	**327**
	2,8	123	1,0	500			4840	
	2,3	159	0,9	600			4840	
	1,9	185	0,8	750			4840	
	1,6	212	0,7	900			4840	
	1,6	200,0	1,0	900	**NMRV063/030**	**56B4**	6270	**327**
	1,2	263	0,9	1200			6270	
	0,93	305	0,7	1500			6270	
	0,9	359,7	1,1	1500	**NMRV075/040**	**56B4**	7380	**328**
	0,78	404	1,0	1800			7380	
	0,58	496	0,7	2400			7380	
	0,5	608,9	0,9	3000	**NMRV090/040**	**56B4**	8180	**328**
	0,35	548	0,8	4000			8180	
0,18	280,0	5,3	3,4	5	**NMRV030**	**63B4**	597	**308**
	186,7	7,8	2,3	7,5			683	
	140,0	10	1,8	10			752	
	93,3	14	1,3	15			861	
	70,0	18	1,0	20			948	
	56,0	21	1,0	25			1021	
	46,7	24	0,8	30			1085	
	70,0	19,2	2,0	20	**NMRV040**	**63B4**	1824	**310**
	56,0	23	1,7	25			1964	
	46,7	26	1,7	30			2087	
	35,0	32	1,3	40			2298	
	28,0	38	1,0	50			2475	
	23,3	43	0,8	60			2630	
	35,0	32,9	2,3	40	**NMRV050**	**63B4**	3153	**312**
	28,0	39	1,9	50			3397	
	23,3	43	1,6	60			3610	

Selection Tables

P1 (kW)	n2 (1/min)	m2 (Nm)	f.s	i	Size	Frame size	Radial Load (N)	AxialLoad (N)
	17,5	52	1,2	80			3973	
	14,0	60	0,9	100			4280	
	18,7	63,5	1,4	75	**NMRV050/PC063**	**63B4**	3889	**321**
	15,6	71	1,5	90			4132	
	11,7	87	1,1	120			4548	
	9,3	101	0,9	150			4840	
	7,8	113	0,7	180			4840	
	5,8	133	0,6	240			4840	
	9,3	103,1	1,7	150	**NMRV063/PC063**	**63B4**	6270	**322**
	7,8	117	1,4	180			6270	
	5,8	139	1,0	240			6270	
	4,7	155	0,8	300			6270	
	2,3	362,0	1,1	600	**NMRV075/040**	**63B4**	7380	**328**
	1,9	435	0,9	750			7380	
	1,6	487	0,8	900			7380	
	1,2	629,2	1,0	1200	**NMRV090/040**	**63B4**	8180	**328**
	0,93	735	0,8	1500			8180	
	0,8	860,6	1,3	1800	**NMRV105/050**	**63B4**	10320	**328**
	0,58	1113	0,9	2400			10320	
0,25	280,0	7,6	4,5	5	**NMRV040**	**71A4**	1149	**310**
	186,7	11	3,6	7,5			1315	
	140,0	14	2,8	10			1447	
	93,3	21	1,9	15			1657	
	70,0	27	1,5	20			1824	
	56,0	32	1,2	25			1964	
	46,7	36	1,3	30			2087	
	35,0	44	0,9	40			2298	
	70,0	26,9	2,7	20	**NMRV050**	**71A4**	2503	**312**
	56,0	32	2,2	25			2696	
	46,7	37	2,3	30			2865	
	35,0	46	1,7	40			3153	
	28,0	54	1,4	50			3397	
	23,3	60	1,1	60			3610	
	17,5	72	0,9	80			3973	
	18,7	88,3	1,0	75	**NMRV050/PC071**	**71A4**	3889	**322**
	15,6	98	1,1	90			4132	
	11,7	121	0,8	120			4548	
	28,0	56,3	2,4	50	**NMRV063**	**71A4**	4440	**314**
	23,3	63	2,0	60			4719	
	17,5	78	1,6	80			5193	
	14,0	87	1,4	100			5595	
	18,7	90,8	1,8	75	**NMRV063/PC071**	**71A4**	5083	**322**
	15,6	100	2,0	90			5401	
	11,7	125	1,5	120			5945	
	9,3	143	1,2	150			6270	
	7,8	163	1,0	180			6270	
	5,8	192	0,7	240			6270	
	4,7	215	0,6	300			6270	
	17,5	81,9	2,3	80	**NMRV075**	**71A4**	6130	**315**
	14,0	94	1,9	100			6603	

Selection Tables

P1 (kW)	n2 (1/min)	m2 (Nm)	f.s	i	Size	Frame size	Radial Load (N)	AxialLoad (N)
	9,3	150,9	1,7	150	**NMRV075/PC071**	**71A4**	7380	**323**
	7,8	172	1,4	180			7380	
	5,8	201	1,1	240			7380	
	4,7	230	0,9	300			7380	
	3,5	336,3	1,1	400	**NMRV075/040**	**71A4**	7380	**328**
	2,8	384	0,8	500			7380	
	2,3	511,8	1,2	600	**NMRV090/040**	**71A4**	8180	**328**
	1,9	598	0,9	750			8180	
	1,6	667	0,8	900			8180	
	1,2	943,0	1,1	1200	**NMRV105/050**	**71A4**	10320	**328**
	0,93	1064	1,0	1500			10320	
	0,78	1195	0,9	1800			10320	
	0,6	1624,0	1,0	2400	**NMRV130/063**	**71A4**	13500	**329**
	0,47	1935	0,8	3000			13500	
	0,35	2046	0,6	4000			13500	
	0,28	2430	0,5	5000			13500	
	0,8	1199,0	1,8	1800	**NMRV150/063**	**71A4**	18000	**329**
	0,6	1446	1,8	2400			18000	
	0,5	1713	1,4	3000			18000	
	0,4	2026	0,9	4000			18000	
	0,3	2251	0,7	5000			18000	
0,37	280,0	11,2	3,0	5	**NMRV040**	**71B4**	1149	**310**
	186,7	16	2,4	7,5			1315	
	140,0	21	1,9	10			1447	
	93,3	31	1,3	15			1657	
	70,0	39	1,0	20			1824	
	56,0	47	0,8	25			1964	
	46,7	53	0,8	30			2087	
	140,0	21,7	3,3	10	**NMRV050**	**71B4**	1987	**312**
	93,3	31	2,4	15			2274	
	70,0	40	1,8	20			2503	
	56,0	48	1,5	25			2696	
	46,7	55	1,5	30			2865	
	35,0	68	1,1	40			3153	
	28,0	80	0,9	50			3397	
	23,3	89	0,8	60			3610	
	35,0	70,7	2,1	40	**NMRV063**	**71B4**	4122	**314**
	28,0	83	1,6	50			4440	
	23,3	94	1,4	60			4719	
	17,5	115	1,1	80			5193	
	14,0	129	0,9	100			5595	
	18,7	134,4	1,2	75	**NMRV063/PC071**	**71B4**	5083	**322**
	15,6	148	1,4	90			5401	
	11,7	185	1,0	120			5945	
	9,3	212	0,8	150			6270	
	23,3	98,4	2,0	60	**NMRV075**	**71B4**	5569	**315**
	17,5	121	1,6	80			6130	
	14,0	139	1,3	100			6603	
	18,7	138,2	1,8	75	**NMRV075/PC071**	**71B4**	6000	**323**
	15,6	154	1,9	90			6375	
	11,7	191	1,5	120			7017	

Selection Tables

P1 (kW)	n2 (1/min)	m2 (Nm)	f.s	i	Size	Frame size	Radial Load (N)	AxialLoad (N)
	9,3	223	1,1	150			7380	
	7,8	254	0,9	180			7380	
	4,7	405,5	1,0	300	**NMRV075/040**	**71B4**	7380	**328**
	3,5	498	0,7	400			7380	
	7,8	268,0	1,5	180	**NMRV090/PC071**	**71B4**	8180	**323**
	5,8	321	1,1	240			8180	
	4,7	321	0,9	300			8180	
	4,7	401,8	1,5	300	**NMRV090/040**	**71B4**	8180	**328**
	3,5	523	1,2	400			8180	
	2,8	611	0,9	500			8180	
	2,3	757	0,8	600			8180	
	1,9	949,5	1,2	750	**NMRV105/050**	**71B4**	10320	**328**
	1,6	1079	1,0	900			10320	
	1,2	1396	0,7	1200			10320	
	0,9	1674,1	1,1	1500	**NMRV130/063**	**71B4**	13500	**329**
	0,78	1887	0,9	1800			13500	
	0,8	1774,5	1,2	1800	**NMRV150/063**	**71B4**	18000	**329**
	0,6	2141	1,2	2400			18000	
	0,5	2535	0,9	3000			18000	
0,55	280,0	16,7	2,0	5	**NMRV040**	**80A4**	1149	**310**
	186,7	24	1,6	7.5			1315	
	140,0	32	1,3	10			1447	
	93,3	46	0,9	15			1657	
	280,0	16,7	3,7	5	**NMRV050**	**80A4**	1577	**312**
	186,7	25	2,9	7,5			1805	
	140,0	32	2,2	10			1987	
	93,3	46	1,6	15			2274	
	70,0	59	1,2	20			2503	
	56,0	71	1,0	25			2696	
	46,7	81	1,0	30			2865	
	70,0	60,8	2,2	20	**NMRV063**	**80A4**	3272	**314**
	56,0	73	1,8	25			3524	
	46,7	83	1,9	30			3745	
	35,0	105	1,4	40			4122	
	28,0	124	1,1	50			4440	
	23,3	140	0,9	60			4719	
	18,7	199,8	0,8	75	**NMRV063/PC080**	**80A4**	5083	**322**
	15,6	219	0,9	90			5401	
	35,0	108,1	2,0	40	**NMRV075**	**80A4**	4865	**315**
	28,0	129	1,6	50			5241	
	23,3	146	1,4	60			5569	
	17,5	180	1,1	80			6130	
	14,0	206	0,9	100			6603	
	18,7	205,4	1,2	75	**NMRV075/PC080**	**80A4**	6000	**323**
	15,6	230	1,3	90			6375	
	11,7	284	1,0	120			7017	
	9,3	332	0,8	150			7380	
	17,5	189,1	1,5	80	**NMRV090**	**80A4**	6783	**316**
	14,0	221	1,2	100			7306	
	18,0	198,4	2,0	50	**NMRV090**	**80B6**	6719	**316**
	15,0	224	1,6	60			7140	

Selection Tables

P1 (kW)	n2 (1/min)	m2 (Nm)	f.s	i	Size	Frame size	Radial Load (N)	AxialLoad (N)
	11,3	275	1,1	80			7859	
	9,0	315	0,9	100			8180	
	15,6	239,7	2,3	90	**NMRV090/PC080**	**80A4**	7054	**324**
	11,7	297	1,6	120			7764	
	9,3	355	1,3	150			8180	
	7,8	398	1,0	180			8180	
	5,8	477	0,8	240			8180	
	17,5	201,1	2,4	80	**NMRV105**	**80A4**	8571	**317**
	14,0	236	1,9	100			9232	
	7,8	425,5	1,7	180	**NMRV105/PC080**	**80A4**	10320	**324**
	5,8	513	1,2	240			10320	
	4,7	597	1,0	300			10320	
	4,7	638,9	1,7	300	**NMRV105/050**	**80A4**	10320	**328**
	3,5	826	1,2	400			10320	
	2,8	984	1,0	500			10320	
	2,3	1181	0,9	600			10320	
	1,9	1411	0,8	750			10320	
	2,8	995,5	1,6	500	**NMRV130/063**	**80A4**	13500	**329**
	1,9	1471	1,2	750			13500	
	1,2	2132	0,8	1200			13500	
	0,8	2637,8	0,8	1800	**NMRV150/063**	**80A4**	18000	**329**
	0,6	3182	0,8	2400			18000	
0,75	280,0	22,8	2,7	5	**NMRV050**	**80B4**	1577	**312**
	186,7	34	2,1	7,5			1805	
	140,0	44	1,6	10			1987	
	93,3	63	1,2	15			2274	
	70,0	81	0,9	20			2503	
	93,3	63,7	2,2	15	**NMRV063**	**80B4**	2973	**314**
	70,0	83	1,6	20			3272	
	56,0	100	1,3	25			3524	
	46,7	114	1,4	30			3745	
	35,0	143	1,0	40			4122	
	56,0	102,3	2,0	25	**NMRV075**	**80B4**	4160	**315**
	46,7	117	2,0	30			4421	
	35,0	147	1,5	40			4865	
	28,0	177	1,2	50			5241	
	23,3	200	1,0	60			5569	
	18,7	280,1	0,9	75	**NMRV075/PC080**	**80B4**	6000	**323**
	15,6	313	1,0	90			6375	
	28,0	184,2	1,8	50	**NMRV090**	**80B4**	5799	**316**
	23,3	212	1,5	60			6163	
	17,5	258	1,1	80			6783	
	14,0	302	0,9	100			7306	
	15,6	326,9	1,7	90	**NMRV090/PC080**	**80B4**	7054	**324**
	11,7	405	1,2	120			7764	
	9,3	483	0,9	150			8180	
	7,8	543	0,7	180			8180	
	17,5	274,2	1,8	80	**NMRV105**	**80B4**	8571	**317**
	14,0	322	1,4	100			9232	
	11,7	429,8	1,9	120	**NMRV105/PC080**	**80B4**	9811	**324**
	9,3	506	1,6	150			10320	

Selection Tables

P1 (kW)	n2 (1/min)	m2 (Nm)	f.s	i	Size	Frame size	Radial Load (N)	AxialLoad (N)
	7,8	580	1,2	180			10320	
	5,8	700	0,9	240			10320	
	4,7	871,2	1,3	300	**NMRV105/050**	**80B4**	10320	**328**
	3,5	1126	0,9	400			10320	
	5,8	712,2	1,4	240	**NMRV130/PC080**	**80B4**	13500	**325**
	4,7	813	1,1	300			13500	
	2,8	1357,5	1,1	500	**NMRV130/063**	**80B4**	13500	**329**
	2,3	1631	1,0	600			13500	
	1,9	2005	0,9	750			13500	
	1,6	2283	0,8	900			13500	
	2,8	1290,8	1,8	500	**NMRV150/063**	**80B4**	18000	**329**
	2,3	1529	1,7	600			18000	
	1,9	1783	1,3	750			18000	
	1,6	2215	0,9	900			18000	
	1,2	2680	1,0	1200			18000	
1,1	186,7	49,5	2,6	8	**NMRV063**	**90S4**	2359	**314**
	140,0	65	2,0	10			2597	
	93,3	93	1,5	15			2973	
	70,0	122	1,1	20			3272	
	56,0	146	0,9	25			3524	
	46,7	167	1,0	30			3745	
	93,3	95,7	2,1	15	**NMRV075**	**90S4**	3509	**315**
	70,0	123	1,7	20			3862	
	56,0	150	1,3	25			4160	
	46,7	171	1,3	30			4421	
	35,0	216	1,0	40			4865	
	35,0	225,1	1,6	40	**NMRV090**	**90S4**	5383	**316**
	28,0	270	1,3	50			5799	
	23,3	311	1,0	30			6163	
	28,0	281,4	2,1	50	**NMRV105**	**90S4**	7328	**317**
	23,3	324	1,7	60			7787	
	17,5	402	1,2	80			8571	
	14,0	473	1,0	100			9232	
	17,5	408,2	2,1	80	**NMRV130**	**90S4**	11210	**319**
	14,0	480	1,5	100			12076	
	19,3	392,2	2,2	73	**NMRV105/PC090**	**90S4**	8298	**324**
	14,5	508	1,6	96,8			9133	
	11,6	599	1,3	121			9838	
	9,6	686	1,0	145,2			10320	
	7,2	828	0,8	193,6			10320	
	19,3	397,7	3,5	73	**NMRV130/PC090**	**90S4**	10853	**325**
	14,5	508	2,6	96,8			11945	
	11,6	608	2,0	121			12868	
	9,6	686	1,6	145,2			13500	
	7,2	843	1,2	193,6			13500	
	5,8	962	0,9	242			13500	
	4,7	1312,1	1,3	300	**NMRV130/063**	**90S4**	13500	**329**
	3,5	1671	1,0	400			13500	
	2,8	1991	0,8	500			13500	
	9,3	752,8	3,1	150	**NMRV150/063**	**90S4**	18000	**329**
	7,0	966	2,4	200			18000	

Selection Tables

P1 (kW)	n2 (1/min)	m2 (Nm)	f.s	i	Size	Frame size	Radial Load (N)	AxialLoad (N)
	5,6	1175	1,7	250			18000	
	4,7	1364	1,7	300			18000	
	3,5	1619	1,6	400			18000	
	2,8	1893	1,2	500			18000	
	2,3	2242	1,2	600			18000	
	1,9	2616	0,9	750			18000	
1,5	186,7	67,5	1,9	8	**NMRV063**	**90L4**	2359	**314**
	140,0	89	1,5	10			2597	
	93,3	127	1,1	15			2973	
	70,0	166	0,8	20			3272	
	140,0	90,0	2,2	10	**NMRV075**	**90L4**	3065	**315**
	93,3	130	1,5	15			3509	
	70,0	168	1,3	20			3862	
	56,0	205	1,0	25			4160	
	46,7	233	1,0	30			4421	
	70,0	171,9	2,1	20	**NMRV090**	**90L4**	4273	**316**
	56,0	210	1,6	25			4603	
	46,7	239	1,7	30			4891	
	35,0	307	1,2	40			5383	
	28,0	368	0,9	50			5799	
	23,3	424	0,8	60			6163	
	35,0	319,2	1,9	40	**NMRV105**	**90L4**	6803	**317**
	28,0	384	1,6	50			7328	
	23,3	442	1,3	60			7787	
	17,5	548	0,9	80			8571	
	19,3	534,9	1,6	73	**NMRV105/PC090**	**90L4**	8298	**324**
	14,5	693	1,2	96,8			9133	
	11,6	817	1,0	121			9838	
	9,6	936	0,8	145,2			10320	
	17,5	556,6	1,5	80	**NMRV130**	**90L4**	11210	**319**
	14,0	655	1,1	100			12076	
	19,3	542,3	2,6	73	**NMRV130/PC090**	**90L4**	10853	**325**
	14,5	693	1,9	96,8			11945	
	11,6	830	1,5	121			12868	
	9,6	936	1,1	145,2			13500	
	7,2	1148,9	0,8	194			13500	
	4,7	1789,3	1,0	300	**NMRV130/063**	**90L4**	13500	**329**
	3,5	2279	0,7	400			13500	
	9,3	1026,5	2,3	150	**NMRV150/063**	**90L4**	18000	**329**
	7,0	1317	1,8	200			18000	
	5,6	1602	1,3	250			18000	
	4,7	1860	1,3	300			18000	
	3,5	2208	1,2	400			18000	
	2,8	2582	0,9	500			18000	
	2,3	3057	0,9	600			18000	
2,2	186,7	100,2	1,8	8	**NMRV075**	**100LA4**	2785	**315**
	140,0	132	1,5	10			3065	
	93,3	191	1,0	15			3509	
	186,7	101,3	2,9	8	**NMRV090**	**100LA4**	3081	**316**
	140,0	134	2,3	10			3391	
	93,3	194	1,9	15			3882	

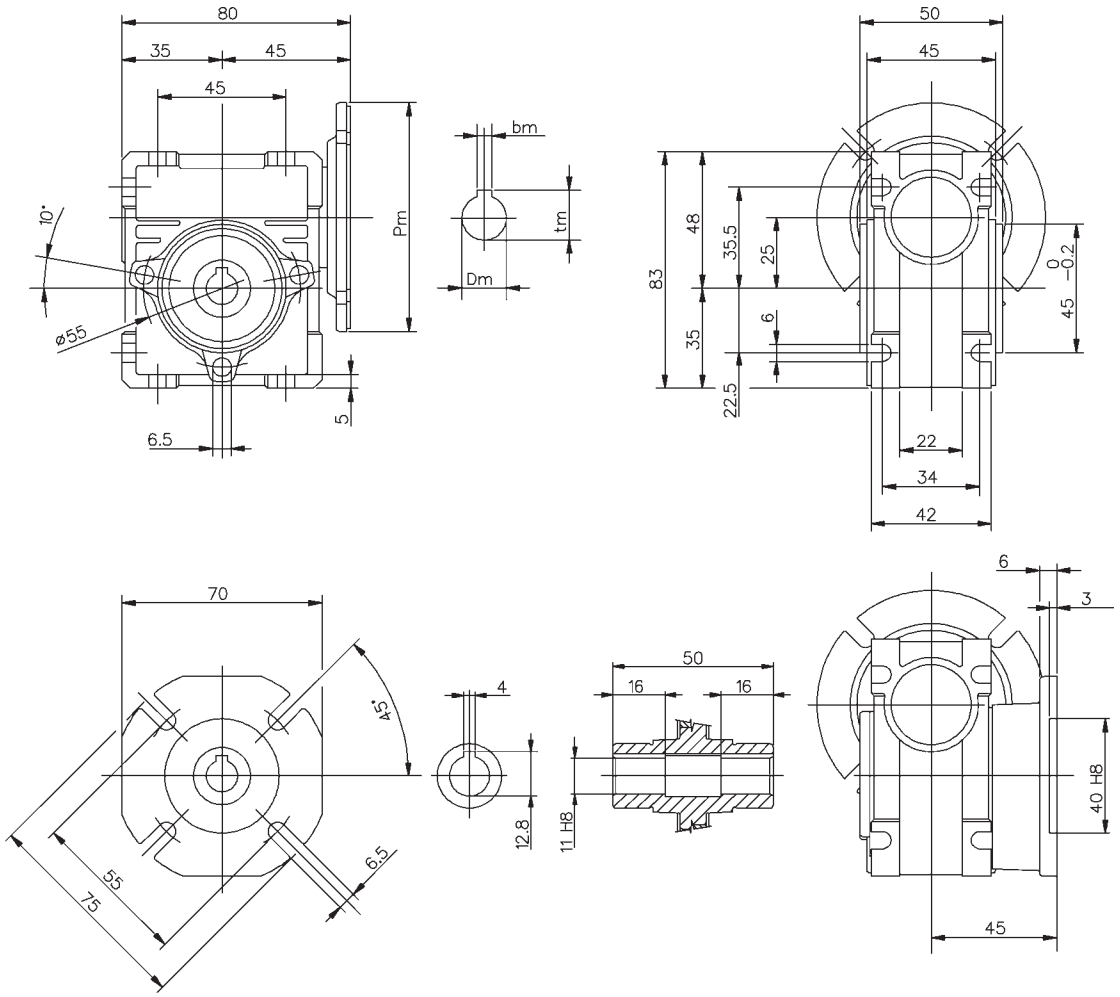
Selection Tables

P1 (kW)	n2 (1/min)	m2 (Nm)	f.s	i	Size	Frame size	Radial Load (N)	AxialLoad (N)
	70,0	252	1,4	20			4273	
	56,0	308	1,1	25			4603	
	46,7	351	1,2	30			4891	
	70,0	255,1	2,2	20	**NMRV105**	**100LA4**	5399	**317**
	56,0	315	1,9	25			5816	
	46,7	356	1,8	30			6181	
	35,0	468	1,3	40			6803	
	28,0	563	1,1	50			7328	
	23,3	648	0,9	60			7787	
	35,0	468,2	2,2	40	**NMRV130**	**100LA4**	8897	**319**
	28,0	563	1,7	50			9584	
	23,3	648	1,4	60			10185	
	17,5	816	1,0	80			11210	
	28,0	570,3	2,5	50	**NMRV150**	**100LA4**	13103	**320**
	23,3	657	1,9	60			13924	
	17,5	816	1,4	80			15325	
	14,0	960	1,0	100			16508	
3	186,7	136,6	1,4	8	**NMRV075**	**100LB4**	2785	**315**
	140,0	180	1,1	10			3065	
	93,3	261	0,8	15			3509	
	186,7	138,1	2,1	8	**NMRV090**	**100LB4**	3081	**316**
	140,0	182	1,7	10			3391	
	93,3	264	1,4	15			3882	
	70,0	344	1,0	20			4273	
	56,0	420	0,8	25			4603	
	46,7	479	0,9	30			4891	
	93,3	264,0	2,2	15	**NMRV105**	**100LB4**	4905	**317**
	70,0	348	1,6	20			5399	
	56,0	430	1,4	25			5816	
	46,7	485	1,4	30			6181	
	35,0	638	1,0	40			6803	
	28,0	767	0,8	50			7328	
	120,0	212,5	2,7	8	**NMRV105**	**132S6**	4511	**317**
	90,0	280	2,2	10			4965	
	60,0	406	1,6	15			5684	
	45,0	528	1,2	20			6256	
	56,0	429,8	2,2	25	**NMRV130**	**100LB4**	7607	**319**
	46,7	491	2,1	30			8084	
	35,0	638	1,6	10			8897	
	28,0	767	1,3	50			9584	
	23,3	884	1,0	60			10185	
	17,5	1113	0,8	80			11210	
	28,0	777,6	1,8	50	**NMRV150**	**100LB4**	13103	**320**
	23,3	896	1,4	60			13924	
	17,5	1113	1,0	80			15325	
	14,0	1310	0,8	100			16508	
4	186,7	184,2	1,6	8	**NMRV090**	**112M4**	3081	**316**
	140,0	243	1,3	10			3391	
	93,3	352	1,0	15			3882	
	70,0	458	0,8	20			4273	
	140,0	242,8	2,1	10	**NMRV105**	**112M4**	4285	**317**

Selection Tables

P1 (kW)	n2 (1/min)	m2 (Nm)	f.s	i	Size	Frame size	Radial Load (N)	AxialLoad (N)
	93,3	352	1,6	15			4905	
	70,0	464	1,2	20			5399	
	56,0	573	1,0	25			5816	
	46,7	647	1,0	30			6181	
	56,0	573,0	1,6	25	**NMRV130**	**112M4**	7607	**319**
	46,7	655	1,6	30			8084	
	35,0	851	1,2	40			8897	
	28,0	1023	1,0	50			9584	
	23,3	1179	0,8	60			10185	
	28,0	1036,9	1,4	50	**NMRV150**	**112M4**	13103	**320**
	23,3	1195	1,1	60			13924	
	17,5	1484	0,8	80			15325	
5,5	186,7	253,2	1,9	8	**NMRV105**	**132S4**	3893	**317**
	140,0	334	1,6	10			4285	
	93,3	484	1,2	15			4905	
	70,0	638	0,9	20			5399	
	140,0	333,9	2,5	10	**NMRV130**	**132S4**	5605	**319**
	93,3	490	1,9	15			6416	
	70,0	645	1,4	20			7062	
	56,0	788	1,2	25			7607	
	46,7	900	1,2	30			8084	
	35,0	1171	0,9	40			8897	
	70,0	645,3	2,0	20	**NMRV150**	**132S4**	9654	**320**
	56,0	788	1,5	25			10400	
	46,7	934	1,3	30			11051	
	35,0	1171	1,3	40			12163	
	28,0	1426	1,0	50			13103	
	23,3	1643	0,8	60			13924	
7,5	186,7	345,3	1,4	8	**NMRV105**	**132L4**	3893	**317**
	140,0	455	1,1	10			4285	
	93,3	660	0,9	15			4905	
	186,7	349,2	2,1	8	**NMRV130**	**132L4**	5092	**319**
	140,0	455	1,8	10			5605	
	93,3	668	1,4	15			6416	
	70,0	880	1,0	20			7062	
	56,0	1074	0,9	25			7607	
	46,7	1228	0,8	30			8084	
	35,0	1596	0,7	40			8897	
	70,0	880,0	1,5	20	**NMRV150**	**132L4**	9654	**320**
	56,0	1074	1,1	25			10400	
	46,7	1274	0,9	30			11051	
	35,0	1596	1,0	40			12163	
11	186,7	512,1	2,3	8	**NMRV150**	**160M4**	6962	**320**
	140,0	675	1,8	10			7663	
	93,3	990	1,3	15			8771	
	70,0	1291	1,0	20			9654	
	56,0	1576	0,8	25			10400	
15	186,7	698,3	1,7	8	**NMRV150**	**160L4**	6962	**320**
	140,0	921	1,3	10			7663	
	93,3	1351	0,9	15			8771	
	70,0	1760	0,7	20			9654	

Dimensions 025

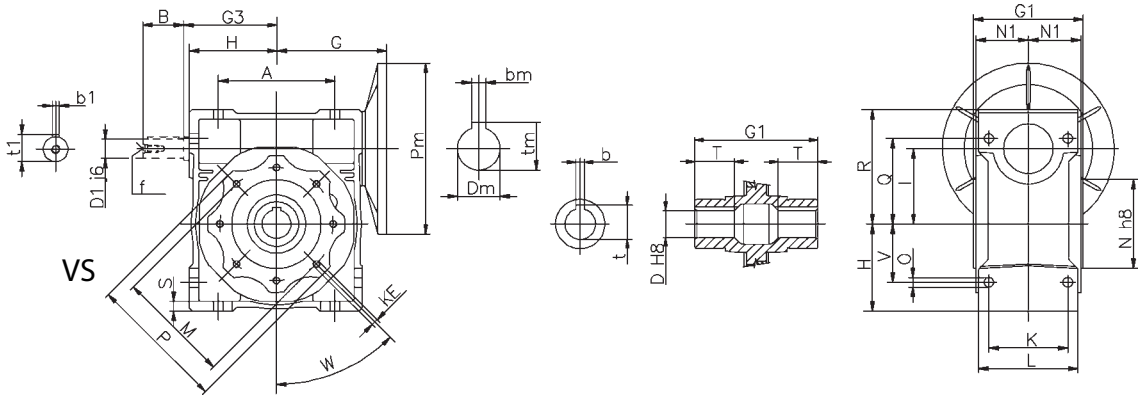


FA

- Weight without motor ~0.7 kg

For the dimensions concerning the motor connection area (Pm, Dm, bm, tm) please refer to the table shown at page 30.

Dimensions 030-150



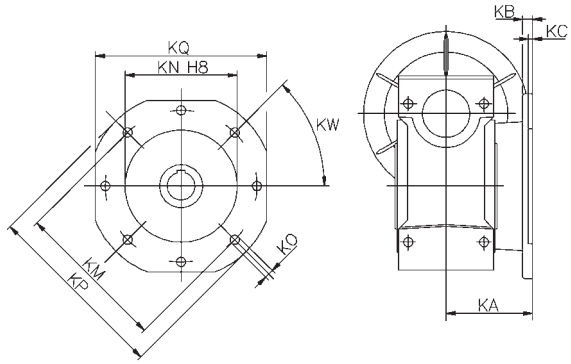
(..) Only on request

	030	040	050	063	075	090	105	110	130	150
A	54	70	80	100	120	140	170	170	200	240
B	20	23	30	40	50	50	60	60	80	80
D	14	18 (19)	25 (24)	25 (28)	28 (35)	35 (38)	42	42	45	50
D1	9	11	14	19	24	24	28	28	30	35
G	55	70	80	95	112.5	129.5	160	160	180	210
G1	63	78	92	112	120	140	155	155	170	200
G3	45	53	64	75	90	108	135	135	155	175
H	40	50	60	72	86	103	127.5	127.5	147.5	170
I	30	40	50	63	75	90	110	110	130	150
K	44	60	70	85	90	100	115	115	120	145
KE	M6*11 (4)	M6*10 (4)	M8*10 (4)	M8*14(8)	M8*14(8)	M10*18(8)	M10*18(8)	M10*18(8)	M12*21(8)	M12*21(8)
L	56	71	85	103	112	130	144	144	155	185
M	65	75	85	95	115	130	165	165	215	215
N	55	60	70	80	95	110	130	130	180	180
N1	29	36.5	43.5	53	57	67	74	74	81	96
O	6.5	6.5	8.5	8.5	11.5	13	14	14	16	18
P	75	87	100	110	140	160	200	200	250	250
Q	44	55	64	80	93	102	125	125	140	180
R	57	71.5	84	102	119	135	167.5	167.5	187.5	230
S	5.5	6.5	7	8	10	11	16	14.5	15.5	18
T	21	26	30	36	40	45	50	50	60	72.5
V	27	35	40	50	60	70	85	85	100	120
W	0°	45°	45°	45°	45°	45°	45°	45°	45°	45°
b	5	6	8	8	8 (10)	10	12	12	14	14
t	16.3	20.8 (21.8)	28.3 (27.3)	28.3 (31.3)	31.3 (38.3)	38.3 (41.3)	45.3	45.3	48.8	53.8
b1	3	4	5	6	8	8	8	8	8	10
t1	10.2	12.5	16	21.5	27	27	31	31	33	38
f	-	-	M6	M6	M8	M8	M10	M10	M10	M12
~Kg	1.2	2.3	3.5	6.2	9	13	21	35	48	84

~kg Weight without motor

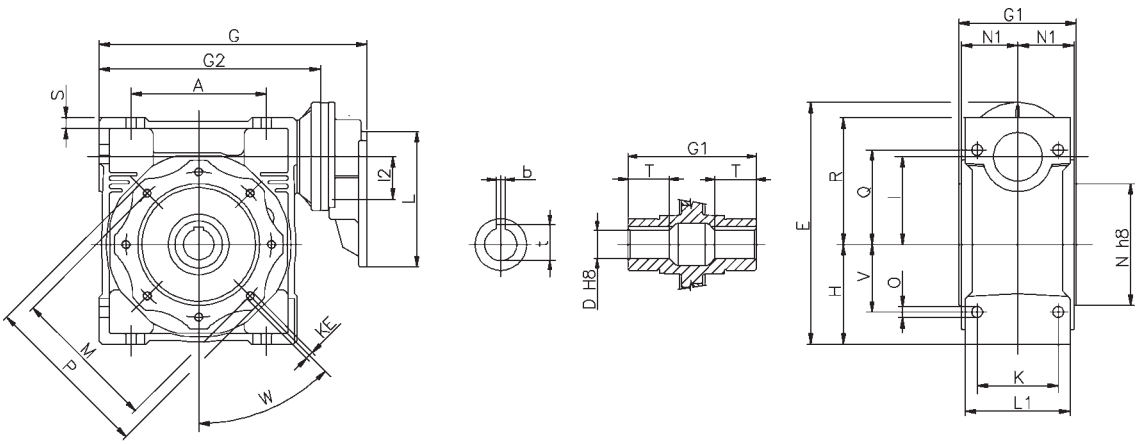
For the dimensions concerning the motor connection area (Pm, Dm, bm, tm) please refer to the table shown at page 30

Dimensions 030-150F



		030	040	050	063	075	090	105	110	130	150
FA	KA	54.5	67	90	82	111	111	131	131	140	155
	KB	6	7	9	10	13	13	15	15	15	15
	KC	4	4	5	6	6	6	6	6	6	6
	KN	50	60	70	115	130	152	170	170	180	180
	KM	68	75	85	150	165	175	230	230	255	255
	KO	6.5 (n°4)	9 (n°4)	11 (n°4)	11 (n°4)	14 (n°4)	14 (n°4)	14 (n°8)	14 (n°8)	16 (n°8)	16 (n°8)
	KP	80	110	125	180	200	210	280	280	320	320
	KQ	70	95	110	142	170	200	260	260	290	290
	KW	45°	45°	45°	45°	45°	45°	45°	45°	22.5°	22.5°
FB	KA	-	97	120	112	90	122	180	180	-	-
	KB	-	7	9	10	13	18	15	15	-	-
	KC	-	4	5	6	6	6	6	6	-	-
	KN	-	60	70	115	110	180	170	170	-	-
	KM	-	75	85	150	130	215	230	230	-	-
	KO	-	9 (n°4)	11 (n°4)	11 (n°4)	14 (n°4)	14 (n°4)	14 (n°8)	14 (n°8)	-	-
	KP	-	110	125	180	160	250	280	280	-	-
	KQ	-	95	110	142	-	-	260	260	-	-
	KW	-	45°	45°	45°	45°	45°	45°	45°	-	-
FC	KA	-	80	89	98	-	110	-	-	-	-
	KB	-	9	10	10	-	17	-	-	-	-
	KC	-	5	5	5	-	6	-	-	-	-
	KN	-	95	110	130	-	130	-	-	-	-
	KM	-	115	130	165	-	165	-	-	-	-
	KO	-	9.5 (n°4)	9.5 (n°4)	11 (n°4)	-	11 (n°4)	-	-	-	-
	KP	-	140	160	200	-	200	-	-	-	-
	KW	-	45°	45°	45°	-	45°	-	-	-	-
FD	KA	-	58	72	107	-	151	-	-	-	-
	KB	-	12	14.5	10	-	13	-	-	-	-
	KC	-	5	5	5	-	6	-	-	-	-
	KN	-	80	95	130	-	152	-	-	-	-
	KM	-	100	115	165	-	175	-	-	-	-
	KO	-	9 (n°4)	11 (n°4)	11 (n°4)	-	14 (n°4)	-	-	-	-
	KP	-	120	140	200	-	210	-	-	-	-
	KW	-	45°	45°	45°	-	45°	-	-	-	-
FE	KA	-	-	-	80.5	-	-	-	-	-	-
	KB	-	-	-	16.5	-	-	-	-	-	-
	KC	-	-	-	5	-	-	-	-	-	-
	KN	-	-	-	110	-	-	-	-	-	-
	KM	-	-	-	130	-	-	-	-	-	-
	KO	-	-	-	11 (n°4)	-	-	-	-	-	-
	KP	-	-	-	160	-	-	-	-	-	-
	KW	-	-	-	45°	-	-	-	-	-	-

Dimensions NMRV/PC

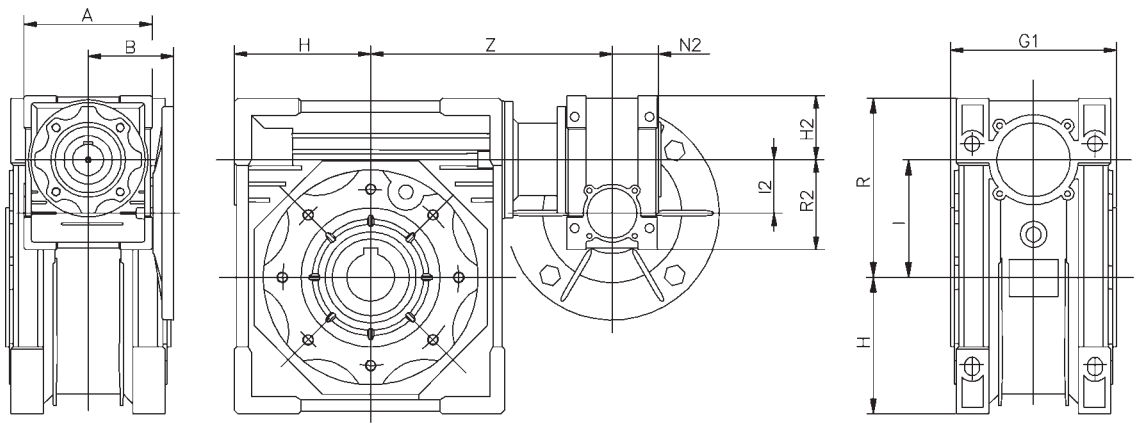


	NMRV/PC063			NMRV/PC071				NMRV/PC080-090				
	040	050	063	050	063	075	090	075	090	105	110	130
A	70	80	100	80	100	120	140	120	140	170	170	200
E	147	167	192	177.5	202.5	228.5	260.5	241	273	317.5	317.5	357.5
G	165	185	212	193	220	251.5	285.5	267.5	301.5	356.5	356.5	396.5
G1	78	92	112	92	112	120	140	120	140	155	155	170
G2	120	140	167	140	167	198.5	232.5	198.5	232.5	287.5	287.5	327.5
H	50	60	72	60	72	86	103	86	103	127.5	127.5	147.5
I	40	50	63	50	63	75	90	75	90	110	110	130
I2	40	40	40	50	50	50	50	63	63	63	63	63
L	140	140	140	160	160	160	160	200	200	200	200	200
L1	71	85	103	85	103	112	130	112	130	144	144	155
K	60	70	85	70	85	90	100	90	100	115	115	120
KE	M6*10(4)	M8*10(4)	M8*14(8)	M8*10(4)	M8*14(8)	M8*14(8)	M10*18(8)	M8*14(8)	M10*18(8)	M10*18(8)	M10*18(8)	M12*21(8)
M	75	85	95	85	95	115	130	115	130	165	165	215
N	60	70	80	70	80	95	110	95	110	130	130	180
N1	36.5	43.5	53	43.5	53	57	67	57	67	74	74	81
O	6.5	8.5	8.5	8.5	8.5	11.5	13	11.5	13	14	14	16
P	87	100	110	100	110	140	160	140	160	200	200	250
Q	55	64	80	64	80	93	102	93	102	125	125	140
R	71.5	84	102	84	102	119	135	119	135	167.5	167.5	187.5
S	6.5	7	8	7	8	10	11	10	11	16	14.5	15.5
T	26	30	36	30	36	40	45	40	45	50	50	60
V	35	40	50	40	50	60	70	60	70	85	85	100
W	45°	45°	45°	45°	45°	45°	45°	45°	45°	45°	45°	45°
D	18	25	25	25	25	28	35	28	35	42	42	45
b	6	8	8	8	8	8	10	8	10	12	12	14
t	20.8	28.3	28.3	28.3	28.3	31.3	38.3	31.3	38.3	45.3	45.3	48.8
~Kg	3.4	4.6	7.3	5.1	7.8	10.6	14.6	12.4	16.4	24.4	38.4	51.4

~kg Weight without motor

- For the dimensions of the output flanges, please consider the drawing of relevant NMRV size.
- For the dimensions of the hollow shafts in option, please consider the drawing of relevant NMRV size.
- For the dimensions of the double extention worm shafts, please consider the drawing of relevant NMRV size.

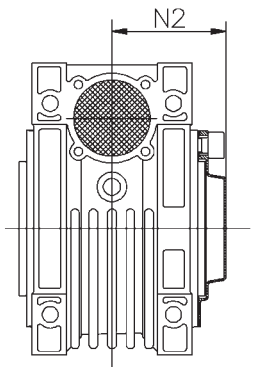
Dimensions NMRV/NMRV (Double worm geared)



NMRV-NMRV											
	030/025	040/025	040/030	063/030	075/040	040/075	090/040	105/050	110/050	130/063	150/063
A	70	70	80	80	80	100	100	120	120	144	144
B	45	45	55	55	55	70	70	80	80	95	95
G1	63	78	78	92	112	120	140	155	155	170	200
H	40	50	50	60	72	86	103	127.5	127.5	147.5	170
I	30	40	40	50	63	75	90	110	110	130	150
R	57	71.5	71.5	84	102	119	135	167.5	167.5	187.5	230
H2	35	35	40	40	40	50	50	60	60	72	72
I2	25	25	30	30	30	40	40	50	50	63	63
N2	22.5	22.5	29	29	29	36.5	36.5	43.5	43.5	53	53
R2	48	48	57	57	57	71.5	71.5	84	84	102	102
Z	100	115	122	132	145	167.5	184.5	226	226	245	275
~Kg	1.9	3	3.5	4.7	7.4	11.3	15.3	24.5	38.5	54.2	90.2

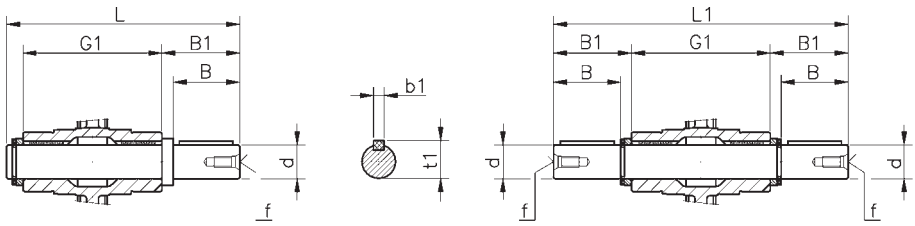
~kg Weight without motor

Cover



	N2
030	42
040	50
050	57.5
063	68.5
075	73.5
090	85.5
105	94
110	94
130	102
150	117

Low speed shafts

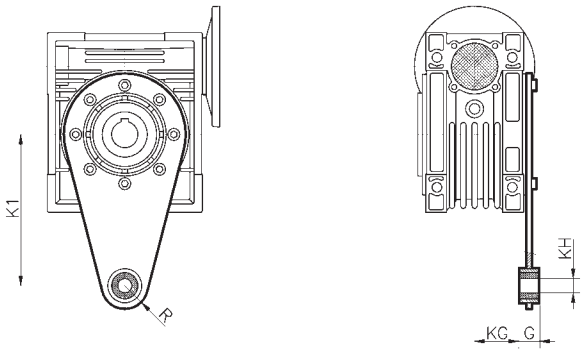


AS AB

	d	B	B1	G1	L	L1	f	b1	t1
025	11g6 (9)	23 (25)	25,5 (30)	50	81 (85,5)	101	-	4 (3)	12,5 (10,2)
030	14 g6	30	32,5	63	102	128	M6	5	16
040	18 h6	40	43	78	128	164	M6	6	20,5
050	25 h6	50	53,5	92	153	199	M10	8	28
063	25 h6	50	53,5	112	173	219	M10	8	28
075	28 h6	60	63,5	120	192	247	M10	8	31
090	35 h6	80	84,5	140	234	309	M12	10	38
105	42 h6	80	84,5	155	249	324	M16	12	45
110	42 h6	80	84,5	155	249	324	M16	12	45
130	45 h6	80	85	170	265	340	M16	14	48,5
150	50 h6	82	87	200	297	374	M16	14	53,5

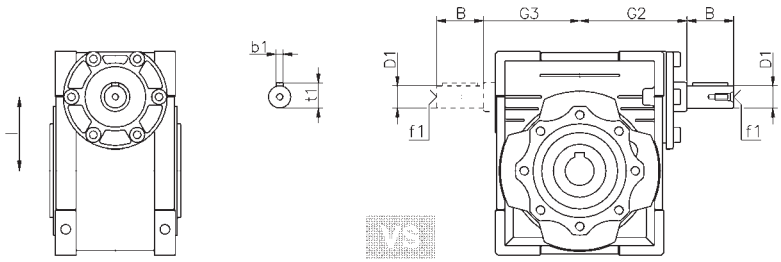
(..) Only on request

Torque arm



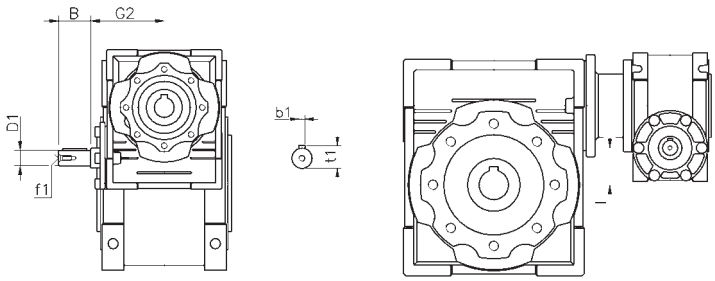
	K1	G	KG	KH	R
025	70	14	17,5	8	15
030	85	14	24	8	15
040	100	14	31,5	10	18
050	100	14	38,5	10	18
063	150	14	49	10	18
075	200	25	47,5	20	30
090	200	25	57,5	20	30
105	250	30	62	25	35
110	250	30	62	25	35
130	250	30	69	25	35
150	250	30	84	25	35

Dimensions NRV



NRV	030	040	050	063	075	090	105	110	130	150
B	20	23	30	40	50	50	60	60	80	80
D1	9 j6	11 j6	14 j6	19 j6	24 j6	24 j6	28 j6	28 j6	30 j6	35 j6
G2	51	60	74	90	105	125	142	142	162	195
G3	45	53	64	75	90	108	135	135	155	175
I	30	40	50	63	75	90	110	110	130	150
b1	3	4	5	6	8	8	8	8	8	10
f1	-	-	M6	M6	M8	M8	M10	M10	M10	M12
t1	10,2	12,5	16	21,5	27	27	31	31	33	38

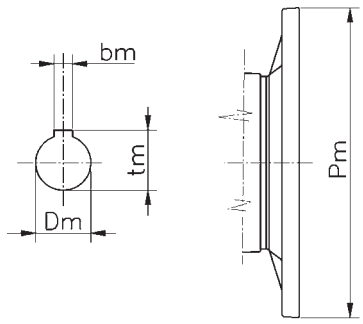
Dimensions NRV-NMRV



NRV-NMRV	030-040	030-050	030-063	040-075	040-090	050-105	050-110	063-130	063-150
B	20	20	20	23	23	30	30	40	40
D1	9 j6	9 j6	9 j6	11 j6	11 j6	14 j6	14 j6	19 j6	19 j6
G2	51	51	51	60	60	74	74	90	90
I	10	20	33	35	50	60	60	67	87
b1	3	3	3	4	4	5	5	6	6
f1	-	-	-	-	-	M6	M6	M6	M6
t1	10,2	10,2	10,2	12,5	12,5	16	16	21,5	21,5

For the missing dimensions, please consider the drawing of relevant NMRV size.

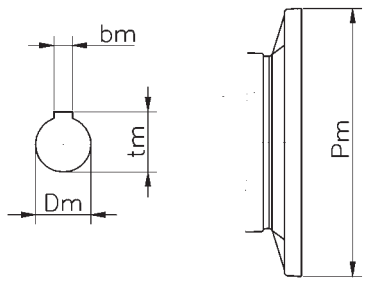
Dimensions PAM B5



B5	IEC										
	056	063	071	080	090	100	112	132	160	180	200
Pm	120	140	160	200	200	250	250	300	350	350	400
Dm	9	11	14	19	24	28	28	38	42	48	55
bm	3	4	5	6	8	8	8	10	12	14	16
tm	10,4	12,8	16,3	21,8	27,3	31,3	31,3	41,3	45,3	51,8	59,3

NMRV (105 ÷ 130) tm= 40,3 (IEC 132)

Dimensions PAM B14



B14	IEC							
	056	063	071	080	090	100	112	132
Pm	80	90	105	120	140	160	160	200
Dm	9	11	14	19	24	28	28	38
bm	3	4	5	6	8	8	8	10
tm	10,4	12,8	16,3	21,8	27,3	31,3	31,3	41,3

NMRV (105 ÷ 130) tm= 40,3 (IEC 132)

HUMMER

GEARREDUCER

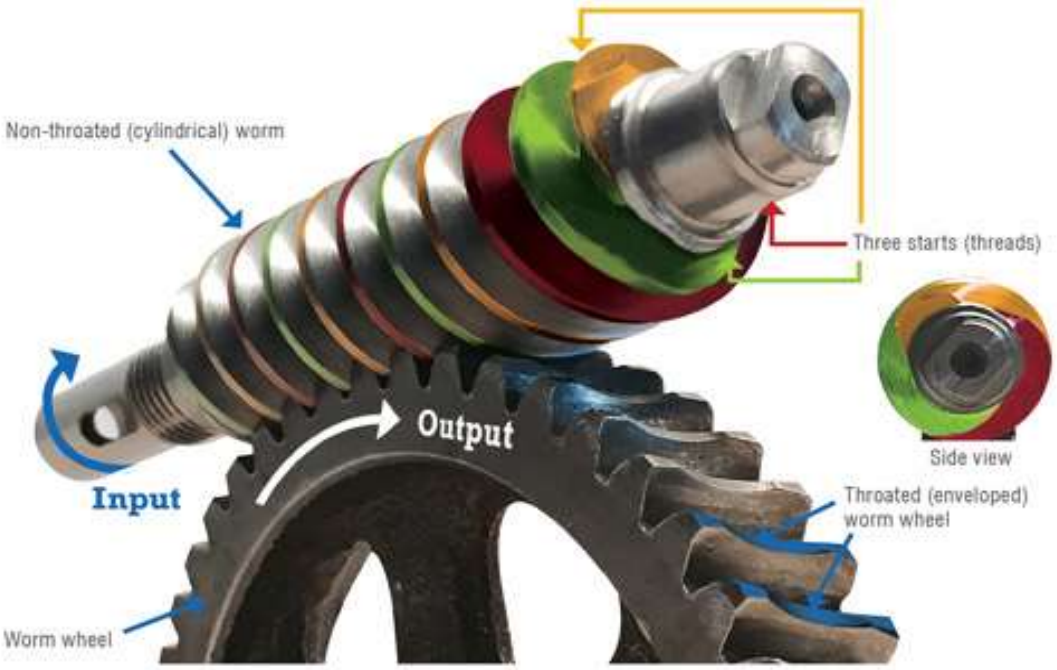


Figure 4. Single-throated (single-enveloping) worm drive

WORM GEAR

TORSION ENGINEERING CO.,LTDบริษัท ทอร์ชั่น เอนจิเนียริ่ง จำกัด
3/129 ถนนหมู่บ้านเศรษฐกิจ แขวงบางไผ่ เขตบางแค กรุงเทพฯ 10160
โทร 02-000-6945 โทรสาร 02-000-6945 เลขประจำตัวผู้เสียภาษีอากร 0105561089501