

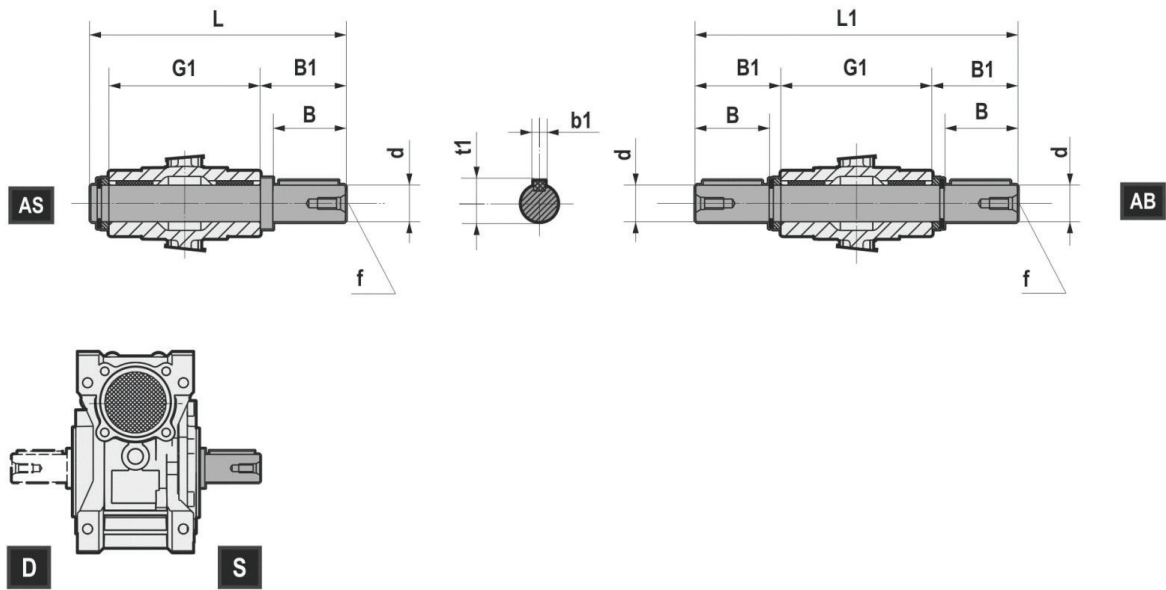
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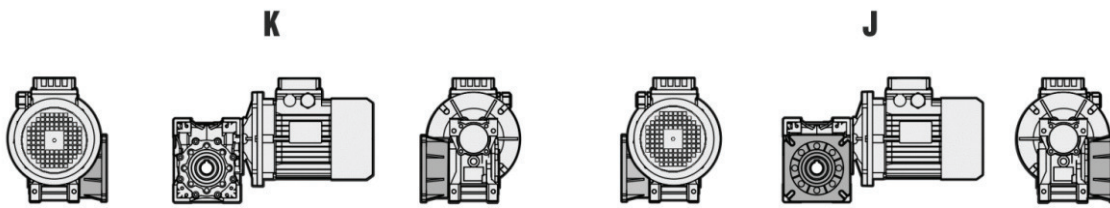
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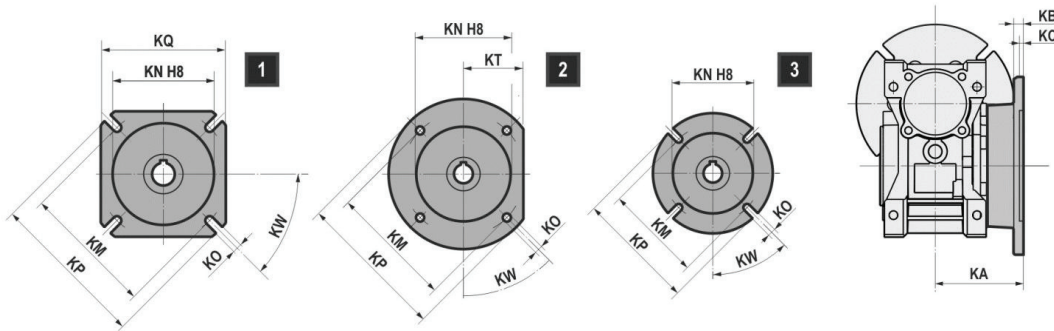


		d	B	B1	G1	L	L1	f	b1	t1
NMRV	025	11g6 (9)	23 (25)	25,5 (30)	50	81 (85,5)	101	-	4 (3)	12,5 (10,2)
NMRV SW	030	14 h6	30	32,5	63	102	128	M6	5	16
NMRV SW	040	18 h6	40	43	78	128	164	M6	6	20,5
NMRV SW	050	25 h6	50	53,5	92	153	199	M10	8	28
NMRV-P SW	063	25 h6	50	53,5	112	173	219	M10	8	28
NMRV-P SW	075	28 h6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

4.2 OUTPUT FLANGE



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



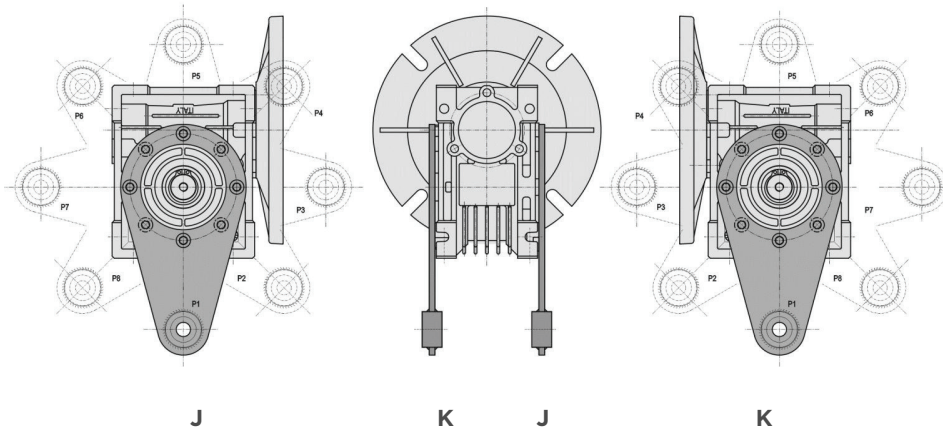
	NMRV - SW	NMRV - SW	NMRV - SW	NMRV-P - SW	NMRV-P - SW	NMRV-P - SW	SW	NMRV-P	NMRV	NMRV
	030	040	050	063	075	090	105	110	130	150
FA	1	1	1	1	1	1	1	1	1	1
FB	-	1	1	1	3	2	1	1	-	-
FC	-	2	2	2	-	3	-	-	-	-
FD	-	2	2	2	-	1	-	-	-	-
FE	-	-	-	3	-	-	-	-	-	-

		FA									FB									
		KA	KB	KC	KN	KM	KO	KP	KQ	KW	KA	KB	KC	KN	KM	KO	KP	KQ	KT	KW
NMRV - SW	030	54,5	6	4	50	68	6.5 (n ^o 4)	80	70	45°	-	-	-	-	-	-	-	-	-	-
NMRV - SW	040	67	7	4	60	80 min	9 (n ^o 4)	110	95	45°	97	7	4	60	80 min	9 (n ^o 4)	110	95	-	45°
NMRV - SW	050	90	9	5	70	90 min	11 (n ^o 4)	125	110	45°	120	9	5	70	90 min	11 (n ^o 4)	125	110	-	45°
NMRV-P - SW	063	82	10	6	115	150	11 (n ^o 4)	180	142	45°	112	10	6	115	150	11 (n ^o 4)	180	142	-	45°
NMRV-P - SW	075	111	13	6	130	165	14 (n ^o 4)	200	170	45°	90	13	6	110	130	11 (n ^o 4)	160	-	-	45°
NMRV-P - SW	090	111	13	6	152	175	14 (n ^o 4)	210	200	45°	122	18	6	180	215	14 (n ^o 4)	250	-	105	45°
SW	105	131	15	6	170	230	14 (n ^o 8)	280	260	45°	180	15	6	170	230	14 (n ^o 8)	280	260	-	45°
NMRV-P	110	131	15	6	170	230	14 (n ^o 8)	280	260	45°	180	15	6	170	230	14 (n ^o 8)	280	260	-	45°
NMRV	130	140	15	6	180	255	16 (n ^o 8)	320	290	22.5°	-	-	-	-	-	-	-	-	-	-
NMRV	150	155	15	6	180	255	16 (n ^o 8)	320	290	22.5°	-	-	-	-	-	-	-	-	-	-

		FC									FD									
		KA	KB	KC	KN	KM	KO	KP	KT	KW	KA	KB	KC	KN	KM	KO	KP	KQ	KT	KW
NMRV - SW	040	80	9	5	95	115	9.5 (n ^o 4)	140	56	45°	58	12	5	80	100	9 (n ^o 4)	120	-	50	45°
NMRV - SW	050	89	10	5	110	130	9.5 (n ^o 4)	160	66	45°	72	14,5	5	95	115	11 (n ^o 4)	140	-	60	45°
NMRV-P - SW	063	98	10	5	130	165	11 (n ^o 4)	200	80	45°	107	10	5	130	165	11 (n ^o 4)	200	-	-	45°
NMRV-P - SW	090	110	17	6	130	165	11 (n ^o 4)	200	-	45°	151	13	6	152	175	14 (n ^o 4)	210	200	-	45°

		FE							
		KA	KB	KC	KN	KM	KO	KP	KW
NMRV-P - SW	063	80,5	16,5	5	110	130	11 (n ^o 4)	160	45°

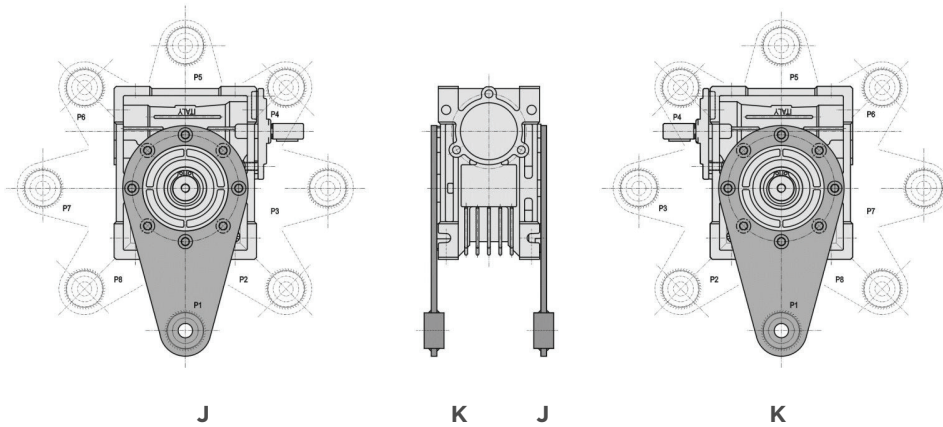
4.3.1 Torque arm: Mounting position



NMRV NMRV-P NMRL	P1		P2		P3		P4		P5		P6		P7		P8	
	J	K	J	K	J	K	J	K	J	K	J	K	J	K	J	K
025			/	/	NO	NO	/	/			/	/			/	/
030			NO	NO	NO	NO	NO	NO								
040	NO NMRL		NO	NO	NO	NO	NO	NO	NO NMRL		NO NMRL		NO NMRL		NO NMRL	
050			NO	NO	NO	NO	NO	NO			NO	NO				
063					NO	NO	NO	NO								
075			NO	NO	NO	NO	NO	NO								
090					NO	NO	NO	NO								
110					NO	NO	NO	NO								
130					NO	NO	NO	NO								
150			NO	NO	NO	NO	NO	NO	NO	NO	NO	NO			NO	NO

SW SWL	P1		P2		P3		P4		P5		P6		P7		P8	
	J	K	J	K	J	K	J	K	J	K	J	K	J	K	J	K
030			NO	NO	NO	NO	NO	NO								
040	NO SWL		NO	NO	NO	NO	NO	NO	NO SWL		NO SWL		NO SWL		NO SWL	
050			NO	NO	NO	NO	NO	NO			NO	NO				
063					NO	NO	NO	NO								
075			NO	NO	NO	NO	NO	NO								
090					NO	NO	NO	NO								
105					NO	NO	NO	NO								

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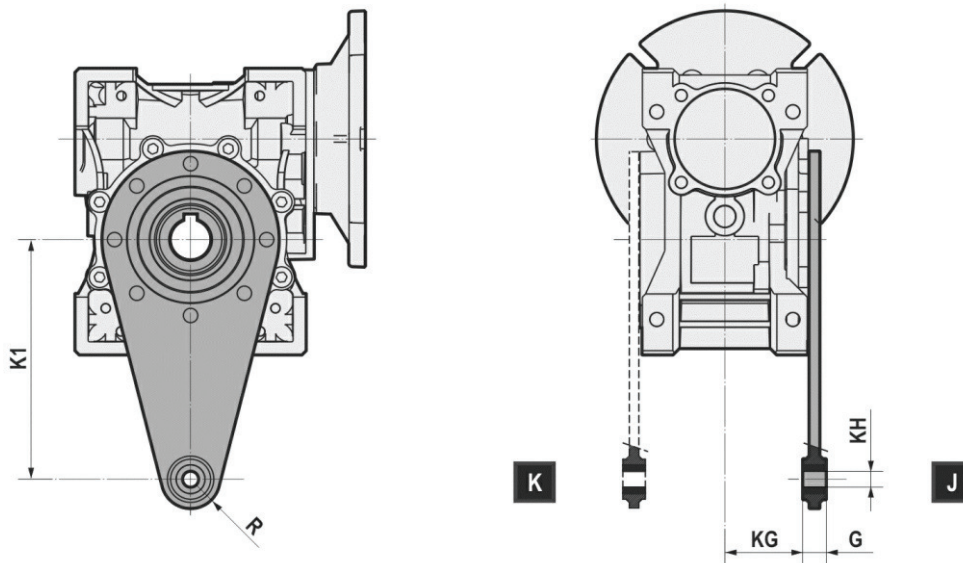
NRV NRV-P NRL	P1		P2		P3		P4		P5		P6		P7		P8		
	J	K	J	K	J	K	J	K	J	K	J	K	J	K	J	K	
030			NO	NO			NO	NO									
040	NO NRL		NO NRL	NO	NO NRL	NO	NO	NO	NO NRL		NO NRL		NO NRL		NO NRL		NO NRL
050			NO	NO			NO	NO			NO	NO					
063							NO	NO									
075							NO	NO									
090							NO	NO									
110							NO	NO									
130							NO	NO									
150			NO	NO			NO	NO	NO	NO	NO	NO				NO	NO

ISW SWL	P1		P2		P3		P4		P5		P6		P7		P8		
	J	K	J	K	J	K	J	K	J	K	J	K	J	K	J	K	
030			NO	NO	NO	NO	NO	NO									
040	NO SWL		NO	NO	NO	NO	NO	NO	NO SWL		NO SWL		NO SWL		NO SWL		NO SWL
050			NO	NO	NO	NO	NO	NO			NO	NO					
063					NO	NO	NO	NO									
075			NO	NO	NO	NO	NO	NO									
090					NO	NO	NO	NO									
105					NO	NO	NO	NO									

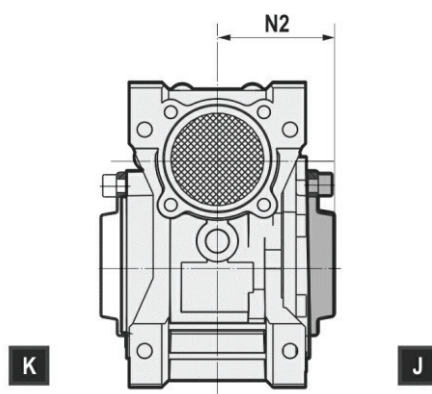
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For information on torque arm mounting positions on combined worm gear reducers and worm gear reducers with pre-stage units, please contact our Technical Service.

4.3.2 Torque arm: Dimensions



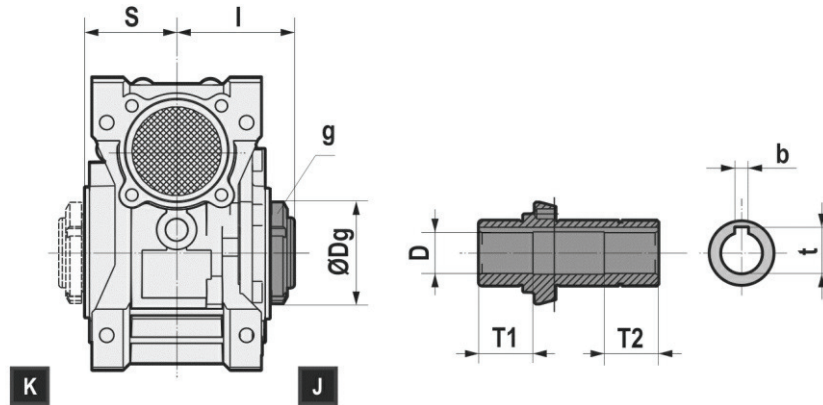
NMRV NMRV-P SW	025	030	040	050	063	075	090	105	110	130	150
K1	70	85	100	100	150	200	200	250	250	250	250
G	14	14	14	14	14	25	25	30	30	30	30
KG	17,5	24	31,5	38,5	49	47,5	57,5	62	62	69	84
KH	8	8	10	10	10	20	20	25	25	25	25
R	15	15	18	18	18	30	30	35	35	35	35



NMRV NMRV-P SW	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

4.5.1 Dimensions

The torque limiter is available for worm gearbox type NMRL050, SWL040, SWL050, SWL063, SWL075, SWL090 in J position only. The MTV torque limiter is univocally supplied for every gear unit with the hollow output shaft diameter equal to dimension D shown in the table. Different diameters could be provided upon request, after technical and manufacturing control. Upon request it's possible to assemble an output solid shaft kit, different from the standard one available in the Catalogue.



	NMRL			
	050	063	075	090
I	63,5	74	78,5	89,5
S	46	56	60	70
Dg	56	62	68	80
g	M40x1,5	M45x1,5	M50x1,5	M60x2
b	8	8	8	10
t	28,3	28,3	31,3	38,3
D	Ø25	Ø25	Ø28	Ø35
T1	33	37	40	45
T2	33	37	40	45

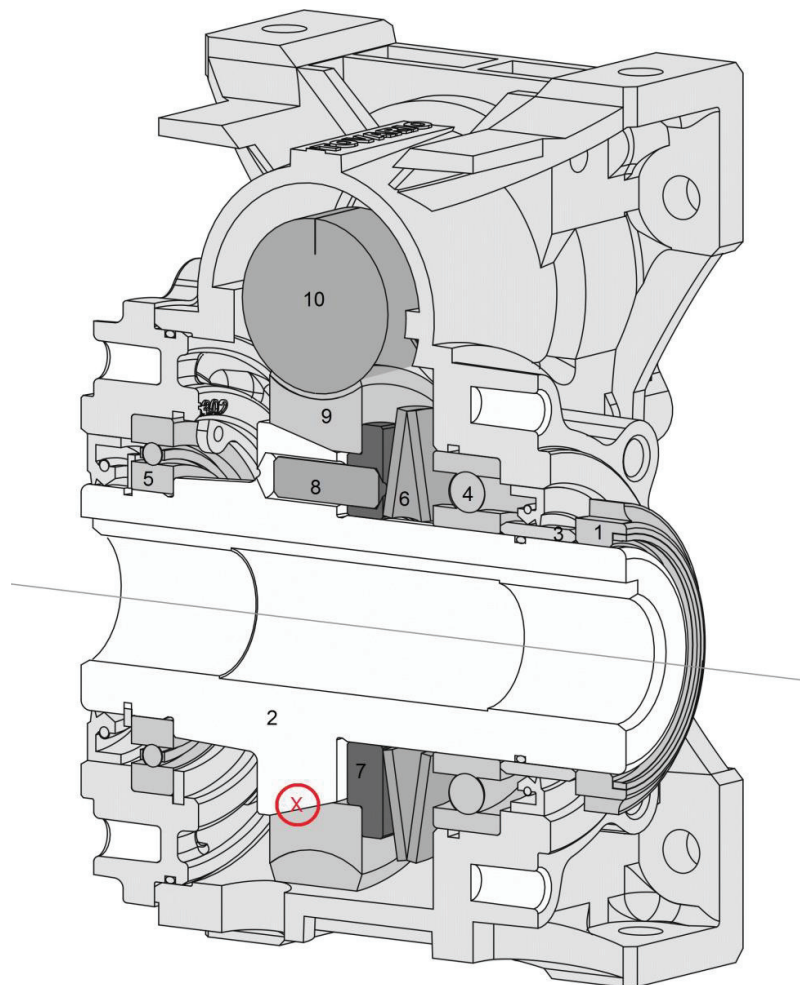
	SWL				
	040	050	063	075	090
I	55	63,5	74	78,5	89,5
S	39	46	56	60	70
Dg	44	56	62	68	80
g	M30x1,5	M40x1,5	M45x1,5	M50x1,5	M60x2
b	6	8	8	8	10
t	20,8	28,3	28,3	31,3	38,3
D	Ø18	Ø25	Ø25	Ø28	Ø35
T1	28	33	35	40	45
T2	28	33	37	40,5	45

4.5.2 Operating principle

In this mechanical device the transmission of movement takes place by means of friction between the driving surface (input shaft (10)) and the driven surface (wormwheel (9)). These are subject of a determined compression created by the plate (7) which is generated by two belleville washers (6), arranged in series. The belleville washers action is generated by the bushing (3), driven by the external locking ring nut (1) which is screwed on the output shaft. The shift (X) is guaranteed by the connection between the two conical elements of the hub (2) and the worm wheel.

The transmission of movement has a standard operation up to a maximum admissible torque value (slip torque); over this value the torque limiter starts to work generating a slip between the worm wheel, which continues to spin conducted by the input shaft, and the hub which remains still. Over the slip torque expected from the regulation, the torque limiter is still "on hold": it transmits the set value and it doesn't transmit higher values. This ensures to the machine to restart automatically without external action.

For safety reasons it isn't recommended to install this device in lifting equipment: in case of overloads or irregularities, during the shift, the weight could not be maintained in suspension.



4.5.3 Description

The torque limiter is a mechanical device designed to protect the transmission from movement caused by accidental overloads or irregularities. It is applied to the output of the worm gear reducers and it works as an internal friction applied on the output shaft, which can be adjusted manually through an external locking ring nut. Compared to electronic or external mechanical devices, this solution presents the following advantages:

- Limited additional dimensions compared to the version without the torque limiter;
- Hollow output shaft without changes in terms of diameter compared to the standard version;
- Quick action directly on the transmission that must be protected;
- It has been designed for oil-bath operation, therefore wear-free and reliable;
- Manual adjustment of the slip torque;
- Over the slip torque, the torque limiter is still “on hold”, ensuring the automatic machine restart without external intervention;
- Using the torque limiter, it 's possible also to rotate the gearbox shaft by loosening the external locking ring nut, for example in case of mechanical locks due to worm irreversibility.

The torque limiter device must be installed as a protection system for accidental events and not as protection of wrong gearbox selection (for example after selecting a gearbox with a low service factor compared with the real needs of the application).

The torque limiter is available for worm gear reducers type NMRL050 / NMRL-P063-075-090 / SWL040-050-063-075-090 and it is applicable in all combined unit configurations provided in the catalogue, usually on the last gearbox. The torque limiter is supplied on the gearbox output shaft in J or K position.

4.5.4 Slip torque setting

A slip torque setting is easily adjustable from the outside through the rotation of the locking ring nut, characterized by 4 marks to define the number of turns (each mark is equivalent to $\frac{1}{4}$ of a turn). The device is preliminary set during the assembly phase. The following factors may affect the setting: temperature and period of adjustment. It is therefore recommended, during the installation, to actually verify the slip torque limit, in according to the real needs of the application.

The standard direction of rotation for the registration of the ring nut is clockwise. Looking frontally from the ring nut side, the torque limiter is in J position when the motor position is on the right side; with the motor on left side the torque limiter is in K position.

It's recommended for long stops, even if the machine restarts automatically, to return the ring nut to its original position and to set it again.

As previously mentioned, for each reducers size (040-050-063-075-090) the slip torque range depends by the ratio and the direction of rotation of the gearbox, which affects the tolerances between the two conical components that generate the slip (there is an axial component which tends to approach or move their away). Therefore in the setting diagrams are shown two lines which represent the approximate limits within the provided slip torque could change. The slip torque setting must be always checked afterward to determine if the number of turns of the ring nut guarantees the desired slip torque value.

	Ring nut rotation
040	1/2 (turn)
050	1/2 (turn)
063	3/4 (turn)
075	1 (turn)
090	1 (turn)

4.5.5 Adjustment graphs

IMP: the values (1/4, 1/2, 3/4, 1, 1 1/4 ...) correspond to the center of the column.

