

WORM GEAR UNITS

ACCESSORIES FOR GEAR BOXES

03.07

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WORM GEARED MOTORS AND WORM GEAR UNITS



CHM



CHME



CHMR



CHMRE

INTRODUCTION

The worm gears made by Chiaravalli Trasmissioni SpA are square and are considerably versatile for mounting. The machining of the components, carried out using numeric control machines, guarantees maximum precision for the restricted tolerances, producing a product that will remain reliable over time. The groups are constructed with aluminium casings from sizes 025 to 090, while the sizes 110 and 130 are made from cast iron.

All of the bodies are painted with RAL 9022 aluminium colour to protect the parts from aging and to give better protection against micro-blowholes that may be present in the aluminium.

The gears are supplied with at least one filling plug that is also used during testing to check for possible leaks. A connection flange allows two gears to be combined in order to obtain high gear ratios.

Four sizes of CHTPC pre-stage gears are available to pair with the gears; these are also constructed in aluminium and are painted like the worm gears.

All of the groups are supplied with a lubricant whose characteristics are described in the following table.

LUBRICATION

	CHM 025/090	CHM 110/130			CHTPC
Lubricant	Synthetic	Mineral	Mineral	Mineral	Synthetic
°C Ambient	-25°C/+50°C	-25°C/+50°C	-5°C/+40°C	-15°C/+25°C	-25°C/+50°C
ISO	VG320	VG320	VG460	VG220	VG320
AGIP	TELIUM VSF 320	BLASIA 320	BLASIA 460	BLASIA 220	TELIUM VSF 320
SHELL	TIVELA OIL SC 320	OMALA OIL 320	OMALA OIL 460	OMALA OIL 220	TIVELA OIL SC 320
IP	TELIUM VSF	MELLANA OIL 320	MELLANA OIL 460	MELLANA OIL 220	TELIUM VSF

LUBRICATION

The size 025 to 090 gears are supplied complete with synthetic oil and therefore do not require any maintenance. The size 110 and 130 gears are supplied with the quantity of mineral oil foreseen for the B3 assembly position. It is the client's responsibility to adapt the quantity of oil to the assembly position and in addition, to substitute the filling plug, supplied closed for transport reasons, with the one equipped with a hole attached to the gear. If the breather plug is not installed it may create internal pressure with a consequent leakage of oil from the oil seals. For the sizes 110 and 130 we recommend that the oil is changed after the running in period, approx. 300 working hours.

QUANTITY OF OIL IN LITRES

CHM	025	030	040	050	063	075	090	110	130	CHTPC	63	71	80	90
B3	0.02	0.04	0.08	0.15	0.30	0.55	1	3	4.5		0.05	0.07	0.15	0.16
B8	0.02	0.04	0.08	0.15	0.30	0.55	1	2.2	3.3		0.05	0.07	0.15	0.16
B6/B7	0.02	0.04	0.08	0.15	0.30	0.55	1	2.5	3.5		0.05	0.07	0.15	0.16
V5	0.02	0.04	0.08	0.15	0.30	0.55	1	3	4.5		0.05	0.07	0.15	0.16
V6	0.02	0.04	0.08	0.15	0.30	0.55	1	2.2	3.3		0.05	0.07	0.15	0.16

MOTOR MOUNTING FLANGES

Gears that are supplied with mounting flanges must be assembled with motors whose shaft and flange tolerances correspond to a "normal class" of quality in order to avoid vibration and forcing of the input bearing. Motors supplied by Chiaravalli guarantee that this requirement is fulfilled. For ease of consultation, the correspondence of the size of the B5 and B14 motor with the sizes of the shaft and the motor connection flange are shown in the following table.

Remember that, as the motor connection flanges are separate from the body it is also possible to have a shaft / flange combination that does not correspond to the table, e.g. 19/140, thereby offering adaptability for other non-unified models such as the brushless or direct current types.

MMF	056	063	071	080	090	100	112	132
B5	9/120	11/140	14/160	19/200	24/200	28/250	28/250	38/300
B14	9/80	11/90	14/105	19/120	24/140	28/160	28/160	38/200

MODELS CHM - CHMR - CHME - CHMRE

TYPE (1)	SIZE (2)	VERSION (3)	FLANGE POS. (4)	i	M.M.F.	MOUNT. POS. (4)
CHM	025	FA	1	7.5		U UNIVERSAL
	030	FB	2	10		B3
CHMR	040	FC		15		B8
	050	FD		20		B6
CHME	063	FE		25		B7
	075			30		V5
CHMRE	090			40		V6
	110			50		
	130			60		
				80		
				100		

See page 4

EXAMPLE ORDER

CHM	090	FA (5)	2 (5)	30	90 B14	V5
-----	-----	--------	-------	----	--------	----

If the motor is also required, please specify:

Size es. 90 L4

Power es. Kw 1.5

Poles es. 4

Voltage es. V230/400

Frequency es. 50 Hz

Flange es. B 14

N.B. From size 25 to 63 the gears are always supplied in the Universal position and can therefore be mounted in any position, from size 75 to size 130 if the position required differs from B3 it must be specified.
In particular, in the event that a gear in position B3 is to be mounted in positions V5 or V6, the bearing positioned in the upper side must be lubricated using suitable grease that ensures proper lubrication.
We have tested Tecnolubeseal POLYMER 400/2 grease.

1) see page 1

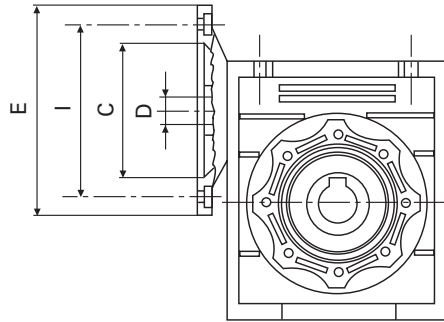
2) see pages 6 and 7

3) see page 9

4) see page 5

5) lack of instructions indicates that the gear is not equipped with an output flange.

MOTOR MOUNTING FLANGES AVAILABLE

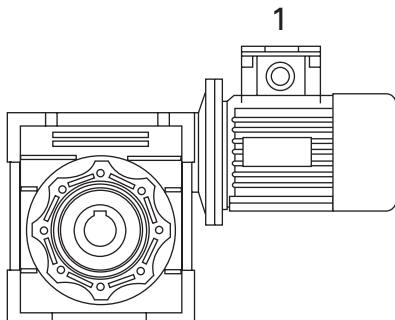


	PAM	C	I	E	7,5	10	15	20	25	30	40	50	60	80	100
					D										
CHM 025	56B14	50	65	80	9	9	9	9	9	9	9	9	9		
CHM 030 *	63B5	95	115	140	11	11	11	11	11	11	11	11			
	63B14	60	75	90											
	56B5	80	100	120	9	9	9	9	9	9	9	9	9	9	
CHM 040 *	56B14	50	65	80											
	71B5	110	130	160	14	14	14	14	14	14	14			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

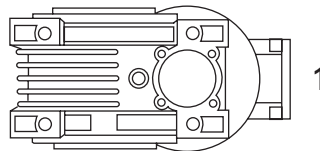
* Ratio 5 available on request.

MOUNTING POSITION

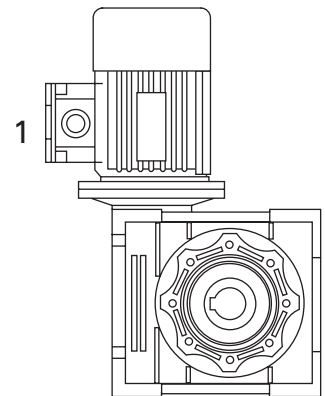
B3



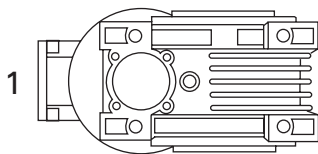
B6



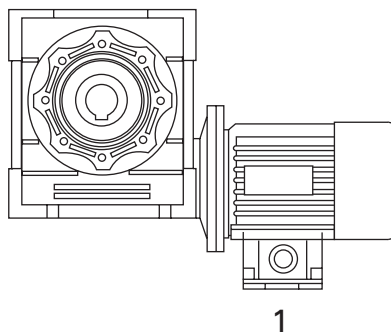
V5



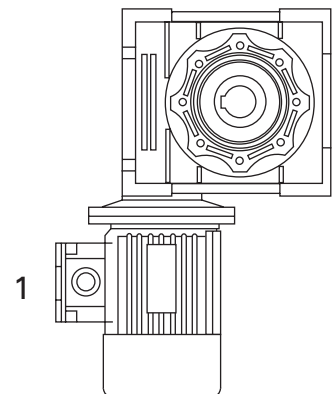
B7



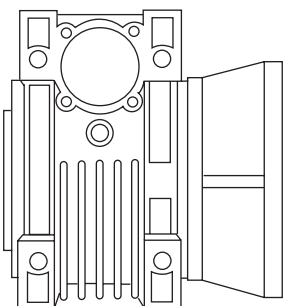
B8



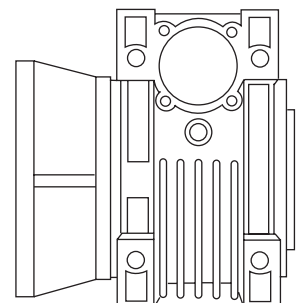
V6



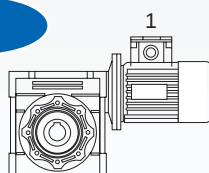
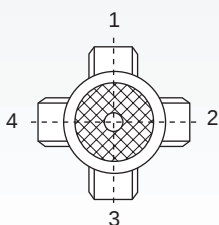
F...1



F...2



B3



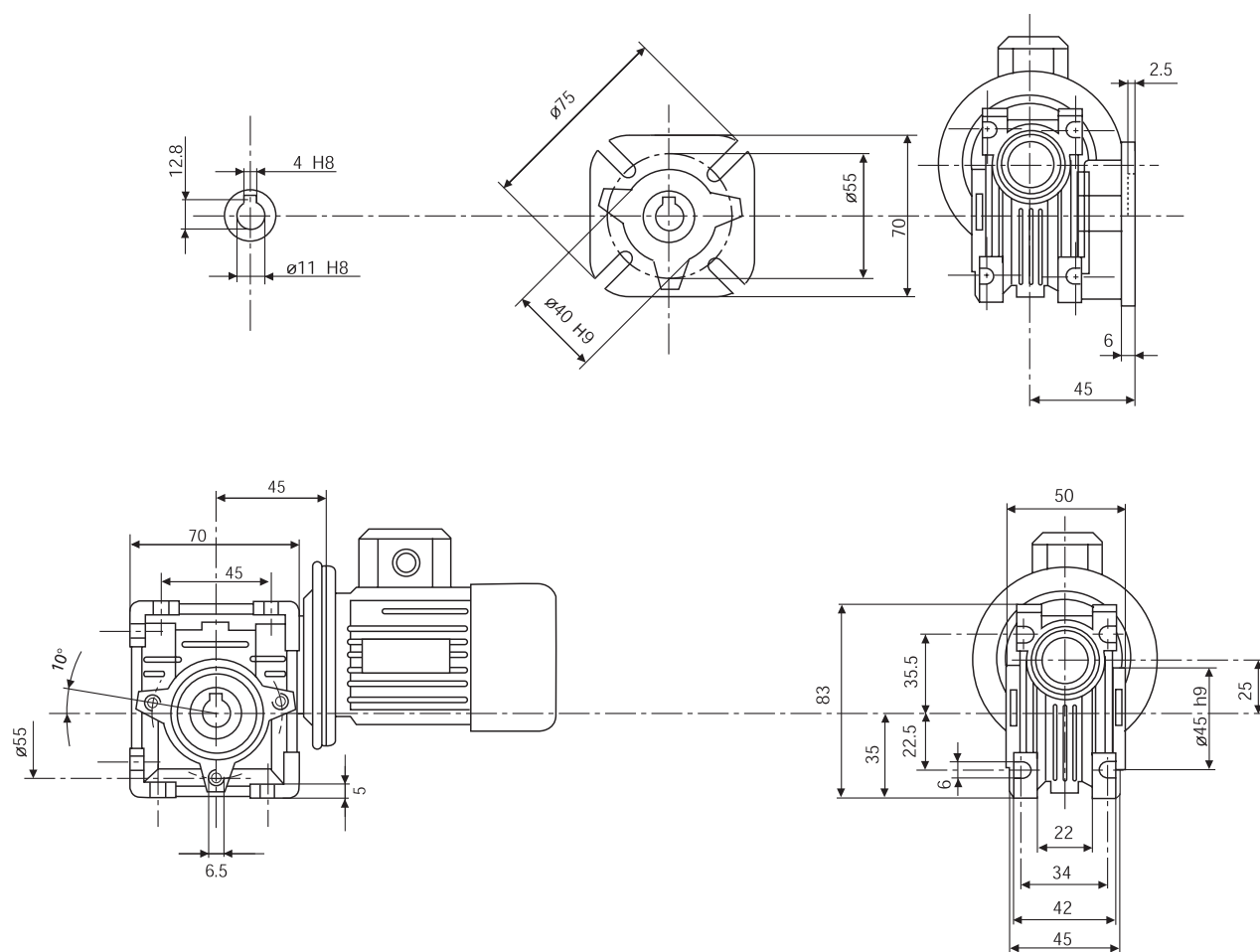
POSITION OF TERMINAL BOX

N.B. The position of the terminal box always refers to the B3 position.

CHM 025 PERFORMANCE WITH 4-POLE MOTORS – 1400 REVS. INPUT

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2	f.s.
CHM 025	7.5	186.7	0.09	3.8	2.8
	10	140.0	0.09	5	2.4
	15	93.3	0.09	7.2	1.6
	20	70.0	0.09	9	1.3
	25	56.0	0.09	10	1.0
	30	46.7	0.09	12.3	1.1
	40	35.0	0.09	13	1.0
	50	28.0	0.09	14	0.7
	60	23.3	0.09	14	0.6

CHM 025 DIMENSIONS



CHM 025

Weight 0.7 Kg. excluding motor

CHM PERFORMANCE WITH 4-POLE MOTORS – 1400 REVS.INPUT

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2	f.s.
CHM 030	7.5	186.7	0.22	9	2.1
	10	140.0	0.22	11	1.6
	15	93.3	0.22	16	1.0
	20	70.0	0.22	20	0.9
	25	56.0	0.18	20	1.0
	30	46.7	0.18	22	0.9
	40	35.0	0.18	21	0.8
	50	28.0	0.18	19	0.8
	60	23.3	0.09	18	0.9
	80	17.5	0.09	13	0.9

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2	f.s.
CHM 075	7.5	186.7	4.00	180	1.0
	10	140.0	4.00	237	0.8
	15	93.3	3.00	260	0.8
	20	70.0	1.50	167	1.2
	25	56.0	1.50	204	1.0
	30	46.7	1.50	232	1.0
	40	35.0	1.10	214	1.0
	50	28.0	0.75	176	1.2
	60	23.3	0.75	199	1.0
	80	17.5	0.55	178	1.1
	100	14.0	0.55	203	0.9

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2	f.s.
CHM 040	7.5	186.7	0.55*	22	1.6
	10	140.0	0.55*	30	1.4
	15	93.3	0.55*	44	0.9
	20	70.0	0.55*	38	1.0
	25	56.0	0.37	45	0.9
	30	46.7	0.37	52	0.8
	40	35.0	0.25	43	0.9
	50	28.0	0.22	44	0.9
	60	23.3	0.18	42	0.8
	80	17.5	0.18	36	0.8
	100	14.0	0.18	35	0.8

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2	f.s.
CHM 090	7.5	186.7	4.00	184	1.5
	10	140.0	4.00	242	1.3
	15	93.3	4.00	351	1.1
	20	70.0	4.00	456	0.8
	25	56.0	3.00	417	0.8
	30	46.7	3.00	478	0.9
	40	35.0	1.50	306	1.2
	50	28.0	1.50	367	1.0
	60	23.3	1.50	421	0.8
	80	17.5	0.75	257	1.1
	100	14.0	0.75	300	0.9

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2	f.s.
CHM 050	7.5	186.7	0.75	33.3	2.0
	10	140.0	0.75	43.9	1.6
	15	93.3	0.75	62.6	1.2
	20	70.0	0.75	80	0.9
	25	56.0	0.55	70	1.0
	30	46.7	0.55	80	1.0
	40	35.0	0.37	67	1.1
	50	28.0	0.37	78	0.9
	60	23.3	0.37	87	0.8
	80	17.5	0.25	70	0.9
	100	14.0	0.18	59	0.9

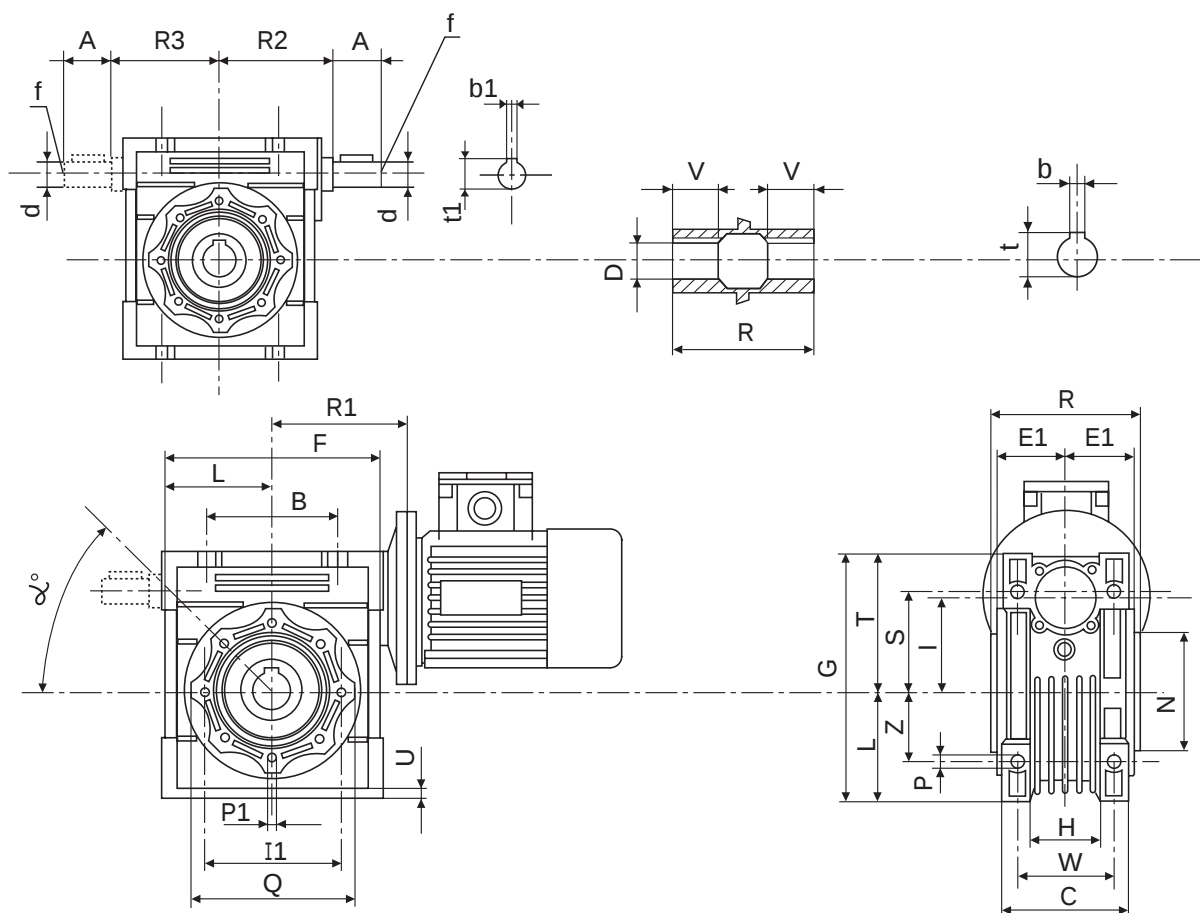
TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2	f.s.
CHM 110	7.5	186.7	7.50	344	1.6
	10	140.0	7.50	453	1.3
	15	93.3	7.50	659	1.0
	20	70.0	5.50	635	1.0
	25	56.0	4.00	573	1.2
	30	46.7	4.00	645	1.1
	40	35.0	3.00	636	1.1
	50	28.0	3.00	764	0.9
	60	23.3	2.20	645	1.0
	80	17.5	1.50	546	0.9
	100	14.0	1.10	470	1.0

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2	f.s.
CHM 063	7.5	186.7	1.50	67.4	1.8
	10	140.0	1.50	88.6	1.4
	15	93.3	1.50	126	1.1
	20	70.0	1.50	164	0.8
	25	56.0	1.10	145	0.9
	30	46.7	1.10	165	1.0
	40	35.0	0.75	143	1.0
	50	28.0	0.55	122	1.1
	60	23.3	0.55	138	0.9
	80	17.5	0.37	114	1.1
	100	14.0	0.37	127	0.9

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2	f.s.
CHM 130	7.5	186.7	7.50	348	2.2
	10	140.0	7.50	455	1.8
	15	93.3	7.50	660	1.2
	20	70.0	7.50	877	1.0
	25	56.0	7.50	1071	0.9
	30	46.7	7.50	1225	0.8
	40	35.0	5.50	1173	0.9
	50	28.0	4.00	1023	0.9
	60	23.3	3.00	886	1.1
	80	17.5	3.00	1112	0.8
	100	14.0	1.50	652	1.1

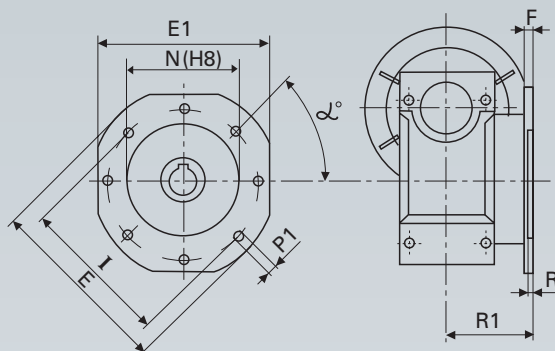
It is also possible to couple motors that are less powerful than those shown in the table. It is possible to couple 2800 or 900 rev. motors by adapting the power and verifying the application. For any clarification, please contact our technical office.

CHM - CHMR - CHME - CHMRE 030 ÷ 130 DIMENSIONS



	B	A	F	D(H7)	d(j6)	G	H	R1	R	R2	R3	L	I	C	I1	N(h8)	E1	P	Q
030	54	20	80	14	9	97	32	55	63	51	45	40	30	56	65	55	29	6	75
040	70	23	100	18	11	121.5	43	70	78	60	53	50	40	71	75	60	36.5	6.5	87
050	80	30	120	25	14	144	49	80	92	74	64	60	50	85	85	70	43.5	8.5	100
063	100	40	144	25	19	174	67	95	112	90	75	72	63	103	95	80	53	8.5	110
075	120	50	172	28	24	205	72	112.5	120	105	90	86	75	112	115	95	57	11	140
090	140	50	208	35	24	238	74	129.5	140	125	108	103	90	130	130	110	67	13	160
110	170	60	252.5	42	28	295	-	160	155	142	135	127.5	110	144	165	130	74	14	200
130	200	80	292.5	45	30	335	-	180	170	162	155	147.5	130	155	215	180	81	16	250

	S	T	U	V	Z	W	P1	α	b	b1	f	t	t1	Weight in kg. excluding motor
030	44	57	5.5	21	27	44	M6x11(n.4)	0°	5	3	-	16.3	10.2	1.2
040	55	71.5	6.5	26	35	60	M6x8(n.4)	45°	6	4	-	20.8	12.5	2.3
050	64	84	7	30	40	70	M8x10(n.4)	45°	8	5	M6	28.3	16.0	3.5
063	80	102	8	36	50	85	M8x14(n.8)	45°	8	6	M6	28.3	21.5	6.2
075	93	119	10	40	60	90	M8x14(n.8)	45°	8	8	M8	31.3	27.0	8.5
090	102	135	11	45	70	100	M10x18(n.8)	45°	10	8	M8	38.3	27.0	12
110	125	167.5	14	50	85	115	M10x18(n.8)	45°	12	8	M10	45.3	31.0	35
130	140	187.5	15	60	100	120	M12x21(n.8)	45°	14	8	M10	48.8	33.0	53



		030	040	050	063	075	090	110	130
FA	R1	54.5	67	90	82	111	111	131	140
	F	6	7	9	10	13	13	15	15
	R	4	4	5	6	6	6	6	6
	N	50	60	70	115	130	152	170	180
	I	68/72*	75/95*	85/110*	150/165*	165/185*	175/195*	230	255
	P1	6 (n°4)	9(n°4)	11(n°4)	11(n°4)	14(n°4)	14(n°4)	14(n°8)	16(n°8)
	E	80	110	125	180	200	210	280	320
	E1	70	95	110	142	170	200	260	290
	α°	45°	45°	45°	45°	45°	45°	45°	22.5°
FB	R1	-	97	120	112	90	122	180	-
	F	-	7	9	10	13	18	15	-
	R	-	4	5	6	6	6	6	-
	N	-	60	70	115	110	180	170	-
	I	-	75/95*	85/110*	150/165*	130/145*	215/230*	230	-
	P1	-	9(n°4)	11(n°4)	11(n°4)	11(n°4)	14(n°4)	14(n°8)	-
	E	-	110	125	180	160	250	280	-
	E1	-	95	110	142	-	-	260	-
	α°	-	45°	45°	45°	45°	45°	45°	-
FC	R1	-	80	89	98	-	110	-	-
	F	-	9	10	10	-	17	-	-
	R	-	5	5	5	-	6	-	-
	N	-	95	110	130	-	130	-	-
	I	-	115	130	165	-	165/185*	-	-
	P1	-	9.5(n°4)	9.5(n°4)	11(n°4)	-	11(n°4)	-	-
	E	-	140	160	200	-	200	-	-
	α°	-	45°	45°	45°	-	45°	-	-
FD	R1	-	58	72	107	-	151	-	-
	F	-	12	14.5	10	-	13	-	-
	R	-	5	5	5	-	6	-	-
	N	-	80	95	130	-	152	-	-
	I	-	100/110*	115/125*	165	-	175/195*	-	-
	P1	-	9(n°4)	11(n°4)	11(n°4)	-	14(n°4)	-	-
	E	-	120	140	200	-	210	-	-
	α°	-	45°	45°	45°	-	45°	-	-
FE	R1	-	-	-	80.5	-	-	-	-
	F	-	-	-	16.5	-	-	-	-
	R	-	-	-	5	-	-	-	-
	N	-	-	-	110	-	-	-	-
	I	-	-	-	130/145*	-	-	-	-
	P1	-	-	-	11(n°4)	-	-	-	-
	E	-	-	-	160	-	-	-	-
	α°	-	-	-	45°	-	-	-	-

* The values marked have a slot instead of a hole, therefore the fixing centreline, value, may be within the range indicated, an intermediate value is recommended.

CHTPC WORM GEAR WITH PRE-STAGE MODULE



DESIGNATION CHTPC / CHM - CHME

TYPE	SIZE	i =	P.A.M.	MOUNT. POS
CHTPC	63	3	63B5	If supplied coupled with CHM or CHME types specify the position of these, when the pre-stage module is supplied by itself it is prepared for universal assembly.
	71	3	71B5	
	80	3	80B5	
	90	2.42	90B5	

EXAMPLE ORDER FOR A CHTPC COUPLED TO A CHM OR CHME GEAR

CHTPC	90	CHM	110	i=242 (2.42x100)	PAM 90B5	POS.B3
-------	----	-----	-----	------------------	----------	--------

If the motor is also required, please specify:

Size	es. 90 L4
Power	es. Kw 1.5
Poles	es. 4
Voltage	es. V230/400
Frequency	es. 50 Hz
Flange	sempre B 5

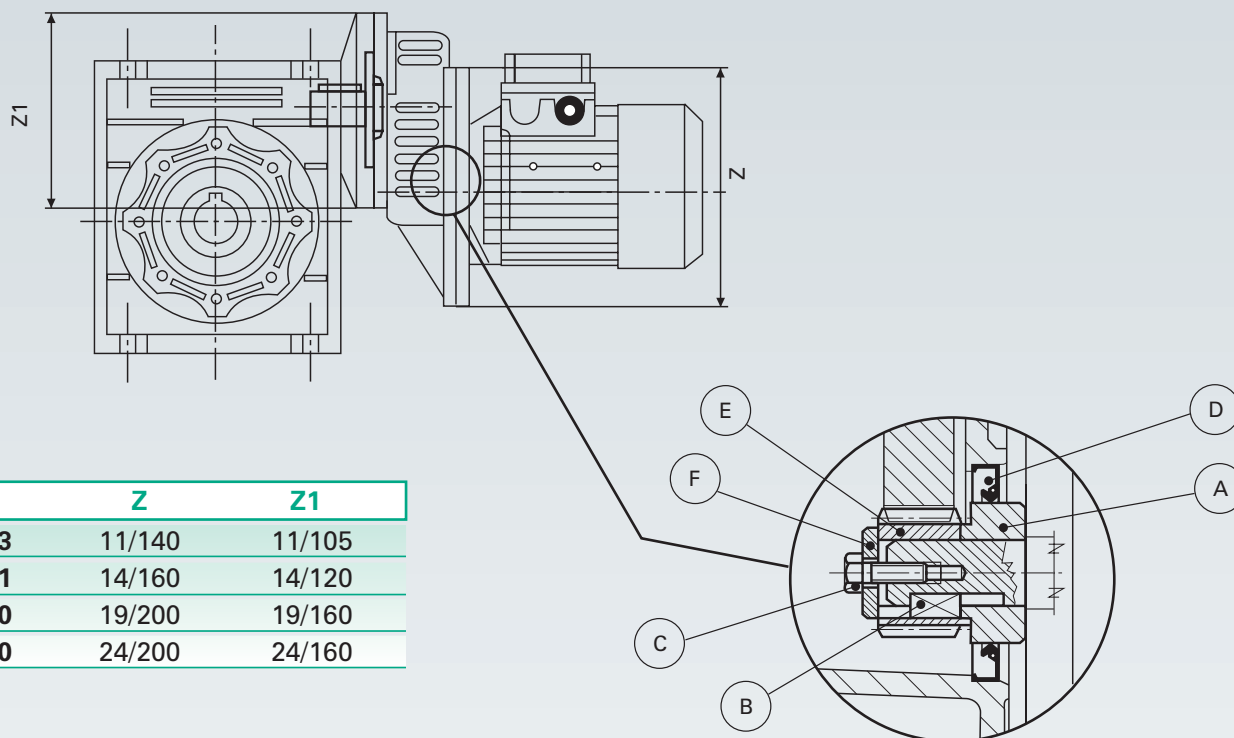
N.B. From size 25 to 63 the gears are always supplied in the Universal position and can therefore be mounted in any position, from size 75 to size 130 if the position required differs from B3 it must be specified.

In particular, in the event that a gear in position B3 is to be mounted in positions V5 or V6, the bearing positioned in the upper side must be lubricated using suitable grease that ensures proper lubrication.

We have tested Tecnolubeseal POLYMER 400/2 grease.

POSSIBLE COUPLINGS FOR CHTPC / CHM – CHME

CHM - CHME	i	CHTPC 63	CHTPC 71	CHTPC 80	CHTPC 90
40	all	#			
40	da 7.5 a 40		#		
50	da 40 a 100	#			
50	da 7.5 a 50		#		
63	da 50 a 100	#			
63	da 30 a 100		#		
75	da 30 a 100		#		
75	da 30 a 100			#	
90	da 30 a 100		#		
90	da 30 a 100			#	
110	da 40 a 100			#	
110	da 30 a 100				#
130	da 30 a 100				#



	Z	Z1
CHTPC 63	11/140	11/105
CHTPC 71	14/160	14/120
CHTPC 80	19/200	19/160
CHTPC 90	24/200	24/160

PINION ASSEMBLY INSTRUCTIONS

- 1) Assemble the spacer A (if necessary heat between 80° and 100° C) onto the driving shaft and block it with Loctite 638 for coaxial blockings
- 2) Insert the key B included in the kit
- 3) Assemble the pinion E (if necessary heat between 80° and 100° C) onto the driving shaft
- 4) Fix the washer F using the screw C
- 5) Assemble the oil seal D in the direction shown in the drawing
- 6) Insert the motor with the pinion, taking care not to damage the oil seal

Note: CHTPC pre-stage modul doesn't allow radial loads.

* The size CHTPC 90 is fixed using a ring and dowel.

CHTPC/CHM PERFORMANCE WITH 4-POLE MOTORS – 1400 REVS.INPUT

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2
CHTPC63 CHM040	90	15.6	0.18	61
	120	11.7	0.18	52
	150	9.3	0.18	46
	180	7.8	0.18	46
	240	5.8	0.18	40
	300	4.7	0.18	36

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2
CHTPC71 CHM075	90	15.6	0.37	153
	120	11.7	0.37	190
	150	9.3	0.37	220
	180	7.8	0.37	236
	180	7.8	0.25	159
	240	5.8	0.25	208
	300	4.7	0.25	210

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2
CHTPC63 CHM050	90	15.6	0.18	69
	120	11.7	0.18	85
	150	9.3	0.18	89
	180	7.8	0.18	88
	240	5.8	0.18	76
	300	4.7	0.18	65

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2
CHTPC80 CHM075	90	15.6	0.75	307
	120	11.7	0.55	278
	150	9.3	0.55	260

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2
CHTPC71 CHM050	90	15.6	0.25	97
	120	11.7	0.25	110
	150	9.3	0.25	112

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2
CHTPC71 CHM090	180	7.8	0.37	260
	240	5.8	0.37	320
	300	4.7	0.37	345

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2
CHTPC63 CHM063	150	9.3	0.18	101
	180	7.8	0.18	115
	240	5.8	0.18	136
	300	4.7	0.18	121

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2
CHTPC80 CHM090	90	15.6	0.75	320
	120	11.7	0.75	397
	150	9.3	0.75	426
	180	7.8	0.75	425
	240	5.8	0.55	374

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2
CHTPC71 CHM063	90	15.6	0.37	145
	90	15.6	0.25	98
	120	11.7	0.37	184
	120	11.7	0.25	124
	150	9.3	0.37	192
	150	9.3	0.25	129
	180	7.8	0.25	164
	240	5.8	0.25	139
	300	4.7	0.25	128

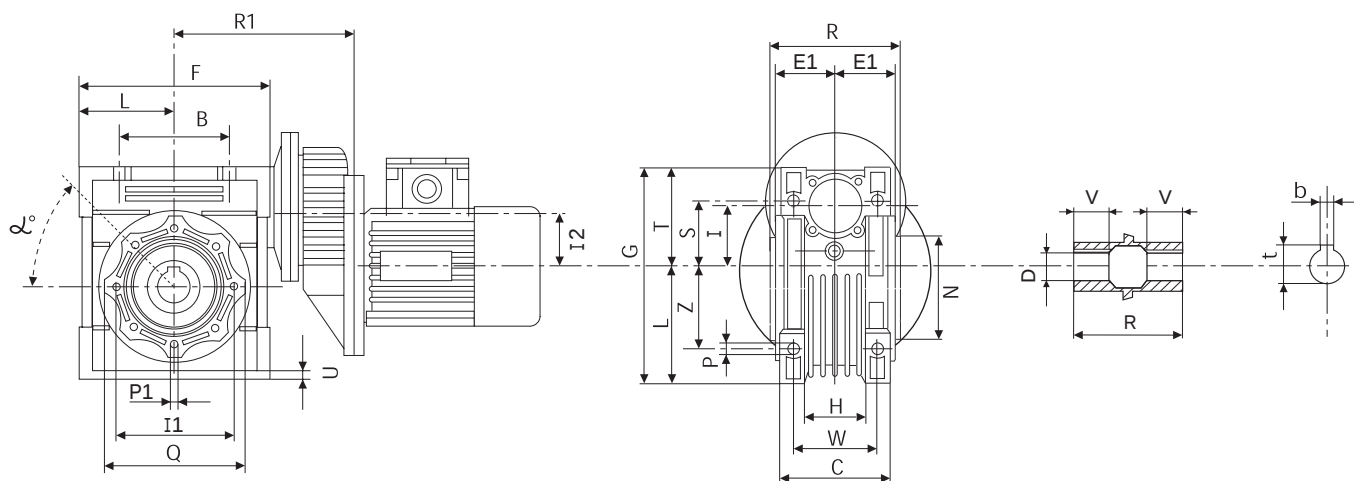
TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2
CHTPC80 CHM110	120	11.7	0.75	421
	150	9.3	0.75	496
	180	7.8	0.75	569
	240	5.8	0.75	617
	300	4.7	0.55	585

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2
CHTPC90 CHM110	96.8	14.5	1.50	679
	121	11.6	1.50	801
	145.2	9.6	1.50	810
	145.2	9.6	1.10	595
	193.6	7.2	1.10	660

TYPE	i=ratio	n2 r/min	Kw=P1	Nm=T2
CHTPC90 CHM130	96.8	14.5	1.50	679
	121	11.6	1.50	813
	145.2	9.6	1.50	917
	193.6	7.2	1.50	1013
	242	5.8	1.10	848

The choice of power installed is tied to the unification of the motors, therefore it is sometimes in exuberance compared to the gear; always verify the maximum torque indicated when making the selection and if in doubt please contact our technical office.

CHTPC – CHM DIMENSIONS



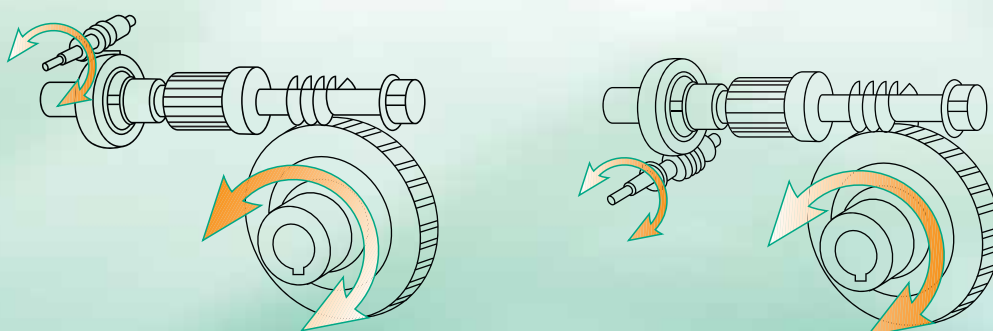
CHTPC CHM	B	F	D(H7)	G	H	R1	R	L	I	I2	C	I1	N(h8)	E1	P	Q	S	T
63+040	70	100	18	121.5	43	115	78	50	40	40	71	75	60	36.5	6.5	87	55	71.5
63+050	80	120	25	144	49	125	92	60	50	40	85	85	70	43.5	8.5	100	64	84
71+050	80	120	25	144	49	133	92	60	50	50	85	85	70	43.5	8.5	100	64	84
63+063	100	144	25	174	67	140	112	72	63	40	103	95	80	53	8.5	110	80	102
71+063	100	144	25	174	67	148	112	72	63	50	103	95	80	53	8.5	110	80	102
71+075	120	172	28	205	72	165,5	120	86	75	50	112	115	95	57	11	140	93	119
80+075	120	172	28	205	72	181,5	120	86	75	63	112	115	95	57	11	140	93	119
71+090	140	208	35	238	74	182,5	140	103	90	50	130	130	110	67	13	160	102	135
80+090	140	208	35	238	74	198,5	140	103	90	63	130	130	110	67	13	160	102	135
80(90)+110	170	252.5	42	295	-	229	155	127.5	110	63	144	165	130	74	14	200	125	167.5
80(90)+130	200	292.5	45	335	-	249	170	147.5	130	63	155	215	180	81	16	250	140	187.5

CHTPC CHM	U	V	Z	W	P1	45°	b	t	Weight in Kg. excluding motor
63+040	6.5	26	35	60	M6x8n.4	45°	6	20.8	3.9
63+050	7	30	40	70	M8x10n.4	45°	8	28.3	5.2
71+050	7	30	40	70	M8x10n.4	45°	8	28.3	5.8
63+063	8	36	50	85	M8x14n.8	45°	8	28.3	7.9
71+063	8	36	50	85	M8x14n.8	45°	8	28.3	8.5
71+075	10	40	60	90	M8x14n.8	45°	8	31.3	11
80+075	10	40	60	90	M8x14n.8	45°	8	31.3	12.6
71+090	11	45	70	100	M10x18n.8	45°	10	38.3	14.3
80+090	11	45	70	100	M10x18n.8	45°	10	38.3	16.2
80(90)+110	14	50	85	115	M10x18n.8	45°	12	45.3	39
80(90)+130	15	60	100	120	M12x21n.8	45°	14	48.8	67.2

N.B. For the side flange and double extended input worm dimensions see the corresponding size of the CHM series. See pages 8 and 9.



DIRECTION OF ROTATION



DESIGNATION CHM/CHM - CHME E CHMR/CHM - CHME

TYPE	SIZE(1)	VERSION(2)	FLANGE POS.(3)	i	EXEC.(4)	M.M.F.	MOUNT. POS.(3)
CHM/CHM	025/030	FA	1	300	OAD		U
CHM/CHME	030/040	FB	2	400	OAS		B3
CHMR/CHM	030/050	FC		500	OBD		B8
CHMR/CHME	030/063	FD		600	OBS		B6
	040/075	FE		750	VAD		B7
	040/090			900	VAS		V5
	050/110			1200	VBD		V6
	063/130			1500	VBS		
				1800			
				2400			

See page 4

For the motor mounting flanges (M.M.F.) see the table showing the types available.
 For the executions see the table with drawings, if not specified OBS would be supplied.
 The mounting position refers to the second gear.

EXAMPLE ORDER

CHM/CHM	040/090	FA(5)	2(5)	500	OAD	63 B14	V5
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If the motor is also required, please specify:

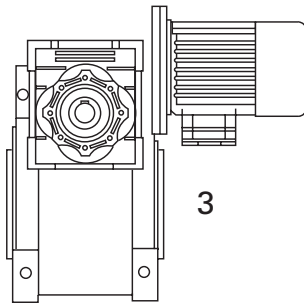
Size	es. 63 B4
Power	es. Kw 0.18
Poles	es. 4
Voltage	es. V230/400
Frequency	es. 50 Hz
Flange	es. B 14

N.B. From size 25 to 63 the gears are always supplied in the Universal position and can therefore be mounted in any position, from size 75 to size 130 if the position required differs from B3 it must be specified.
 In particular, in the event that a gear in position B3 is to be mounted in positions V5 or V6, the bearing positioned in the upper side must be lubricated using suitable grease that ensures proper lubrication.
 We have tested Tecnolubeseal POLYMER 400/2 grease.

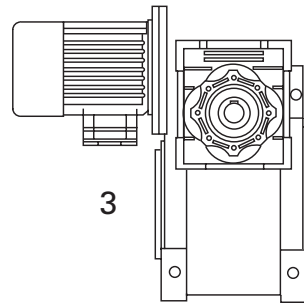
- 1) see page 17
- 2) see page 9
- 3) see page 5
- 4) see page 16
- 5) lack of instructions indicates that the gear is not equipped with an output flange.

EXECUTION

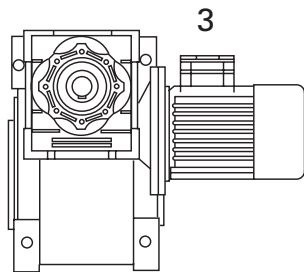
OAD



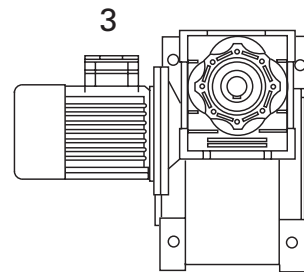
OAS



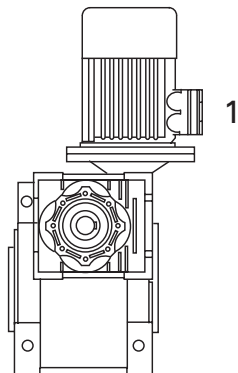
OBD



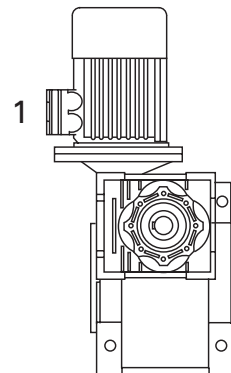
OBS



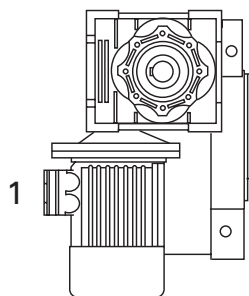
VAD



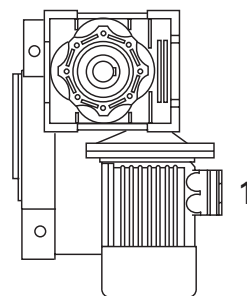
VAS



VBS



VBD



The execution determines the mounting position of the first gear in relation to the second gear. If not otherwise specified at the time of order, the group will be supplied in the OBS execution. The placing position refers to the second gear.

CHM/CHM PERFORMANCE WITH 4-POLE MOTORS – 1400 REVS.INPUT

TIPO	i=ratio	n2 r/min	Kw=P1	Nm=T2
	300	4.7	0.09*	31
	400	3.5	0.09*	28
	500	2.8	0.09*	34
CHM	600	2.3	0.09*	31
025/030	750	1.9	0.09*	34
	900	1.6	0.09*	31
	1200	1.2	0.09*	31
	1500	0.9	0.09*	26
	1800	0.8	0.09*	23
	2400	0.6	0.09*	23

TIPO	i=ratio	n2 r/min	Kw=P1	Nm=T2
	300	4.7	0.37	405
	400	3.5	0.25	336
	500	2.8	0.25	307
CHM	600	2.3	0.18	362
040/075	750	1.9	0.18	391
	900	1.6	0.18*	325
	1200	1.2	0.18*	359
	1500	0.9	0.09	360
	1800	0.8	0.09	404
	2400	0.6	0.09*	330

TIPO	i=ratio	n2 r/min	Kw=P1	Nm=T2
	300	4.7	0.09*	70
	400	3.5	0.09*	63
	500	2.8	0.09*	57
CHM	600	2.3	0.09*	72
030/040	750	1.9	0.09*	72
	900	1.6	0.09*	73
	1200	1.2	0.09*	65
	1500	0.9	0.09*	73
	1800	0.8	0.09*	73
	2400	0.6	0.09*	65

TIPO	i=ratio	n2 r/min	Kw=P1	Nm=T2
	300	4.7	0.37	405
	400	3.5	0.37	523
	500	2.8	0.37	550
CHM	600	2.3	0.37	605
040/090	750	1.9	0.25	538
	900	1.6	0.25	533
	1200	1.2	0.18	629
	1500	0.9	0.18	588
	1800	0.8	0.18*	492
	2400	0.6	0.18*	625

TIPO	i=ratio	n2 r/min	Kw=P1	Nm=T2
	300	4.7	0.18	142
	400	3.5	0.18	127
	500	2.8	0.09	123
	600	2.3	0.09	143
CHM	750	1.9	0.09	148
030/050	900	1.6	0.09*	141
	1200	1.2	0.09*	118
	1500	0.9	0.09*	139
	1800	0.8	0.09*	155
	2400	0.6	0.09*	124

TIPO	i=ratio	n2 r/min	Kw=P1	Nm=T2
	300	4.7	0.75	871
	400	3.5	0.75	1013
	500	2.8	0.55	984
	600	2.3	0.55	1062
CHM	750	1.9	0.55	1128
050/110	900	1.6	0.37	1079
	1200	1.2	0.25	943
	1500	0.9	0.25	1064
	1800	0.8	0.25	1075
	2400	0.6	0.18	1001

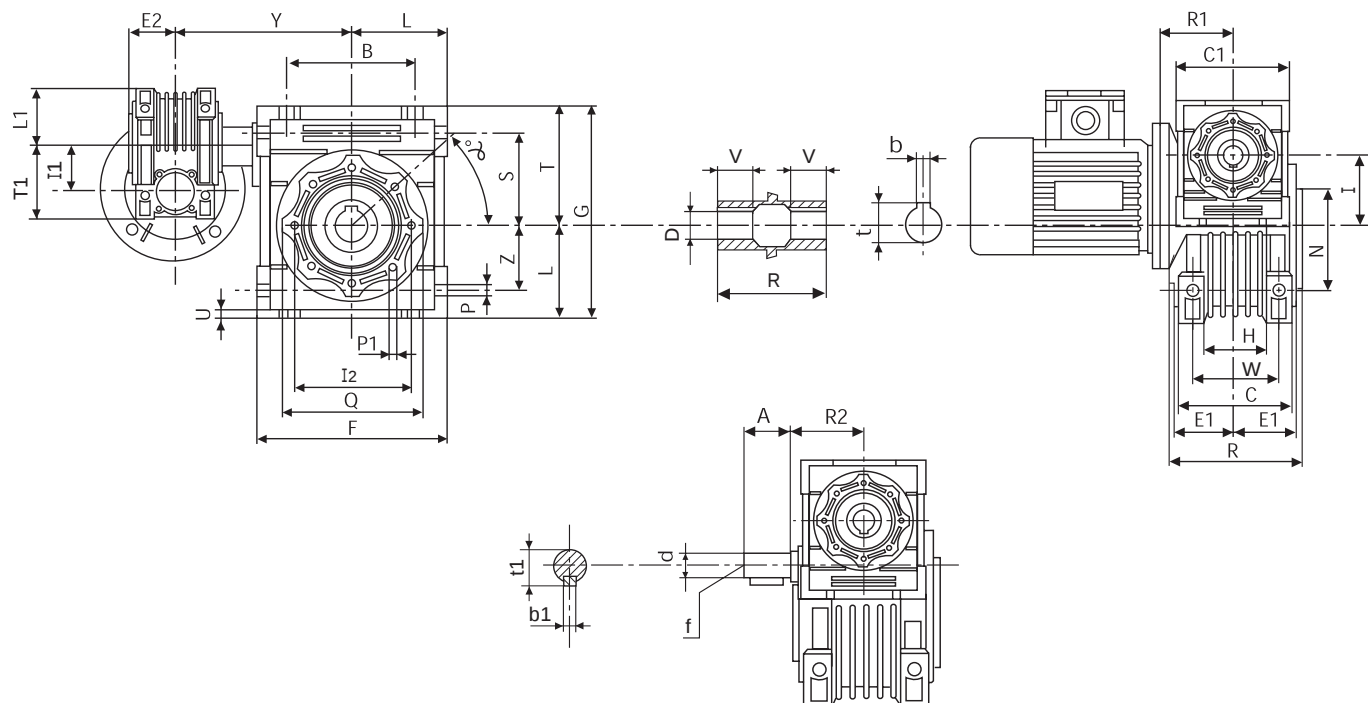
TIPO	i=ratio	n2 r/min	Kw=P1	Nm=T2
	300	4.7	0.22	210
	400	3.5	0.18	222
	500	2.8	0.18	205
	600	2.3	0.18*	208
CHM	750	1.9	0.18*	216
030/063	900	1.6	0.09	200
	1200	1.2	0.09	236
	1500	0.9	0.09*	204
	1800	0.8	0.09*	202
	2400	0.6	0.09*	220

TIPO	i=ratio	n2 r/min	Kw=P1	Nm=T2
	300	4.7	1.50	1789
	400	3.5	1.10	1519
	500	2.8	1.10	1629
	600	2.3	0.75	1631
CHM	750	1.9	0.75	1804
063/130	900	1.6	0.75	1826
	1200	1.2	0.55	1705
	1500	0.9	0.37	1674
	1800	0.8	0.37	1698
	2400	0.6	0.25	1624

N.B. The powers marked with an asterisk are higher than those that the gear allows, therefore the applicative choice must be made in accordance with the torque and not the power.

The gear ratios are those most frequently requested. It is possible to obtain multiple combinations using the various ratios of the two single gears.

DIMENSIONS OF COMBINED GEARS CHM – CHM / CHMR – CHM



CHM-CHM	B	A	F	C1	D(H7)	d(j6)	G	H	R1	R	R2	L	L1	I	I1	C	I2	N(h 8)	E1	E2	P
030/040	70	20	100	80	18	9	121.5	43	55	78	51	50	40	40	30	71	75	60	36.5	29	6.5
030/050	80	20	120	80	25	9	144	49	55	92	51	60	40	50	30	85	85	70	43.5	29	8.5
030/063	100	20	144	80	25	9	174	67	55	112	51	72	40	63	30	103	95	80	53	29	8.5
040/075	120	23	172	100	28	11	205	72	70	120	60	86	50	75	40	112	115	95	57	36.5	11
040/090	140	23	208	100	35	11	238	74	70	140	60	103	50	90	40	130	130	110	67	36.5	13
050/110	170	30	252.5	120	42	14	295	-	80	155	74	127.5	60	110	50	144	165	130	74	43.5	14
063/130	200	40	292.5	144	45	19	335	-	95	170	90	147.5	72	130	63	155	215	180	81	53	16

CHM-CHM	Q	S	T	T1	U	V	Z	Y	W	P1	a	b	b1	f	t	t1	Weight in Kg. excluding motor
030/040	87	55	71.5	57	6.5	26	35	120	60	M6x8(n.4)	45°	6	3	-	20.8	10.2	3.9
030/050	100	64	84	57	7	30	40	130	70	M8x10(n.4)	45°	8	3	-	28.3	10.2	5.0
030/063	110	80	102	57	8	36	50	145	85	M8x14(n.8)	45°	8	3	-	28.3	10.2	7.8
040/075	140	93	119	71.5	10	40	60	165	90	M8x14(n.8)	45°	8	4	-	31.3	12.5	11.5
040/090	160	102	135	71.5	11	45	70	182	100	M10x18(n.8)	45°	10	4	-	38.3	12.5	15
050/110	200	125	167.5	84	14	50	85	225	115	M10x18(n.8)	45°	12	5	M6	45.3	16.0	39.2
063/130	250	140	187.5	102	15	60	100	245	120	M12x21(n.8)	45°	14	6	M6	48.8	21.5	70

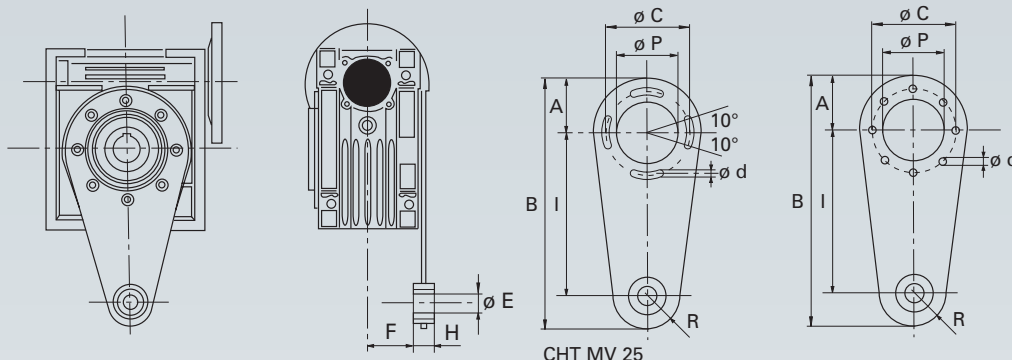
N.B. For the side flange and double extended input worm dimensions see the corresponding size of the CHM models. See pages 8 and 9.

TORQUE ARM

TYPE	I	R	F	H	Ø E	A	B	Ø C	Ø d	Ø P	N°	Weight per kit kg.
CHT MV 25 *	70	15	17.5	14	8	33.5	118.5	55	7	45	4	0.17
CHT MV 30 *	85	15	24	14	8	38	138	65	7	55	8	0.18
CHT MV 40	100	18	31.5	14	10	44	162	75	7	60	8	0.24
CHT MV 50	100	18	38.5	14	10	50	168	85	9	70	8	0.27
CHT MV 63	150	18	49	14	10	55	223	95	9	80	8	0.57
CHT MV 75	200	30	47.5	25	20	70	300	115	9	95	8	1.10
CHT MV 90	200	30	57.5	25	20	80	310	130	11	110	8	1.26
CHT MV 110	250	35	62	30	25	100	385	165	11	130	8	1.92
CHT MV 130/150	250	35	69	30	25	125	410	215	14	180	8	2.23

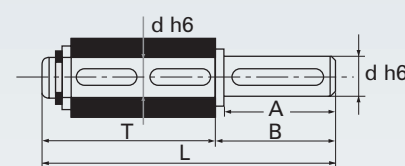
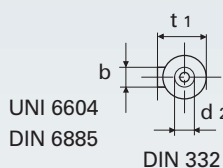
* Without vibration resistant bushing

The anchoring point of the torque arm is equipped with a vibration resistant bushing.



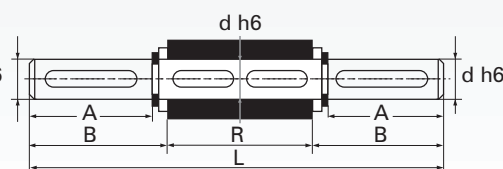
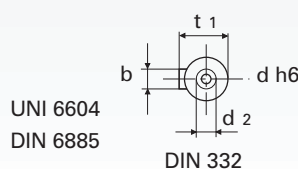
SINGLE OUTPUT SHAFT KIT

TYPE	A	Ø d	B	b	t 1	T	L	d 2	Weight per kit kg.
CHT MVS 25	23	11	25.5	4	12.5	55.5	81	-	0.07
CHT MVS 30	30	14	32.5	5	16	69.5	102	M6x16	0.14
CHT MVS 40	40	18	43	6	20.5	85	128	M6x16	0.27
CHT MVS 50	50	25	53.5	8	28	99.5	153	M10x22	0.60
CHT MVS 63	50	25	53.5	8	28	119.5	173	M10x22	0.67
CHT MVS 75	60	28	63.5	8	31	128.5	192	M10x22	0.94
CHT MVS 90	80	35	84.5	10	38	149.5	234	M12x28	1.79
CHT MVS 110	80	42	84.5	12	45	164.5	249	M16x35	2.70
CHT MVS 130	80	45	85	14	48.5	180	265	M16x35	3.60

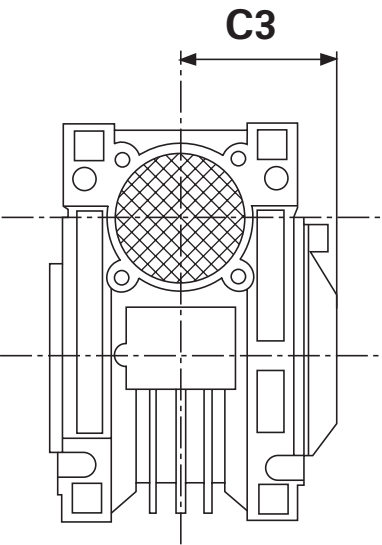


DOUBLE OUTPUT SHAFT KIT

TYPE	A	Ø d	B	R	b	t 1	L	d 2	Weight per kit kg.
CHT MVD 25	23	11	25.5	50	4	12.5	101	-	0.11
CHT MVD 30	30	14	32.5	63	5	16	128	M6x16	0.16
CHT MVD 40	40	18	43	78	6	20.5	164	M6x16	0.34
CHT MVD 50	50	25	53.5	92	8	28	199	M10x22	0.75
CHT MVD 63	50	25	53.5	112	8	28	219	M10x22	0.84
CHT MVD 75	60	28	63.5	120	8	31	247	M10x22	1.20
CHT MVD 90	80	35	84.5	140	10	38	309	M12x28	2.50
CHT MVD 110	80	42	84.5	155	12	45	324	M16x35	3.44
CHT MVD 130	80	45	85	170	14	48.5	340	M16x35	4.25



COVER



TYPE	C3
030	43
040	50
050	59
063	70
075	75
090	87
110	95
130	103

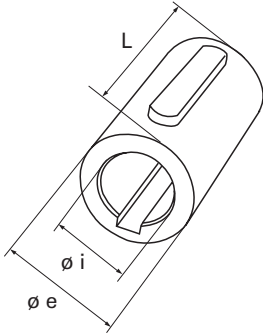
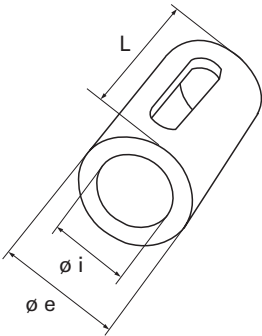
REDUCTION BUSHINGS KIT

SINGLE				
TYPE	ø i/ø e	L	Key	Weight per kit kg
CHT BRM-S	9/11	20	4/3 x 4 x 11 RB*	0.006
CHT BRM-S	11/14	30	5/4 x 6 x 10 RB*	0.015
CHT BRM-S	14/19	40	6 x 5 x 30 *	0.045
CHT BRM-S	19/24	50	6 x 5.5 x 20 * 8 x 5.5 x 40 *	0.07
CHT BRM-S	24/28	60	8 x 9 x 40 *	0.08
CHT BRM-S	28/38	80	10 x 7 x 60 *	0.33
CHT BRM-S	38/42	110	12/10 x 10 x 48 RB*	0.22

DOUBLE				
TYPE	ø i/ø e	L	Key	Weight per kit kg
CHT BRM-D	11/19	40	6 x 6 x 30 *	0.06
CHT BRM-D	14/24	50	8 x 7 x 40 A	0.12
CHT BRM-D	19/28	60	8 x 7 x 50 A	0.16
CHT BRM-D	24/38	80	10 x 8 x 60 A	0.44

* to drawing

Tongue acc. to UNI 6604 – DIN 6885
Quenched

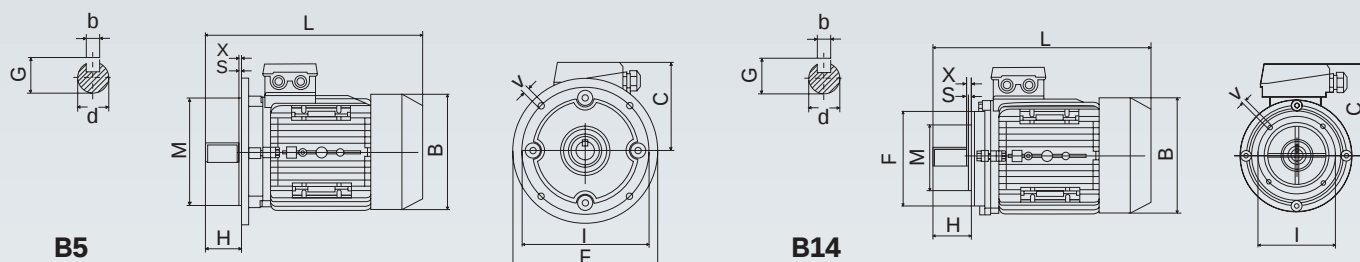


THREE-PHASE ELECTRIC MOTORS

TECHNICAL DATA FOR 4-POLE MOTORS

(1400 RPM)

TYPE	POWER kW	VOLTAGE V	CURRENT 400 V	TORQUE N/m	EFFICIENCY %	POWER FACTOR Ø	WEIGHT Kg.
CHT 56 B4	0.09	230/400	0.43	0.64	50	0.61	3.2
CHT 63 A4	0.12	230/400	0.47	0.86	57	0.64	3.9
CHT 63 B4	0.18	230/400	0.70	1.27	57	0.65	4.5
CHT 63 C4	0.22	230/400	0.92	1.77	59	0.67	4.8
CHT 71 A4	0.25	230/400	0.84	1.77	60	0.72	5.6
CHT 71 B4	0.37	230/400	1.12	2.58	65	0.74	6.2
CHT 71 C4	0.55	230/400	1.61	3.81	66	0.75	7.0
CHT 80 A4	0.55	230/400	1.59	3.81	67	0.75	8.9
CHT 80 B4	0.75	230/400	1.94	5.20	72	0.78	10.0
CHT 80 D4	1.10	230/400	2.67	7.60	76.2	0.78	11.0
CHT 90 S4	1.10	230/400	2.64	7.50	76.2	0.79	12.1
CHT 90 L4	1.50	230/400	3.46	10.20	78.5	0.80	14.3
CHT 90 LL4	1.85	230/400	4.30	9.24	79	0.78	16.0
CHT 100 L A4	2.20	230/400	4.86	14.80	81.0	0.81	21.0
CHT 100 L B4	3.00	230/400	6.50	20.20	82.6	0.81	24.7
CHT 112 M4	4.00	230/400	8.26	26.70	84.2	0.83	30.1
CHT 132 S4	5.50	230/400	11.00	36.22	85.7	0.84	44.0
CHT 132 M4	7.50	230/400	14.64	49.40	87.0	0.85	52.0



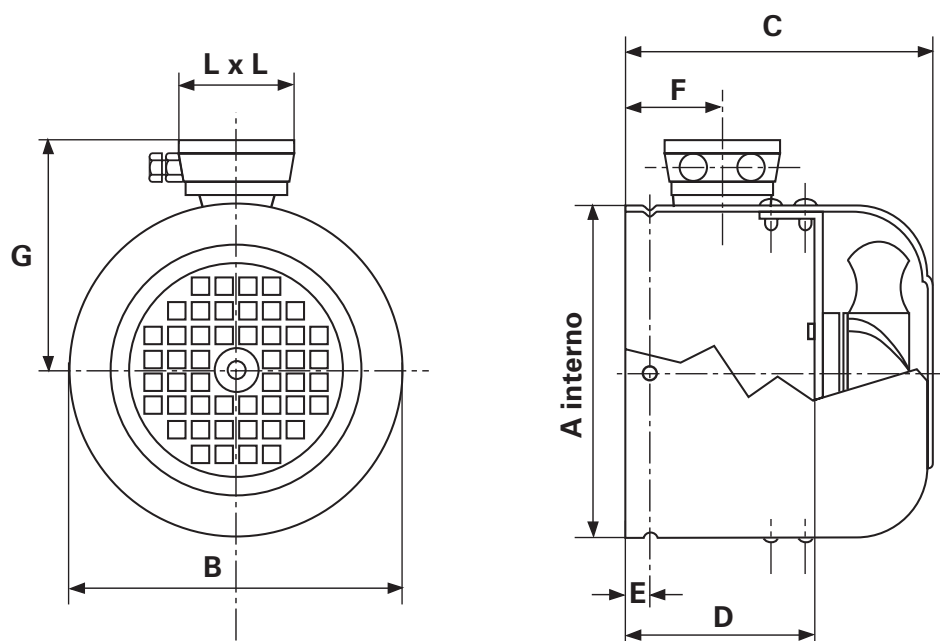
SIZES AND DIMENSIONS

Type	Mounting dimensions (mm)															Dimensions			
	d	H	b	G	B5						B14						B	C	L
					I	M	F	X	V	S	I	M	F	X	V	S			
56	9	20	3	10.2	98	80	120	0	7	3.0	65	50	80	0	M5	2.5	110	100	195
63	11	23	4	12.5	115	95	140	0	10	3.0	75	60	90	0	M5	2.5	123	110	215
71	14	30	5	16	130	110	160	0	10	3.5	85	70	105	0	M6	2.5	138	117	255
80	19	40	6	21.5	165	130	200	0	12	3.5	100	80	120	0	M6	3.0	155	137	290
90S	24	50	8	27	165	130	200	0	12	3.5	115	95	140	0	M8	3.0	176	145	310
90L/90LL	24	50	8	27	165	130	200	0	12	3.5	115	95	140	0	M8	3.0	176	145	335
100L	28	60	8	31	215	180	250	0	15	4.0	130	110	160	0	M8	3.5	197	152	386
112M	28	60	8	31	215	150	250	0	15	4.0	130	110	160	0	M8	3.5	220	180	395
132S	38	80	10	41	265	230	300	0	15	4.0	165	130	200	0	M10	4.0	257	195	436
132M	38	80	10	41	265	230	300	0	15	4.0	165	130	200	0	M10	4.0	257	195	475

- Motors with cage rotor, closed with external surface ventilation.
- Design, construction and testing in conformity with the standards CEI2-3, international standards IEC 34-1 and the main foreign standards.
- Power-sizes in accordance with the standards IEC 72, national standards UNEL-MEC.
- Insulation class F
- Protection IP55

- S1 Continuous service
- European Directive ROHS 2002/95/CE
- Phase separators
- 2-pole and 6-pole motors available
- Kit of feet available
- Forced ventilation kit available for single-phase and three-phase models

FORCED VENTILATION KIT* SINGLE-PHASE MODELS



OVERALL DIMENSIONS WITH IP55 TERMINAL BOX

SIZE	VOLTAGE	HZ	SPEED NOM. MIN/1	ASSORB. WATT	CURRENT M.A.	AIR FLOW M ³ /H
GR.63	230	50 / 60	2750	15 / 14	120 / 100	180
GR.71	230	50 / 60	2750	15 / 14	120 / 100	180
GR.80	230	50 / 60	2750	15 / 14	120 / 100	180
GR.90	230	50 / 60	2900	42 / 36	190 / 180	340
GR.100	230	50 / 60	2900	42 / 36	190 / 180	340
GR.112	230	50 / 60	2900	42 / 36	190 / 180	340
GR.132	230	50 / 60	2900	42 / 36	190 / 180	340

SIZE	COD. IP55	A	B	C	D	E	F	G	L x L
GR.63	AS063230	121	123	102	58	6	50	104	75
GR.71	AS071230	136	138	120	70	6	50	111	75
GR.80	AS080230	153	155	130	80	6	55	125	100
GR.90	AS090230	172	176	145	75	6	60	135	100
GR.100	AS100230	195	197	158	85	8	60	150	100
GR.112	AS112230	218	220	160	100	10	60	160	100
GR.132	AS132230	255	257	180	120	8	65	175	100

* FORCED VENTILATION KIT THREE-PHASE MODELS AVAILABLE ON REQUEST

RADIAL LOADS ON THE OUTPUT SHAFT

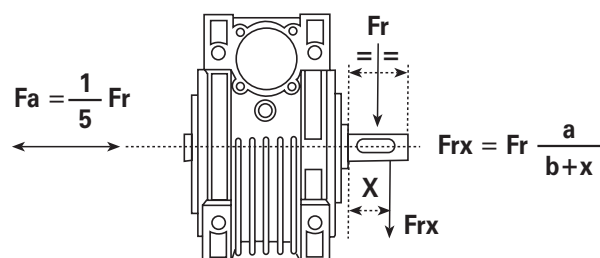
RADIAL LOADS ON THE OUTPUT SHAFT

The loads indicated are valid for all application directions.

The maximum allowable axial loads are equal to 1/5 of the radial load value shown in the table when applied with the same radial load; if this is not the case, please contact our technical office. If double output shafts are used, the sum of radial loads applicable to the centre lines of the two ends of the shaft must not exceed the value shown in the table below.

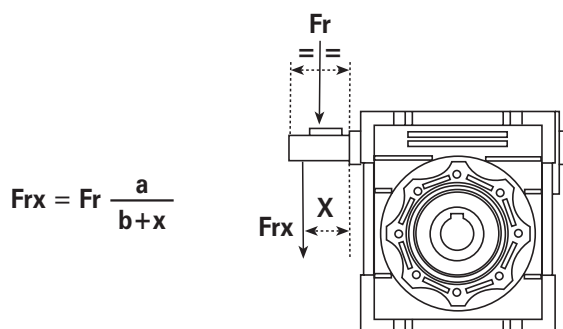
The radial loads related to the output speed (n_2)=10 are the maximum loads supported by the gear.

- a** • Gear constant
- b** • Gear constant
- x** • Load distance from shaft shoulder in mm.
- Fr_x** • Radial load in position x (in N)
- Fr** • Radial load (N)
- Fa** • Axial load (N)



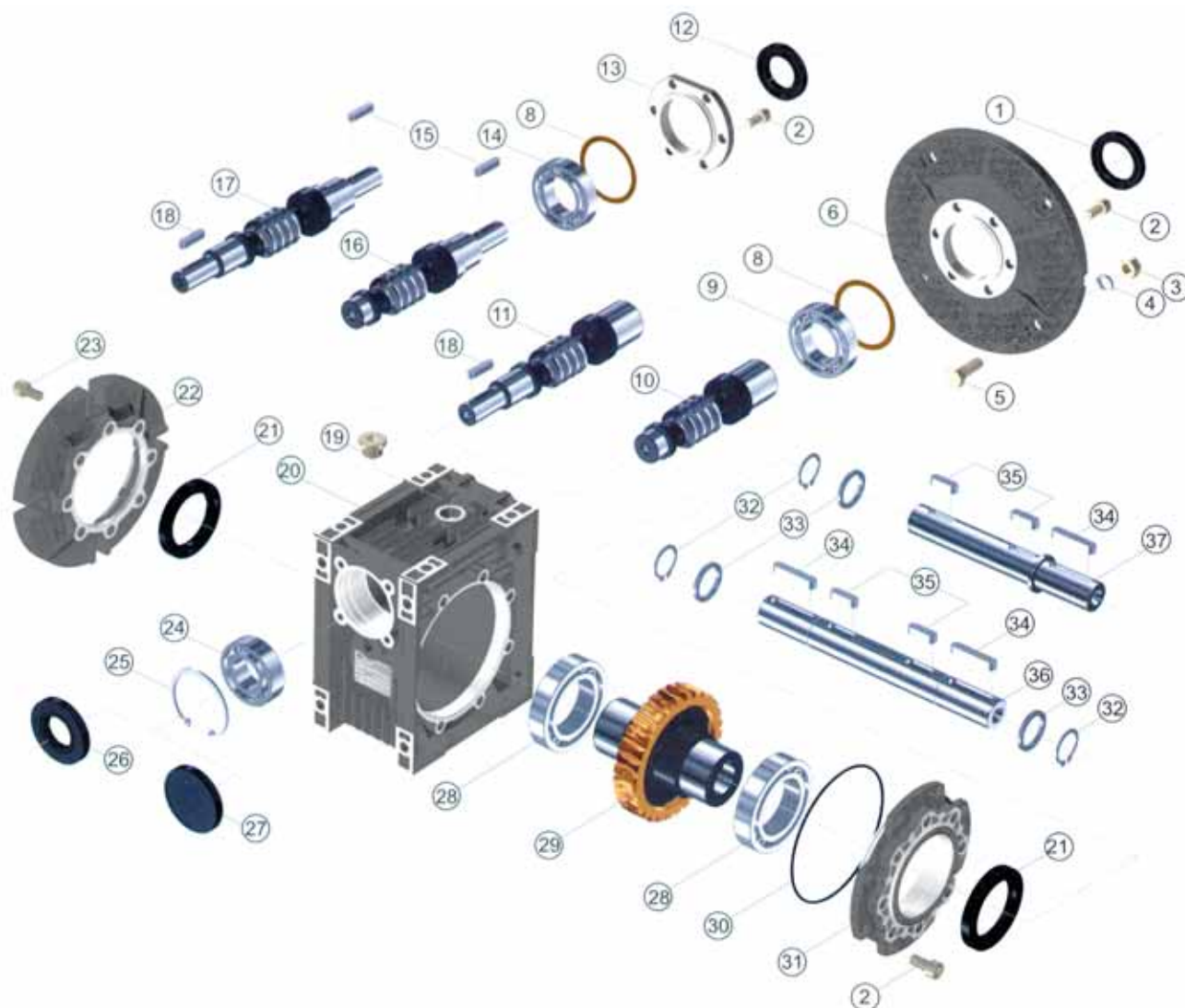
	SIZES								
Output speed (n_2)	025	030	040	050	063	075	090	110	130
400	390	530	1020	1400	1830	2160	2390	3530	3950
250	460	620	1200	1650	2150	2520	2800	4130	4610
150	550	740	1420	1960	2540	2990	3310	4890	5470
100	630	850	1620	2250	2910	3430	3800	5600	6260
60	740	1000	1920	2660	3450	4060	4500	6640	7420
40	850	1150	2200	3050	3950	4650	5150	7600	8500
25	990	1350	2570	3570	4620	5440	6020	8890	9940
10	1350	1830	3490	4840	6270	7380	8180	12000	13500
	CONSTANTS' VALUES								
a	50	65	84	101	120	131	162	176	188
b	38	50	64	76	95	101	122	136	148

RADIAL LOADS ON THE CENTRE LINE OF THE INPUT SHAFT



	SIZES							
	030	040	050	063	075	090	110	130
	CONSTANTS' VALUES							
a	86	106	129	159	192	227	266	314
b	76	94	114	139	167	202	236	274
Fr max	210	350	490	700	980	1270	1700	2100

EXPLODED DRAWING AND SPARE PARTS LIST CHM



- 1 • Oil seal
- 2 • Torx screw
- 3 • Nut
- 4 • Washer
- 5 • Hexagonal-head screw
- 6 • Motor connection flange
- 8 • Adjust spacer
- 9 • Bearing
- 10 • Hole input worm
- 11 • Hole input and shaft output worm
- 12 • Oil seal
- 13 • Input cover
- 14 • Bearing
- 15 • Key
- 16 • Shaft input worm
- 17 • Double extended input shaft worm
- 18 • Key
- 19 • Oil plug

- 20 • Casing
- 21 • Oil seal
- 22 • Output flange
- 23 • Embedded hexagonal-head screw
- 24 • Bearing
- 25 • Seeger
- 26 • Oil seal
- 27 • Cap
- 28 • Bearing
- 29 • Worm wheel
- 30 • O-ring
- 31 • Output cover
- 32 • Seeger
- 33 • Spacer
- 34 • Key
- 35 • Key
- 36 • Double output shaft
- 37 • Single output shaft

Use and maintenance instructions

INSTALLATION

- The data shown on the identification name plate must correspond to the gear ordered
- The oil level, for the sizes 110 and 130 equipped with filling, draining and level plug, must correspond to the quantity foreseen for the assembly position requested (see catalogue), in addition, always for the sizes indicated, it will be the client's responsibility to substitute the blind plug, supplied for transport, with the corresponding plug equipped with a bleed hole included in the supply with the gear
- All of the other gears are supplied complete with permanent synthetic oil in a quantity that is sufficient for any assembly position
- The gear must be fixed on a flat surface that is sufficiently rigid in order to avoid any vibration
- The gear and the axis of the machine to be driven must be perfectly aligned
 - o In the event that knocks, overloading or blockage of the machine are foreseen, the client must install a limiting device, joints, overload cut-out etc.
- Coupling with pinions, joints, pulleys and other parts must be done after the parts have been cleaned and knocks should be avoided while assembling as they could damage the bearings and other internal parts
- In the event that the motor is supplied by the client, he must check that the flange and shaft tolerances correspond to a "normal" class; our motors satisfy this requirement
- Check that the fixing screws for the gear and the related accessories are correctly tightened
- Take suitable measures to protect the groups from any aggressive atmospheric agents
- Where foreseen, protect rotating parts from any possible contact with the operators
- If the gears are painted, protect the oil seals and the machined surfaces
- All of the gears are painted RAL 9022 grey

OPERATION AND RUNNING-IN

- To obtain the best performance the gears must first be run-in by gradually increasing the power in the first few hours of operation, in this phase an increase in temperature is considered normal
- In the event of defective operation, noise, oil leakage, etc. stop the gear immediately and, when possible, remove the cause. Alternatively, send the piece to our factory to be controlled.

MAINTENANCE

- The worm gears from size 25 to size 90 and the pre-stage modules are lubricated with permanent synthetic oil and therefore do not require any maintenance
- The gears size 110 and 130 are lubricated with mineral oil and are equipped with a breather plug, therefore the oil level must be checked periodically and if necessary topped up with the same oil or one that is compatible with those indicated in our catalogue
- For the gears size 110 and 130 proceed with the substitution of the oil after the first 300 working hours, replacing it with the correct quantity in accordance with the assembly position, as detailed in our catalogue, after the inside of the gear has been thoroughly washed

WAREHOUSE STORAGE

- If the warehouse storage will be for a long time, more than 3 months, the shafts and machined surfaces should be protected using antioxidants and the oil seals should be greased

HANDLING

- Care must be taken not to damage the oil seals and the machined surfaces when handling the groups

DISPOSAL OF PACKAGING

- The packaging in which our gears are delivered should be sent to specialised companies for recycling if possible.

GENERAL SALES CONDITIONS

1) **ORDERS** – Orders for special and standard material must always refer to offers made by CHIARAVALLI Trasmissioni SpA.

The orders are binding for the client. Once work has commenced no cancellations or order reductions will be accepted unless the client reimburses the costs of the material and the work carried out up to the moment in which the order was suspended. The quantity despatched can vary by $\pm 5\%$ compared to the quantity ordered.

2) **PRICES** – The prices are those in force at the date of order. All prices are for goods delivered ex-works Premezzo, packing excluded. If there should be any increase in production and material costs over the duration of the supply, CHIARAVALLI Trasmissioni SpA reserves the right to adapt the prices accordingly, even for orders in course.

3) **TERMS OF DELIVERY** – Only the terms of delivery indicated by CHIARAVALLI Trasmissioni SpA are to be considered valid. However, they must only be considered as indicative. In the event of difficulty in the procurement of materials, strikes or in any event in all cases of force majeure, the terms of delivery will be automatically extended without CHIARAVALLI Trasmissioni SpA having to pay any reimbursement for damages. The client is obligated to collect special material ordered when ready.

4) **DELIVERIES** – Deliveries are the responsibility of the purchaser and are carried out at his own risk and peril. Any claims for shortages must be presented within 8 days of receipt of the goods. If it is agreed that the cost of transport is to be paid, even if only in part, by CHIARAVALLI Trasmissioni SpA, the latter reserves the right to choose the most economical means of transport.

5) **PACKING** – Packing will be invoiced at cost.

6) **RETURNS** – No returns for any reason will be accepted unless previously authorised and with packing, any customs clearance and the return paid for by the purchaser. To cover warehouse and administrative expenses a debit note will be issued for approx. 15% of the value of the goods returned.

7) **WARRANTY** – CHIARAVALLI Trasmissioni SpA promises to repair or substitute free of charge any parts that they recognise as being defective. The questioned goods must be returned to the factory of CHIARAVALLI Trasmissioni SpA, free of all expenses. The warranty will be considered cancelled in the event that the parts returned as defective have been repaired or tampered with. The repair of defective parts carried out by the purchaser will only be accepted after authorisation from CHIARAVALLI Trasmissioni SpA and after their approval of the cost estimate. CHIARAVALLI Trasmissioni SpA does not accept responsibility or pay any reimbursement for damages that occur during the use of their products, even if defective. Warranty is excluded for leakage of lubricant caused by normal wear of the oil seals.

8) **RESPONSIBILITY** – CHIARAVALLI Trasmissioni SpA does not accept responsibility or pay any reimbursement for damages that occur during the use of their products, even if defective. CHIARAVALLI Trasmissioni SpA declines all responsibility in the execution of parts to a client's design under any patents.

9) **PAYMENTS** – Only payments carried out in the manner and terms agreed will be considered valid. Once the due date of payment has passed, CHIARAVALLI Trasmissioni SpA will calculate the interest on delayed payment at a rate that is 3% higher than the legal one, retaining the right to demand payment. In the event of delayed or missing payment by the purchaser, the company CHIARAVALLI Trasmissioni SpA reserves the right to suspend deliveries of the orders in course or to demand advance payment without having to pay any reimbursement or compensation to the purchaser. Any dispute regarding materials in manufacture or already possessed by the purchaser does not free the latter from the commitment of making the payment by the agreed date and for the whole amount of the invoice without making any deductions.

10) **OWNERSHIP** – All of the goods despatched remain the property of CHIARAVALLI Trasmissioni SpA until the invoice is fully paid.

11) **COMPETENT COURT** – Any controversy concerning business relations with CHIARAVALLI Trasmissioni SpA will be dealt with under the jurisdiction of the Court of Busto Arsizio.



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