



**THE INNOVATIVE TEAM
IN POWER TRANSMISSION**

MOTOVARIO LIMITED

INTRODUCTION

- **FORMERLY GORTON ENGINEERING LIMITED**
- **UK AGENT FOR MOTOVARIO SPA SINCE 1989**
- **6TH & LATEST SUBSIDIARY FOR MOTOVARIO SPA**
- **2ND LARGEST WORM GEAR MANUFACTURER IN ITALY**
- **2ND LARGEST A.C. MOTOR MANUFACTURER IN ITALY**

PRODUCTS

- 1. MECHANICAL VARIATORS.**
- 2. HELICAL GEARS & GEAR MOTORS.**
- 3. WORM GEARS & GEAR MOTORS.**
- 4. HELICAL BEVEL GEARS & GEAR MOTORS.**
- 5. A.C. ELECTRIC MOTORS.**
- 6. AGENT FOR LEESON ELECTRIC CORP. U.S.A. D.C. ELECTRIC MOTORS.**

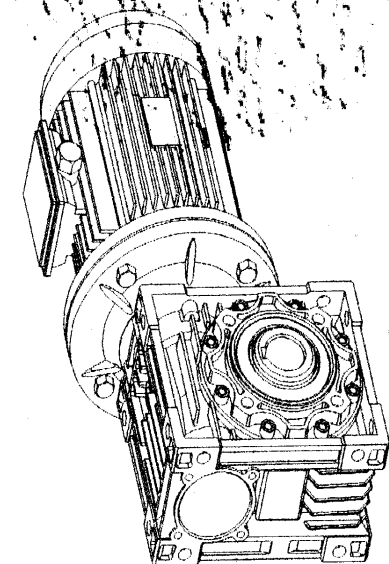
MOTOVARIO

Short history

- 1965 Foundation of MOTOVARIO S.p.A.
- 1966 Starts the production of SPEED VARIATORS for the tile industry
- 1978 Starts the production of HELICAL GEARBOXES
- 1984 Starts the production of WORM GEARBOXES
- 1991 Starts the production of HELICAL BEVEL GEARBOXES
- 1993 Certification ISO 9000
- 1995 Building of a new plant in FORMIGINE
- 1996 Foundation of the first three subsidiaries in Europe (F, D, DK)
- 1997 Foundation of the subsidiary in U.S.A.
- 1997 Starts the production of ELECTRIC MOTORS
- 1998 Foundation of the subsidiary in G.B.
- 1999 Take-over of ST Spaggiari Trasmissioni

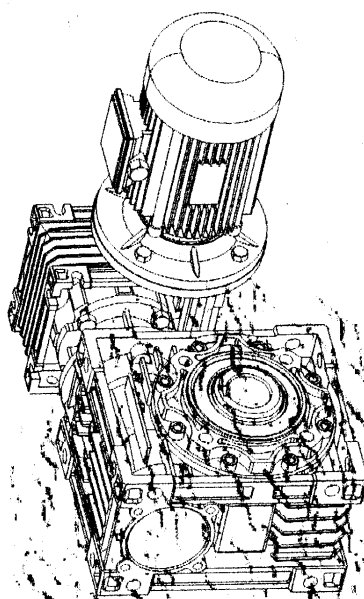


Worm Gears and Gear Motors



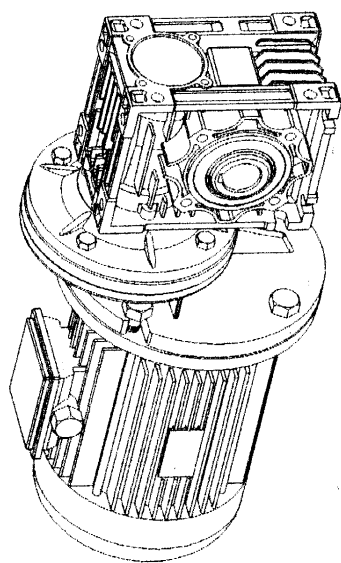
NMRV

WORM GEAR MOTOR



NMRV+NMRV

DOUBLE WORM GEAR MOTOR



PC+NMRV

WORM GEAR MOTOR WITH
HELICAL PRE-STAGE

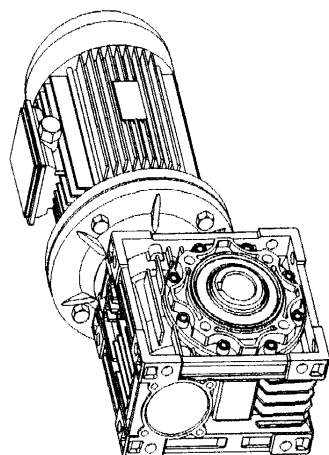
FEATURES:

9 different sizes

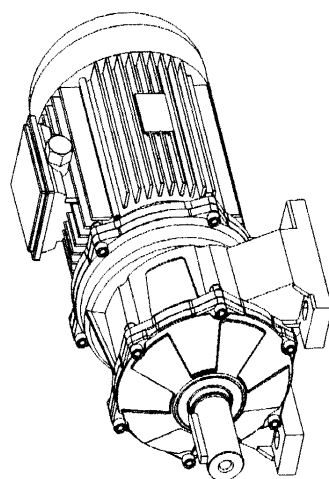
Motor power $N = 0.06 \div 9.2 \text{ kW}$

Ratios $i = 5 \div 100$

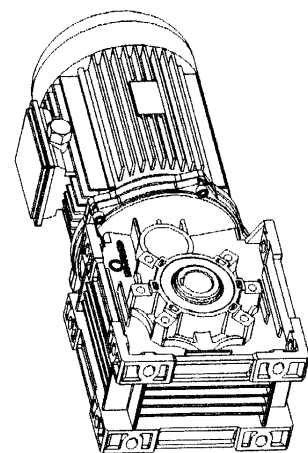
Product Range



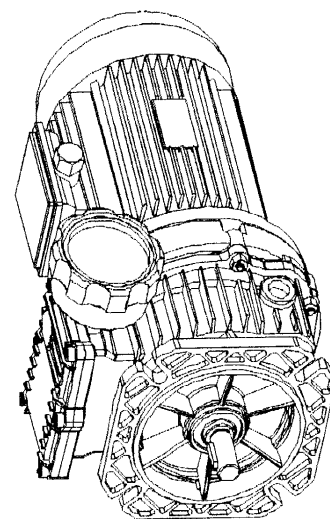
**1 - WORM GEARS and GEAR
MOTORS**



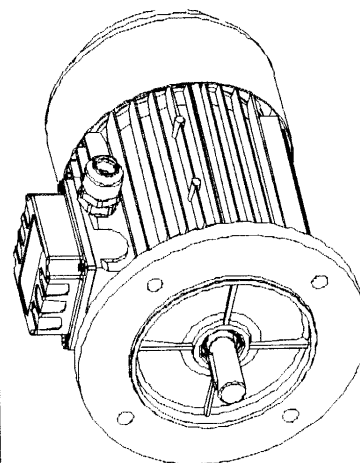
**2 - HELICAL GEARS and
GEAR MOTORS**



**3 - HELICAL BEVEL and
GEAR MOTORS**



**4 - SPEED VARIATORS and
MOTOVARIATORS**



5 - ELECTRIC MOTORS

MOTOVARIO LIMITED PART NUMBERS

WORM GEARS: REFERENCE 'NMRV'

EXAMPLE: **NMRV 50 25 14 105**

BREAKDOWN: NMRV : GEARBOX TYPE / DESIGNATION

50 : GEAR BOX SIZE

25 : GEAR REDUCTION RATIO

14 : MOTOR SHAFT/ GEAR BOX INPUT SHAFT DIAMETER

105: OUTER DIAMETER OF MOTOR / INPUT FLANGE

D.C. ELECTRIC MOTORS

EXAMPLE: **L 71 25 18 L + L71 B14**

BREAKDOWN: L : DESIGNATES LEESON MANUFACTURE

71: IEC FRAME SIZE REFERENCE

25: MOTOR MAXIMUM POWER RATING (0.25 kW)

18: MOTOR NOMINAL SPEED (1800 RPM)

L: LEESON FRAME CODE

L71: LEESON MANUFACTURE & IEC FRAME SIZE (71 FRAME = 14 mm SHAFT DIAMETER)

B14: IEC FLANGE DESIGNATION (IEC 71 B14 FLANGE = 105 mm OUTER DIAMETER).

LEESON CATALOGUE NUMBERS

PREVIOUS EXAMPLE; PART NO. : 'L712518L' + 'L71B14'

CATALOGUE NO. : '098014' + '175107'

THE LEESON CATALOGUE NUMBER IS MERELY A SEQUENTIAL NUMBER ALLOCATED TO A PRODUCT IN ORDER TO UNIQUELY IDENTIFY IT WITHIN THE LEESON PRODUCT RANGE.

	MOTOR POWER	CATALOGUE NO.	PART NUMBER
1800 RPM	0.06	M1130136	L560618B14
"	0.06	M1130146	L560618B5
"	0.09	M1130137	L560918E14
"	0.09	M1130147	L560918E5
"	0.12	M1130138	L631218E14
"	0.12	M1130148	L631218E5
"	0.15	M1130158	L631518B5
"	0.15	#	L631518B5
"	0.18	M1130139	L631818G14
"	0.18	M1130149	L631818G5
"	0.25	098014	L712518L
"	0.37	098015	L713718M
"	0.55	108369	L805518Y
"	0.75	108370	L807518ZL
"	1.10	108371	L801118ZL
"	1.10	118007	L901118G
"	1.50	118008	L901518K
"	2.20	118014	L1122218M
3000 RPM	0.06	M1110024	L560630B14
"	0.09	M1130140	L560930C14
"	0.09	M1130150	L560930C14
"	0.12	M1130141	L561230E14
"	0.12	M1130151	L561230E5
"	0.18	M1130142	L631830G14
"	0.18	M1130152	L631830G5
"	0.25	M1130143	L632530G14
"	0.25	M1130153	L632530G5
"	0.37	098016	L713730K
"	0.55	098017	L715530L
"	0.75	108372	L807530Y
"	1.10	108373	L801130XL
"	1.50	118009	L901530F
"	2.20	118010	L902230H

NOTE: 56 & 63 FRAME MOTORS HAVE DEDICATED FLANGES, EITHER B14 OR B5, HENCE CAT. NOS. EXIST FOR BOTH DESIGNATIONS. FRAMES 71+ ARE SUPPLIED AS MOTOR BODIES ONLY WITH EXTRA FLANGES TO BE RETRO- FITTED.

	CAT. NO.	PART NO.	CAT NO.	PART NO.
IEC FRAME	B14	B14	B5	B5
71	175107	L175107 or L71B14	175106	L175106 or L71B5
80	175109	L175109 or L80B14	175108	L175108 or L80B5
90	175129	L175129 or L90B14	175108	L175108 or L90B5
100/112	175130	L175130 or L100/112B14	175137	L175137 or L100/112 B5

SELECTION EXAMPLE

REQUESTED SPECIFICATIONS BY CLIENT:

- MOTOR POWER 0.25 k W (0.33 HP).
- FINAL OUTPUT SPEED 70 RPM.

1. FROM REQUIRED OUTPUT SPEED FIRST DETERMINE GEAR RATIO REQUIRED
THUS:-

$$\frac{\text{NOMINAL MOTOR SPEED}}{\text{REQUIRED OUTPUT SPEED}} = \frac{1800 \text{ RPM}}{70 \text{ RPM}}$$

$$\text{ANSWER} = \underline{25.7}$$

25:1 REDUCTION RATIO IS SELECTED

2. SELECT FROM CATALOGUE APPROPRIATE GEAR BOX(ES) WHICH WILL ACCEPT
INPUT POWER OF 0.25 kW (0.33 HP) AT 25:1 REDUCTION:

ANSWER : NMRV40 OR NMRV50

THE CHOICE IS THEN NARROWED FURTHER BY CHECKING THE REQUIRED SERVICE FACTOR FOR THE PROPOSED APPLICATION. THIS IS DONE USING THE APPLICATION OR AGMA CLASSIFICATION vs SERVICE FACTOR CHART.

NMRV40 HAS SERVICE FACTOR 1.5, NMRV50 HAS SERVICE FACTOR 2.7

A HEAVY SHOCK LOAD, 24 HOUR PER DAY, 100 STARTS PER HOUR APPLICATION WOULD NECESSITATE NMRV50, WHEREAS A MODERATE SHOCK LOAD, 16 HOUR PER DAY, 40 STARTS PER HOUR APPLICATION WOULD ONLY REQUIRE NMRV40 UNIT.

SELECT THE APPROPRIATE MOTOR FROM THE TABLE WITH 0.25 kW POWER AND 1800 RPM NOMINAL SPEED **I.E. L712518L**

FINALLY DECIDE WHICH FLANGE INTERFACE IS DESIRED (B14 OR B5) AND THE SELECTION OF MOTOR AND GEAR UNIT IS ESTABLISHED.

General Information

Choosing a Reducer and Service Factor

Choosing a Reducer

There are various ways of choosing the right gear reducer for an application: technical specifications can be calculated for the application, absorbed power can be directly measured on similar applications, or simple comparisons can be made with similar existing projects.

Check these parameters when choosing a reducer:

- Power and Torque ratings
- Service Factor
- Radial loads (if present)
- Transmission ratio
- Motor mounting facilities for geared motors
- Mounting positions

Once the application's torque or power requirement has been determined, simply refer to the gear reducer selection tables that provide the data necessary to choose the correct size and type of unit. Please take into account the application's service factor.

Make sure the shocks generated in the application do not exceed twice the gear reducer's maximum torque specified in the catalog.

The performance values given in this catalog are for normal industry applications.

For conditions that are considered to be unusual, i.e. endangering human life, high dynamic stresses or hazardous environments, or for mounting positions not included in this catalog, please contact Motovario Technical Service Representatives.

Service Factor and AGMA Classification

The service factor (s.f.) depends on the conditions under which the gear reducer operates. The following parameters must be taken into consideration in calculating the service factor to apply:

- Type of load of driven machine:

Class I, s.f. ≥ 1.0 - Steady loads not exceeding normal rating and 8-10 hours running time per day.

Class II, s.f. ≥ 1.4 - Moderate shock loads not exceeding 1.25 x rated load torque and 8-10 hours running time per day.

Class III, s.f. ≥ 2.0 - Heavy shock loads exceeding 1.25 x rated load torque and 8-10 hours running time per day.

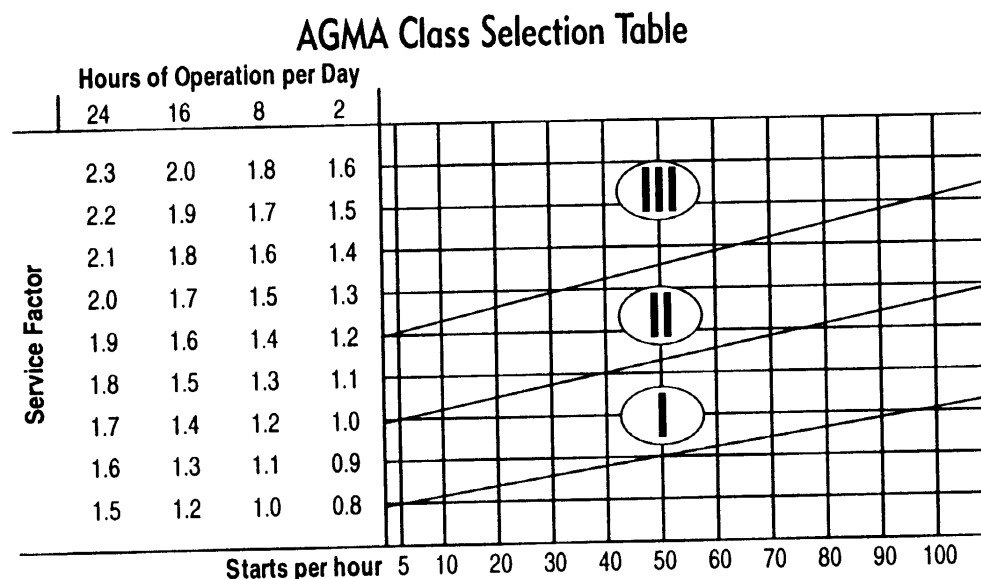
- Type of load of driven machine
- Hours of operation per day
- Start frequency

Maximum duration of shock is 15 seconds. If shocks are likely to last longer than 15 seconds, please contact Motovario Technical Service Representatives for additional support.

Consider ambient temperature when choosing a gear reducer. The service factor determined according to the above conditions must be corrected as follows for temperature:

Ambient Temperature	Multiply s.f. by
86-104° F	1.1-1.2
104-122° F	1.3-1.4
122-140° F	1.5-1.6
above 140° F	contact Technical Service Representative

fig. 1 Summary of Service Factor



NOTE: Figures should be adjusted for ambient temperature (see information above)



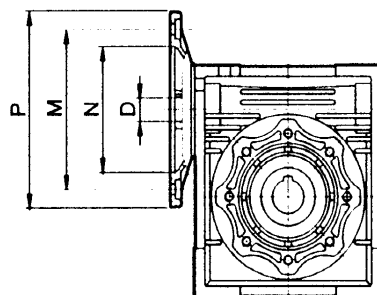
Single Worm Gearmotor Ratings and Selection Tables

1750 RPM 共应商

Max Output Torque (in-lbs)	Actual Input HP	Output Speed (RPM)	Service Factor (s.f.)	Actual Output Torque (in-lbs)	Exact Ratio (i)	Max Input Power (HP)	Model		Overhung Load (OHL) - lbs		
							Nema C input	Frame Size	Output (bearing type)		Input
									Ball	Taper Roller	Solid Input Shaft
1044	0.33	18	2.3	459	100	0.57	NMRV 063	56C	1088	1410	102
1593		18	3.2	495	100	0.80	NMRV 075	56C	1289	1659	143
159		350	3.1	51	5	1.02	NMRV 030	48C	113	-	31
301		350	5.7	53	5	1.88	NMRV 040	56C	221	599	51
159		233	2.1	76	7.5	0.69	NMRV 030	48C	129	-	31
354		233	4.6	78	7.5	1.51	NMRV 040	56C	253	693	51
159		175	1.6	97	10	0.54	NMRV 030	48C	142	-	31
354		175	3.5	101	10	1.16	NMRV 040	56C	279	757	51
159		117	1.2	138	15	0.38	NMRV 030	48C	163	-	31
354		117	2.4	146	15	0.80	NMRV 040	56C	319	785	51
345		88	1.9	185	20	0.61	NMRV 040	56C	350	785	51
646		88	3.4	188	20	1.14	NMRV 050	56C	510	1088	71
336		70	1.5	223	25	0.50	NMRV 040	56C	378	785	51
619		70	2.7	226	25	0.90	NMRV 050	56C	551	1088	71
398		58	1.6	249	30	0.53	NMRV 040	56C	403	785	51
743		58	2.9	257	30	0.96	NMRV 050	56C	586	1088	71
363		44	1.2	309	40	0.39	NMRV 040	56C	441	785	51
672		44	2.1	318	40	0.70	NMRV 050	56C	643	1088	71
1283		44	3.9	333	40	1.27	NMRV 063	56C	807	1410	102
646		35	1.7	374	50	0.57	NMRV 050	56C	694	1088	71
1194		35	3.0	392	50	1.01	NMRV 063	56C	871	1410	102
602		29	1.4	421	60	0.47	NMRV 050	56C	739	1088	71
1150		29	2.6	442	60	0.86	NMRV 063	56C	928	1014	102
1770		29	3.8	463	60	1.26	NMRV 075	56C	1099	1659	143
575		22	1.1	504	80	0.38	NMRV 050	56C	810	1088	71
1079		22	2.0	542	80	0.66	NMRV 063	56C	1017	1410	102
1681		22	2.9	570	80	0.97	NMRV 075	56C	1205	1659	143
1044		18	1.7	606	100	0.57	NMRV 063	56C	1088	1410	102
1593		18	2.4	653	100	0.80	NMRV 075	56C	1289	1659	143
2389		18	3.4	701	100	1.12	NMRV 090	56C	1482	1839	184
301	0.50	350	3.8	80	5	1.88	NMRV 040	56C	221	599	51
354		233	3.0	117	7.5	1.51	NMRV 040	56C	253	693	51
354		175	2.3	153	10	1.16	NMRV 040	56C	279	757	51
655		117	3.0	221	15	1.48	NMRV 050	56C	464	1088	71
354		117	1.6	221	15	0.80	NMRV 040	56C	319	785	51
345		88	1.2	281	20	0.61	NMRV 040	56C	350	785	51
646		88	2.3	284	20	1.14	NMRV 050	56C	510	1088	71
336		70	1.0	338	25	0.50	NMRV 040	56C	378	785	51
619		70	1.8	342	25	0.90	NMRV 050	56C	551	1088	71
1150		70	3.3	351	25	1.64	NMRV 063	56C	692	1410	102
398		58	1.1	378	30	0.53	NMRV 040	56C	403	785	51
743		58	1.9	389	30	0.96	NMRV 050	56C	586	1088	71
1416		58	3.5	400	30	1.77	NMRV 063	56C	736	1410	102
672		44	1.4	482	40	0.70	NMRV 050	56C	643	1088	71
1283		44	2.5	504	40	1.27	NMRV 063	56C	807	1410	102
646		35	1.1	567	50	0.57	NMRV 050	56C	694	1088	71
1194		35	2.0	594	50	1.01	NMRV 063	56C	871	1410	102
1858		35	3.0	621	50	1.50	NMRV 075	56C	1033	1659	143
1150		29	1.7	670	60	0.86	NMRV 063	56C	928	1410	102
1770		29	2.5	702	60	1.26	NMRV 075	56C	1099	1659	143
2831		29	3.8	745	60	1.90	NMRV 090	56C	1264	1839	184
1079		22	1.3	821	80	0.66	NMRV 063	56C	1017	1410	102
1681		22	1.9	864	80	0.97	NMRV 075	56C	1205	1659	143

For ratings on NMRV 025, please see page 197

Predisposizione / Predispotion / Motoranbau / Pr diposition / Predispoci n



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												
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

(*) Linguetta ribassata di nostra fornitura.

(*) Low profile key supplied by Motovario

(*) Abgeflachte Pa feder im Lieferumfang.

(*) Clavette surbaiss e fournie.

(*) Chavetero rebajado de nuestro suministro.