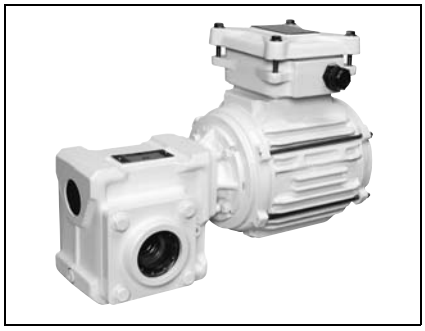
Electromechanical products - Food processing
Very harsh atmosphere
Multibloc IAW 2000

General



Multibloc 2000 geared motors with worm gear are used to adapt the speed of the electric motor to that of the driven machine.
Their size is therefore determined by the motor power (P) expressed in kilowatts (kW) and the output rotation speed of the gearbox (n_S) in revolutions per minute (min^{-1}).
The characteristic parameter of speed reducers is the rated output torque (M_{nS}) expressed in Newton-metres (N.m):

$$M_{nS} = \frac{P \times 9550}{n_S} \times \text{efficiency}$$

A range of five sizes: Mb IAW 31, 22, 23, 24, 25.
Rated output torque: from 20 N.m to 1500 N.m.
Power ratings: from 0.25 to 4 kW.
Reduction ratios: from 5.2 to 100.
Efficiency: 55% to 88%.
Very quiet operation.

IP66 KP cast iron assembly.
Special anti-corrosion surface protection.

D

Construction

Description of Multibloc gearboxes (Mb IAW)

Component	Materials	Remarks
Frame	Cast iron	- use of single-component pearlitic FGL cast iron (flake graphite: 150 MPa tensile strength) to ensure unit is fully sealed - monobloc with internal reinforcements to absorb vibrations and noise, and increase its rigidity - with **NU** housing, it can be adapted for sizes 22, 23, 24, 25 by using **BS** flanges. They are compact and meet the requirements of food processing applications by elimination of retention zones
Wheel Worm	Bronze Steel	- moulded on a steel or cast iron insert, fixed with respect to the worm, supported by two large-diameter bearings without intermediate shields - cut on a whirl lathe, toughened and ground
Shafts	Steel	- grinding of sealing surfaces - cylindrical hollow according to ISO R773, with stainless steel screw fixing the hollow shaft protective cover, sealed and conforming to machinery directive 89/392/EEC - tolerance of diameters H7 - corrosion "anti-fretting" adaptation
Seals	Nitrile	- antidust lipseals in accordance with DIN 3760 form AS - ground sealing surfaces - maximum sealing at spigots
End shield	Cast iron	- reinforced by large ribs, this ensures ruggedness of the gearbox under heavy loads
Lubrication	Oil	- in accordance with ISO 6743/6 and F.D.A. 21 CFR 178.3570 - standard: USDA H2 certification with lubricant approved for the food processing industry but which cannot come into contact, even accidental, with food - option: USDA H1 certification: lubricant which can come into accidental contact with food
Mounting		MU (FT): geared motor with IEC motor, manufactured with universal mounting
Standard motor		FLS IAW: - multi-voltage 220/380 V - 230/400 V - 240/415 V - cast iron terminal box with nitrile seal and stainless steel screws, fitted with IP 68 cable gland by concentric tightening with anchoring
Finish	Paint	Special surface protection System Ib, shade RAL 9010 (white), (1 epoxy top coat: 20 to 30 µm) • resistance to saline mist: 600 hours (in accordance with NF ISO 9227)

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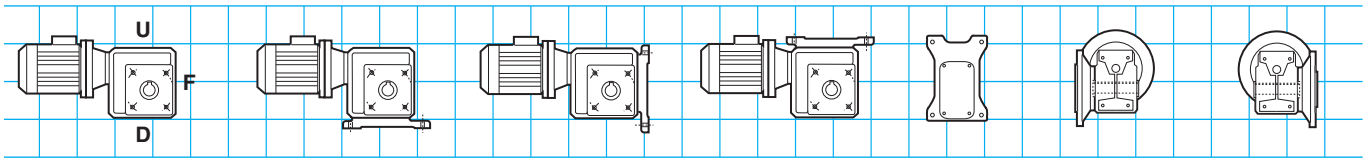
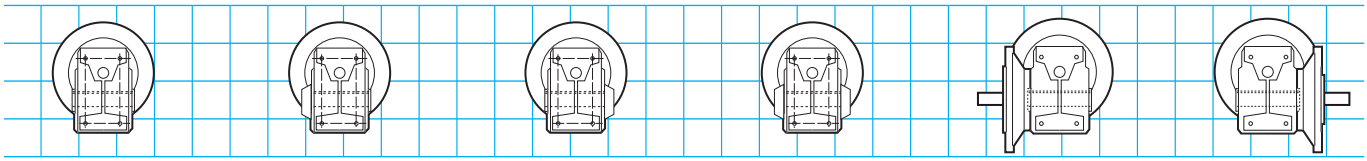
Standard position: gearbox view from side F, motor behind, side D on the floor.

1 - Mounting form



NU | **NSD** | **NSF** | **NSU** | **NSK** | **BSL** | **BSR**

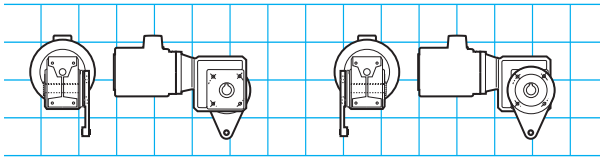
2 - Output shaft



H (Only with flange) | **HC L** (Hollow + cartridge on left) | **HC R** (Hollow + cartridge on right) | **HC LR** (Hollow + cartridge on both sides) | **SH L** (Only with flange) | **SH R** (Only with flange)

3 - Options

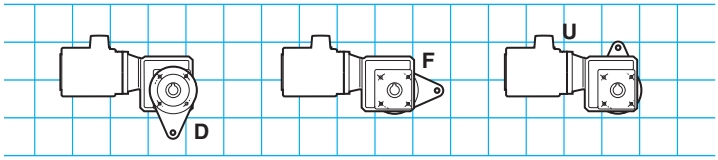
Torque arm mounting side



RRD Torque arm on right with cartridge

RLD Torque arm on left with cartridge

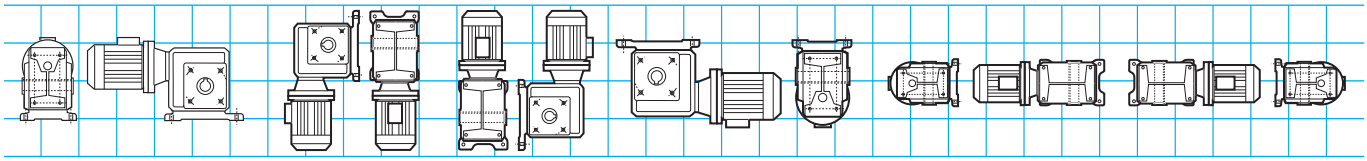
Possible orientation of the torque arm (examples)



RLD | **RRF** | **RRU**

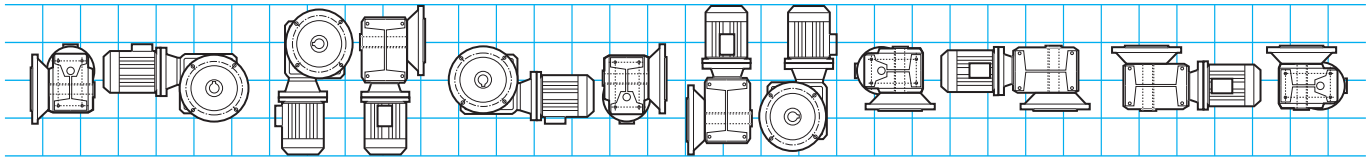
4 - Operating position

NU, NS D, NS U, R mounting



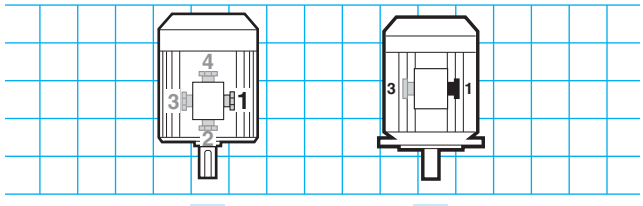
B3 | **B6** | **B7** | **B8** | **V5** | **V6**

BS mounting



B5 | **B52** | **B53** | **B54** | **V1** | **V3**

5 - Cable gland positions



1 Non-brake motor

1 Brake motor

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Adaptation possibilities

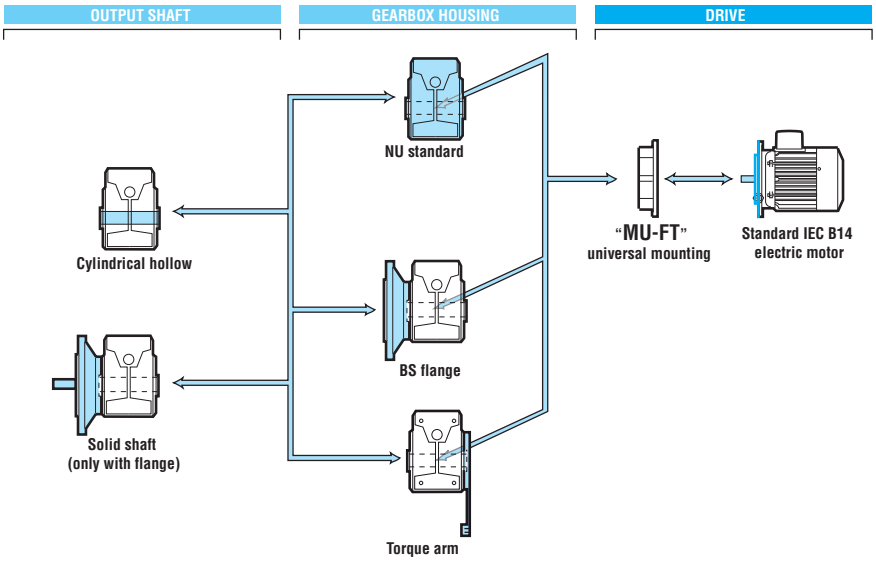
Leroy-Somer offers several drives for its gearboxes which satisfy a very broad range of requirements. They are described below and offered in this catalogue.
For other drives, please consult the Leroy-Somer technical specialists who will be glad toassist.

☞ ***Multibloc gearboxes can be used in conjunction with the following drives:***

- **fixed speed 3-phase induction motors:**
  - FLS IAW motors of 0.25 to 4 kW

☞ ***Options:***

- baseplate kit
- BS flanges
- torque arm with sealing cartridge
- H1 edible oil



D

Designation / Coding

Mb IAW	2301	B3	NU	D	HC L	20	MU-FT	4P	FLS IAW 100 LK	1.1 kW	230/400 V 50 Hz	S1 food processing
Gearbox type	Size	Operating position	Mounting form	Mounting position	Definition of output shaft	Exact reduction	Type of input	Polarity	Series, frame size and manufacturer code	Rated output power	Mains voltage and frequency	Special application

☞ ***Example coding in IA, S1 duty:***

Multibloc Mb IAW 2301 1.1 kW, 72 min^{-1}, S1

Designation	Code
Mb IAW 2301 B3 NU D HC L 20 MU-FT 4P, FLS IAW 100 LK 1.1 kW	-

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Selection

The selection of a gearbox or a geared motor should take account of the application.
Some of these applications are listed in the indicative “AGMA” load classification, on page D0.10.

The table opposite summarises the relationship between the “AGMA” class and the duty factor K_p of the gearbox.

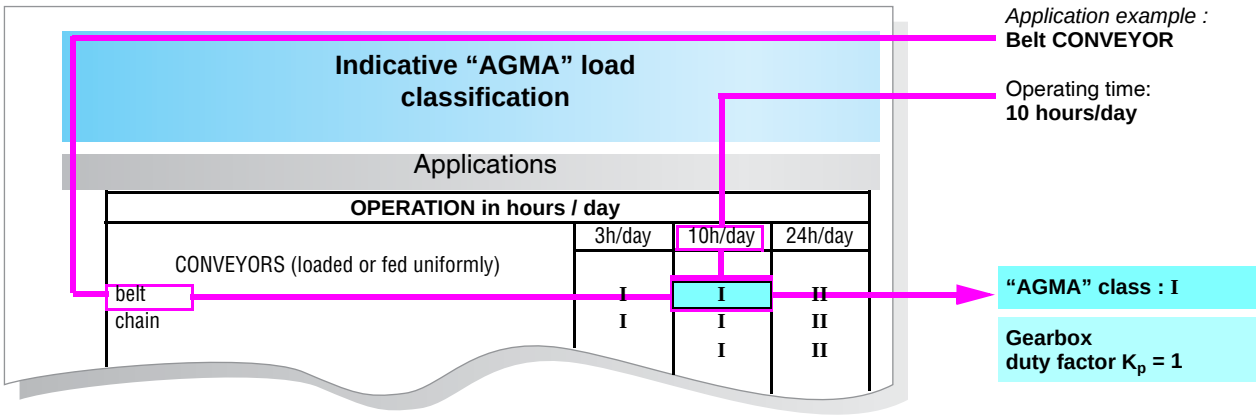
“AGMA” class	Gearbox duty factor K_p
I	1
II	1.4
III	2

NOTE: In the case of Multibloc 2000 worm and wheel gearboxes, it is necessary to take account of the operating factor, i.e. the operating time under full load in relation to the total operating time per day of the gearbox.
In this catalogue, the selection is made for an operating factor of 50%.
For an operating factor of 100%, Class I becomes Class II, and Class II becomes Class III.
(K_p multiplied by 1.4).

D

1st case. – Your application is listed

Follow the indicative classification table of loads according to "AGMA" on page D0.10 of the Catalogue for Industry.



2nd case. – Your application is not listed

The “AGMA” selection class is defined by the daily operating time and the type of operation of the application, according to the table below.

Type of application	Daily operating time	“AGMA” class
Shock-free, not many starts	10 hours/day	I
Damped shocks	10 hours/day	II
Shock-free, not many starts	24 hours/day	
Violent shocks, many starts	10 hours/day	III
Damped shocks	24 hours/day	

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Conditions

Mb IAW 3101, Mb IAW 2000: NU, BS
FLS IAW - CI.F - 400 V Y - 50 Hz

	Inputs[1]	Maximum quantity per order				
		Mb IAW 3101	Mb IAW 2201	Mb IAW 2301	Mb IAW 2401	Mb IAW 2501
FLS IAW	0.25-4 kW/4p	3	3	3	3	3

	Mechanical options		
	NU HC	BS H/BS SH	R
Mb IAW 3101		-	
Mb IAW 2201			
Mb IAW 2301			
Mb IAW 2401			
Mb IAW 2501			

Inputs		Electrical options			
4p/MU		230/400 V	400 V Δ	PTO/PTC	Coated winding
FLS IAW	0.25-4 kW				

<

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AGMA I

Mb IAW 3101, Mb IAW 2000: USDA H1 for S1
Non-ventilated cast iron motor (IC410)

Mb IAW 3101 - Mb IAW 2000 - H1 S1

		FLS IAW (kW)									
		0.25	0.37	0.55	0.75	1.1	1.5	1.8	2.2	3	4
		FLS IAW 4p									
min^{-1}	i	80 L		90 S	90 L	100 LK		112 M		132 M	
14.3	100	2201	2301	2401							
17.9	80	2201	2301	2401	2401	2501					
23.8	60	2201	2201	2301	2401	2501	2501				
28.6	50	3101	2201	2301	2401	2501	2501	2501			
35.8	40	3101	3101	2301	2301	2401	2501	2501	2501		
47.7	30	3101	3101	2201	2301	2401	2501	2501	2501		
56.1	25.5	3101	3101	2201	2301	2401	2401	2501	2501	2501	
71.5	20	3101	3101	2201	2201	2301	2401	2401	2501	2501	
95.3	15	3101	3101	2201	2201	2301	2301	2401	2401	2501	2501
124.3	11.5	3101	3101	2201	2201	2301	2301	2301	2301		
138.8	10.3	3101	3101	2201	2201	2301	2301	2301	2301	2401	2501
195.9	7.33	3101	3101	2201	2201	2301	2301	2301	2301	2401	2401
275	5.2	2301	2301	2301	2301	2301	2301	2301	2301		

Exact reduction

	Reduction indices												
Type	100	80	60	50	40	30	25.5	20	15	11.5	10.3	7.3	5.2
Mb IAW 2501	100	80	60	50	40	30	25.5	20.5	15.5		10.3	7.25	
Mb IAW 2401	100	80	60	50	40	30	25.5	19.5	14.5		10.3	7.25	
Mb IAW 2301	100	80	60	50	40	30	25.5	20	15	11.5	10.3	7.5	5.2
Mb IAW 2201	100	80	60	50	40	30	25.5	20	15	11.5	10.3	7.33	
Mb IAW 3101	100	80	60	50	40	30	25	20	15	12.5	10	7.5	

FLS IAW motor flanges and shaft extensions

	Frame size 80	Frame size 90	Frame size 100	Frame size 112	Frame size 132
Mb IAW 3101	14x30 FT85	NA	NA	NA	NA
Mb IAW 2201	14x30 FT85	19x40 FT100	NA	NA	NA
Mb IAW 2301	14x30 FT85	19x40 FT100	24x50 FT115	24x50 FT115	NA
Mb IAW 2401	NA	19x40 FT100	24x50 FT115	24x50 FT115	28x60 FT130
Mb IAW 2501	NA	19x40 FT100	24x50 FT115	24x50 FT115	28x60 FT130

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AGMA I

Mb IAW 3101, Mb IAW 2000: USDA H2 for S1/S4 - USDA H1 for S4
Non-ventilated cast iron motor (IC410)

Mb IAW 3101 - Mb IAW 2000 - H1 S4

		FLS IAW (kW)									
		0.25	0.37	0.55	0.75	1.1	1.5	1.8	2.2	3	4
		FLS IAW 4p									
min^{-1}	i	80 L		90 S	90 L	100 LK		112 M		132 M	
14.3	100	2201	2301	2401	2401	2501					
17.9	80	2201	2201	2301	2401	2501	2501				
23.8	60	3101	2201	2301	2401	2501	2501	2501			
28.6	50	3101	2201	2301	2301	2401	2501	2501	2501		
35.8	40	3101	3101	2201	2301	2401	2401	2501	2501		
47.7	30	3101	3101	2201	2201	2301	2401	2401	2501	2501	
56.1	25.5	3101	3101	2201	2201	2301	2401	2401	2501	2501	
71.5	20	3101	3101	2201	2201	2301	2301	2401	2401	2501	2501
95.3	15	3101	3101	2201	2201	2301	2301	2301	2401	2401	2501
124.3	11.5	3101	3101	2201	2201	2301	2301	2301	2301		
138.8	10.3	3101	3101	2201	2201	2301	2301	2301	2301	2401	2401
195.9	7.33	3101	3101	2201	2201	2301	2301	2301	2301	2401	2401
275	5.2				2301	2301	2301	2301	2301		

D

Exact reduction

Type	Reduction indices												
	100	80	60	50	40	30	25.5	20	15	11.5	10.3	7.3	5.2
Mb IAW 2501	100	80	60	50	40	30	25.5	20.5	15.5		10.3	7.25	
Mb IAW 2401	100	80	60	50	40	30	25.5	19.5	14.5		10.3	7.25	
Mb IAW 2301	100	80	60	50	40	30	25.5	20	15	11.5	10.3	7.5	5.2
Mb IAW 2201	100	80	60	50	40	30	25.5	20	15	11.5	10.3	7.33	
Mb IAW 3101	100	80	60	50	40	30	25	20	15	12.5	10	7.5	

FLS IAW motor flanges and shaft extensions

	Frame size 80	Frame size 90	Frame size 100	Frame size 112	Frame size 132
Mb IAW 3101	14x30 FT85	NA	NA	NA	NA
Mb IAW 2201	14x30 FT85	19x40 FT100	NA	NA	NA
Mb IAW 2301	14x30 FT85	19x40 FT100	24x50 FT115	24x50 FT115	NA
Mb IAW 2401	NA	19x40 FT100	24x50 FT115	24x50 FT115	28x60 FT130
Mb IAW 2501	NA	19x40 FT100	24x50 FT115	24x50 FT115	28x60 FT130

S4
USDA H1
Edible oil
Lubricant which can come into accidental contact with food

S1/S4
USDA H2
Lubricant approved for the food processing industry but which cannot come into contact, even accidental, with food

Electromechanical products - Food processing
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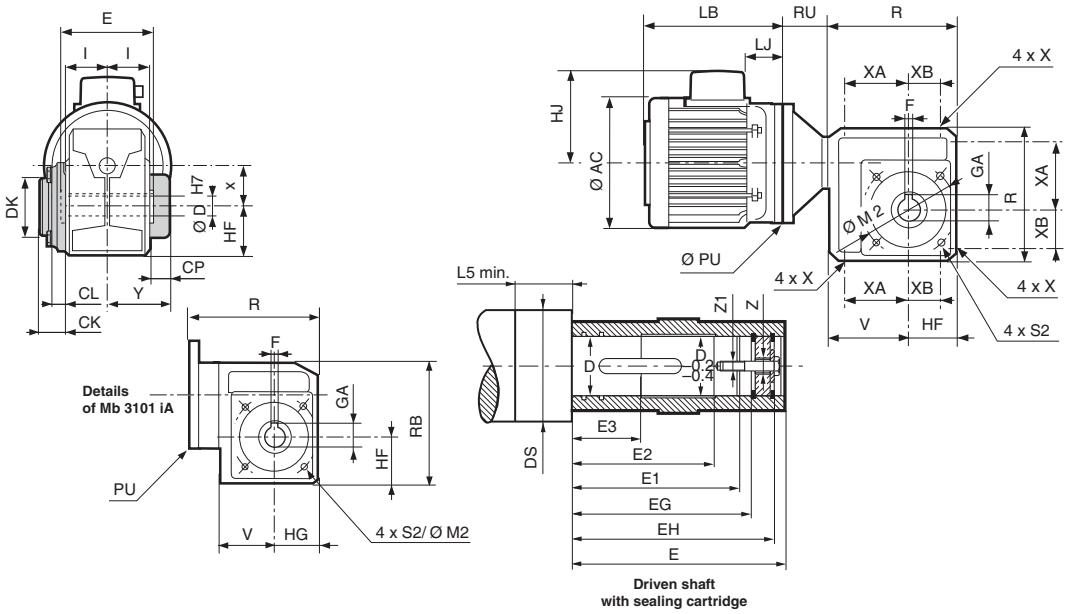
Multibloc IAW 2000

Dimensions

Dimensions of Multibloc IAW geared motors, MU-FT universal mounting, with IM 3601 (IM B14) motor, Mb IAW 3101, Mb IAW 2201 to Mb IAW 2501

Dimensions in millimetres

- NU standard form, H hollow shaft



Type	NU gearbox												Max. weight kg
	CP	CL	CK	DK	HF	I	M2	R	S2	V	x	Y	
Mb IAW 2501	28.5	16	31	133	93	78	180	228	M12 x 20	135	80	106.5	49.2
Mb IAW 2401	28	14	31	92	78	64	130	193	M10 x 15	115	63	92	30
Mb IAW 2301	22.5	13	27	80	66	54	115	163	M8 x 12	97	55	76.5	17.4
Mb IAW 2201	23.5	13	25	68	59	49	105	143	M8 x 12	84	45	72.5	12.3
Mb IAW 3101[1]	22.5	16	21	65	50	41	85	123	M8 x 12	54.5	40	63.5	5.8

1. See Details of Mb 3101 iA: HG = 48 and RB = 127.

Type	H hollow output shaft				Driven shaft									
	D	E	F	GA	D	DS[2]	EG	EH	E1	E2	E3	L5	Z	Z1
Mb IAW 2501	45H7	168	14	48.8	45h6	56h8	133	147	131	107	57	25	M20	M16
Mb IAW 2401	35H7	138	10	38.3	35h6	45h8	110	121	107	95	49	25	M16	M12
Mb IAW 2301	30H7	108	8	33.3	30h6	35h8	95	105	91	79	39	21	M12	M10
Mb IAW 2201	25H7	108	8	28.3	25h6	35h8	91	99	87	72	36	20	M12	M10
Mb IAW 3101	20H7	90	6	22.8	20h6	25h8	73	80.1	71	60	30	17	M8	M6

2. Surface roughness: ra = 1.6

Frame size	Induction motors, brake and gearboxes														
	3-phase FLS IAW					Gearboxes									
					Weight	3101		2201		2301		2401		2501	
	AC	HJ	LB	LJ	kg	RU[3]	PU	RU	PU	RU	PU	RU	PU	RU	PU
80	160	150	177	27	15	-	105[4]	33	105[4]	36	105[4]	-	-	-	-
90	185	160	224	22	23	-	-	33	120[4]	38	120[4]	50	120[4]	50	120[4]
100	227	194	275	34	44	-	-	-	-	35	140[4]	50	140[4]	50	140[4]
112	227	194	275	34	48	-	-	-	-	35	140[4]	50	140[4]	50	140[4]
132	261	214	330	25	75	-	-	-	-	-	-	50	160[4]	50	160[4]

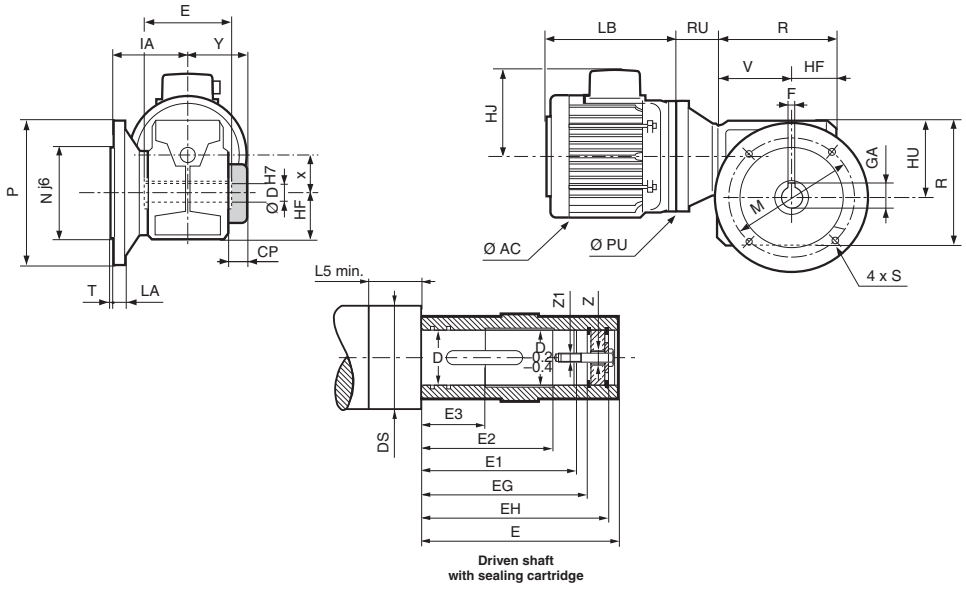
3. For Mb 3101, input flange integrated with the housing, i.e. V + RU = 75.
4. Caution: motor with smaller IEC flange and shaft extension.

Dimensions

Dimensions of Multibloc IAW geared motors, MU-FT universal mounting, with IM 3601 (IM B14) motor, Mb IAW 3101, Mb IAW 2201 to Mb IAW 2501

Dimensions in millimetres

- BS standard flange form, H hollow shaft



Type	Gearbox with flange								BS flange							Max. weight kg
	CP	HF	HU	IA	R	V	x	Y	M	N[1]	P	LA	S	T	Y	
Mb IAW 2501	28.5	90	135	126	225	135	80	106.5	265	230	300	12	14	4	106.5	50.5
Mb IAW 2401	28	75	115	126	190	115	63	88.5	215	180	250	12	14	4	92	32.5
Mb IAW 2301	22.5	63	97	106	160	97	55	74.5	165	130	200	10	11	3.5	76.5	19
Mb IAW 2201	23.5	56	84	100.5	140	84	45	70.5	165	130	200	10	11	3.5	72.5	14.5
Mb IAW 3101	22.5	50[2]	77	77	120[2]	54.5	40	61.5	100	-	120	7	7[3]	-	63.5	6

1. BN flange without spigot: Nj6 = 0 and T = 0. *2. See Details of Mb 3101 iA: page D49.8.* *3. 4 radial slots.*

Type	H hollow output shaft				Driven shaft											
	D	E	F	GA	D	DS[4]	EG	EH	E1	E2	E3	L5	Z	Z1	IA	M
Mb IAW 2501	45H7	168	14	48.8	45h6	56h8	133	147	131	107	57	25	M20	M16	138	215
Mb IAW 2401	35H7	138	10	38.3	35h6	45h8	110	121	107	95	49	25	M16	M12	126	165
Mb IAW 2301	30H7	108	8	33.3	30h6	35h8	95	105	91	79	39	21	M12	M10	106	130
Mb IAW 2201	25H7	108	8	28.3	25h6	35h8	91	99	87	72	36	20	M12	M10	100.5	130
Mb IAW 3101	20H7	90	6	22.8	20h6	25h8	73	80.1	71	60	30	17	M8	M6	76	85

4. Surface roughness: ra = 1.6

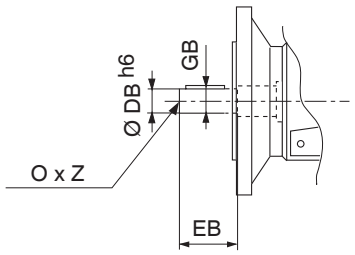
	Induction motors, brake and gearboxes														
	3-phase FLS IAW					Gearboxes									
Frame					Weight	3101		2201		2301		2401		2501	
size	AC	HJ	LB	LJ	kg	RU[5]	PU	RU	PU	RU	PU	RU	PU	RU	PU
80	160	150	177	27	15	-	105[6]	33	105[6]	36	105[6]	-	-	-	-
90	185	160	224	22	23	-	-	33	120[6]	38	120[6]	50	120[6]	50	120[6]
100	227	194	275	34	44	-	-	-	-	35	140[6]	50	140[6]	50	140[6]
112	227	194	275	34	48	-	-	-	-	35	140[6]	50	140[6]	50	140[6]
132	261	214	330	25	75	-	-	-	-	-	-	50	160[6]	50	160[6]

5. For Mb 3101, input flange integrated with the housing, i.e. V + RU = 75.
6. Caution: motor with smaller IEC flange and shaft extension.

Dimensions

**Dimensions of the solid output shaft extension kit
Mb IAW 3101, and Mb IAW 2201 to Mb IAW 2501
(Not possible with the sealing cartridge option)**

Dimensions in millimetres



**Solid output shaft
H L or H R,
for flange**

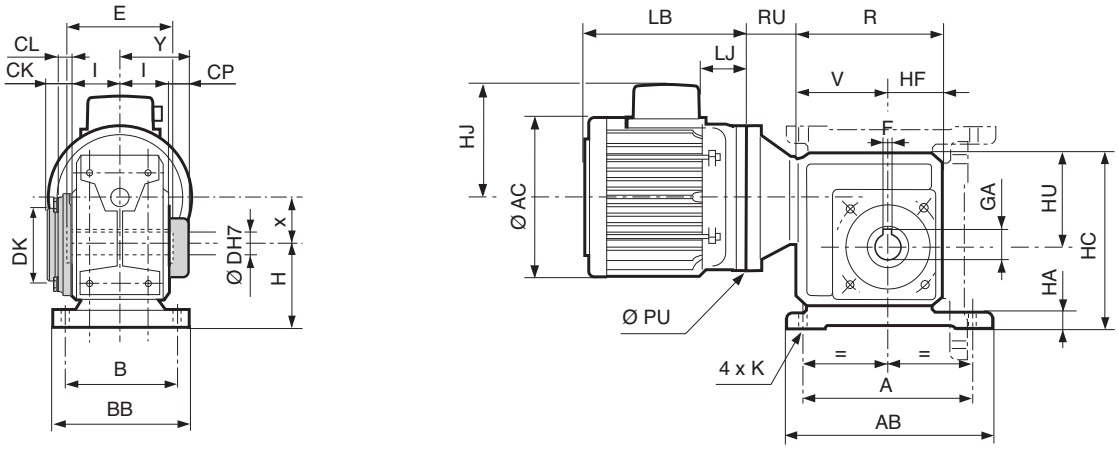
	Solid output shaft					
Type	DB	EB	GB	O	Z	Hc screws
Mb IAW 2501	45	90	48.5	M16	36	M5
Mb IAW 2401	35	70	38	M12	28	M5
Mb IAW 2301	30	60	33	M10	22	M5
Mb IAW 2201	25	50	28	M10	22	M5
Mb IAW 3101	20	40	22.5	M6	16	M5

Dimensions

Dimensions of the baseplate kit
Mb IAW 3101 and Mb IAW 2201 to Mb IAW 2501

Dimensions in millimetres

- NS D [NS F or NS U] foot mounted form, H hollow shaft



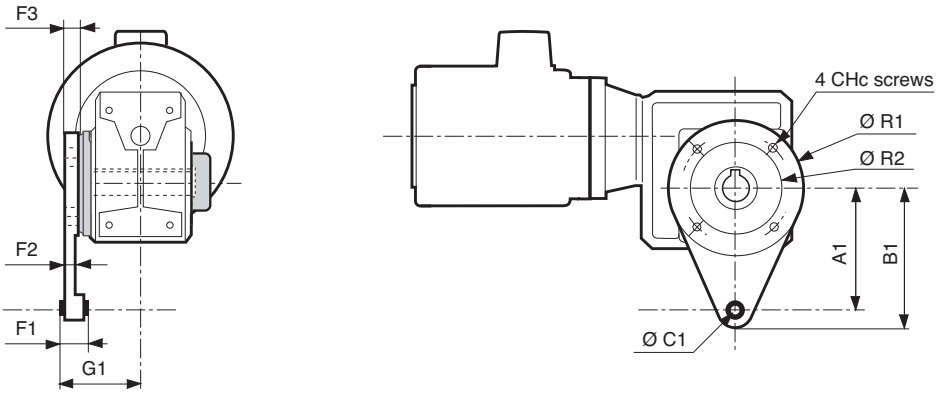
Type	NS gearboxes							
	A	AB	B	BB	H	HA	HC	K
Mb IAW 2501	220	270	156	188	112	16	247	16
Mb IAW 2401	202	235	156	187	90	15	205	14
Mb IAW 2301	154	184	128	156	80	6	177	11
Mb IAW 2201	134	164	125	153	71	6	155	11

Dimensions

Dimensions of torque arms R and sealing cartridge
Mb IA 3101 and Mb IA 2201 to Mb IA 2501

Dimensions in millimetres

- Mb IAW 3101 and Mb IAW 2201 to Mb IAW 2501: Form LD [or RD]



Type[1]	Torque arm R										Weight kg
	A1	B1	C1	F1	F2	F3	G1	R1	R2	Screws	
Mb IAW 2501	310	340	16 H10	54	23	25	121.2	225	135	M12 x 25	6.7
Mb IAW 2401	200	230	16 H10	54	23	25	105	179	97	M10 x 25	4.3
Mb IAW 2301	160	181	10 H10	33	14	16	84.5	153	86	M8 x 15	1.8
Mb IAW 2201	130	151	10 H10	33	14	16	79.5	133	77	M8 x 15	1.4
Mb IAW 3101	100	120	10 H10	23	6	11.5	64.5	109	68	M8 x 20	0.5

1. As standard, the torque arm (fitted with a Silentbloc flexible joint) is supplied separately, painted black.
*As an option, the torque arm is supplied mounted on the gearbox: in this case, specify the mounting side **R** or **L** and the orientation **D**, **F** or **U**.*