

“AT” Drives 1 through 200 HP Models AT-140 Through AT-440



Description

Dynumatic Model AT Drives is a combination of an air-cooled, adjustable speed clutch and a flange mounted AC induction motor. The AT Drive transmits torque at variable speeds. There is no physical contact between input and output members. This results in smooth response, thereby eliminating shock loading and extending equipment life. All drives have an integral tachometer generator mounted around the output shaft to provide a feedback signal to the drive's controller. The controller provides the DC excitation for the clutch coil. The feedback signal from the tachometer generator is used as a reference signal within the controller to maintain accurate speed regulation.

Features & Benefits

- AC power input – AT drives and controllers are available to run on virtual any 3-phase voltage input, which makes them compatible with existing wiring and plant power.
- Approximately 250% motor torque available at clutch output. Accelerates high inertia loads quickly and handles intermittent overloads without having to increase the horsepower rating.
- AT drives are built to give long, reliable, low-cost life in diverse applications, including harsh environments.
- Simple design – Drive consists of a clutch, AC induction motor and separate controller. This makes them easy to understand, install, operate and maintain.
- Fewer wearing parts – All AT variable speed drives have only four bearings and no slip rings or brushes. This prevents downtime and allows maximum production from initial startup.
- 0.5% speed regulation is standard. Provides a consistent, high quality product under changing load and environmental conditions.
- Uses existing wiring and motor starters. Easy to retrofit in industrial environments.
- Totally enclosed fan-cooled AC motor is standard, which makes it suitable for harsh environments.

ADJUSTABLE SPEED DRIVES

“AT” Drives 1 through 200 HP Specifications for AT-140 Through AT-440

Motor	<p>HP and RPM Totally Enclosed Fan Cooled (TEFC) NEMA Design B Class F insulation, Class B rise 1.15 service factor Input Power Options</p>	<p>See selection table - Page 41 Standard Standard Standard Standard 208/220 through 380V, 3 phase, 50 Hz 230 through 460V, 3 phase, 60 Hz 575V, 3 phase, 60 Hz</p>
Clutch	<p>Stationary coil Coil voltages Rated for constant torque Starting torque Intermittent torque AC tachometer generator Cooling</p>	<p>Standard 45 or 90 VDC - Standard Standard Approximately 250% Approximately 250% Standard 100% self-ventilated</p>
Status Indication	<p>Speed indicating signal</p>	<p>0-60 VAC from tachometer generator for optional meter</p>
Environmental Ratings	<p>Storage temperature Operating temperature Maximum operating temperature Altitude</p>	<p>-4° to 149° F (-20° to 65° C) Standard 32° to 104° F (0° to 40° C) Standard (Others available; consult factory) 150° F (De-rating required) 3300 Ft. (1000 m) Standard</p>
Codes and Standards	<p>Mechanical NEMA, as applicable</p>	<p>Standard</p>
Reliability Testing	<p>Mechanical 100% dynamometer tested Controllers (sold separately) Pre-tested components Computer test and pre-calibrated PCBs</p>	<p>Standard Standard Standard</p>

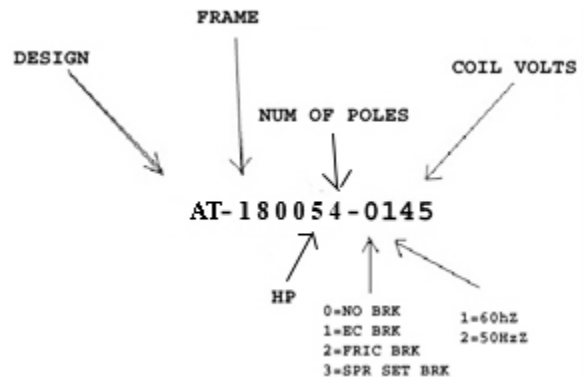
ADJUSTABLE SPEED DRIVES

“AT” Drives 1 through 200 HP Ordering Information

Selection Table - 60 Hz 45V & 90V Coil

HP	Speed Range (RPM)	Model Number	Motor Frame Size
1	1690-50	AT-140014-01*	145TC
2	1650-50	AT-140024-01*	145TC
3	1680-50	AT-180034-01*	182TC
5	1650-50	AT-180054-01*	184TC
7.5	1660-350	AT-180074-01*	213TC
	1680-50	AT-210074-01*	213TC
10	1655-175	AT-210104-01*	215TC
15	1625-700	AT-210154-01*	254TC
	1690-50	AT-250154-01*	254TD
20	1665-350	AT-250204-01*	256TD
25	1705-50	AT-320254-01*	326TD
	1092-50	AT-320256-01*	326TD
30	1705-50	AT-320304-01*	326TD
	1097-50	AT-320306-01*	326TD
40	1665-50	AT-320404-01*	326TD
	1082-233	AT-320406-01*	365TD
50	1700-175	AT-320504-01*	326TD
	1122-50	AT-360506-01*	365TD
60	1690-438	AT-320604-01*	365TD
	1670-50	AT-360604-01*	365TD
	1102-214	AT-360606-01*	405TD
75	1665-700	AT-320754-01*	405TD
	1705-163	AT-360754-01*	405TD
	1097-156	AT-440756-01*	405TD
100	1675-560	AT-361004-01*	405TD
	1685-175	AT-441004-01*	405TD
	1112-408	AT-441006-01*	445TD
125	1650-798	AT-361254-01*	445TD
	1690-490	AT-441254-01*	449TD
	1097-560	AT-441256-01*	449TD
150	1695-700	AT-441504-01*	449TD
200	1660-963	AT-442004-01*	449TD

*The last two digits of the model code represent the 0145 and 0190 coil.



ADJUSTABLE SPEED DRIVES

“AT” Drives 1 through 200 HP Drive Engineering Data

Adjustable Speed Drive Data

Model	Clutch Torque Lb. Ft. at Slip RPM of ¹					Rated Dissipation HP at Input RPM of ²					Inertia Lb. Ft. Sq. Output Member
	50	75	100	150	1750	900	1000	1200	1500	1800	
AT-140	4.5	6.0	7.2	9.5	25.0	1.6	1.8	2.0	2.6	3.0	0.9
AT-180	10.0	13.5	16.0	21.0	46.0	3.3	3.6	4.1	5.2	6.0	2.0
AT-210	19.0	25.0	32.0	44.0	74.0	5.0	5.3	6.2	7.8	9.0	3.6
AT-250	42.0	56.0	68.0	82.0	115.0	8.8	9.5	11.0	14.0	16.0	6.2
AT-320	70.0	110.0	140.0	185.0	460.0	24.5	27.0	32.0	39.0	45.0	30.5
AT-320C ⁴	140.0	200.0	250.0	300.0	550.0	24.5	27.0	32.0	39.0	45.0	30.5
AT-360	130.0	170.0	210.0	250.0	640.0	39.0	42.5	49.0	59.0	68.0	55.0
AT-360C	230.0	320.0	370.0	440.0	700.0	39.0	42.5	49.0	59.0	68.0	55.0
AT-440	325.0	380.0	415.0	485.0	860.0	51.0	56.0	65.0	78.0	90.0	123.0
AT-440C	450.0	575.0	650.0	760.0	1060.0	51.0	56.0	65.0	78.0	90.0	123.0

Adjustable Speed Drive Data

Model	Motor Frame	Overhung Load Lbs. at Output RPM of ³						45V Clutch Coil Current (Hot Amps)	Approx. Weight Lbs.
		900		1200		1800			
		Std.	Spher.	Std.	Spher.	Std.	Spher.		
AT-140	143T/145T	378	-	378	-	378	-	3.40	150
AT-180	182T/215T	281	-	281	-	281	-	3.90	263
AT-210	213T/254T	790	-	790	-	680	-	3.90	430
AT-250	254T/286T	682	-	682	-	664	-	4.20	630-675
AT-320	326T/365T	1490	1739	1341	1739	1156	1739	7.04	1297-1806
AT-360	365T/405T	2012	2796	1811	2796	1560	2796	8.37	2490-2712
AT-440	405T/447T	3372	3372	3372	3372	3372	3372	8.23	3055-3650

¹ Values are for four-pole motor speeds.

² Indicates maximum HP that can be safely dissipated at a given input speed. Dissipation should be de-rated 10% for each 10° F (5.5° C) above 100° F (38° C) ambient, to 149° F (71° C) maximum ambient.

³ Values are based on B-10 bearing life of 15,000 hours. For 20,000 hours use 91% of the values shown. The figures are the maximum weights at the center of a standard output shaft keyway perpendicular to the axis. Ratings are for ball bearings or spherical roller bearings, as noted.

⁴ Copper plated drum

ADJUSTABLE SPEED DRIVES

“AT” Drives 1 through 200 HP Engineering Data

Noise Levels - AT Adjustable Speed Drives

These sound pressure levels are typical values given for engineering information only, and it is not guaranteed that any particular production unit will exceed these values.

Microphone 3 feet from side of drive, tested in a semi-anechoic chamber above reflecting plane per IEEE-85. All readings are sound pressure level, dB; reference 20 micro-Newton's per square meter. Average sound pressure in a 3-foot radius hemispherical free field. Noise level for 1200 RPM drives will be 9 dB less than 1800-RPM values shown, and for 3600 RPM the noise level will be 15 dB greater.

Model	RPM	Sound Pressure dB	
		Output Rating	Output Stalled
AT-140	1800	65.0	-
AT-180	1800	72.0	-
AT-210	1800	72.0	-
AT-250	1800	76.0	-
AT-320	1800	83.2	86.4
AT-360	1800	85.9	87.3
AT-440	1800	87.1	89.0

Full Load Motor Currents

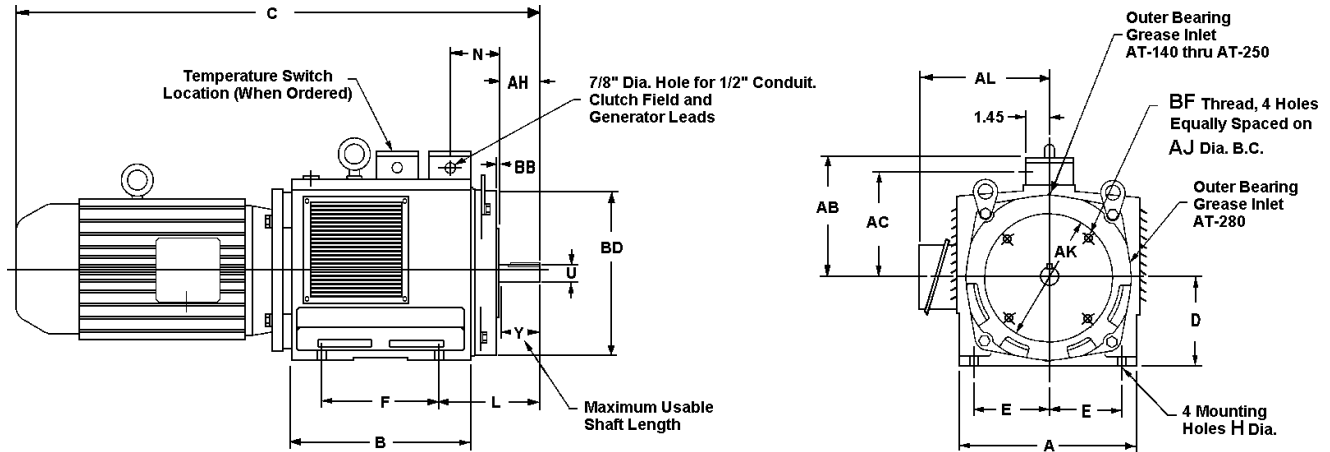
The full load motor currents shown in the following table are typical for 4-pole motors. Full load current for 6-and 8-pole motors will typically be higher than the values listed below. This table is intended for use as an aid in sizing motor branch circuit components. For setting motor over-current protection devices, consult the motor nameplate. For full load motor currents of 200 and 208-volt motors, increase the corresponding 230-volt motor full load current by 15% and 10% respectively. Multi-speed motors will have the full load current varying with speed in which case the nameplate rating shall be used.

HP	Full Load Amperes for 4 Pole Motors at				
	230V	460V	575V	220V	380V
	60Hz	60Hz	60Hz	50Hz	50Hz
1	3.4	1.7	-	3.69	2.1
1.5	5.2	2.6	-	5.48	3.2
2	6.4	3.2	-	6.99	4.0
3	8.8	4.4	-	9.83	5.7
5 ¹	13.2	6.6	-	-	-
7.5	20.4	10.2	-	-	11.7
10	26.2	13.1	-	-	15.8
15	36.2	18.1	-	-	22.0
20	46.0	23.0	-	-	29.0
25	58.0	29.0	-	-	36.0
30	66.0	33.0	-	-	42.0
40	104.0	52.0	41.0	-	-
50	130.0	65.0	52.0	-	-
60	152.0	76.0	61.0	-	-
75	184.0	92.0	74.0	-	-
100	240.0	120.0	96.0	-	-
125	296.0	148.0	118.0	-	-
150	344.0	172.0	138.0	-	-
200	448.0	224.0	179.0	-	-

¹ 184TC Frame

ADJUSTABLE SPEED DRIVES

“AT” Drives 1 through 200 HP Outline Drawings – AT-140 through AT-250



Model	Motor Frame	A	B	C ¹	D ²	E	F	H	L	N	Shaft Extension			AB	AC	AH
											U ³	Y ⁴	KEY			
140	143TC 145TC	8.68	8.41	22.40 24.90	4.50	3.75	5.12	.50	5.00	2.96	.875	1.94	.18 Sq. x 1.38 Lg.	6.81	5.56	2.00
180	182TC 184TC 213TC	10.25	10.07	27.94 28.94 30.56	5.25	4.25	6.25	.50	6.25	3.18	1.125	2.50	.25 Sq. x 1.75 Lg.	7.75	6.50	2.62
210	213TC 215TC 254TC	12.00	10.96	32.06 33.56 36.43	6.25	5.00	6.50	.62	7.62	3.81	1.375	3.00	.31 Sq. x 2.38 Lg.	8.63	7.38	3.12
250	254TD 256TD 284TD	14.00	12.52	38.79 40.54 40.41	7.00	5.50	7.25	.62	8.75	3.41	1.625	3.62	.38 Sq. x 2.88 Lg.	9.63	8.38	3.75

¹ C is approximate overall dimension dependent on motor specified.

² D dimension will never be exceeded. When exact dimension is needed shims up to .03 may be required.

³ U shaft diameter tolerance 1.50" and smaller +.0000/- .0005, over 1.50" +.000/- .001.

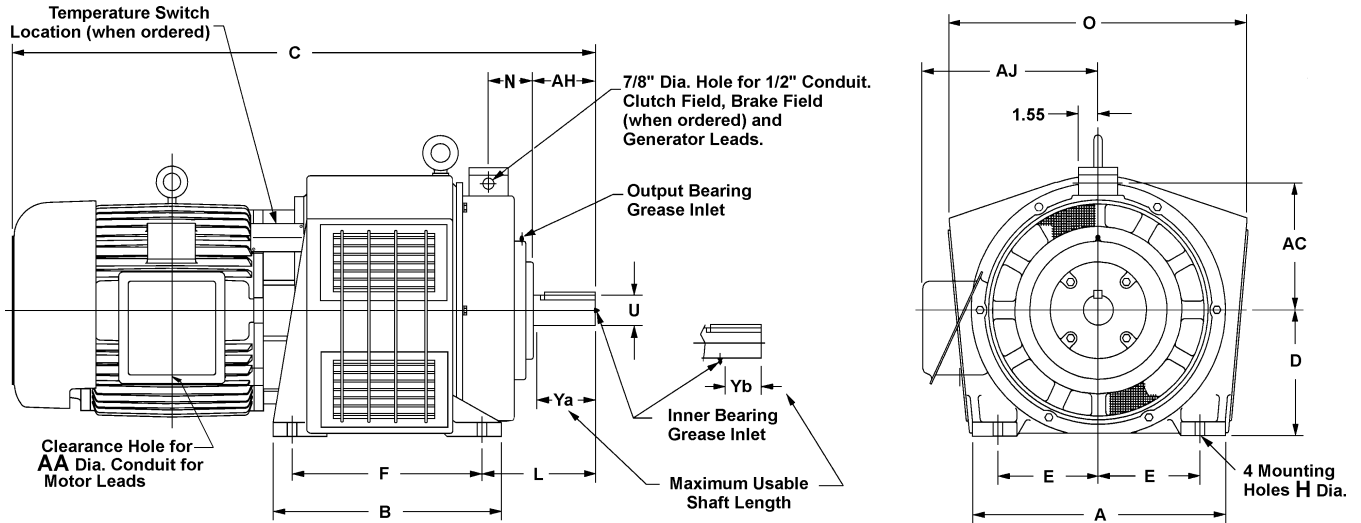
⁴ Y is maximum useable shaft length.

⁵ AK Pilot diameter tolerance +.000/- .002.

Model	Motor Frame	AJ	AK ⁵	AL	BB	BD	BF
140	143TC 145TC	5.88	4.499	5.56	.12	8.38	3/8 - 16
180	182TC 184TC 213TC	7.25	8.499	7.19 7.50	.25	10.06	1/2 - 13
210	213TC 215TC 254TC	7.25	8.499	7.50 8.10	.27	11.82	1/2 - 13
250	254TD 256TD 284TD	7.25	8.499	10.00 12.31	.27	13.32	1/2 - 13

ADJUSTABLE SPEED DRIVES

“AT” Drives 1 through 200 HP Outline Drawings – AT-320 through AT-440



Model	Motor Frame	A	B	C	D ¹	E	F	H	L	N	O	Shaft Extension		
												U ²	Ya ³	Yb ³
320 (STD)	326T	20.00	18.00	49.50	10.00	8.00	15.00	.75	9.00	3.29	23.60	2.375	4.75	2.88
	365T			51.50										
360 (STD)	365T	22.00	23.00	56.18	11.00	9.00	20.00	.88	14.00	5.78	25.76	2.875	6.44	4.62
	405T			63.12										
	445T			71.75										
440 (STD)	405T	24.00	24.00	67.50	12.00	10.00	21.00	.88	17.14	6.80	28.72	3.375	8.26	5.62
	445T			76.10										
	449T			84.14										

Model	Motor Frame	KEY	AA ⁴	AB	AC	AH	AJ
320 (STD)	326T	.62 Sq. x 4.00 Lg.	2.00	11.25	10.00	4.88	13.18
	365T		3.00				16.68
360 (STD)	365T	.75 Sq. x 6.00 Lg.	3.00	12.37	11.12	6.57	16.68
	405T						17.68
	445T						19.75
440 (STD)	405T	.88 Sq. x 7.50 Lg.	3.00	13.87	12.62	8.58	17.94
	445T						19.56
	449T						19.56

¹ D dimension will never be exceeded. When exact dimension is needed, shims up to .03 inch may be required.

² U shaft diameter tolerance: +.000/- .001 inch. Diameter shown is standard.

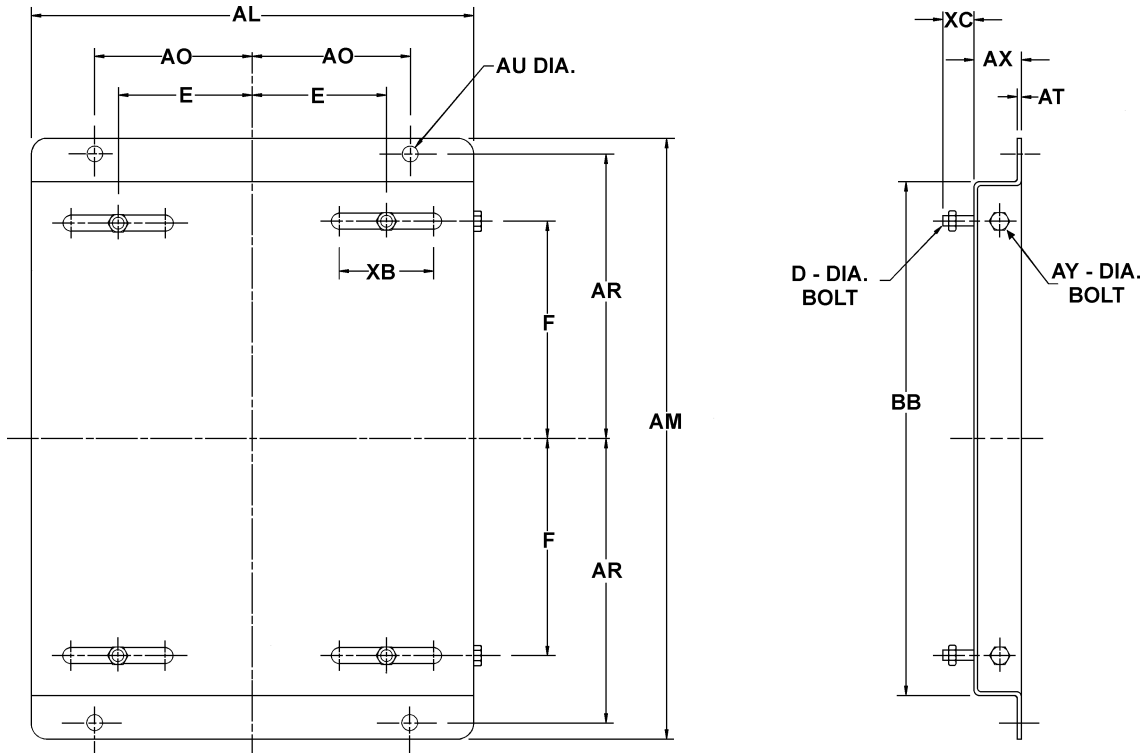
³ Y Dimensions are usable shaft lengths: Ya grease fitting on end; Yb grease fitting on side.

⁴ Conduit box can be turned to any of four positions: horizontally, vertically, opposite side or on top on request. To get weights on above units, please contact the factory.

Smaller diameter shafts of 2.125 for Model 320 and 2.375 for Model 360 are available upon request.

ADJUSTABLE SPEED DRIVES

“AT” Drives 1 through 200 HP Outline Drawings – Adjustable Slide Base Models AT-140 - 440



Adjustable Slide Base for Dynamatic Model AT-140 Through AT-440 Drives with Motor

Model	Base Number	D-Bolt	E	F	AL	AM	AO	AR	AT	AU
AT-140	81453-0100	3/8 x 3.00 Lg.	3.75	2.56	12.75	11.50	4.50	5.00	.134	.50
AT-180	81453-0200	3/8 x 3.00 Lg.	4.25	3.12	14.00	13.00	5.00	6.00	.134	.50
AT-210	81453-0300	1/2 x 3.00 Lg.	5.00	3.25	16.00	14.00	6.00	6.50	.164	.50
AT-250	81453-0400	1/2 x 3.00 Lg.	5.50	3.62	18.00	16.50	7.00	7.25	.187	.62
AT-320	64131-0200	5/8 x 3.00 Lg.	8.00	7.50	28.75	25.12	10.00	11.25	.250	.88
AT-360	64131-0300	3/4 x 3.00 Lg.	9.00	10.00	31.25	30.12	11.00	13.75	.320	.88
AT-440	64131-0500	3/4 x 3.00 Lg.	10.00	10.50	35.00	33.00	12.50	15.00	.320	1.00

Model	Base Number	AX	AY-Bolt	BB	XB	XC
AT-140	81453-0100	1.50	1/2 Dia.	8.50	3.00	1.00
AT-180	81453-0200	1.50	1/2 Dia.	10.00	3.00	1.00
AT-210	81453-0300	1.75	1/2 Dia.	11.00	3.50	1.25
AT-250	81453-0400	2.00	5/8 Dia.	12.50	4.00	1.25
AT-320	64131-0200	3.00	3/4 x 11.00 Lg.	18.75	7.00	2.50
AT-360	64131-0300	3.00	3/4 x 14.00 Lg.	24.75	7.50	2.50
AT-440	64131-0500	3.50	7/8 x 16.00 Lg.	25.75	8.00	2.50