

NT Motor 230 V

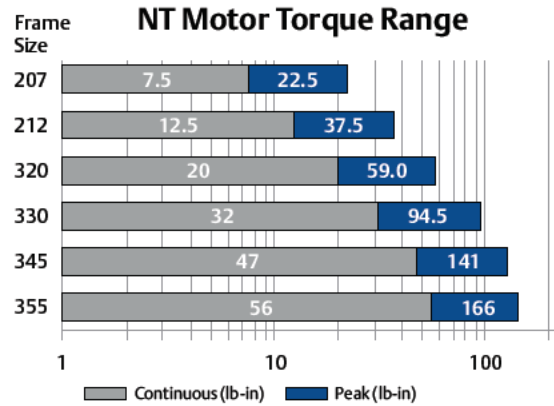
Compact NEMA or Metric Flange AC Servo Motors

The NT motor is a compact, high performance brushless AC Servo motor designed to maximize torque and minimize size. The NT motor uses powerful magnets and is manufactured with a segmented core to maximize stator efficiency.

These motors are available with direct motor-to-drive connector terminations for Control Techniques' brand Unidrive M, Digitax ST and Epsilon EP servo drives – cable lengths up to 20 ft are available.

Key Features

- Torque range: 7.5 to 56 lb-in (0.85 to 6.3 Nm)
- Very low inertia for high acceleration and cycle rates
- English (NEMA 23 or 34) or Metric (IEC 72-1) flanges
- Available with or without holding brakes
- Direct connect available – no additional cables required!
- Flying-lead cabling option (ex: NTE-320-LONS-0005) with improved ingress protection; flying leads are available with or without MS connectors
- IP65 conformance (IP67S and IP68S optional)
- Standard 2048 encoder
- Installed shaft seal are standard with all motors
- Optional white epoxy food-grade finish



NT Motor 230 V Order Information

Use the information below to create an order code for an NT Motor (top row is an example).

NT	E	2	07	T	B	N	S	DP	10
Motor	Mounting Flange	Frame Size (in)	Rated Torque (lb-in)	Lead Configuration	Brake (24 V)	Feedback Device	Inertia	Feedback Cable Connectors / Optional Finish	Cable Length
NT	E = English M = Metric	2 = 2" ¹ 3 = 3" ³	2-in frame 07 = 7.5 12 = 12.5 3-in frame 20 = 20 30 = 32 45 = 47 55 = 56	IP65 C = MS connector L = Flying leads (no connectors) T = MS style connector on flying leads IP67S IP68S F = Flying lead and white epoxy food-grade finish	O = Unbraked B = Holding Brake	N = Incremental encoder 2048 ppr	S = Low	Lead Configuration C, L, T, E 00 = Std. configuration Lead Configuration T DP = Flying lead with molded 15-pin feedback connector to Digitax ST, Unidrive SP and Epsilon EP Lead Configurations C, L, T, E, F E0 = White epoxy food-grade finish applied to standard motor*	Lead Configuration C, L, T, E 00 = Std. configuration Lead Config L, T And F 05 = 5-ft leads 10 = 10-ft leads 15 = 15-ft leads 20 = 20-ft leads XX = Custom lengths available up to 20 ft max. in 2-ft increments

*Include this code when ordering "F" type lead configuration

Approvals



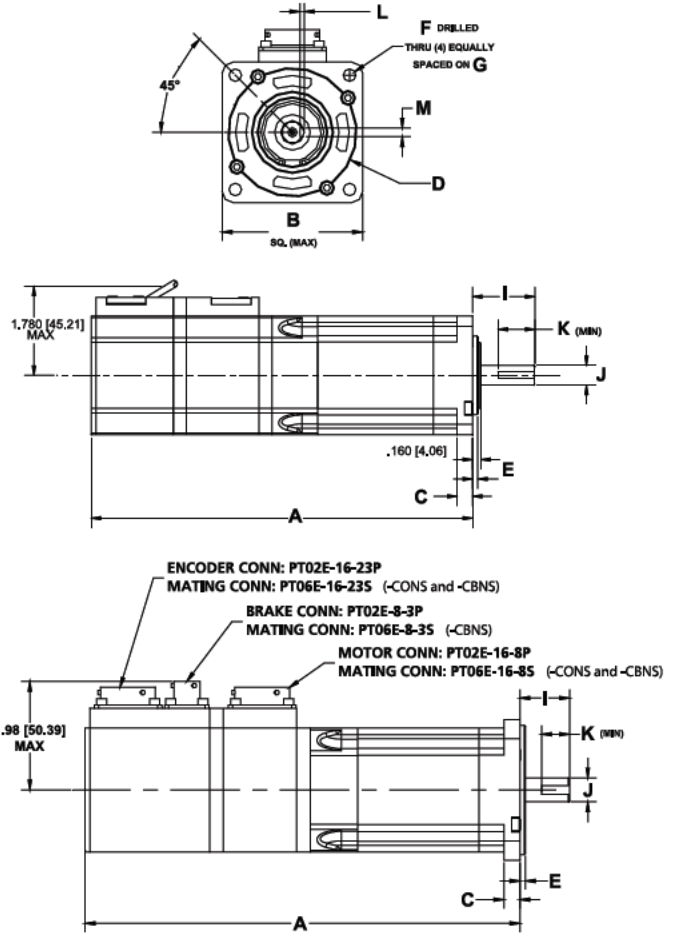
NOTES:
¹2 = 2-in NEMA 23
³3 = 3-in NEMA 34

NT Motor 2-inch Frame Ratings and Dimensions

Motor Frame Size (in)	2		
Voltage (Vrms)	230		
Model	NT-207	NT-212	
Continuous Stall Torque (lb-in)	7.5	12.5	
Continuous Stall Torque (Nm)	0.85	1.4	
Peak Torque (lb-in)	22.5	37.5	
Peak Torque (Nm)	2.54	4.24	
Inertia (lb-in-sec ²)	0.000094	0.000164	
Inertia (kgm ²)	0.0000106	0.0000185	
Cogging (lb-in) (typ.)	0.094	0.12	
Cogging (Nm) (typ.)	0.011	0.014	
Motor Weight (lbs)	3.0	4.0	
Motor Weight (kg)	1.36	1.81	
5000 rpm	Kt (lb-in/A) =	5.12	5.08
	Kt (Nm/A) =	0.58	0.57
	Ke (V/k rpm) =	35	34.7
Rated Torque (lb-in)	7.50	12.50	
Rated Torque (Nm)	0.85	1.4	
Stall Current (A)	1.7	2.7	
Rated Power (kW)	0.432	0.740	
R (ph-ph) (Ohms)	11.1	4.56	
L (ph-ph) (mH)	39.1	18.9	

NOTES:

- Δt= 212 °F (100 °C) winding 104 °F (40 °C) maximum ambient; all data subject to +/-10% tolerance
- Stall torque, rated torque and power relate to maximum continuous operation above 10 kHz drive switching frequency
- Maximum intermittent winding temperature is 284 °F (140 °C)



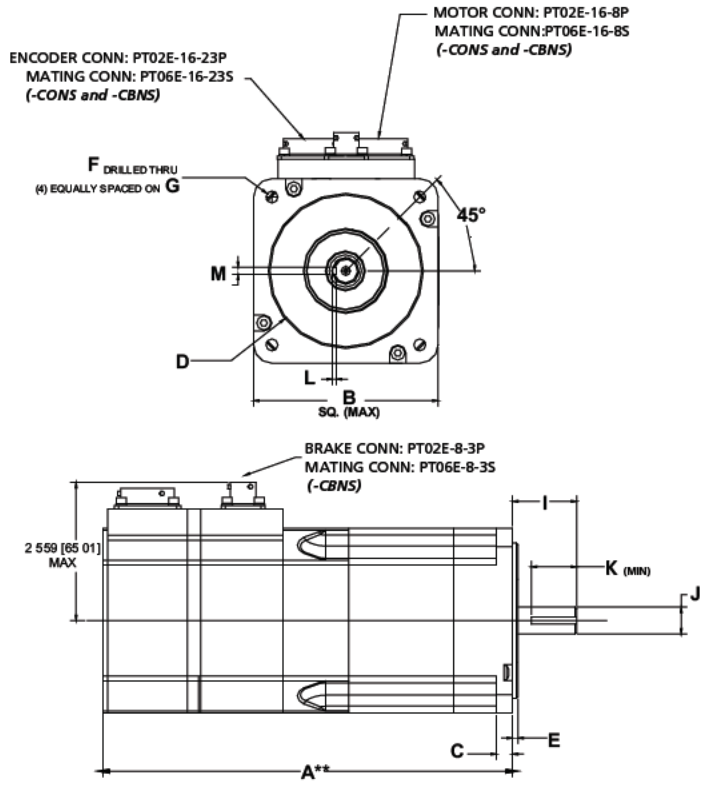
Motor Dimensions	English Flange				Metric Flange				
	NTE-207		NTE-212		NTM-207		NTM-212		
	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	
Unbraked Length — CONS/EONS*	5.55	141.0	6.55	166.4	5.55	141.0	6.55	166.4	
Braked Length — TONS/LONS/FONS	4.39	111.5	5.39	136.9	4.39	111.5	5.39	136.9	
Unbraked Length — CBNS/EBNS*	6.94	176.4	7.94	201.8	6.94	176.4	7.94	201.8	
Braked Length — TBNS/LBNS/FBNS	6.28	159.4	7.94	201.8	6.28	159.4	7.28	184.8	
Flange Square	B	2.27	57.7	2.27	57.7	2.57	65.2	2.57	65.2
Flange Thickness	C	0.29	7.5	0.29	7.5	0.29	7.5	0.29	7.5
Pilot Diameter	D	1.50	38.1	1.50	38.1	2.36	60.0	2.36	60.0
Pilot Thickness	E	0.10	2.5	0.10	2.5	0.10	2.5	0.10	2.5
Bolt Hole Diameter	F	0.21	5.2	0.21	5.2	0.23	5.8	0.23	5.8
Bolt Circle Diameter	G	2.63	66.7	2.63	66.7	2.95	75.0	2.95	75.0
Connector Height — CONS	H	1.92	48.9	1.92	48.9	1.92	48.9	1.92	48.9
Connector Height — TONS/LONS		1.78	45.2	1.78	45.2	1.78	45.2	1.78	45.2
Connector Height — CBNS		1.98	50.4	1.98	50.4	1.98	50.4	1.98	50.4
Connector Height — TBNS/LBNS		1.78	45.2	1.78	45.2	1.78	45.2	1.78	45.2
Shaft Length	I	1.21	30.7	1.21	30.7	0.93	23.5	0.93	23.5
Shaft Diameter	J	0.37	9.5	0.37	9.5	0.43	11.0	0.43	11.0
Shaft Key Dimensions					Shaft Key Dimensions				
Keyway Length (min)	K	0.70	17.8	0.70	17.8	0.51	13.0	0.51	13.0
Keyway Depth	L	0.08	2.0	0.08	2.0	0.08	2.1	0.08	2.1
Keyway Width	M	0.13	3.2	0.13	3.2	0.16	4.0	0.16	4.0

NOTE:

*Not all variations are represented above; see our website for complete mechanical dimension drawings

NT Motor 3-inch Frame Ratings and Dimensions

Motor Frame Size (in)	3			
Voltage (Vrms)	230			
Model	NT-320	NT-330	NT-345	NT-355
Continuous Stall Torque (lb-in)	19.7	31.5	47.5	55.5
Continuous Stall Torque (Nm)	2.2	3.56	5.31	6.27
Inertia (lb-in-sec ²)	0.000328	0.000438	0.000668	0.000888
Inertia (kgm ²)	0.000037	0.000049	0.000075	0.000100
Peak Torque (lb-in)	59.0	94.5	141.0	166.0
Peak Torque (Nm)	6.67	10.68	15.93	18.75
Cogging (lb-in) (typ.)	0.18	0.315	0.47	0.555
Cogging (Nm) (typ.)	0.020	0.036	0.053	0.063
Motor Weight (lbs)	6.0	7.3	10.0	12.3
Motor Weight (kg)	2.72	3.31	4.54	5.58
3000 rpm	Kt (lb-in/A) =		7.13	7.30
	Kt (Nm/A) =		0.806	0.825
	Ke (V/k rpm) =		50.0	50.0
	Rated Torque (lb-in)		47.0	55.5
Rated Torque (Nm)		5.31	6.27	
Stall Current (A)		6.59	7.6	
Rated Power (kW)		1.668	1.97	
R (ph-ph) (Ohms)		1.3	1.0	
L (ph-ph) (mH)		17.0	13.0	
4000 rpm	Kt (lb-in) =	3.50	5.04	
	Kt (Nm/A) =	0.40	0.569	
	Ke (V/k rpm) =	29.0	36.0	
	Rated Torque (lb-in)	16.0	31.6	
	Rated Torque (Nm)	1.8	3.56	
	Stall Current (A)	5.4	6.25	
	Rated Power (kW)	0.757	1.49	
	R (ph-ph) (Ohms)	1.5	1.2	
	L (ph-ph) (mH)	16.0	15.0	



NOTES:

- Δt= 212 °F (100 °C) winding 104 °F (40 °C) maximum ambient; all data subject to +/-10% tolerance
- Stall torque, rated torque and power relate to maximum continuous operation above 10 kHz drive switching frequency
- Max. intermittent winding temperature is 284 °F (140 °C)

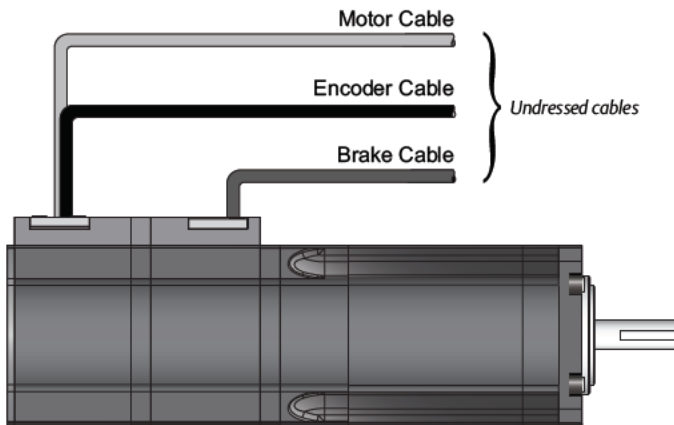
Motor Dimensions	English Flange								Metric Flange							
	NTE-320		NTE-330		NTE-345		NTE-355		NTM-320		NTM-330		NTM-345		NTM-355	
	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)
Unbraked Length — CONS/EONS*	5.22	132.5	5.82	147.8	7.02	178.3	9.42	239.2	5.22	132.5	5.82	147.8	7.02	178.3	9.42	239.2
Braked Length — TONS/LONS/FONS	5.22	132.5	5.82	147.8	7.02	178.3	9.43	239.6	5.22	132.5	5.82	147.8	7.02	178.3	9.43	239.6
Unbraked Length — CBNS/EBNS*	7.24	184.0	7.84	199.2	9.04	229.7	11.44	290.7	7.24	184.0	7.84	199.2	9.04	229.7	11.44	290.7
Braked Length — TBNS/LBNS/FBNS	7.24	184.0	7.84	199.2	9.04	229.7	11.44	290.7	7.24	184.0	7.84	199.2	9.04	229.7	11.44	290.7
Flange Square	B	3.42	86.9	3.42	86.9	3.42	86.9	3.42	86.9	3.42	86.9	3.42	86.9	3.42	86.9	3.42
Flange Thickness	C	0.30	7.6	0.30	7.6	0.30	7.6	0.30	7.6	0.30	7.6	0.30	7.6	0.30	7.6	0.30
Pilot Diameter	D	2.88	73.0	2.88	73.0	2.88	73.0	2.88	73.0	3.15	80.0	3.15	80.0	3.15	80.0	3.15
Pilot Thickness	E	0.10	2.5	0.10	2.5	0.10	2.5	0.10	2.5	0.12	3.0	0.12	3.0	0.12	3.0	0.12
Bolt Hole Diameter	F	0.22	5.6	0.22	5.6	0.22	5.6	0.22	5.6	0.28	7.0	0.28	7.0	0.28	7.0	0.28
Bolt Circle Diameter	G	3.88	98.4	3.88	98.4	3.88	98.4	3.88	98.4	3.94	100.0	3.94	100.0	3.94	100.0	3.94
Connector Height — CONS		2.45	62.2	2.45	62.2	2.45	62.2	2.45	62.2	2.45	62.2	2.45	62.2	2.45	62.2	2.45
Connector Height — TONS/LONS		2.35	59.7	2.35	59.7	2.35	59.7	2.35	59.7	2.35	59.7	2.35	59.7	2.35	59.7	2.35
Connector Height — CBNS		2.56	65.0	2.56	65.0	2.56	65.0	2.56	65.0	2.56	65.0	2.56	65.0	2.56	65.0	2.56
Connector Height — TBNS/LBNS		2.50	63.5	2.50	63.5	2.50	63.5	2.50	63.5	2.50	63.5	2.50	63.5	2.50	63.5	2.50
Shaft Length	I	1.21	30.7	1.21	30.7	1.21	30.7	1.21	30.7	1.21	30.7	1.21	30.7	1.21	30.7	1.21
Shaft Diameter	J	0.50	12.7	0.50	12.7	0.50	12.7	0.50	12.7	0.55	14.0	0.55	14.0	0.55	14.0	0.55
Shaft Key Dimensions																
Keyway Length (min)	K	0.84	21.3	0.84	21.3	0.84	21.3	0.84	21.3	0.79	20.0	0.79	20.0	0.79	20.0	0.79
Keyway Depth	L	0.08	2.0	0.08	2.0	0.08	2.0	0.08	2.0	0.10	2.6	0.10	2.6	0.10	2.6	0.10
Keyway Width	M	0.13	3.2	0.13	3.2	0.13	3.2	0.13	3.2	0.20	5.1	0.20	5.1	0.20	5.1	0.20

NOTE:

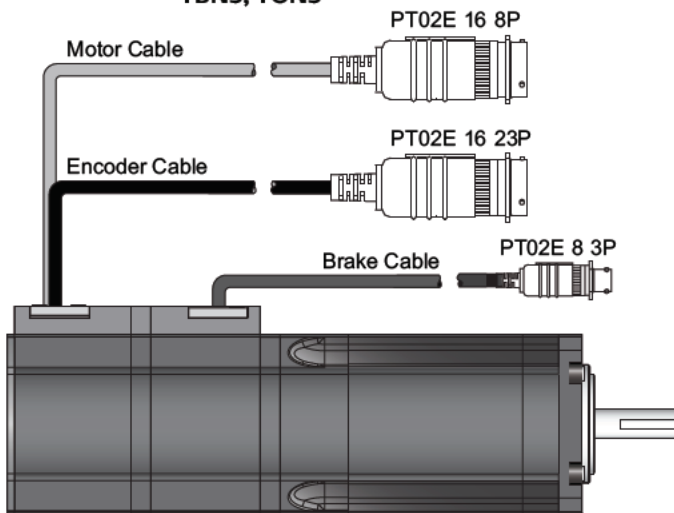
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NT Motor Flying Lead and Connector Details

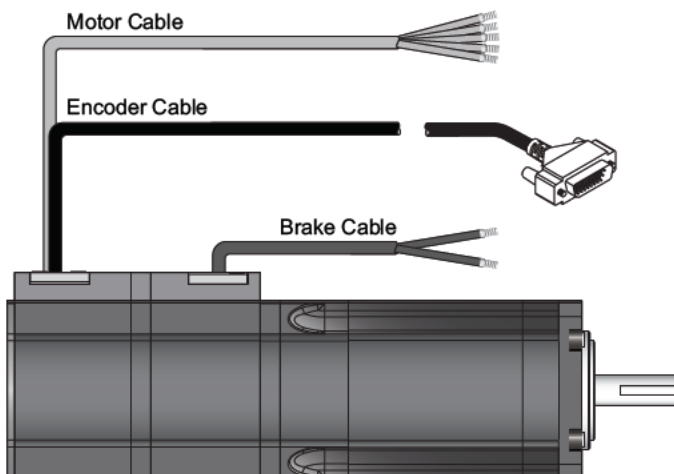
LBNS, LONS



TBNS, TONS



TBNS-DP, TONS-DP

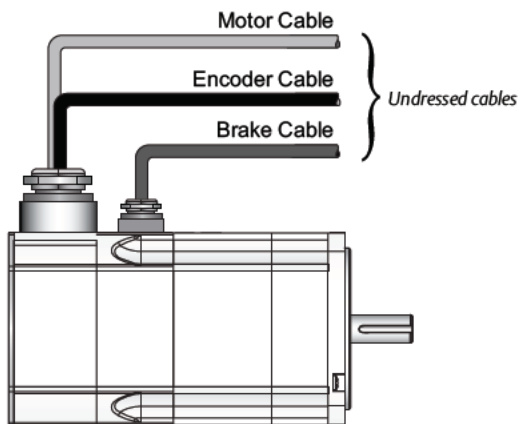


NOTE:

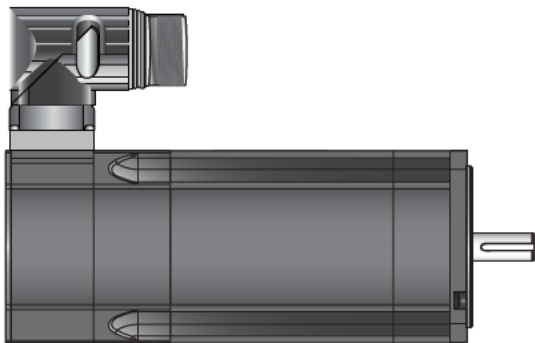
DP models include connector terminations specifically for Unidrive M, Unidrive SP, Epsilon EP and Digitax ST (DP-15)

NT Motor Flying Lead and Connector Details

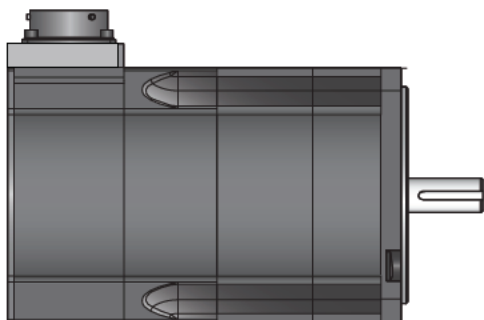
FBNS, FONS



EBNS, EONS



CBNS, CONS



NT Motor Selection Considerations

Feedback Options

Feedback Device Order Code	Feedback Type	Encoder Supply Voltage	SinCos or Incremental Pulses per Revolution	Resolution Available to Position Loop	Feedback Accuracy
-T_NS, -C_NS, -L_NS, -E_NS, -F_NS	Incremental Encoder	5 Vdc	2048	16384 (14 bits)	±600 arc sec.

Motor Selection

Motor Derating

Any adverse operating conditions require that the motor performance be derated. These conditions include ambient temperature above 104 °F (40 °C), motor mounting position, drive switching frequency or a drive oversized for the motor.

Drive Switching Frequency

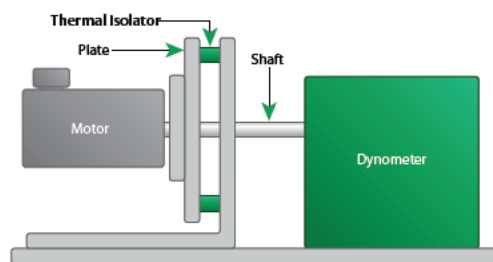
Most drive current ratings are reduced at higher switching frequencies. See individual drive manuals for details.

Mounting Arrangements

In general, motor torque should be derated if the motor mounting surface is heated from an external source such as a gearbox, the motor is connected to a poor thermal conductor, or the motor is mounted in a confined space with restricted air flow.

Thermal Test Conditions

The performance data shown was recorded with an ambient temperature of 68 °F (20 °C) and the motor mounted on a thermally-isolated aluminum plate.



Motor Model	Frame Size	Mounting Plate Dimensions
NT	2"	6" x 6" x ¼"
	3"	10" x 10" x ¾"

NT Motor Holding Brake Specifications

Motor Frame Size (in)	Power Supply (Vdc)	Current (A)	Static Torque (lb-in) (Nm)		Mechanical Release Time (ms)	Mechanical Engagement Time (ms)	Added Inertia (lb-in-sec ²) (kgm ²)	
2	24	0.33	20.0	2.26	28.0	14.0	0.000106	0.000012
3	24	0.65	88.5	10.0	43.0	13.0	0.000968	0.000109

Brake Operation

Do not apply the brake while the motor shaft is rotating. The brake can only take a limited number of emergency braking operations and must not be used for repeated dynamic braking.

Thermal Protection

Thermistor protection to 284 °F (140 °C) is built into the motor windings and gives an indication of serious overheating problems. **The installer must connect the thermistor to the drive. Failure to do so will invalidate the motor warranty if winding burns out.**

Environmental Conditions

Any liquids or gases that may come into contact with the motor must be confirmed to ensure compliance with the correct international standards.

Ingress Protection

All NT Motors have shaft seals installed as standard. Standard models have an ingress rating (IP rating) of IP65. Lead configuration "E" models are rated IP67S. Configuration "F" models are rated IP68S.