

Need for premium efficiency motors

Ever increasing energy costs and increasing concerns about environment are the main focus areas across the globe.

Electric motors consume about 65-70% of electrical energy used in the industry. Therefore, improvement in motor efficiency will result in significant reduction in energy consumption.

Purchase cost and running cost of motor

Purchase cost of the motor is insignificant when compared to the running cost of the motor over a period of 20 years. This can be seen in the table below:

	IE3	IE1
Power Rating (kW)	37	
Purchase Cost of Motor (Rs.)	104200	77260
Motor Efficiency	93.90%	91.20%
Per Hour kW Consumption	39.40	40.57
Annual running Hours (24Hrs X 313 Days)	7500	7500
Power Consumption/Annum (kW)	295527	304276
Average energy cost(Rs./kWH)	7	7
Average energy cost /annum	2068690	2129934
Annual Saving(Rs.)	61244	
Payback period for added cost	5.3 months	
Total Saving Over Motor's 20 year Life(Rs.)	1224882 <small>(Approximately 11.75 times of motor purchase cost)</small>	

Reducing energy costs is one way organizations can cut their overheads to remain competitive. Significant savings can be made by installing energy efficient motors either new installations or equipment packages, replacing oversized and under-loaded motors, making major modifications to facilities or processes, or instead of repairing or rewinding a failed motor.

IE3 Efficiency class of motors from Bharat Bijlee:

Bharat Bijlee's new IE3 efficiency class of motors is an improvement over IE2 efficiency class of motors. An energy efficient solution to save energy, these motors is designed for loss reduction of 15-20 % over IE2 efficiency class of motors. Therefore the energy saving by using these motors is much higher when compared to IE1 class of efficiency motors running in the plant. Upgradation to IE3 motors is smooth and easy since the frame size is same and there is no change in mandatory mounting dimensions, shaft diameter and shaft extension length.

Advantages:

- High Efficiency
- Inverter Grade Winding
- Optimized ventilation system for cooler operation and reduced Noise
- Reduced Vibration Levels
- Highly reliable under most demanding conditions
- Reduced Life Cycle Cost

Standards compliance:

These motors comply with the latest efficiency standards and requirements of IS:12615-2011 and IEC 60034-30. Bharat Bijlee closely follows the developments in the global regulatory environments and develops the product complying with these requirements.



Efficiency values defined in IEC 60034-30

kW	2 POLE			4 POLE			6 POLE		
	IE1	IE2	IE3	IE1	IE2	IE3	IE1	IE2	IE3
0.75	72.1	77.4	80.7	72.1	79.6	82.5	70.0	75.9	78.9
1.1	75.0	79.6	82.7	75.0	81.4	84.1	72.9	78.1	81.0
1.5	77.2	81.3	84.2	77.2	82.8	85.3	75.2	79.8	82.5
2.2	79.7	83.2	85.9	79.7	84.3	86.7	77.7	81.8	84.3
3	81.5	84.6	87.1	81.5	85.5	87.7	79.7	83.3	85.6
4	83.1	85.8	88.1	83.1	86.6	88.6	81.4	84.6	86.8
5.5	84.7	87.0	89.2	84.7	87.7	89.6	83.1	86.0	88.0
7.5	86.0	88.1	90.1	86.0	88.7	90.4	84.7	87.2	89.1
11	87.6	89.4	91.2	87.6	89.8	91.4	86.4	88.7	90.3
15	88.7	90.3	91.9	88.7	90.6	92.1	87.7	89.7	91.2
18.5	89.3	90.9	92.4	89.3	91.2	92.6	88.6	90.4	91.7
22	89.9	91.3	92.7	89.9	91.6	93.0	89.2	90.9	92.2
30	90.7	92.0	93.3	90.7	92.3	93.6	90.2	91.7	92.9
37	91.2	92.5	93.7	91.2	92.7	93.9	90.8	92.2	93.3
45	91.7	92.9	94.0	91.7	93.1	94.2	91.4	92.7	93.7
55	92.1	93.2	94.3	92.1	93.5	94.6	91.9	93.1	94.1
75	92.7	93.8	94.7	92.7	94.0	95.0	92.6	93.7	94.6
90	93.0	94.1	95.0	93.0	94.2	95.2	92.9	94.0	94.9
110	93.3	94.3	95.2	93.3	94.5	95.4	93.3	94.3	95.1
132	93.5	94.6	95.4	93.5	94.7	95.6	93.5	94.6	95.4
160	93.8	94.8	95.6	93.8	94.9	95.8	93.8	94.8	95.6
200	94.0	95.0	95.8	94.0	95.1	96.0	94.0	95.0	95.8
250	94.0	95.0	95.8	94.0	95.1	96.0	94.0	95.0	95.8
315	94.0	95.0	95.8	94.0	95.1	96.0	94.0	95.0	95.8
355	94.0	95.0	95.8	94.0	95.1	96.0	94.0	95.0	95.8
375	94.0	95.0	95.8	94.0	95.1	96.0	94.0	95.0	95.8

Range and Standard features:

Range in kW	0.75kW to 315kW*
Polarity	2P, 4P & 6P
Frame size	80 to 355L
Insulation	Class F, temperature rise limited to class B
Supply condition	415V+/- 10%, 50Hz +/-5%
Ambient temperature	50 deg C
Protection	IP 55
Mounting	B3 & B5 (Dual mounting hole)
Re greasing facility	From 225 frame and onwards

* Contact sales office for rating above 315 kW.

Optional features available

- Frequency 60Hz
- Voltages from 220V to 690V
- Class H insulation
- Re-greasing facility from frame 180 and above
- Roller bearings at DE from frame 180 and above
- Insulated Bearings at NDE from frame 160 and above
- Forced cooling arrangement / Encoder Mounting from frame 250 and above
- RTD, Thermistor in the winding
- BTD on the bearings from frame 250 and above
- Space Heaters
- Larger Size Terminal Box
- Non Standard Shaft Extension

Bearing Details for IE3 Motors

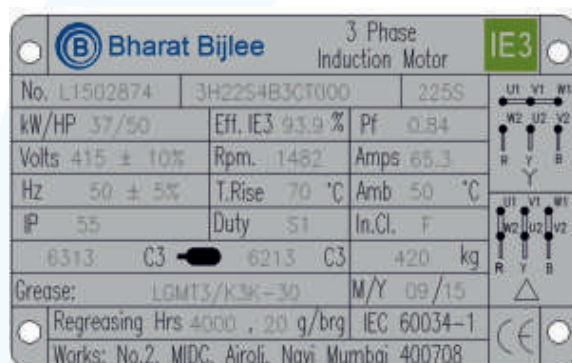
Frame Size	Number of Poles	Standard design		Optional
		Deep groove ball bearing		Roller bearings
		Drive end	Non-drive end	Drive end
80	2,4&6	6204 2ZC3	6204 2ZC3	-
90	2,4&6	6205 2ZC3	6205 2ZC3	-
100	2,4&6	6206 2ZC3	6205 2ZC3	-
112	2,4&6	6206 2ZC3	6205 2ZC3	-
132	2,4&6	6208 2ZC3	6208 2ZC3	-
160	2,4&6	6309 2ZC3	6209 2ZC3	-
180	2,4&6	6310 2ZC3	6210 2ZC3	NU310
200	2,4&6	6312 2ZC3	6212 2ZC3	NU312
225	2,4&6	6313 C3	6213 C3	NU313
250	2,4&6	6315 C3	6215 C3	NU315
280	2	6316 C3	6316 C3	NU316
	4&6	6317 C3	6316 C3	NU317
315	2,4&6	6319 C3	6319 C3	NU319
355	4&6	6322 C3	6322 C3	NU322

Standard design of Bearings

Frame Size	Bearing Drive end	Bearing Non-drive end
132...225	Locating bearing	Non-locating bearing
250...355	Non-locating bearing	Locating bearing

Terminal Box Details

Frame Size	Terminal box position	No of terminals	Terminal bolt size	Max. conductor cross section (mm ²)	Hole for cable entry (BSC)
80	Top	6	M4	4	3/4"
90	Top	6	M4	4	3/4"
100	Top	6	M4	10	1"
112	Top	6	M4	10	1"
132	Top	6	M5	16	1"
160	Top	6	M5	16	1"
180	Top	6	M6	35	1"
200	Top	6	M8	50	1-1/4"
225	Top	6	M8	50	1-1/4"
250	Top	6	M10	150	2"
280	Top	6	M10	150	2"
315	Top	6	M12	240	2-1/2"
355	Top	6	M16	300	3"



TEFC 3 Phase Squirrel Cage Induction Motors - Frame size 80 to 355L

Applicable standard for testing & efficiency determination: IS 15999

Voltage : 415V+/-10%
 Frequency : 50Hz+/-5%
 Combined Variation : +/-10%

Ambient : 50 °C
 Duty : S1 (Continuous)
 3000 rpm (2-Pole)

Ins. Class : F
 Temp. Rise : B
 Protection : IP55

Rated Output		Frame size	Rated Speed	Rated Current	Rated Torque	Operating Characteristics at Rated output				With DOL Starting			Rotor GD ²	motor weight		
						Power Factor		% Efficiency		Starting Current to Rated Current Ratio	Starting Torque to Rated Torque Ratio	Pullout Torque to Rated Torque Ratio			kgm ²	kg
kW	HP	IEC	RPM	Amps.	Kg.m	FL	3/4L	1/2L	FL	3/4L	1/2L	FL	3/4L	1/2L	kgm ²	kg
0.75	1	80	2840	1.54	0.26	0.84	0.80	0.68	80.7	80.7	78.0	80.7	80.7	78.0	0.009	17
1.1	1.5	80	2840	2.20	0.38	0.84	0.80	0.68	82.7	82.7	80.0	82.7	82.7	80.0	0.011	18
1.5	2	90S	2885	2.88	0.51	0.86	0.81	0.70	84.2	84.2	83.2	84.2	84.2	83.2	0.013	25
2.2	3	90L	2885	4.10	0.74	0.87	0.83	0.75	85.9	85.9	85.9	85.9	85.9	85.9	0.016	27
3.7	5	100L	2890	6.74	1.25	0.87	0.82	0.70	87.8	87.8	87.3	87.8	87.8	87.3	0.021	37
5.5	7.5	132S	2960	9.86	1.81	0.87	0.84	0.75	89.2	89.2	87.8	89.2	89.2	87.8	0.134	79
7.5	10	132S	2960	13.3	2.47	0.87	0.84	0.75	90.1	90.1	88.7	90.1	90.1	88.7	0.150	82
9.3	12.5	160M	2945	16.6	3.08	0.86	0.83	0.76	90.7	90.7	88.7	90.7	90.7	88.7	0.190	120
11	15	160M	2945	19.5	3.64	0.86	0.83	0.76	91.2	91.2	89.2	91.2	91.2	89.2	0.220	127
15	20	160M	2945	26.1	4.96	0.87	0.84	0.77	91.9	91.9	90.0	91.9	91.9	90.0	0.300	144
18.5	25	160L	2945	31.7	6.12	0.88	0.86	0.79	92.4	92.4	90.8	92.4	92.4	90.8	0.374	161
22	30	180M	2960	37.5	7.24	0.88	0.84	0.78	92.7	92.7	91.0	92.7	92.7	91.0	0.500	192
30	40	200L	2970	51.4	9.84	0.87	0.85	0.79	93.3	93.3	91.5	93.3	93.3	91.5	0.910	306
37	50	200L	2970	63.1	12.1	0.87	0.85	0.79	93.7	93.7	92.0	93.7	93.7	92.0	1.13	315
45	60	225M	2970	74.0	14.8	0.90	0.88	0.82	94.0	94.0	93.0	94.0	94.0	93.0	2.11	475
55	75	250M	2970	91.2	18.0	0.89	0.86	0.80	94.3	94.3	93.0	94.3	94.3	93.0	2.60	550
75	100	280S	2970	121	24.6	0.91	0.89	0.86	94.7	94.7	92.7	94.7	94.7	92.7	3.08	675
90	120	280M	2970	145	29.5	0.91	0.89	0.86	95.0	95.0	93.0	95.0	95.0	93.0	3.69	760
110	150	315S	2985	183	35.9	0.88	0.86	SA	95.2	95.2	93.2	95.2	95.2	93.2	5.00	940
132	180	315M	2985	219	43.1	0.88	0.86	0.80	95.4	95.4	93.4	95.4	95.4	93.4	6.20	1100
150	200	315L	2985	248	48.9	0.88	0.86	0.80	95.5	95.5	93.5	95.5	95.5	93.5	7.70	1390
160	215	315L	2985	265	52.2	0.88	0.86	0.80	95.6	95.6	93.6	95.6	95.6	93.6	7.70	1390
180	240	355L	2987	284	58.7	0.92	0.89	0.86	95.7	95.7	93.7	95.7	95.7	93.7	12.0	1680
200	270	355L	2988	316	65.2	0.92	0.89	0.84	95.8	95.8	93.8	95.8	95.8	93.8	12.0	1680
225	335	355L	2987	355	73.4	0.92	0.89	0.84	95.8	95.8	93.8	95.8	95.8	93.8	12.0	1680
250	335	355L	2988	395	81.5	0.92	0.90	0.86	95.8	95.8	93.8	95.8	95.8	93.8	14.7	1870
280	375	355L	2987	442	91.3	0.92	0.90	0.86	95.8	95.8	93.8	95.8	95.8	93.8	14.7	1870

Note : Efficiency class 'IE3' will be punched on the nameplate as per IS:12615-2011
 All performance values are subject to tolerance as per IS/IEC 60034-1

TEFC 3 Phase Squirrel Cage Induction Motors - Frame size 80 to 355L

Applicable standard for testing & efficiency determination: IS 15999

Voltage : 415V+/-10%

Frequency : 50Hz+/-5%

Combined Variation : +/-10%

Ambient : 50 °C

Duty : S1(Continuous)

1500 rpm (4-Pole)

Ins. Class : F

Temp. Rise : B

Protection : IP55

Rated Output		Frame size IEC	Rated Speed RPM	Rated Current Amps.	Rated Torque Kg.m	Operating Characteristics at Rated output				With DOL Starting				Rotor GD ² kgm ²	motor weight kg	
kW	HP					Power Factor		% Efficiency		Starting Current to Rated Current Ratio	Starting Torque to Rated Torque Ratio	Pullout Torque to Rated Torque Ratio				
		FL	3/4L	1/2L	FL	3/4L	1/2L	FL	3/4L	1/2L	FL	3/4L	1/2L			
0.75	1	80.00	1430	1.62	0.51	0.78	0.74	0.60	82.5	82.5	82.5	5.0	2.6	2.8	0.015	19
1.1	1.5	90S	1425	2.22	0.75	0.82	0.78	0.68	84.1	84.1	84.1	5.5	2.8	3.3	0.017	24
1.5	2	90L	1425	2.98	1.03	0.82	0.78	0.68	85.3	85.3	85.3	5.5	2.8	3.3	0.023	28
2.2	3	100L	1440	4.53	1.49	0.78	0.74	0.60	86.7	86.7	85.8	6.0	2.5	3.0	0.028	35
3.7	5	112M	1455	7.28	2.48	0.80	0.74	0.60	88.4	88.4	86.5	6.5	3.0	3.5	0.066	49
5.5	7.5	132S	1470	10.4	3.64	0.82	0.78	0.68	89.6	89.6	89.0	6.5	2.6	3.0	0.141	75
7.5	10	132M	1470	13.9	4.97	0.83	0.78	0.68	90.4	90.4	90.4	6.5	2.6	3.3	0.193	87
9.3	12.5	160M	1470	17.3	6.16	0.82	0.77	0.68	91.0	91.0	90.0	6.5	2.7	3.2	0.340	124
11	15	160M	1470	20.4	7.29	0.82	0.77	0.68	91.4	91.4	90.8	6.5	2.7	3.2	0.375	135
15	20	160L	1470	27.3	9.94	0.83	0.78	0.70	92.1	92.1	91.1	6.5	2.7	3.2	0.520	153
18.5	25.0	180M	1470	31.9	12.3	0.87	0.84	0.76	92.6	92.6	92.0	6.5	2.5	3.0	0.750	200
22	30	180L	1470	37.8	14.6	0.87	0.84	0.76	93.0	93.0	92.5	6.5	2.5	3.0	0.860	220
30	40	200L	1475	51.3	19.8	0.87	0.84	0.77	93.6	93.6	91.5	6.5	2.6	3.0	1.38	295
37	50	225S	1482	66.0	24.3	0.83	0.80	0.74	93.9	93.9	93.4	6.0	2.0	2.6	2.30	400
45	60	225M	1482	80.1	29.6	0.83	0.80	0.74	94.2	94.2	93.6	6.0	2.0	2.6	2.83	430
55	75	250M	1480	96.3	36.2	0.84	0.80	0.72	94.6	94.6	93.8	6.0	2.0	2.6	3.06	500
75	100	280S	1485	128	49.2	0.86	0.82	0.74	95.0	95.0	94.5	6.5	2.5	3.0	5.53	670
90	120	280M	1485	153	59.0	0.86	0.82	0.74	95.2	95.2	95.0	6.5	2.5	3.0	6.36	735
110	150	315S	1488	189	72.0	0.85	0.82	0.74	95.4	95.4	95.9	6.8	2.5	3.0	11.7	965
132	180	315M	1488	226	86.4	0.85	0.82	0.74	95.6	95.6	94.1	6.8	2.5	3.0	14.0	1115
160	215	315L	1490	277	105	0.84	0.80	0.72	95.8	95.8	94.5	6.6	2.5	3.0	15.6	1225
180	240	315L	1491	311	118	0.84	0.80	0.72	95.9	95.9	94.6	6.6	2.7	3.0	17.8	1290
200	270	315L	1491	345	131	0.84	0.80	0.72	96.0	96.0	95.0	6.6	2.7	3.0	17.8	1290
225	300	355L	1490	375	147	0.87	0.83	0.72	96.0	96.0	95.0	6.0	1.7	2.4	23.3	1680
250	335	355L	1492	416	163	0.87	0.83	0.72	96.0	96.0	95.0	6.5	1.8	2.4	32.7	1855
315	422	355L	1492	525	206	0.87	0.83	0.72	96.0	96.0	95.0	6.5	1.8	2.4	37.9	2025

Note : Efficiency class 'IE3' will be punched on the nameplate as per IS:12615-2011
All performance values are subject to tolerance as per IS/IEC 60034-1

TEFC 3 Phase Squirrel Cage Induction Motors - Frame size 90 to 355L

Applicable standard for testing & efficiency determination: IS 15999

Voltage : 415V+/-10%

Frequency : 50Hz+/-5%

Combined Variation : +/-10%

Ambient : 50 °C

Duty : S1(Continuous)

1000 rpm (6-Pole)

Ins. Class : F

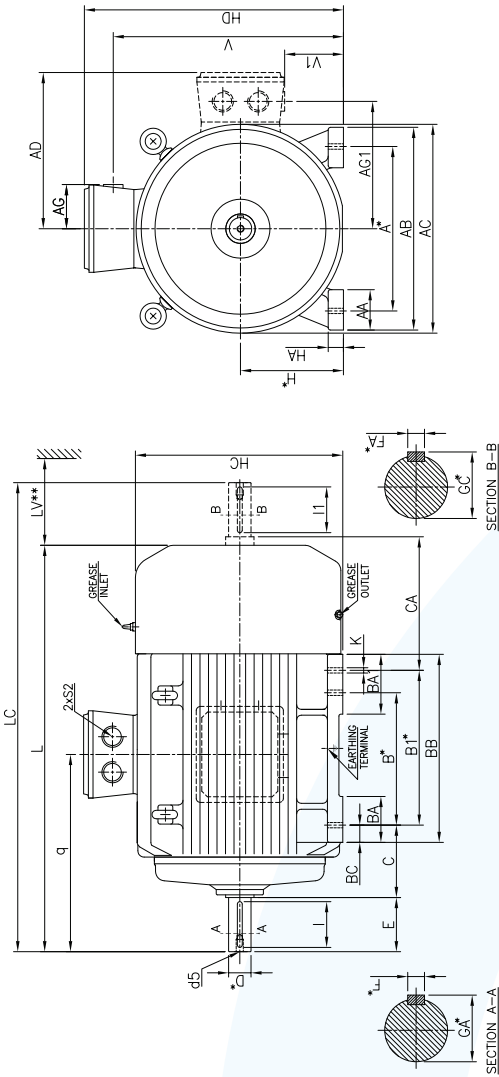
Temp. Rise : B

Protection : IP55

Rated Output		Frame size IEC	Rated Speed RPM	Rated Current Amps.	Rated Torque Kg.m	Operating Characteristics at Rated output						With DOL Starting			Rotor GD ² kgm ²	motor weight kg
						Power Factor			% Efficiency			Starting Current to Rated Current Ratio	Starting Torque to Rated Torque Ratio	Pullout Torque to Rated Torque Ratio		
kW	HP					FL	3/4L	1/2L	FL	3/4L	1/2L					
0.75	1	90S	945	1.84	0.77	0.72	0.62	0.52	78.9	78.9	78.9	4.0	2.1	2.5	0.017	25
1.1	1.5	90L	945	2.62	1.13	0.72	0.62	0.52	81.0	81.0	81.0	4.0	2.1	2.5	0.025	27
1.5	2	100L	935	3.51	1.56	0.72	0.62	0.54	82.5	82.5	82.5	4.5	2.3	2.5	0.029	36
2.2	3	112M	960	4.84	2.23	0.75	0.70	0.58	84.3	84.3	81.0	6.0	2.3	2.5	0.074	50
3.7	5	132S	965	7.44	3.73	0.80	0.75	0.64	86.5	86.5	86.5	5.0	1.8	2.3	0.202	72
5.5	7.5	132M	965	11.1	5.55	0.78	0.74	0.62	88.0	88.0	88.0	5.0	1.8	2.3	0.276	83
7.5	10	160M	970	14.6	7.53	0.80	0.76	0.68	89.1	89.1	89.1	5.5	2.5	3.0	0.450	125
9.3	12.5	160L	975	18.0	9.29	0.80	0.76	0.68	89.8	89.8	89.8	5.5	2.5	3.0	0.560	138
11	15	160L	975	21.2	11.0	0.80	0.76	0.68	90.3	90.3	90.3	5.5	2.5	3.0	0.646	145
15	20	180L	977	27.6	15.0	0.83	0.78	0.72	91.2	91.2	91.2	5.5	2.5	3.0	1.20	210
18.5	25	200L	977	32.3	18.4	0.87	0.83	0.75	91.7	91.7	91.5	6.5	2.6	3.2	1.81	295
22	30	200L	977	37.7	21.9	0.88	0.85	0.76	92.2	92.2	92.2	6.5	2.6	3.2	2.10	302
30	40	225M	984	51.1	29.7	0.88	0.84	0.77	92.9	92.9	92.5	6.5	3.0	3.5	3.51	410
37	50	250M	982	62.0	36.7	0.89	0.86	0.79	93.3	93.3	92.8	6.5	2.8	3.2	3.72	528
45	60	280S	984	78.6	44.5	0.85	0.80	0.72	93.7	93.7	92.9	6.0	2.6	3.2	5.11	573
55	75	280M	984	93.5	54.4	0.87	0.84	0.78	94.1	94.1	93.2	6.0	2.6	3.2	6.16	620
75	100	315S	992	130	73.6	0.85	0.82	0.72	94.6	94.6	93.6	6.0	2.5	3.0	10.7	830
90	120	315M	992	155	88.4	0.85	0.82	0.72	94.9	94.9	93.9	6.0	2.5	3.0	12.4	912
110	150	315M	992	189	108	0.85	0.82	0.72	95.1	95.1	94.2	6.0	2.5	3.0	15.5	1010
132	180	315L	992	229	130	0.84	0.80	0.72	95.4	95.4	94.4	6.0	2.5	3.0	18.0	1175
160	215	355L	990	277	157	0.84	0.81	0.71	95.6	95.6	93.0	6.0	2.0	2.5	28.7	1670
180	240	355L	990	319	177	0.82	0.78	0.66	95.7	95.7	94.0	6.0	2.0	2.5	28.7	1670
200	270	355L	991	346	197	0.84	0.80	0.70	95.8	95.8	94.1	6.0	2.0	2.5	35.5	1780
250	335	355L	991	432	246	0.84	0.80	0.70	95.8	95.8	94.1	6.0	2.0	2.5	43.3	1995

Note : Efficiency class 'IE3' will be punched on the nameplate as per IS:12615-2011
All performance values are subject to tolerance as per IS/IEC 60034-1

Dimensional Drawing: Industrial Motors Type 3H Foot Mounted (B3) TEFC (IE3) series Frame 80-355L



IEC Fr. Size	Pole	FIXING										GENERAL										TERMINAL BOX										SHAFT									
		A*	B*	B1*	C	H*	K*	AB	BB	AA	BA	BA1	BC	HA	HC	HD	AD	L	LC	CA	LV**	AC	V	q	AG	V1	AG1	S2 BSC	DA*	D*	DA*	E	EA	F*	FA*	GA*	GC*	I	I1	d5	
80	2,4&6	125	100	—	50	80	10	150	124	32	36	—	12	12	168	220	—	292	335	100	30	174	191	118	40	—	—	3/4"	19	40	6	21.5	35	M6							
90S/L	2,4&6	140	100	125	56	90	10	168	150	34	38	61	12.5	12	188	240	—	355	410	129	35	195	209	138	52	—	—	3/4"	24	50	8	27	45	M8							
100L	2&4 6	160	140	—	63	100	12	190	174	43.5	36	—	21	12	198	257	179	387 366	469 448	146 125	40	195	225	152	56	66	138	1"	28	60	8	31	55	M10							
112M	4&6	190	140	—	70	112	12	220	174	47	36	—	21	12	222	282	191	419	502	172	45	220	249	157	56	80	151	1"	28	60	8	31	55	M10							
132S/M	2,4&6	216	140	178	89	132	12	256	218	50	53	91	20	17	279	340	208	533	618	191	50	294	305	204	63	69	173	1"	38	80	10	41	70	M12							
160M/L	2,4&6	254	210	254	108	160	15	310	294	58	70	105	20	20	334	398	238	673	790	208	60	348	363	345	63	97	203	1"	42	110	12	45	105	M16							
180M/L	2,4&6	279	241	279	121	180	15	344	319	65	70	108	20	26	377	470	290	728	845	225	70	394	414	371	97	83	234	1 1/2"	48	110	14	51.5	100	M16							
200M/L	2,4&6	318	267	305	133	200	19	398	355	85	85	120	25	32	419	536	336	803	920	262	80	438	468	396	155	—	268	2"	55	110	16	59	100	M20							
225S/M	2 4&6	356	286	311	149	225	19	437	361	85	85	85	25	34	461	579	354	855 885	972 1032	292	90	472	511	445	155	—	286	2"	55	110	16	59	100	M20							
250M	2 4&6	406	349	—	168	250	24	506	425	100	115	—	49	42	495	665	415	983 914	1134 1065	337 268	100	489	578	352	243	—	328	2"	60	140	18	64	130	M20							
280S/M	2 4&6	457	368	419	190	280	24	540	490	100	110	149	40	42	552	725	445	1010	1160	271	115	544	638	360	243	—	358	2"	65	140	18	69	130	M20							
315S/M	2 4&6	508	406	457	216	315	28	625	540	120	120	155	46	45	615	830	515	1137 1167	1293 1353	240	130	604	728	416	278	—	413	2"	65	140	18	69	130	M20							
315L	2 4&6	508	508	—	216	315	28	625	593	120	120	—	46	45	615	830	515	1302 1332	1458 1518	454	130	604	728	416	278	—	413	2 1/2"	65	140	18	69	130	M20							
355L	2 4&6	610	630	—	254	355	28	710	770	110	170	—	73	45	693	939	584	1461 1491	1622 1682	458	145	695	850	434 464	403	—	495	3"	75	140	20	79.5	130	M24							

