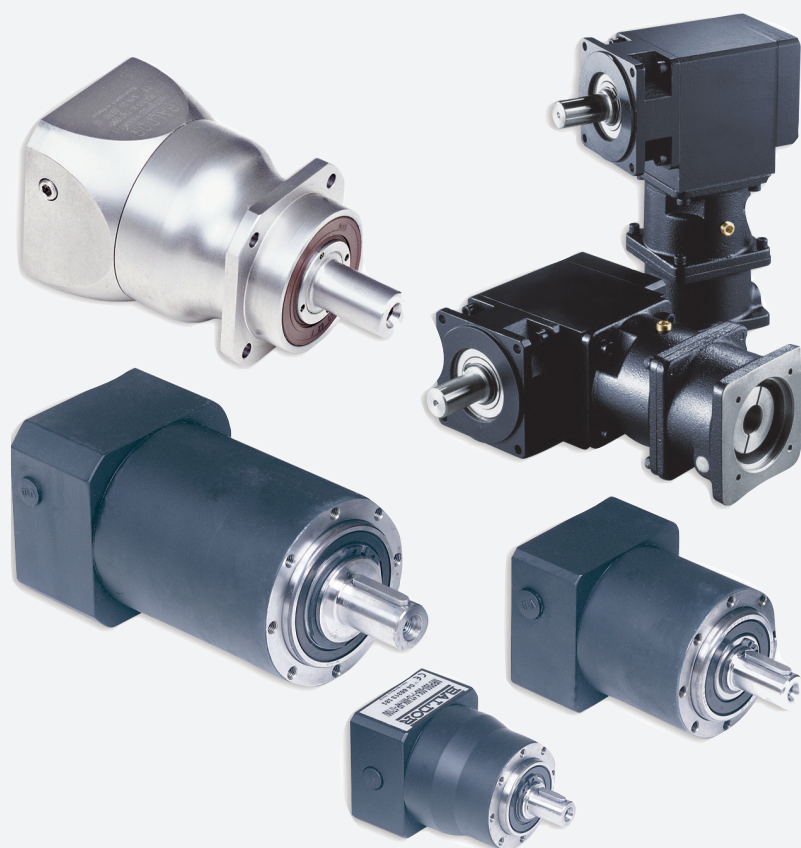


GEARHEADS

# Servo gearheads

## GBSM series



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## **Precision gearheads designed specifically for BSM servo motors**

Planetary gearheads designed for servo applications requiring precision, durability, and long trouble free operation. These are high efficiency gearheads that maximize the power transmission capability. They are designed with low backlash to reduce shock loads in dynamic reversing applications. They mount directly to the BSM servo motor family to provide torque multiplication, speed reduction, and inertia matching.

- Standard servo rated gearheads
- Stainless steel gearheads
- Standard and lower backlash available
- Right angle gearheads available
- High efficiency

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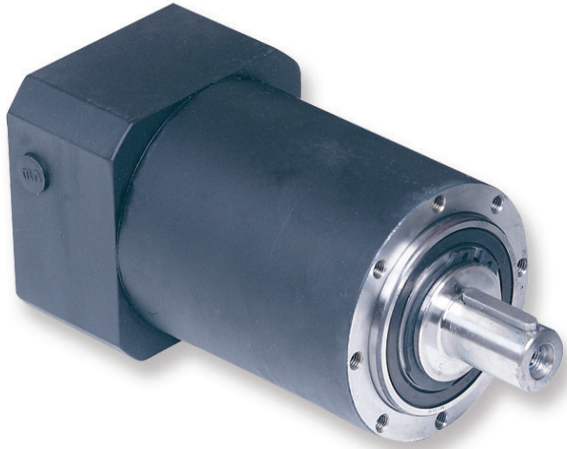
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<b>22</b>	<b>MSS</b> Series stainless steel servo rated gearheads

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# Standard servo rated gearheads

## MRP series



These planetary gearheads provide a standard backlash of 10 - 15 arc min and are designed for mounting directly on to ABB's BSM servo motors. These efficient gearheads will maximize power transmission capability in applications.

### **Standard gearhead**

- Standard backlash is 10 - 15 arc-min max
- Round face with tapped holes
- Integrated, self-locating input pinion clamps onto motor shaft
- Lubrication - grease - 15 K hours
- Satellite gear shaft is cantilever supported in carrier (needle bearings)
- Satellite gear teeth - deep case hardened and finish ground
- Medium to high torque/size & torsional stiffness
- Gearhead housing - aluminum input module, steel output module
- IP64

## Quick selection guide for standard MRP servo rated gearheads

10 to 15 arc min. backlash

Selection chart for BSM C-series and standard gearheads (MRP)

BSM series	1 stage ratios					2 stage ratios							
	3	4	5	7	10	16	20	25	35	40	50	70	100
80C-1XX	090	090	090	090	090	090	090	090	090	090	120	120	155
80C-2XX	090	090	090	090	090	090	120	120	120	120	120	155	*
80C-3XX	090	090	090	090	120	120	120	120	120	120	155	155	*
80C-4XX	090	090	090	090	120	120	120	120	120	155	155	*	*
90C-1XX	120	120	120	120	120	120	120	120	120	120	120	155	*
90C-2XX	120	120	120	120	120	120	120	120	155	155	155	*	*
90C-3XX	120	120	120	120	155	120	120	155	155	*	*	*	*
100C-1XXX	120	120	120	120	120	120	120	120	120	155	155	*	*
100C-2XXX	120	120	120	120	155	120	155	155	*	*	*	*	*
100C-3XXX	120	120	120	120	155	155	155	*	*	*	*	*	*
100C-4XXX	120	120	120	155	*	*	*	*	*	*	*	*	*
100C-5XXX	120	120	155	*	*	*	*	*	*	*	*	*	*
100C-6XXX	120	120	155	*	*	*	*	*	*	*	*	*	*

### Ordering nomenclature for gearhead only:

Example: **GBSM80 - MRP090 - 4**

**G:** Gear

**BSM80:** Motor

**MRP090:** Gearhead type

**4:** Ratio

Selection chart for BSM N-series and standard gearheads (MRP)

BSM series	1 stage ratios					2 stage ratios							
	3	4	5	7	10	16	20	25	35	40	50	70	100
50N-1XX	070	050	050	050	050	050	070	090	090	090	090	090	*
50N-2XX	070	050	050	070	070	070	090	090	090	090	090	*	*
50N-3XX	070	050	070	070	070	090	090	090	090	090	*	*	*
63N-1XX	070	070	070	070	070	070	070	090	090	090	090	120	120
63N-2XX	070	070	070	070	070	070	090	090	090	120	120	120	*
63N-3XX	070	070	070	070	090	090	090	120	120	120	120	120	*
80N-1XX	090	090	090	090	090	090	090	090	120	120	120	120	155
80N-2XX	090	090	090	090	090	090	120	120	120	120	120	155	*
80N-3XX	090	090	090	090	120	120	120	120	120	155	155	*	*
90N-1XX	120	120	120	120	120	120	120	120	155	155	155	*	*
90N-2XX	120	120	120	120	155	120	155	155	*	*	*	*	*
90N-3XX	120	120	120	120	155	155	155	155	*	*	*	*	*
100N-1XXX	120	120	120	120	155	155	155	*	*	*	*	*	*
100N-2XXX	120	120	120	155	*	*	*	*	*	*	*	*	*
100N-3XXX	120	120	155	155	*	*	*	*	*	*	*	*	*
100N-4XXX	120	120	155	*	*	*	*	*	*	*	*	*	*

### Ordering nomenclature for gearhead only:

Example: **GBSM50 - MRP050 - 10**

**G:** Gear

**BSM50:** Motor

**MRP050:** Gearhead type

**10:** Ratio

## Characteristics of standard planetary gearheads

### MRP 50 - MRP 155

#### MRP 050

No. of stages		1 stage					2 stages						
Ratio		4	5	7	10	16	20	25	35	40	50	70	100
<b>Input</b>													
Rated speed/max.	RPM	4000/6000					4000/6000						
Power in @ T1 & N1 rated	kW	0.67	0.54	0.29	0.21	0.21	0.13	0.13	0.08	0.04	0.04	0.04	0.04
Rated torque (T1)	Lb.-in.	14.2	11.5	6.2	4.4	4.4	2.7	2.7	1.8	0.88	0.88	0.88	0.88
	Nm	1.6	1.3	0.7	0.5	0.5	0.3	0.3	0.2	0.1	0.1	0.1	0.1
Accel torque <sup>(1)</sup>	Lb.-in.	27.4	22.1	13.3	8.8	7.1	5.3	4.4	2.7	2.7	1.8	1.8	0.88
	Nm	3.1	2.5	1.5	1	0.8	0.6	0.5	0.3	0.3	0.2	0.2	0.1
<b>Output</b>													
Rated speed	RPM	1000	800	571	400	250	200	160	114	100	80	57	57
Rated torque (T2)	Lb.-in.	53	53	44	44	62	53	53	44	44	44	44	44
	Nm	6	6	5	5	7	6	6	5	5	5	5	5
Accel torque <sup>(1)</sup>	Lb.-in.	106	106	88	88	106	106	106	88	88	88	88	88
	Nm	12	12	10	10	12	12	12	10	10	10	10	10
<b>General data</b>													
Inertia <sup>(2)</sup>	Lb.-in.-s <sup>2</sup> x10 <sup>-4</sup>	0.65	0.65	0.62	0.62	0.58	0.58	0.58	0.56	0.53	0.53	0.53	0.53
	Kg-m <sup>2</sup> x10 <sup>-5</sup>	0.74	0.74	0.70	0.70	0.65	0.65	0.65	0.63	0.60	0.60	0.60	0.60
Max. backlash	arc-mins						12						
Efficiency <sup>(3)</sup>	%						96						
Rated life	H						15,000						
Weight	Kg/Lbf						0.9/2						
Radial load <sup>(4)</sup>	N/Lbf						700/157						
Axial load	N/Lbf						700/157						

#### MRP 070

No. of stages		1 stage					2 stages							
Ratio		3	4	5	7	10	16	20	25	35	40	50	70	100
<b>Input</b>														
Rated speed/max.	RPM	4000/6000					4000/6000							
Power in @ T1 & N1 rated	kW	1.5	1.1	0.9	0.7	0.4	0.6	0.4	0.3	0.2	0.2	0.2	0.1	0.05
Rated torque (T1)	Lb.-in.	48.7	37.2	29.2	19.5	13.3	11.5	7.1	6.2	3.5	3.5	2.7	1.8	0.88
	Nm	5.5	4.2	3.3	2.2	1.5	1.3	0.8	0.7	0.4	0.4	0.3	0.2	0.1
Accel torque <sup>(1)</sup>	Lb.-in.	97.4	73.5	58.4	38.1	26.6	18.6	15.0	12.4	8.0	6.2	5.3	5.3	2.7
	Nm	11	8.3	6.6	4.3	3	2.1	1.7	1.4	0.9	0.7	0.6	0.6	0.3
<b>Output</b>														
Rated speed	RPM	1333	1000	800	571	400	250	200	160	114	100	80	57	57
Rated torque (T2)	Lb.-in.	142	142	142	133	133	177	142	142	133	133	133	133	133
	Nm	16	16	16	15	15	20	16	16	15	15	15	15	15
Accel torque <sup>(1)</sup>	Lb.-in.	283	283	283	257	257	283	283	283	257	257	257	257	257
	Nm	32	32	32	29	29	32	32	32	29	29	29	29	29
<b>General data</b>														
Inertia <sup>(2)</sup>	Lb.-in.-s <sup>2</sup> x10 <sup>-4</sup>	0.956	0.947	0.867	0.805	0.779	0.912	0.938	0.797	0.779	0.770	0.770	0.770	0.752
	Kg-m <sup>2</sup> x10 <sup>-5</sup>	1.08	1.07	0.98	0.91	0.88	1.03	1.06	0.90	0.88	0.87	0.87	0.87	0.85
Max. backlash	arc-mins						12							
Efficiency <sup>(3)</sup>	%						96							
Rated life	H						15,000							
Weight	Kg/Lbf						1.5/3.3							
Radial load <sup>(4)</sup>	N/Lbf						1500/337							
Axial load	N/Lbf						1500/337							

(1) S5 duty service.

(2) On the motorside.

(3) Theoretical gear efficiency value.

(4) Load applied in the middle of the output shaft at 300 RPM.

(5) Emergency stop torque is 2.5 times rated output torque for 1000 times max during the service life of the gearhead.

## Characteristics of standard planetary gearheads

MRP 50 - MRP 155

### MRP 090

No. of stages		1 stage					2 stages									
Ratio		3	4	5	7	10	16	20	25	35	40	50	70	100		
<b>Input</b>																
Rated speed/max.	RPM	4000/6000					4000/6000									
Power in @ T1 & N1 rated	kW	6.2	4.7	4	2.5	1.2	1.3	1	0.7	0.5	0.5	0.4	0.3	0.1		
Rated torque (T1)	Lb.-in.	150	115	97.4	62	27	31	24.8	15.9	13.3	11.5	8.8	5.3	2.7		
	Nm	17	13	11	7	3	3.5	2.8	1.8	1.5	1.3	1	0.6	0.3		
Accel torque <sup>(1)</sup>	Lb.-in.	248	186	150	97.4	66.4	48.7	39.8	31	22.1	18	18	8.8	7.1		
	Nm	28	21	17	11	7.5	5.5	4.5	3.5	2.5	2	2	1	0.8		
<b>Output</b>																
Rated speed	RPM	1167	875	700	500	350	219	175	140	100	87.5	70	50	35		
Rated torque (T2)	Lb.-in.	443	443	443	443	310	443	443	443	443	443	443	310	310		
	Nm	50	50	50	45	35	50	50	50	50	50	50	35	35		
Accel torque <sup>(1)</sup>	Lb.-in.	708	708	708	637	637	708	708	708	708	708	708	637	637		
	Nm	80	80	80	72	72	80	80	80	80	80	80	72	72		
<b>General data</b>																
Inertia <sup>(2)</sup>	Lb.-in.-s <sup>2</sup> x10 <sup>-4</sup>	4.6	4.6	4.5	4.2	4.1	4.4	4.4	4.4	4.2	4.2	4.0	3.8	3.8		
	Kg-m <sup>2</sup> x10 <sup>-5</sup>	5.2	5.2	5.1	4.8	4.6	5	5	5	4.7	4.7	4.5	4.3	4.3		
Max. backlash	arc-mins											10				
Efficiency <sup>(3)</sup>	%											96				
Rated life	H											15,000				
Weight	Kg/Lbf											3/6.6				
Radial load <sup>(4)</sup>	N/Lbf											2500/562				
Axial load	N/Lbf											2000/450				

### MRP 120

No. of stages		1 stage					2 stages									
Ratio		3	4	5	7	10	16	20	25	35	40	50	70	100		
<b>Input</b>																
Rated speed/max.	RPM	4000/6000					4000/6000									
Power in @ T1 & N1 rated	kW	15	12	8.5	5	3	3	2.5	2	1.5	1	0.8	0.6	0.3		
Rated torque (T1)	Lb.-in.	478	372	266	159	84.1	97.4	80	62	44	35	27	18	8.8		
	Nm	54	42	30	18	9.5	11	9	7	5	4	3	2	1		
Accel torque <sup>(1)</sup>	Lb.-in.	611	460	363	416	168	124	115	97.4	71	53	44	27	18		
	Nm	69	52	41	47	19	14	13	11	8	6	5	3	2		
<b>Output</b>																
Rated speed	RPM	1000	750	600	429	300	187.5	150	120	85.5	75	60	43	30		
Rated torque (T2)	Lb.-in.	1372	1416	1283	1062	797	1416	1443	1407	1407	1283	1204	1124	805		
	Nm	155	160	145	120	90	160	163	159	159	145	136	127	91		
Accel torque <sup>(1)</sup>	Lb.-in.	1770	1770	1770	1593	1593	1814	2080	2213	2257	1903	1991	1593	1593		
	Nm	200	200	200	180	180	205	235	250	255	215	225	180	180		
<b>General data</b>																
Inertia <sup>(2)</sup>	Lb.-in.-s <sup>2</sup> x10 <sup>-4</sup>	15.6	15.6	14.7	14.6	14.0	15.0	14.9	14.7	14.3	14.3	13.8	13.8	13.8		
	Kg-m <sup>2</sup> x10 <sup>-5</sup>	17.6	17.6	16.6	16.5	15.8	16.9	16.8	16.6	16.2	16.2	15.6	15.6	15.6		
Max. backlash	arc-mins											10				
Efficiency <sup>(3)</sup>	%											96				
Rated life	H											15,000				
Weight	Kg/Lbf											7/15.4				
Radial load <sup>(4)</sup>	N/Lbf											4500/1010				
Axial load	N/Lbf											4000/900				

(1) S5 duty service.

(2) On the motorside.

(3) Theoretical gear efficiency value.

(4) Load applied in the middle of the output shaft at 300 RPM.

(5) Emergency stop torque is 2.5 times rated output torque for 1000 times max during the service life of the gearhead.

## Selection

MRP 50 - MRP 155

## MRP 155

No. of stages		1 stage					2 stages									
Ratio		3	4	5	7	10	16	20	25	35	40	50	70	100		
<b>Input</b>																
Rated speed/max.	RPM	4000/6000					4000/6000									
Power in @ T1 & N1 rated	kW	15	16	13	8	4	4	3.5	3	2	1.5	1.5	0.8	0.4		
Rated torque (T1)	Lb.-in.	646	673	540	336	159	177	142	115	80	62	53	35	18		
	Nm	73	76	61	38	18	20	16	13	9	7	6	4	2		
Accel torque <sup>(1)</sup>	Lb.-in.	1230	920	735	460	292	239	195	150	106	97.4	71	44	27		
	Nm	139	104	83	52	33	27	22	17	12	11	8	5	3		
<b>Output</b>																
Rated speed	RPM	666	500	400	285	200	125	100	80	57	50	40	28	20		
Rated torque (T2)	Lb.-in.	1859	2567	2567	2257	1505	2567	2567	2567	2390	2213	2213	2213	1505		
	Nm	210	290	290	255	170	290	290	290	270	250	250	230	170		
Accel torque <sup>(1)</sup>	Lb.-in.	3540	3540	3540	3098	2832	3540	3540	3540	3540	3540	3540	2832	2832		
	Nm	400	400	400	350	320	400	400	400	400	400	400	320	320		
<b>General data</b>																
Inertia <sup>(2)</sup>	Lb.-in.-s <sup>2</sup> x10 <sup>-4</sup>	33.6	31	31	27.4	25.7	32.7	32.7	30.1	28.3	26.6	24.8	24.8	24.8		
	Kg-m <sup>2</sup> x10 <sup>-5</sup>	38	35	35	31	29	37	37	34	32	30	28	28	28		
Max. backlash	arc-mins											10				
Efficiency <sup>(3)</sup>	%											96				
Rated life	H											15,000				
Weight	Kg/Lbf											10/22				
Radial load <sup>(4)</sup>	N/Lbf											7500/1690				
Axial load	N/Lbf											6000/1350				

(1) S5 duty service.

(2) On the motorside.

(3) Theoretical gear efficiency value.

(4) Load applied in the middle of the output shaft at 300 RPM.

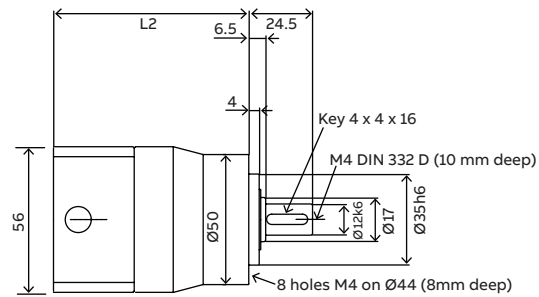
(5) Emergency stop torque is 2.5 times rated output torque for 1000 times max during the service life of the gearhead.



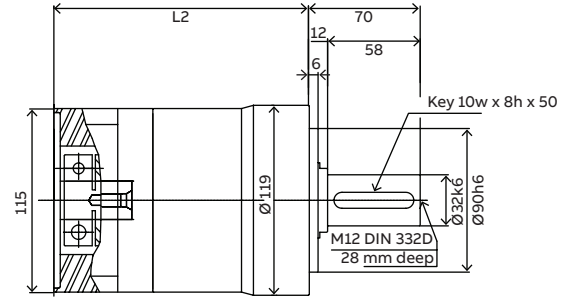
## Standard gearhead

### Dimensions

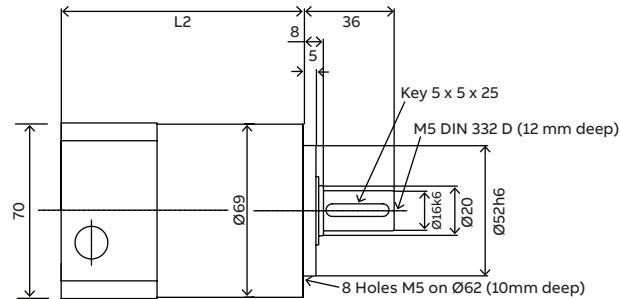
GBSM50-MRP050-XX



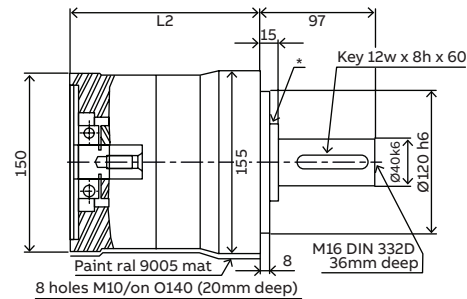
GBSM90-MRP120-XX



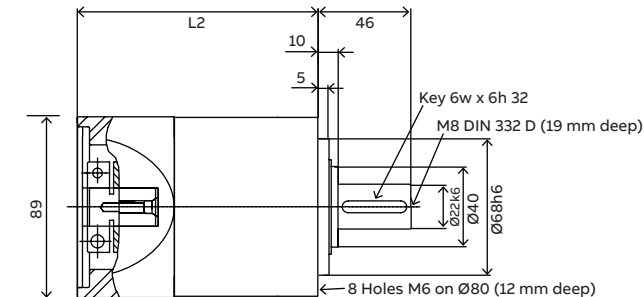
GBSM63-MRP070-XX



GBSM100-MRP155-XX



GBSM80-MRP090-XX



#### Standard gearhead dimensions

Gear number	No. of stages	"L2" length (mm)
MRP050	1	70
	2	97
MRP070	1	96
	2	113
MRP090	1	121
	2	157
MRP120	1	160
	2	202
MRP155	1	185
	2	225

- "XX" insert specific gear ratios. Verify that motor torque does not exceed gear rated input torque.
- Other BSM and gearhead possibility exist. Contact ABB with your requirements. Dimensions in mm.

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## Higher torque/lower backlash servo rated gearheads

### MNT series



These planetary servo rated gearheads provide a higher rated torque input and output capability along with lower backlash of 6-15 arc-min, with optional 3-5 arc-min backlash. These are highly efficient gearheads. They are designed to mount directly to ABB's BSM servo motors.

#### **Higher torque/lower backlash gearhead**

- Higher rated torque and higher acceleration torque capability
- Backlash of 6 to 15 arc-min; lower optional 3 to 5 arc-min
- Square flange
- Integrated, self-locating input pinion clamps onto motor shaft
- Lubrication - grease - 15 K hours
- Satellite gear shaft is double supported in carrier (needle bearings)
- Satellite gear teeth - deep case hardened and finish ground
- Highest torque/size & torsional stiffness
- Gearhead housing - all steel
- IP64

## Quick selection guide for higher torque MNT servo gearheads

6 to 15 arc min. backlash

Selection chart for BSM C-series and higher torque gearheads (MNT)

BSM series	1 stage ratios					2 stage ratios							
	3	4	5	7	10	16	20	25	35	40	50	70	100
80C – 1XX	080	080	080	080	080	080	080	080	080	080	080	080	115
80C – 2XX	080	080	080	080	080	080	080	080	080	115	115	115	140
80C – 3XX	080	080	080	080	080	080	080	080	115	115	115	115	*
80C – 4XX	080	080	080	080	080	080	080	115	115	115	115	140	*
90C – 1XX	115	115	115	115	115	115	115	115	115	115	115	115	140
90C – 2XX	115	115	115	115	115	115	115	115	115	115	115	140	180
90C – 3XX	115	115	115	115	115	115	115	115	115	140	140	180	180
100C – 1XXX	115	115	115	115	115	115	115	115	115	115	115	140	180
100C – 2XXX	115	115	115	115	115	115	115	115	140	140	140	210	*
100C – 3XXX	115	115	115	115	115	115	115	140	140	180	180	*	*
100C – 4XXX	115	115	115	115	115	115	140	140	180	210	210	*	*
100C – 5XXX	115	115	115	115	115	115	140	140	180	210	*	*	*
100C – 6XXX	140	140	140	140	140	140	180	180	180	210	*	*	*

### Ordering nomenclature for gearhead only:

Example: **GBSM80 - MNT080 - 10**

**G:** Gear

**BSM80:** Motor

**MNT080:** Gearhead type

**10:** Ratio

Selection chart for BSM N-series and higher torque gearheads (MNT)

BSM series	1 stage ratios					2 stage ratios							
	3	4	5	7	10	16	20	25	35	40	50	70	100
50N – 1XX	065	065	065	065	065	065	065	065	065	065	065	080	080
50N – 2XX	065	065	065	065	065	065	065	065	065	080	080	080	*
50N – 3XX	065	065	065	065	065	065	065	065	080	080	080	*	*
63N – 1XX	065	065	065	065	065	065	065	065	065	080	080	080	115
63N – 2XX	065	065	065	065	065	065	065	065	080	080	080	080	115
63N – 3XX	065	065	065	065	065	065	065	080	080	080	080	115	115
80N – 1XX	080	080	080	080	080	080	080	080	080	080	080	115	115
80N – 2XX	080	080	080	080	080	080	080	080	115	115	115	115	140
80N – 3XX	080	080	080	080	080	080	080	115	115	115	115	140	*
90N – 1XX	115	115	115	115	115	115	115	115	115	115	115	140	180
90N – 2XX	115	115	115	115	115	115	115	115	140	140	140	180	*
90N – 3XX	115	115	115	115	115	115	115	140	140	180	180	210	*
100N – 1XXX	115	115	115	115	115	115	115	140	140	180	180	210	*
100N – 2XXX	115	115	115	115	140	140	140	140	210	210	*	*	*
100N – 3XXX	115	115	115	140	180	180	180	210	*	*	*	*	*
100N – 4XXX	115	115	115	140	*	210	210	210	*	*	*	*	*

### Ordering nomenclature for gearhead only:

Example: **GBSM80 - MNT065 - 10**

**G:** Gear

**BSM80:** Motor

**MNT065:** Gearhead type

**10:** Ratio

## Characteristics of higher torque gearheads

### MNT 065 - MNT 210

#### MRP 065

No. of stages		1 stage					2 stages						
Ratio		3	4	5	7	10	16	20	25	35	50	70	100
<b>Input</b>													
Rated speed/max.	RPM	4000/6000					4000/6000						
Power in @ T1 & N1 rated	kW	1.87	1.87	1.56	1.19	0.67	1.00	0.67	0.54	.039	0.26	0.16	0.08
Rated torque (T1)	Lb.-in.	60.6	45.6	36.3	27.4	17.3	21.2	14.1	11.2	8.1	5.7	3.5	1.8
	Nm	6.85	5.15	4.10	3.10	1.95	2.40	1.59	1.27	0.91	0.64	0.39	0.20
Accel torque <sup>(1)</sup>	Lb.-in.	118.0	88	66.8	47.8	28.8	28.0	19.5	15.6	11.7	8.1	5.6	3.1
	Nm	13.35	10	7.55	5.40	3.25	3.16	2.20	1.76	1.32	0.92	0.63	0.35
<b>Output</b>													
Rated speed	RPM	1333	1000	800	571	400	250	200	160	114	80	57	40
Rated torque (T2)	Lb.-in.	174	174	174	184	165	310	257	257	257	257	221	159
	Nm	19.7	19.7	19.7	20.8	18.7	35	29	29	29	29	25	18
Accel torque <sup>(1)</sup>	Lb.-in.	336	336	319	319	274	407	354	354	372	372	354	283
	Nm	38	38	36	36	31	46	40	40	42	42	40	32
<b>General data</b>													
Inertia <sup>(2)</sup>	Lb.-in.-s <sup>2</sup> x10 <sup>-4</sup>	3.7	3.7	3.7	3.44	3.31	3.62	3.4	3.57	3.4	3.3	3.3	3.3
	Kg-m <sup>2</sup> x10 <sup>-5</sup>	3.30	3.30	3.27	3.04	2.93	3.20	3.00	3.16	3.00	2.90	2.90	2.90
Max. backlash	arc-mins	15 or 5					15 or 5						
Efficiency <sup>(3)</sup>	%	96					91						
Rated life	H	15,000					15,000						
Weight	Kg/Lbf	1.7/3.8					2.2/4.9						
Radial load <sup>(4)</sup>	N/Lbf	1500/337					1500/337						
Axial load	N/Lbf	1300/292					1300/292						

#### MNT 080

No. of stages		1 stage					2 stages							
Ratio		3	4	5	7	10	16	20	25	35	40	50	70	100
<b>Input</b>														
Rated speed/max.	RPM	4000/6000					4000/6000							
Power in @ T1 & N1 rated	kW	12.3	9.2	7.4	4.3	2.2	2.5	1.9	1.6	1.2	0.9	0.8	0.5	0.2
Rated torque (T1)	Lb.-in.	261	196	157	92	46	52	42	33	24	20	17	12	4.4
	Nm	29.5	22.1	17.7	10.4	5.2	5.9	4.7	3.7	2.7	2.3	1.9	1.3	0.5
Accel torque <sup>(1)</sup>	Lb.-in.	336	257	186	133	71	80	62	53	35	31	27	18	9
	Nm	38	29	21	15	8	9	7	6	4	3.5	3	2	1
<b>Output</b>														
Rated speed	RPM	1333	1000	800	571	400	250	200	160	114	100	80	57	40
Rated torque (T2)	Lb.-in.	752	752	752	619	442	761	752	752	761	752	752	619	442
	Nm	85	85	85	70	50	86	85	85	86	85	85	70	50
Accel torque <sup>(1)</sup>	Lb.-in.	973	973	885	885	708	1106	1115	1150	1186	1115	1115	885	708
	Nm	110	110	100	100	80	125	126	130	134	126	126	100	80
<b>General data</b>														
Inertia <sup>(2)</sup>	Lb.-in.-s <sup>2</sup> x10 <sup>-4</sup>	12.8	12.8	11.8	10.8	10.5	12.2	12.1	11.3	10.6	10.3	12.2	12.2	12.1
	Kg-m <sup>2</sup> x10 <sup>-5</sup>	11.3	11.3	10.4	9.6	9.3	10.8	10.7	10	9.4	9.1	10.8	10.8	10.7
Max. backlash	arc-mins	10, 5 or 1					10, 5 or 1							
Efficiency <sup>(3)</sup>	%	96					91							
Rated life	H	15,000					15,000							
Weight	Kg/Lbf	3/6.7					4/8.9							
Radial load <sup>(4)</sup>	N/Lbf	3,500/787					3,500/787							
Axial load	N/Lbf	3,000/675					3,000/675							

(1) S5 duty service.

(2) On the motorside.

(3) Theoretical gear efficiency value.

(4) Load applied in the middle of the output shaft at 300 RPM.

(5) Emergency stop torque is 2.5 times rated output torque for 1000 times max during the service life of the gearhead.

## Characteristics of higher torque gearheads

MNT 065 - MNT 210

### MNT 115

No. of stages		1 stage					2 stages							
Ratio		3	4	5	7	10	16	20	25	35	40	50	70	100
<b>Input</b>														
Rated speed /max.	RPM	4000/6000					4000/6000							
Power in @ T1 & N1 rated	kW	31.4	31.4	22.2	12.6	6.3	8.3	6.7	5	3.8	2.5	2.1	1.7	1.4
	Lb.-in.	796	619	442	265	133	177	142	106	80	62	53	35	18
Rated torque (T1)	Nm	90	70	50	30	15	20	16	12	9	7	6	4	2
	Lb.-in.	920	717	496	327	186	204	186	150	115	80	71	44	27
Accel torque <sup>(1)</sup>	Nm	104	81	56	37	21	23	21	17	13	9	8	5	3
	Lb.-in.	2390	2390	2115	1673	1195	2390	2390	2257	2372	2257	2264	2265	1593
Rated torque (T2)	Nm	270	270	239	189	135	270	270	255	268	255	256	256	180
	Lb.-in.	2708	2743	2390	2212	1770	3009	3380	3407	3451	2743	2743	2832	2390
Accel torque <sup>(1)</sup>	Nm	306	310	270	250	200	340	382	385	390	310	310	320	270
	Lb.-in.	50.2	50.2	45.7	41.6	39.7	47.8	47	44	41	39.2	47.6	47.6	47.3
Inertia <sup>(2)</sup>	Kg-m <sup>2</sup> x10 <sup>-5</sup>	44.4	44.4	40.4	36.8	35.1	42.3	42	38.9	36	34.7	42.1	42.1	41.9
	arc-mins	10, 5 or 1					10, 5 or 1							
Max. backlash	arc-mins	10, 5 or 1					10, 5 or 1							
Efficiency	% <sup>(3)</sup>	96					91							
Rated life	H	15000					15000							
Weight	Kg/Lbf	7.5/16.5					9/20							
Radial load <sup>(4)</sup>	N/Lbf	5500/1237					5500/1237							
Axial load	N/Lbf	5000/1124					5000/1124							

### MNT 140

No. of stages		1 stage					2 stages							
Ratio		3	4	5	7	10	16	20	25	35	40	50	70	100
<b>Input</b>														
Rated speed/max.	RPM	4000/6000					4000/6000							
Power in @ T1 & N1 rated	kW	41.9	41.9	40.1	22.9	11.3	12.1	12.1	9.6	6.7	4.6	3.4	2.9	2.5
	Lb.-in.	1106	885	850	487	239	257	257	204	142	106	88	53	27
Rated torque (T1)	Nm	125	100	96	55	27	29	29	23	16	12	10	6	3
	Lb.-in.	1531	1150	920	655	363	301	274	221	150	133	106	71	35
Accel torque <sup>(1)</sup>	Nm	173	130	104	74	41	34	31	25	17	15	12	8	4
	Lb.-in.	3186	3398	3982	3265	2292	3487	4363	4327	4212	3982	3982	3363	2416
Rated torque (T2)	Nm	360	384	450	369	259	394	493	489	476	450	450	380	273
	Lb.-in.	4425	4425	4425	4425	3540	4425	4956	4956	4780	4832	4876	4425	3186
Accel torque <sup>(1)</sup>	Nm	500	500	500	500	400	500	560	560	540	546	550	500	360
	Lb.-in.	107	101	97	87	81	103	103	96	90	85	79	79	79
Inertia <sup>(2)</sup>	Kg-m <sup>2</sup> x10 <sup>-5</sup>	95	89	86	77	72	91	91	85	80	75	70	70	70
	arc-mins	10, 5 or 1					10, 5 or 1							
Max. backlash	arc-mins	10, 5 or 1					10, 5 or 1							
Efficiency <sup>(3)</sup>	%	96					91							
Rated life	H	15,000					15,000							
Weight	Kg/Lbf	9/20					17/38							
Radial load <sup>(4)</sup>	N/Lbf	9,100/2,046					9,100/2,046							
Axial load	N/Lbf	9,100/2,046					9,100/2,046							

(1) S5 duty service.

(2) On the motorside.

(3) Theoretical gear efficiency value.

(4) Load applied in the middle of the output shaft at 300 RPM.

(5) Emergency stop torque is 2.5 times rated output torque for 1000 times max during the service life of the gearhead.

## Characteristics of higher torque gearheads

MNT 065 - MNT 210

### MNT 180

No. of stages		1 stage					2 stages							
Ratio		3	4	5	7	10	16	20	25	35	40	50	70	100
<b>Input</b>														
Rated speed/max.	RPM	4000/6000					4000/6000							
Power in @ T1 & N1 rated	kW	56.5	56.5	56.5	34.3	16.7	15.9	15.9	12.5	9.2	6.2	4.1	4.1	3.3
Rated torque (T1)	Lb.-in.	1681	1265	1195	726	504	336	336	265	195	133	133	71	53
	Nm	190	143	135	82	57	38	38	30	22	15	15	8	6
Accel torque <sup>(1)</sup>	Lb.-in.	3097	2301	1841	1390	735	711	487	389	274	239	195	142	80
	Nm	350	260	208	157	83	69	55	44	31	27	22	16	9
<b>Output</b>														
Rated speed	RPM	667	500	400	286	200	125	100	80	57	50	40	29	20
Rated torque (T2)	Lb.-in.	4867	4867	5752	4867	4867	4894	6115	6035	6195	4823	6018	4867	4867
	Nm	550	550	650	550	550	553	691	682	700	545	680	550	550
Accel torque <sup>(1)</sup>	Lb.-in.	8850	8850	8850	8850	7080	8850	8850	8850	8850	8850	8850	8850	7080
	Nm	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
<b>General data</b>														
Inertia <sup>(2)</sup>	Lb.-in.-s <sup>2</sup> x10 <sup>-4</sup>	500	296	234	183	156	255	252	206	167	169	147	145	141
	Kg-m <sup>2</sup> x10 <sup>-5</sup>	442	262	207	162	138	226	223	182	148	132	130	128	125
Max. backlash	arc-mins	6 or 3					6 or 3							
Efficiency <sup>(3)</sup>	%	96					91							
Rated life	H	15,000					15,000							
Weight	Kg/Lbf	45/100					50/112							
Radial load <sup>(4)</sup>	N/Lbf	14,500/3,260					14,500/3,260							
Axial load	N/Lbf	14,000/3,147					14,000/3,147							

### MNT 210

No. of stages		1 stage					2 stages							
Ratio		3	4	5	7	10	16	20	25	35	40	50	70	100
<b>Input</b>														
Rated speed/max.	RPM	4000/6000					4000/6000							
Power in @ T1 & N1 rated	kW	145	109	87	62	43	29	23	18	13	11	9	7	4
Rated torque (T1)	Lb.-in.	3080	2310	1850	1310	920	611	487	389	283	239	195	142	80
	Nm	348	261	209	148	104	69	55	44	32	27	22	16	9
Accel torque <sup>(1)</sup>	Lb.-in.	5841	4381	1735	1973	1381	1150	920	743	416	363	292	204	142
	Nm	660	495	196	223	156	130	104	84	47	41	33	23	16
<b>Output</b>														
Rated speed	RPM	667	500	400	286	200	125	100	80	57	50	40	29	20
Rated torque (T2)	Lb.-in.	8850	8850	8850	8850	8850	8850	8850	8850	8850	8850	8850	8850	8850
	Nm	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Accel torque <sup>(1)</sup>	Lb.-in.	16800	16800	16800	16800	13300	16800	16800	16800	13300	13300	13300	13300	13300
	Nm	1900	1900	1900	1900	1500	1900	1900	1900	1500	1500	1500	1500	1500
<b>General data</b>														
Inertia <sup>(2)</sup>	Lb.-in.-s <sup>2</sup> x10 <sup>-4</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
	Kg-m <sup>2</sup> x10 <sup>-5</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
Max. backlash	arc-mins	6 or 3					6 or 3							
Efficiency <sup>(3)</sup>	%	96					91							
Rated life	H	15,000					15,000							
Weight	Kg/Lbf	50/112					55/123							
Radial load <sup>(4)</sup>	N/Lbf	18,000/4,047					18,000/4,047							
Axial load	N/Lbf	18,000/4,047					18,000/4,047							

(1) S5 duty service.

(2) On the motorside.

(3) Theoretical gear efficiency value.

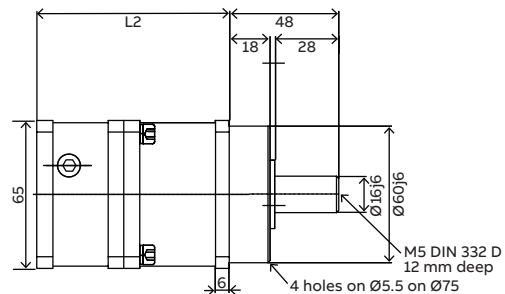
(4) Load applied in the middle of the output shaft at 300 RPM.

(5) Emergency stop torque is 2.5 times rated output torque for 1000 times max during the service life of the gearhead.

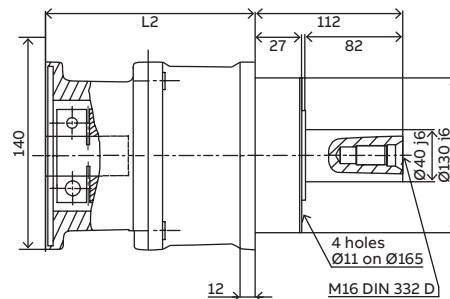
## Higher torque gearhead

### Dimensions

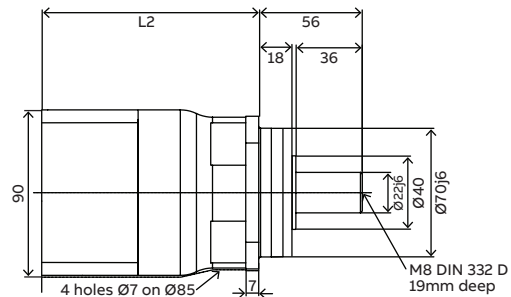
GBSM63-MNT065-XX



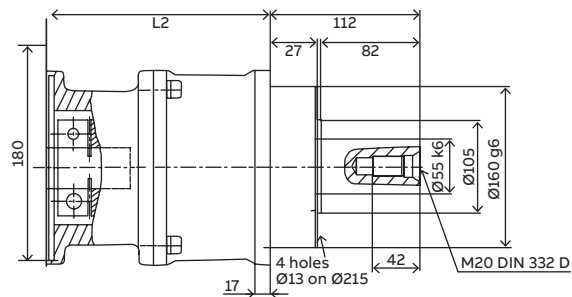
GBSM100-MNT140-XX



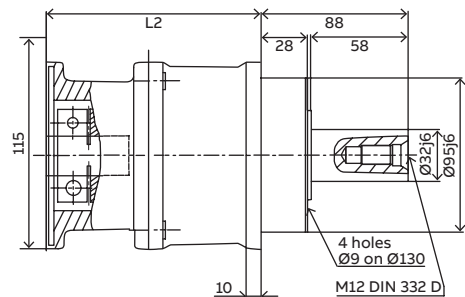
GBSM80-MNT080-XX



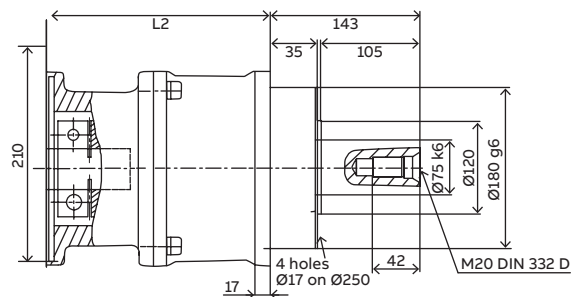
GBSM100-MNT180-XX



GBSM90-MNT115-XX



GBSM100-MNT210-XX



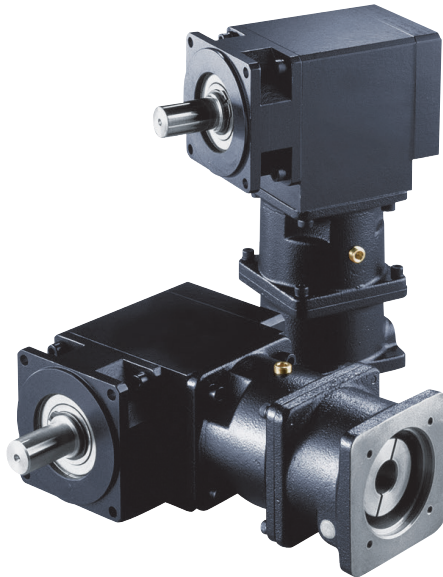
Gear number	No. of stages	"L2" length (mm)
MNT065	1	84
MNT065	2	107
MNT080	1	120
MNT080	2	156
MNT115	1	130
MNT115	2	171
MNT140	1	160
MNT140	2	201
MNT180	1	230
MNT180	2	295
MNT210	1	260
MNT210	2	325

- "XX" insert specific gear ratios. Verify that motor torque does not exceed gear rated input torque.
- Other BSM and gearhead possibility exist. Contact ABB with your requirements. Dimensions in mm.

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## Right angle servo rated gearheads

MRA series



These servo rated right angle gearheads are heavy duty and provide 15, 10 or 5 arc-min backlash. The planetary input stages are hardened and ground with steel housings for rigidity. The distance from the face mounting to the motor centerline is short, allowing the motor-gearhead to hug the machine frame.

### Right angle gearhead

- Backlash of 5 - 15 arc-min
- Integrated, self-locating input pinion clamps onto motor shaft
- Lubrication - in line planetary section oil; bevel gear section metal adhering grease; shaft seal between; - 10 K hours
- Planetary input stages are hardened and ground, slower speed right-angle has cut and hardened gears
- Standard output shaft is "smooth shaft" - keyways upon request
- High torque/size & torsional stiffness
- Gearhead housing - all steel
- IP64



## Quick selection guide for right angle MRA servo gearheads

Selection chart for BSM N-series and right angle gearheads (MRA)

BSM series	1 stage ratios					2 stage ratios						
	3	4	5	7	10	16	20	25	35	50	70	100
50N - 1XX	065	065	065	065	065	065	065	065	065	080	080	080
50N - 2XX	065	065	065	065	065	065	065	080	080	080	080	115
50N - 3XX	065	065	080	080	080	080	080	080	080	080	115	115
63N - 1XX	065	065	065	065	065	065	065	065	080	080	080	115
63N - 2XX	065	065	065	080	080	080	080	080	080	080	115	115
63N - 3XX	065	065	065	080	080	080	080	080	080	080	115	115
80N - 1XX	080	080	080	080	080	080	080	080	080	080	115	115
80N - 2XX	080	080	080	080	080	080	080	080	115	115	140	180
80N - 3XX	080	080	080	080	080	080	080	115	115	140	180	*
90N - 1XX	115	115	115	115	115	115	115	115	140	180	180	*
90N - 2XX	115	115	115	115	115	115	115	140	180	*	*	*
90N - 3XX	115	115	115	115	115	115	115	180	*	*	*	*
100N-1XXX	115	115	115	115	115	115	140	180	*	*	*	*
100N-2XXX	115	115	115	115	140	180	180	*	*	*	*	*
100N-3XXX	115	115	115	140	180	*	*	*	*	*	*	*
100N-4XXX	115	115	140	180	*	*	*	*	*	*	*	*

### Ordering nomenclature for gearhead only:

Example: **GBSM80 - MRA065 - 10**

**G:** Gear

**BSM80:** Motor

**MRA065:** Gearhead type

**10:** Ratio

Selection chart for BSM C-series and right angle gearheads (MRA)

BSM series	1 stage ratios					2 stage ratios						
	3	4	5	7	10	16	20	25	35	50	70	100
80C - 1XX	080	080	080	080	080	080	080	080	080	080	080	115
80C - 2XX	080	080	080	080	080	080	080	080	080	115	140	180
80C - 3XX	080	080	080	080	080	080	080	080	115	115	140	180
80C - 4XX	080	080	080	080	080	080	080	115	115	140	180	*
90C - 1XX	115	115	115	115	115	120	115	115	140	180	180	*
90C - 2XX	115	115	115	115	115	120	115	115	140	180	180	*
90C - 3XX	115	115	115	115	115	115	115	115	140	180	*	*
100C - 1XXX	115 +	115 +	115 +	115 +	115 +	115 +	115 +	115 +	115 +	140	180	*
100C - 2XXX	115 +	115 +	115 +	115 +	115 +	115 +	115 +	140	180	*	*	*
100C - 3XXX	115 +	115 +	115 +	115 +	115 +	140	180	180	*	*	*	*
100C - 4XXX	115 +	115 +	115 +	115 +	140	180	180	*	*	*	*	*
100C - 5XXX	115 +	115 +	115 +	115 +	180	180	*	*	*	*	*	*
100C - 6XXX	115 +	115 +	115 +	140	180	*	*	*	*	*	*	*

### Ordering nomenclature for gearhead only:

Example: **GBSM80 - MRA080 - 4**

**G:** Gear

**BSM80:** Motor

**MRA080:** Gearhead type

**4:** Ratio

Note: The table suggests using MRA140 for better looking physical match of motor to gearhead

## Characteristics of right angle gearheads

### MRA 065 - MRA 180

#### MRA 065

No. of stages		1 stage					2 stages						
Ratio		3	4	5	7	10	16	20	25	35	50	70	100
<b>Input</b>													
Rated speed/max.	RPM	4000/6000					4000/6000						
Rated power	kW	1.05	0.78	0.78	0.55	0.39	0.47	0.39	0.31	0.23	0.16	0.11	0.08
Rated torque	Lb.-in.	22.1	16.6	17.7	11.5	8.3	10.0	8.4	6.7	5.0	3.4	2.5	1.7
	Nm	2.50	1.88	2.0	1.3	0.94	1.13	0.95	0.76	0.57	0.38	0.28	0.19
Accel torque <sup>(1)</sup>	Lb.-in.	20.7	20.7	20.7	15.0	10.6	20.4	15.8	13.0	9.2	6.7	5.0	2.5
	Nm	2.34	2.34	2.35	1.7	1.2	2.31	1.79	1.46	1.04	0.76	0.57	0.28
<b>Output</b>													
Rated speed	RPM	1333	1000	800	571	400	250	200	160	114	80	57	57
Rated torque	Lb.-in.	64	64	80	80	80	144	150	150	158	148	158	150
	Nm	7.2	7.2	9.0	9.0	9.0	16.3	17.0	17.0	17.9	16.7	17.9	17.0
Accel torque <sup>(1)</sup>	Lb.-in.	159	159	100	100	100	295	286	291	289	295	316	226
	Nm	9.0	9.0	11.3	11.3	11.3	33.3	32.3	32.9	32.7	33.3	35.7	25.5
<b>General data</b>													
Inertia <sup>(2)</sup>	Lb.-in.-s <sup>2</sup> x10 <sup>-4</sup>	0.56	0.56	0.34	0.11	0.11	0.45	0.45	0.34	0.34	0.11	0.08	0.08
	Kg-m <sup>2</sup> x10 <sup>-5</sup>	0.50	0.50	0.30	0.10	0.10	0.40	0.40	0.30	0.30	0.10	.070	.070
Max. backlash	arc-mins	15 or 5					15 or 5						
Efficiency <sup>(3)</sup>	%	96					91						
Rated life	H	10,000					10,000						
Weight	Kg/Lbf	3/6.7					4/8.9						
Radial load <sup>(4)</sup>	N/Lbf	750/169					750/169						
Axial load	N/Lbf	300/67.4					300/67.4						

#### MRA 080

No. of stages		1 stage					2 stages						
Ratio		3	4	5	7	10	16	20	25	35	50	70	100
<b>Input</b>													
Rated speed/max.	RPM	4000/6000					4000/6000						
Rated power	kW	9.6	9.6	7.4	3.7	2	2.5	2.0	1.6	1.1	0.79	0.54	0.2
Rated torque	Lb.-in.	204	204	159	80	44	52	42	33	24	17	12	4.4
	Nm	23	23	18	9	5	5.9	4.7	3.7	2.7	1.9	1.3	0.5
Accel torque <sup>(1)</sup>	Lb.-in.	265	265	177	97	53	80	62	53	35	26	18	9
	Nm	30	30	20	11	6	9	7	6	4	3	2	1
<b>Output</b>													
Rated speed	RPM	1333	1000	800	571	400	250	200	160	114	80	57	40
Rated torque	Lb.-in.	752	752	752	575	442	761	752	752	761	752	442	442
	Nm	85	85	85	65	50	86	85	85	86	85	50	50
Accel torque <sup>(1)</sup>	Lb.-in.	973	973	796	619	487	1106	1115	1150	1186	885	885	619
	Nm	110	110	90	70	55	125	126	130	134	100	100	70
<b>General data</b>													
Inertia <sup>(2)</sup>	Lb.-in.-s <sup>2</sup> x10 <sup>-4</sup>	12.8	12.8	11.8	10.8	10.5	12.2	12.1	11.3	10.6	12.2	12.2	12.1
	Kg-m <sup>2</sup> x10 <sup>-5</sup>	11.3	11.3	10.4	9.6	9.3	10.8	10.7	10	9.4	10.8	10.8	10.7
Max. backlash	arc-mins	10 or 5					10 or 5						
Efficiency <sup>(3)</sup>	%	96					91						
Rated life	H	15,000					15,000						
Weight	Kg/Lbf	5/11.2					6/13.4						
Radial load <sup>(4)</sup>	N/Lbf	1,600/360					1,600/360						
Axial load	N/Lbf	650/146					650/146						

(1) S5 duty service.

(2) On the motorside.

(3) Theoretical gear efficiency value.

(4) Load applied in the middle of the output shaft at 300 RPM.

(5) Emergency stop torque is 2.5 times rated output torque for 1000 times max during the service life of the gearhead.

## Characteristics of right angle gearheads

MRA 065 - MRA 180

### MRA 115

No. of stages		1 stage					2 stages						
Ratio		3	4	5	7	10	16	20	25	35	50	70	100
<b>Input</b>													
Rated speed/max.	RPM	4000/6000					4000/6000						
Rated power	kW	26	20	16	11	6.3	5	4.2	3.4	2.1	1.5	0.92	0.84
Rated torque	Lb.-in.	548	416	336	239	133	106	88	71	44	31	19	18
	Nm	62	47	38	27	15	12	10	8	5	3.5	2.2	2
Accel torque <sup>(1)</sup>	Lb.-in.	761	575	460	257	177	150	115	97	62	46	35	27
	Nm	86	65	52	29	20	17	13	11	7	5.2	4	3
<b>Output</b>													
Rated speed	RPM	1333	1000	800	571	400	250	200	160	114	80	57	40
Rated torque	Lb.-in.	1575	1602	1611	1611	1274	1549	1611	1611	1416	1416	1212	1522
	Nm	178	181	182	182	144	175	182	182	160	160	137	172
Accel torque <sup>(1)</sup>	Lb.-in.	2212	2212	2212	1726	1726	2212	2212	2212	2212	2212	2212	2212
	Nm	250	250	250	195	195	250	250	250	250	250	250	250
<b>General data</b>													
Inertia <sup>(2)</sup>	Lb.-in.-s <sup>2</sup> x10 <sup>-4</sup>	50.2	50.2	45.6	41.6	39.7	47.8	47.5	44.0	40.7	47.6	47.6	47.3
	Kg-m <sup>2</sup> x10 <sup>-5</sup>	44.4	44.4	40.4	36.8	35.1	42.3	42	38.9	36	42.1	42.1	41.9
Max. backlash	arc-mins	10 or 5					10 or 5						
Efficiency <sup>(3)</sup>	%	96					91						
Rated life	H	15,000					15,000						
Weight	Kg/Lbf	23/51					25/56						
Radial load <sup>(4)</sup>	N/Lbf	2,400/540					2,400/540						
Axial load	N/Lbf	1,000/225					1,000/225						

### MRA 140

No. of stages		1 stage					2 stages						
Ratio		3	4	5	7	10	16	20	25	35	50	70	100
<b>Input</b>													
Rated speed/max.	RPM	4000/6000					4000/6000						
Rated power	kW	33	25	20	14	10	6.7	5.5	4.2	3	2.1	1.5	1
Rated torque	Lb.-in.	708	531	425	301	212	142	115	88	62	44	31	22
	Nm	80	60	48	34	24	16	13	10	7	5	3.5	2.5
Accel torque <sup>(1)</sup>	Lb.-in.	1221	920	735	389	274	239	195	150	106	71	53	35
	Nm	138	104	83	44	31	27	22	17	12	8	6	4
<b>Output</b>													
Rated speed	RPM	1333	1000	800	571	400	250	200	160	114	80	57	40
Rated torque	Lb.-in.	2035	2035	2035	2035	2035	2035	2035	2035	2035	2035	2035	2035
	Nm	230	230	230	230	230	230	230	230	230	230	230	230
Accel torque <sup>(1)</sup>	Lb.-in.	3540	3540	3540	2655	2655	3540	3540	3540	3540	3540	3540	3540
	Nm	400	400	400	300	300	400	400	400	400	400	400	400
<b>General data</b>													
Inertia <sup>(2)</sup>	Lb.-in.-s <sup>2</sup> x10 <sup>-4</sup>	-	-	-	-	-	-	132	-	-	-	-	-
	Kg-m <sup>2</sup> x10 <sup>-5</sup>	-	-	-	-	-	-	117	-	-	-	-	-
Max. backlash	arc-mins	10 or 5					10 or 5						
Efficiency <sup>(3)</sup>	%	96					91						
Rated life	H	15,000					15,000						
Weight	Kg/Lbf	25/56					33/74						
Radial load <sup>(4)</sup>	N/Lbf	6,000/1350					6,000/1350						
Axial load	N/Lbf	3,000/675					3,000/675						

(1) S5 duty service.

(2) On the motorside.

(3) Theoretical gear efficiency value.

(4) Load applied in the middle of the output shaft at 300 RPM.

(5) Emergency stop torque is 2.5 times rated output torque for 1000 times max during the service life of the gearhead.

## Characteristics of right angle gearheads

MRA 065 - MRA 180

### MRA 180

No. of stages		1 stage					2 stages						
Ratio		3	4	5	7	10	16	20	25	35	50	70	100
<b>Input</b>													
Rated speed/max.	RPM	4000/6000					4000/6000						
Rated power	kW	51	38	31	22	15	10	8	6.3	4.6	3	2.5	1.7
Rated torque	Lb.-in.	1071	805	646	460	319	212	168	133	97	71	53	35
	Nm	121	91	73	52	36	24	19	15	11	8	6	4
Accel torque <sup>(1)</sup>	Lb.-in.	1230	920	735	522	363	239	195	159	115	80	62	44
	Nm	138	104	83	59	41	27	22	18	13	9	7	5
<b>Output</b>													
Rated speed	RPM	1333	1000	800	571	400	250	200	160	114	80	57	40
Rated torque	Lb.-in.	3097	3097	3097	3097	3097	3097	3097	3097	3097	3097	3097	3097
	Nm	350	350	350	350	350	350	350	350	350	350	350	350
Accel torque <sup>(1)</sup>	Lb.-in.	5310	5310	5310	5310	5310	5310	5310	5310	5310	5310	5310	5310
	Nm	600	600	600	600	600	600	600	600	600	600	600	600
<b>General data</b>													
Inertia <sup>(2)</sup>	Lb.-in.-s <sup>2</sup> x10 <sup>-4</sup>	-	-	-	-	-	-	-	-	-	-	-	-
	Kg-m <sup>2</sup> x10 <sup>-5</sup>	-	-	-	-	-	-	-	-	-	-	-	-
Max. backlash	arc-mins	10 or 5					10 or 5						
Efficiency <sup>(3)</sup>	%	96					91						
Rated life	H	15,000					15,000						
Weight	Kg/Lbf	60/134					90/201						
Radial load <sup>(4)</sup>	N/Lbf	9,000/2023					9,000/2023						
Axial load	N/Lbf	5,000/1124					5,000/1124						

(1) S5 duty service.

(2) On the motorside.

(3) Theoretical gear efficiency value.

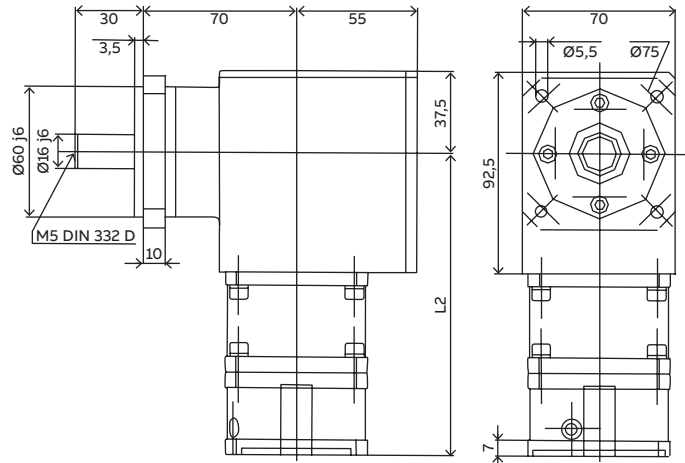
(4) Load applied in the middle of the output shaft at 300 RPM.

(5) Emergency stop torque is 2.5 times rated output torque for 1000 times max during the service life of the gearhead.

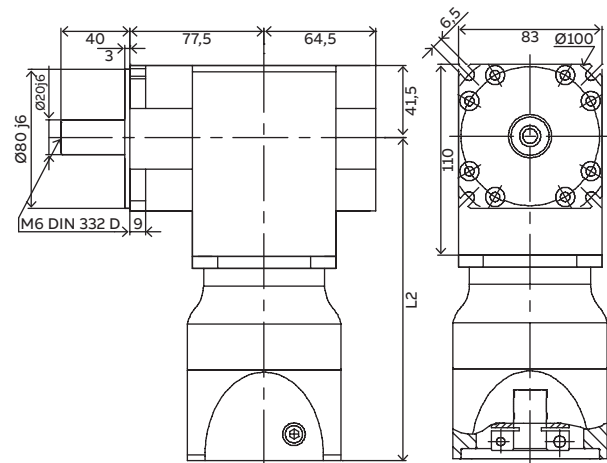
## Right angle gearhead

### Dimensions

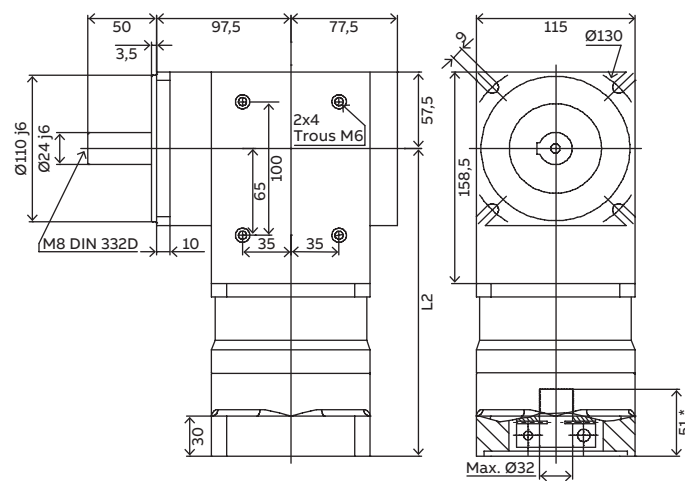
GBSM63-MRA065-XX



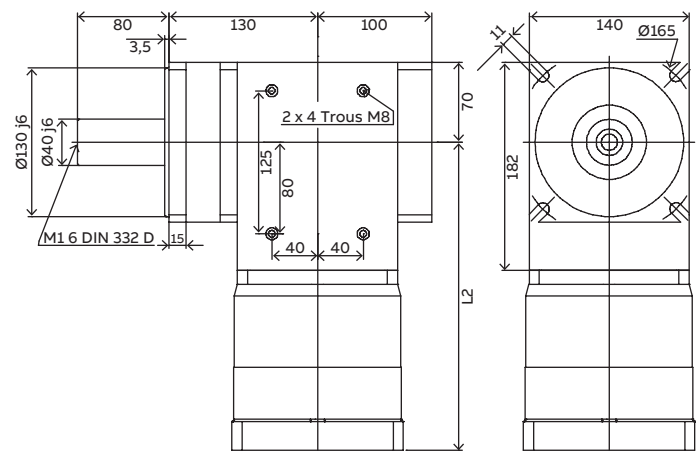
GBSM80-MRA080-XX



GBSM90-MRA115-XX



GBSM100-MRA140-XX



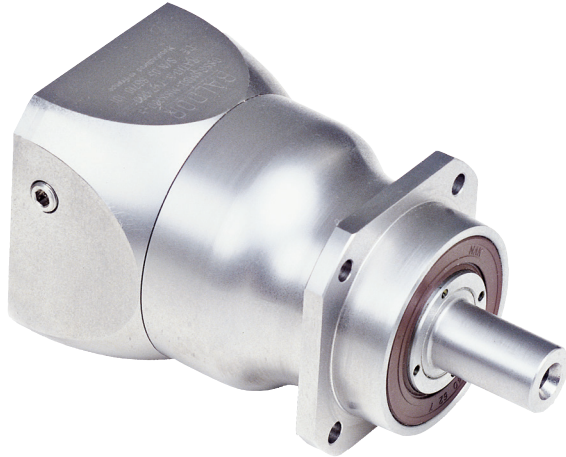
Gear number	No. of stages	"L2" length (mm)
MRA065	1	139
	2	162
MRA080	1	189
	2	204
MRA115	1	231
	2	272
MRA140	1	291
	2	332

- "XX" insert specific gear ratios. Verify that motor torque does not exceed gear rated input torque.
- Other BSM and gearhead possibility exist. Contact ABB with your requirements. Dimensions in mm.

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## Stainless steel servo rated gearheads

MSS series



These highly efficient, all stainless steel, all planetary, servo rated gearheads provide low standard backlash of 6 - 15 arc minute maximum over the life of the gearhead. They are designed to mount directly onto ABB's stainless steel servo motors (SSBSM series).

### Stainless steel gearhead

- Backlash of 6-15 arc min for greater positional accuracy
- Includes an integrated, self-locating, input coupling to make assembly to the motor quick and easy
- Square mounting flange for motor and output
- Lubrication - oil - 15 K hours rated load, speed, & temperature
- Satellite gears are hardened, double supported in carrier and rotate on needle bearings
- Output shaft - stainless steel with Viton™ seal
- Gearhead housing - all stainless steel
- Easily cleanable design to handle IP66 and 1,500 psi washdown

## Quick selection guide for stainless steel MSS servo gearheads

Selection chart for SSBSM C-series and stainless steel gearheads (MSS)

BSM series	1 stage ratios					2 stage ratios							
	3	4	5	7	10	16	20	25	35	40	50	70	100
80C - 1XX	080	080	080	080	080	080	080	080	080	080	080	080	115
80C - 2XX	080	080	080	080	080	080	080	080	080	115	115	115	140
80C - 3XX	080	080	080	080	080	080	080	080	115	115	115	115	*
80C - 4XX	080	080	080	080	080	080	080	115	115	115	115	140	*

### Ordering nomenclature for gearhead only:

Example: **GBSM80 - MSS080 - 10**

**G:** Gear

**BSM80:** Motor

**MSS080:** Gearhead type

**10:** Ratio

Selection chart for SSBSM N-series and stainless steel gearheads (MSS)

SSBSM series	1 stage ratios					2 stage ratios							
	3	4	5	7	10	16	20	25	35	40	50	70	100
50N - 1XX	080	080	080	080	080	080	080	080	080	080	080	080	080
50N - 2XX	080	080	080	080	080	080	080	080	080	080	080	080	*
50N - 3XX	080	080	080	080	080	080	080	080	080	080	080	*	*
63N - 1XX	080	080	080	080	080	080	080	080	080	080	080	080	115
63N - 2XX	080	080	080	080	080	080	080	080	080	080	080	115	115
63N - 3XX	080	080	080	080	080	080	080	080	080	080	080	115	*
80N - 1XX	080	080	080	080	080	080	080	080	080	080	080	115	115
80N - 2XX	080	080	080	080	080	080	080	080	115	115	115	115	140
80N - 3XX	080	080	080	080	080	080	080	115	115	115	115	140	*

### Ordering nomenclature for gearhead only:

Example: **GBSM80 - MSS080 - 10**

**G:** Gear

**BSM80:** Motor

**MSS080:** Gearhead type

**10:** Ratio

## Characteristics of stainless steel gearheads

### MSS 080 - MSS 140

#### MSS 080

No. of stages		1 stage					2 stages								
Ratio		3	4	5	7	10	16	20	25	35	40	50	70	100	
<b>Input</b>															
Rated speed/max.	RPM	4000/6000					4000/6000								
Rated power	kW	12.3	9.2	7.4	4.3	2.2	2.5	1.9	1.6	1.2	0.9	0.8	0.5	0.2	
Rated torque	Lb.-in.	261	196	157	92	46	52	42	33	24	20	17	12	4.4	
	Nm	29.5	22.1	17.7	10.4	5.2	5.9	4.7	3.7	2.7	2.3	1.9	1.3	0.5	
Accel torque <sup>(1)</sup>	Lb.-in.	336	257	186	133	71	80	62	53	35	31	27	18	9	
	Nm	38	29	21	15	8	9	7	6	4	3.5	3	2	1	
<b>Output</b>															
Rated speed	RPM	1333	1000	800	571	400	250	200	160	114	100	80	57	40	
Rated torque	Lb.-in.	752	752	752	619	442	761	752	752	761	752	752	619	442	
	Nm	85	85	85	70	50	86	85	85	86	85	85	70	50	
Accel torque <sup>(1)</sup>	Lb.-in.	973	973	885	885	708	1106	1115	1150	1186	1115	1115	885	708	
	Nm	110	110	100	100	80	125	126	130	134	126	126	100	80	
<b>General data</b>															
Inertia <sup>(2)</sup>	Lb.-in.-s <sup>2</sup> x10 <sup>-4</sup>	12.8	12.8	11.8	10.8	10.5	12.2	12.1	11.3	10.6	10.3	12.2	12.2	12.1	
	Kg-m <sup>2</sup> x10 <sup>-5</sup>	11.3	11.3	10.4	9.6	9.3	10.8	10.7	10	9.4	9.1	10.8	10.8	10.7	
Max. backlash	arc-mins	10, 5 or 1					10, 5 or 1								
Efficiency <sup>(3)</sup>	%	96					91								
Rated life	H	15,000					15,000								
Weight	Kg/Lbf	3/6.7					4/8.9								
Radial load <sup>(4)</sup>	N/Lbf	3500/787					3500/787								
Axial load	N/Lbf	3000/675					3000/675								

#### MSS 115

No. of stages		1 stage					2 stages								
Ratio		3	4	5	7	10	16	20	25	35	40	50	70	100	
<b>Input</b>															
Rated speed/max.	RPM	4000/6000					4000/6000								
Rated power	kW	31.4	31.4	22.2	12.6	6.3	8.3	6.7	5	3.8	2.5	2.1	1.7	1.4	
Rated torque	Lb.-in.	796	619	442	265	133	177	142	106	80	62	53	35	18	
	Nm	90	70	50	30	15	20	16	12	9	7	6	4	2	
Accel torque <sup>(1)</sup>	Lb.-in.	920	717	496	327	186	204	186	150	115	80	71	44	27	
	Nm	104	81	56	37	21	23	21	17	13	9	8	5	3	
<b>Output</b>															
Rated speed	RPM	1333	1000	800	571	400	250	200	160	114	100	82	57	40	
Rated torque	Lb.-in.	2390	2390	2115	1673	1195	2390	2390	2257	2372	2257	2265	2265	1593	
	Nm	270	270	239	189	135	270	270	255	268	255	256	256	180	
Accel torque <sup>(1)</sup>	Lb.-in.	2708	2743	2390	2212	1770	3009	3380	3407	3451	2743	2743	2832	2390	
	Nm	306	310	270	250	200	340	382	385	390	310	310	320	270	
<b>General data</b>															
Inertia <sup>(2)</sup>	Lb.-in.-s <sup>2</sup> x10 <sup>-4</sup>	50.2	50.2	45.7	41.6	39.7	47.8	47	44	41	39.2	47.6	47.6	47.3	
	Kg-m <sup>2</sup> x10 <sup>-5</sup>	44.4	44.4	40.4	36.8	35.1	42.3	42	38.9	36	34.7	42.1	42.1	41.9	
Max. backlash	arc-mins	10, 5 or 1					10, 5 or 1								
Efficiency <sup>(3)</sup>	%	96					91								
Rated life	H	15,000					15,000								
Weight	Kg/Lbf	7.5/16.5					9/20								
Radial load <sup>(4)</sup>	N/Lbf	5500/1237					5500/1237								
Axial load	N/Lbf	5000/1124					5000/1124								

(1) S5 duty service.

(2) On the motorside.

(3) Theoretical gear efficiency value.

(4) Load applied in the middle of the output shaft at 300 RPM.

(5) Emergency stop torque is 2.5 times rated output torque for 1000 times max during the service life of the gearhead.



**Characteristics of stainless steel gearheads**

MSS 080 - MSS 140

**MSS 140**

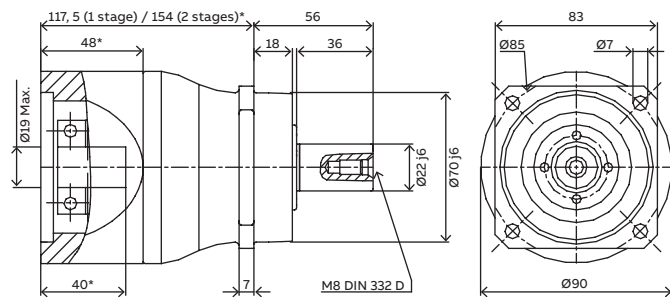
No. of stages		1 stage					2 stages							
Ratio		3	4	5	7	10	16	20	25	35	40	50	70	100
<b>Input</b>														
Rated speed/max.	RPM	4000/6000					4000/6000							
Rated power	kW	41.9	41.9	40.1	22.9	11.3	12.1	12.1	9.6	6.7	4.6	3.4	2.9	2.5
Rated torque	Lb.-in.	1106	885	850	487	239	257	257	204	142	106	88	53	27
	Nm	125	100	96	55	27	29	29	23	16	12	10	6	3
Accel torque <sup>(1)</sup>	Lb.-in.	1531	1150	920	655	363	301	274	221	150	133	106	71	35
	Nm	173	130	104	74	41	34	31	25	17	15	12	8	4
<b>Output</b>														
Rated speed	RPM	1333	1000	800	571	400	250	200	160	114	100	82	57	40
Rated torque	Lb.-in.	3186	3398	3982	3265	2292	3487	4363	4327	4212	3982	3982	3363	2416
	Nm	360	348	450	369	259	394	493	489	476	450	450	380	273
Accel torque <sup>(1)</sup>	Lb.-in.	4425	4425	4425	4425	3540	4425	4956	4956	4780	5832	4867	4425	3486
	Nm	500	500	500	500	400	500	560	560	540	546	550	500	360
<b>General data</b>														
Inertia <sup>(2)</sup>	Lb.-in.-s <sup>2</sup> x10 <sup>-4</sup>	107	101	97	87	81	103	103	96	90	85	79	79	79
	Kg-m <sup>2</sup> x10 <sup>-5</sup>	95	89	86	77	72	91	91	85	80	75	70	70	70
Max. backlash	arc-mins	10, 5 or 1					10, 5 or 1							
Efficiency <sup>(3)</sup>	%	96					91							
Rated life	H	15,000					15,000							
Weight	Kg/Lbf	9/20					17/38							
Radial load <sup>(4)</sup>	N/Lbf	9100/2046					9100/2046							
Axial load	N/Lbf	9100/2046					9100/2046							

- (1) S5 duty service.
- (2) On the motorside.
- (3) Theoretical gear efficiency value.
- (4) Load applied in the middle of the output shaft at 300 RPM.
- (5) Emergency stop torque is 2.5 times rated output torque for 1000 times max during the service life of the gearhead.

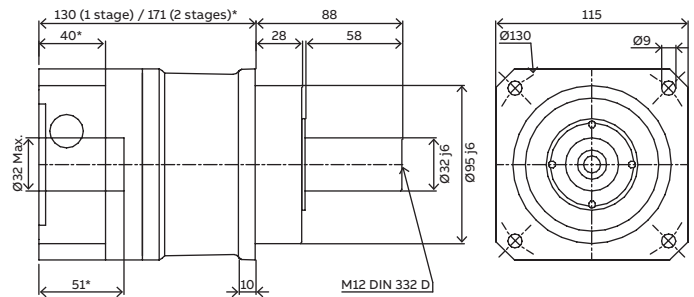
**Stainless steel gearheads**

Dimensions

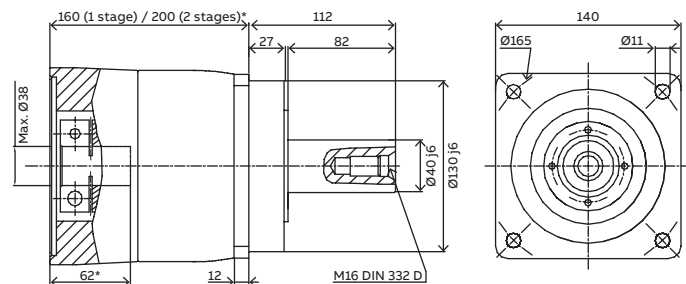
**MSS080**



**MSS115**



**MSS140**



Gear number	No. of stages	"L2" length (mm)
MSS080	1	117.5
	2	154
MSS115	1	130
	2	171
MSS140	1	160
	2	200

- "XX" insert specific gear ratios. Verify that motor torque does not exceed gear rated input torque.
  - Other BSM and gearhead possibility exist. Contact ABB with your requirements.
- Dimensions in mm.

## Servo motor gearhead

### Identification matrix

Motor	Gearbox model					Ratio
50	Standard	Stainless	Right angle stainless	Higher torque lower backlash	Right angle	Rotating flange (Shaftless design)
63						
80	MRP050	MSS080	MRS080	MNT065	MRA065	BDB085
100	MRP070	MSS115	MRS115	MNT080	MRA080	BDB120
132	MRP090	MSS140	MRS140	MNT115	MRA115	BDB145
	MRP120	-	-	MNT140	MRA140	BDB180
	MRP155	-	-	MNT180	MRA180	BDB250
	-	-	-	MNT210	-	BDB300
	-	-	-	-	-	BDB330

**Example:** G BSM80 - MRP090 - 4

## Servo motor gearhead

Designed specifically for BSM servo

Gearhead catalog number	Max. backlash arc - min.	Gear fits these motors		Gear ratio
		BSM-N	BSM-C	
GBSM50-MRP050-5	12	BSM50N-1 or -2	-	5
GBSM50-MRP050-10	12	BSM50N-1	-	10
GBSM63-MRP070-5	12	BSM63N-all	-	5
GBSM63-MRP070-10	12	BSM63N-1 or -2	-	10
GBSM63-MRP090-25	12	BSM63N-1 or -2	-	25
GBSM63-MRP090-50	12	BSM63N-1	-	50
GBSM80-MRP090-4	10	BSM80N-all	BSM80C-all	4
GBSM80-MRP090-5	10	BSM80N-all	BSM80C-all	5
GBSM80-MRP090-7	10	BSM80N-all	BSM80C-all	7
GBSM80-MRP090-10	10	BSM80N-1 or -2	BSM80C-1 or -2	10
GBSM80-MRP090-16	12	BSM80N-1 or -2	BSM80C-1 or -2	16
GBSM80-MRP090-25	12	BSM80N-1	BSM80C-1	25
GBSM80-MRP120-50	12	BSM80N-1 or -2	BSM80C-1 or -2	50
GBSM80-MRP155-100	12	BSM80N-1	BSM80C-1	100
GBSM90-MRP120-4	10	BSM90N-all	BSM80C-all	4
GBSM90-MRP120-5	10	BSM90N-all	BSM80C-all	5
GBSM90-MRP120-7	10	BSM90N-all	BSM80C-all	7
GBSM90-MRP120-10	10	BSM90N-1	BSM90C-1 or -2	10
GBSM90-MRP120-25	12	BSM90N-1	BSM90C-1 or -2	25
GBSM90-MRP155-10	10	BSM90N-all	BSM90C-3	10
GBSM90-MRP155-25	12	BSM90N-all	BSM90C-3	25
GBSM100-MRP120-3	10	BSM100N-all	BSM100C-all	3
GBSM100-MRP120-5	10	BSM100N-1 or -2	BSM100C-1-2-3-4	5
GBSM100-MRP155-5	10	BSM100N-3 or -4	BSM100C-5 or -6	5
GBSM100-MRP155-10	10	BSM100N-1	BSM100C-1or-2or-3	10



## Gearbox model

### Standard gearheads

Gearhead type	Number of stages	Ratios available	Backlash arc - min.	Catalog number
MRP 050	1	4-5-7-10	12	MRP 050 (4-10)
	2	16-20-25-35-40-50-70-100	15	MRP 050 (16-100)
MRP 070	1	3-4-5-7-10	12	MRP 070 (3-10)
	2	16-20-25-35-40-50-70-100	15	MRP 070 (16-100)
MRP 090	1	3-4-5-7-10	10	MRP 090 (3-10)
	2	16-20-25-35-40-50-70-100	12	MRP 090 (16-100)
MRP 120	1	3-4-5-7-10	10	MRP 120 (3-10)
	2	16-20-25-35-40-50-70-100	12	MRP 120 (16-100)
MRP 155	1	3-4-5-7-10	10	MRP 155 (3-10)
	2	16-20-25-35-40-50-70-100	12	MRP 155 (16-100)

### Higher torque/lower backlash gearhead

Gearhead type	Number of stages	Ratios available	Standard arc - min. backlash	Catalog number	Reduced arc - min. backlash	Catalog number
MNT 065	1	3-4-5-7-10	15	MNT 065 (3-10)	5	MNT 065 (3-10-L)
	2	16-20-25-35-40-50-70-100	15	MNT 065 (16-100)	5	MNT 065 (16-100-L)
MNT 080	1	3-4-5-7-10	10	MNT 080 (3-10)	5	MNT 080 (3-10-L)
	2	16-20-25-35-40-50-70-100	10	MNT 080 (16-100)	5	MNT 080 (16-100-L)
MNT 115	3	125 & 175	10	MNT 080 (125-175)	5	MNT 080 (125-175-L)
	1	3-4-5-7-10	10	MNT 115 (3-10)	5	MNT 115 (3-10-L)
MNT 140	2	16-20-25-35-40-50-70-100	10	MNT 115 (16-100)	5	MNT 115 (16-100-L)
	3	125 & 175	10	MNT 115 (125-175)	5	MNT 115 (125-175-L)
MNT 180	1	3-4-5-7-10	10	MNT 140 (3-10)	5	MNT 140 (3-10-L)
	2	16-20-25-35-40-50-70-100	10	MNT 140 (16-100)	5	MNT 140 (16-100-L)
MNT 210	3	125 & 175	10	MNT 140 (125-175)	5	MNT 140 (125-175-L)
	1	3-4-5-7-10	6	MNT 180 (3-10)	3	MNT 180 (3-10-L)
MNT 080	2	16-20-25-35-40-50-70-100	6	MNT 180 (16-100)	3	MNT 180 (16-100-L)
	3	125 & 175	6	MNT 180 (125-175)	3	MNT 180 (125-175-L)
MNT 115	1	3-4-5-7-10	6	MNT 210 (3-10)	3	MNT 210 (3-10-L)
	2	16-20-25-35-40-50-70-100	6	MNT 210 (16-100)	3	MNT 210 (16-100-L)
MNT 140	3	125 & 175	6	MNT 210 (125-175)	3	MNT 210 (125-175-L)

### Right angle gearheads

Gearhead type	Number of stages	Ratios available	Standard arc - min. backlash	Catalog number	Reduced arc - min. backlash	Catalog number
MRA 065	1	3-4-5-7-10	15	MRA 065 (3-10)	5	MRA 065 (3-10-L)
	2	16-20-25-35-50-70-100	15	MRA 065 (16-100)	5	MRA 065 (16-100-L)
MRA 080	1	3-4-5-7-10	10	MRA 080 (3-10)	5	MRA 080 (3-10-L)
	2	16-20-25-35-40-50-70-100	10	MRA 080 (16-100)	5	MRA 080 (16-100-L)
MRA 115	3	125-175	10	MRA 080 (125-175)	5	MRA 080 (125-175-L)
	1	3-4-5-7-10	10	MRA 115 (3-10)	5	MRA 115 (3-10-L)
MRA 140	2	16-20-25-35-40-50-70-100	10	MRA 115 (16-100)	5	MRA 115 (16-100-L)
	3	125-175	10	MRA 115 (125-175)	5	MRA 115 (125-175-L)
MRA 180	1	3-4-5-7-10	10	MRA 140 (3-10)	5	MRA 140 (3-10-L)
	2	16-20-25-35-40-50-70-100	10	MRA 140 (16-100)	5	MRA 140 (16-100-L)
MRA 065	1	3-4-5-7-10	10	MRA 180 (3-10)	5	MRA 180 (3-10-L)
	2	16-20-25-35-40-50-70-100	10	MRA 180 (16-100)	5	MRA 180 (16-100-L)

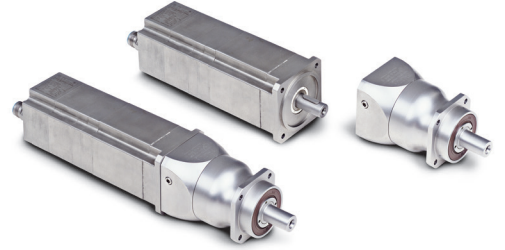
#### How to order custom:

- Email scheduling the abb servo motor model number, gearhead type, ratio and backlash.
- Do not enter req set.

## Stainless steel gearheads

Designed specifically for SSBSM servo

Gearhead catalog number	Max. backlash arc - min.	Gear fits these motors		Gear ratio
		BSM-N	BSM-C	
GBSM80-MSS080-5	10	SSBSM80N-all	SSBSM80C-all	5
GBSM80-MSS080-7	10	SSBSM80N-all	SSBSM80C-all	7
GBSM80-MSS080-10	10	SSBSM80N-all	SSBSM80C-all	10
GBSM80-MSS080-16	10	SSBSM80N-all	SSBSM80C-all	16



### Higher torque/lower backlash gearhead

Gearhead type	Number of stages	Ratios available	Standard arc - min. backlash
MSS 080	1	3-4-5-7-10	10
	2	16-20-25-35-40-50-70-100	10
	3	125-175 & UP	10
MSS 115	1	3-4-5-7-10	10
	2	16-20-25-35-40-50-70-100	10
	3	125-175 & UP	10
MSS 140	1	3-4-5-7-10	10
	2	16-20-25-35-40-50-70-100	10
	3	125-175 & UP	10

### Right angle gearheads

Gearhead type	Number of stages	Ratios available	Standard arc - min. backlash	Reduced arc - min. backlash
MRS 080	1	3-4-5-7-10	10	5
	2	16-20-25-35-40-50-100	10	5
MRS 115	1	3-4-5-7-10	10	5
	2	16-20-25-35-40-50-100	10	5
MRS 140	1	3-4-5-7-10	10	5
	2	16-20-25-35-40-50-100	10	5

#### How to order custom:

- Email scheduling the abb servo motor model number, gearhead type, ratio and backlash.
- Do not enter req set.

## Motor solutions



For over 30 years, ABB has been manufacturing and supplying high reliability servo motor solutions to worldwide applications. Our servo motors are designed for industrial applications, superior durability and proven reliability. Our range of rotary motors are available as a high performance, low inertia family, or as a higher inertia family for applications needing higher inertial matching. We also offer stainless steel motors that lead the way in solutions for harsh and washdown environments.

### Brushless AC servo motors

#### Refer to catalog 9AKK10647 for full information.

BSM motors are hard at work, increasing productivity, improving part quality, providing precision, and reducing costs in many applications. These motors are available in two models, the BSM N-Series and the BSM C-Series. The N-Series motors provide low inertia for the highest performance. The C-Series motors have a higher inertia. All the motors are available with different feedback options including resolver, incremental, and absolute encoders. Motors are available from 0.4 Nm (4 lb.-in) through to 134 Nm (1185 lb.-in).

Both motor families are available in a stainless steel configuration, offering the best protection for harsh environment. These motors are ideally suited for pharmaceutical and food applications.

**Additional information**

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