



ECM OPERATION MANUAL

FOR USE WITH MODELS:

CHX3-75N	CDX3-75N
CHX3-100N	CDX3-100N
CHX3-125N	CDX3-125N

⚠WARNING: IF YOU DO NOT FOLLOW THE SAFETY PRECAUTIONS BELOW AND IN THIS MANUAL, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY, OR LOSS OF LIFE.

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

WHAT TO DO IF YOU SMELL GAS:

- DO NOT TRY TO LIGHT ANY APPLIANCE.
- DO NOT TOUCH ANY ELECTRICAL SWITCH; DO NOT USE ANY PHONE IN YOUR BUILDING.
- LEAVE THE BUILDING IMMEDIATELY.
- IMMEDIATELY CALL YOUR GAS SUPPLIER FROM A NEIGHBOR'S PHONE. FOLLOW THE GAS SUPPLIER'S INSTRUCTIONS.
- IF YOU CANNOT REACH YOUR GAS SUPPLIER; CALL THE FIRE DEPARTMENT.

INSTALLATION AND SERVICE MUST BE PERFORMED BY A QUALIFIED INSTALLER, SERVICE AGENCY OR THE GAS SUPPLIER. (REFERRED TO IN THESE INSTRUCTIONS AS A QUALIFIED HEATING CONTRACTOR).

PLEASE READ THESE INSTRUCTIONS PRIOR TO INSTALLATION, INITIAL FIRING, AND BEFORE PERFORMING ANY SERVICE OR MAINTENANCE. THESE INSTRUCTIONS MUST BE LEFT WITH THE HOMEOWNER AND SHOULD BE RETAINED FOR FUTURE REFERENCE BY QUALIFIED SERVICE PERSONNEL.

THERMO PRODUCTS, LLC.
BOX 217
NORTH JUDSON, IN 46366
PHONE: (574) 896-2133

MADE IN USA



All installations and services must be performed by qualified service personnel.

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All installations and services must be performed by qualified service personnel.

I. FURNACE SPECIFICATIONS (SHIPPED SETTINGS)

CHX3 SERIES

MODEL NO.	CHX3-75	CHX3-100	CHX3-125
HEAT INPUT RATE IN BTU/HR (High fire/ Low fire)	75,000 / 52,000	100,000 / 70,000	125,000 / 87,500
HEATING CAPACITY IN BTU/HR (High fire/ Low fire)	70,875 / 49,612	94,500 / 66,150	117,500 / 82,250
HEIGHT OF CASING	44-1/4"	44-1/4"	44-1/4"
WIDTH OF CASING	17"	21"	24"
DEPTH OF CASING	27-1/2"	27-1/2"	27-1/2"
WARM AIR OUTLET	15 x 18	19 x 18	22 x 18
RETURN AIR INLET	25 x 16	25 x 16	25 x 16
DIA. OF FLUE	2"	3"	3"
DIA. OF COMBUSTION AIR INTAKE	2"	3"	3"
FLOWRATE from .2" & .5" w.c. EXTERNAL STATIC PRESSURE	COOLING	COOLING	COOLING
@COOLING TAP A (CFM)	1000	1200	1400
@COOLING TAP B (CFM)	800	1000	1200
@COOLING TAP C (CFM)	1200	1400	1600
@COOLING TAP D (CFM)	1400	1600	2000
	HEATING	HEATING	HEATING
@HEATING TAP A (CFM @High fire/Low fire)	931 / 760	1243 / 1015	1556 / 1270
TEMPERATURE RISE (°F)	70 / 60	70 / 60	70 / 60
BLOWER MOTOR HP	.5	.75	1
POWER CHOKES	-	2.65 Mh	2.1 Mh
LARGEST RECOMMENDED AIR CONDITIONER	3.5 Ton	4 Ton	5 Ton
SIZE OF FILTERS	24-3/4" x 15-3/4"	24-3/4" x 15-3/4"	24-3/4" x 19-3/4"

NOTES:

1. Heating capacity based on annual fuel utilization efficiency rated by manufacturer.
2. On all outlet and inlet dimensions, the first dimension is width.
3. Electrical characteristics at 115 volts, 60 Hz., 1 phase (less than 15 amps, for all models).
4. All specifications are subject to change without notice.

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CDX3 SERIES

MODEL NO.	CDX3-75	CDX3-100	CDX3-125
HEATING INPUT RATE IN BTU/HR (High fire / Low fire)	75,000 / 56,250	100,000 / 75,000	125,000 / 93,750
HEATING CAPACITY IN BTU/HR (High fire / Low fire)	69,750 / 52,312	93,000 / 69,750	116,250 / 87,187
HEIGHT OF CASING	46-1/4"	46-1/4"	46-1/4"
WIDTH OF CASING	17"	21"	24"
DEPTH OF CASING	27-1/2"	27-1/2"	27-1/2"
WARM AIR OUTLET	15 x 18	19 x 18	22 x 18
RETURN AIR INLET	15 x 22	19 x 22	22 x 22
DIA. OF FLUE	2"	3"	3"
DIA. OF COMBUSTION AIR INTAKE	2"	3"	3"
FLOWRATE from .2" & .5" w.c. EXTERNAL STATIC PRESSURE	COOLING	COOLING	COOLING
@COOLING TAP A (CFM)	1000	1200	1400
@COOLING TAP B (CFM)	800	1000	1200
@COOLING TAP C (CFM)	1200	1400	1600
@COOLING TAP D (CFM)	1400	1600	2000
	HEATING	HEATING	HEATING
@HEATING TAP C (CFM @ High fire / Low fire)	1012 / 826	1340 / 1094	1673 / 1366
TEMPERATURE RISE (°F)	65 / 60	65 / 60	65 / 60
BLOWER MOTOR HP	.5	.75	1
POWER CHOKES	-	2.65Mh	2.1Mh
LARGEST RECOMMENDED AIR CONDITIONER	3.5 Ton	4 Ton	5 Ton
SIZE OF FILTERS	21-3/4" x 14"(2)	21-3/4" x 14"(2)	21-3/4" x 14"(2)

NOTES:

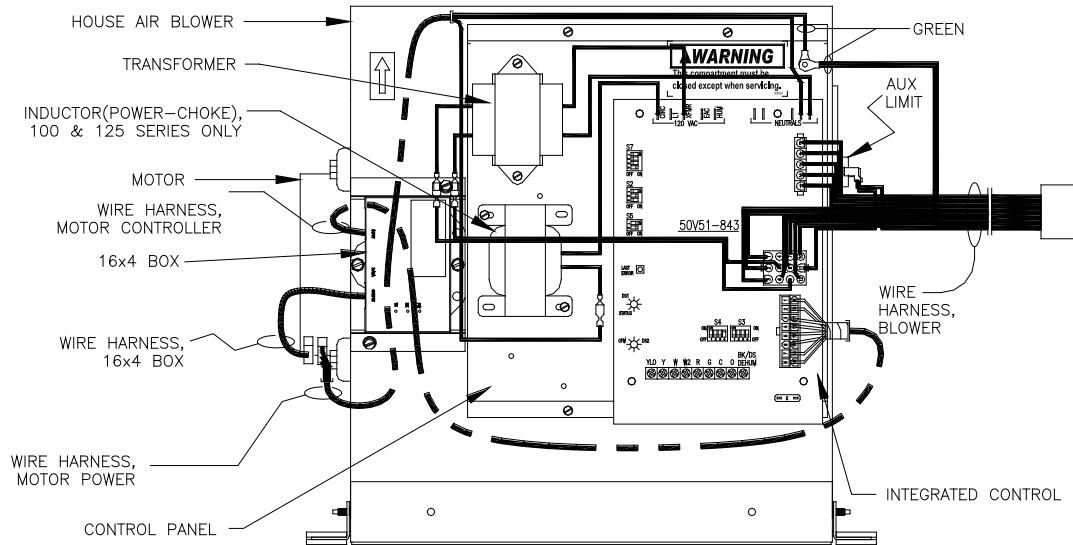
1. Heating capacity based on annual fuel utilization efficiency rated by manufacturer.
2. On all outlet and inlet dimensions, the first dimension is width.
3. Electrical characteristics at 115 volts, 60 Hz., 1 phase (less than 15 amps. for all models).
4. All specifications are subject to change without notice.

All installations and services must be performed by qualified service personnel.

II. BLOWER INFORMATION

A. WIRING

NOTE: CDX3-125 SERIES WITH ULTRATECH MOTOR SHOWN. OTHER UNITS WILL DIFFER SLIGHTLY AS NOTED.



NOTE: CDX3-125 SERIES WITH 2.3/5.0 ECM SHOWN. OTHER UNITS WILL DIFFER SLIGHTLY AS NOTED.

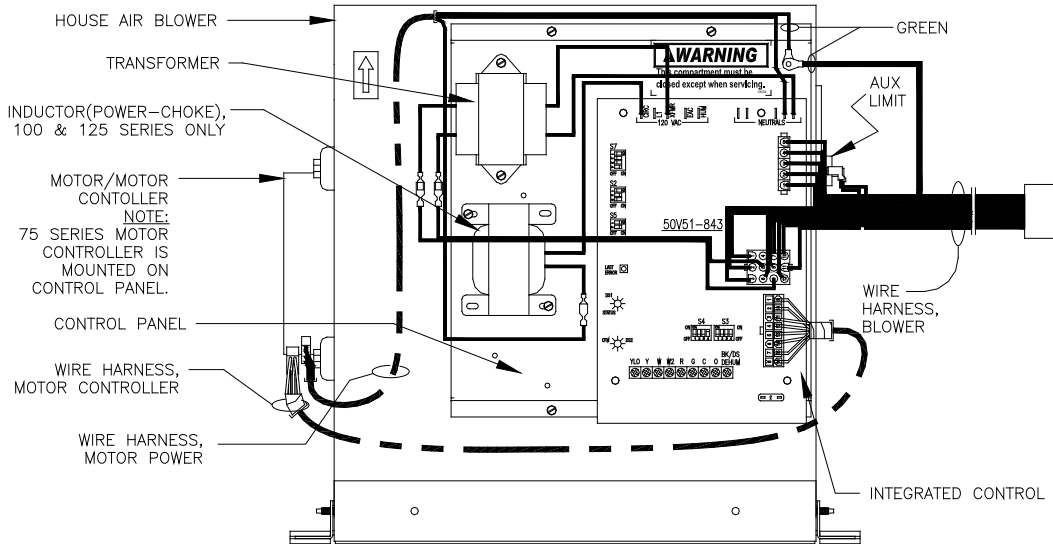


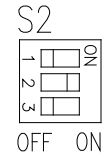
Figure 1: BLOWER WIRING

⚠ WARNING: TURN OFF THE ELECTRICAL POWER to the furnace before attempting to disconnect blower wiring.

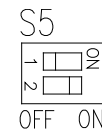
All installations and services must be performed by qualified service personnel.

Option DIP Switch settings:

S2 DIP Switch			
	Switch Settings		
All Furnace Models	S2-1	S2-2	S2-3
	Off	On	Off

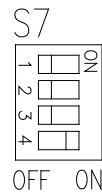


S5 DIP Switch		
	Switch Settings	
All Furnace Models	S5-1	
	Off *	
	On	
De-humidifier	S5-2	Dehumidistat
	Off	Installed
	On	Not Installed *



* Factory Setting

S7 DIP Switch			
	Switch Settings		Options
Thermostat Type and W2 Delay	S7-1	S7-2	Time
	Off	Off	Off *
	On	Off	10 Min
	Off	On	Auto
Heat Fan Off Delay	On	On	20 Min
	S7-3	S7-4	Time
	Off	Off	90 Sec
	Off	On	120 Sec *
	On	Off	150 Sec
On	On	180 Sec	



* Factory Setting / 2 Stage Thermostat setting

For S3 and S4 DIP switches refer to CFM tables in the following section.

All installations and services must be performed by qualified service personnel.

B. CFM TABLES

The following tables contain blower speed settings and their respective airflow rates for the ECM blower motor. To change airflow rates from that of the shipped settings, use the respective S3 and S4 dip switches on the furnace's integrated control board (see Figure 1).

S4 DIP SWITCH - HEATING SPEED SELECTIONS

CHX3-75								
Dip switch settings	Low fire CFM	Rise (°F)	Static Pressure (Amps / Watts)		High Fire CFM	Rise (°F)	Static Pressure (Amps / Watts)	
			0.2	0.5			0.2	0.5
S4-3 OFF S4-4 OFF	760	60	1.4 / 109	2.1 / 175	931	70	2.0 / 163	2.8 / 239
S4-3 ON S4-4 OFF	708	65	1.2 / 95	1.9 / 154	867	75	1.7 / 138	2.4 / 205
S4-3 OFF S4-4 ON	826	55	1.7 / 132	2.3 / 195	1012	65	2.3 / 197	3.1 / 269
S4-3 ON S4-4 ON	909	50	1.9 / 155	2.7 / 227	1114	59	2.8 / 238	3.3 / 289
CHX3-100								
Dip switch settings	Low fire CFM	Rise (°F)	Static Pressure (Amps / Watts)		High Fire CFM	Rise (°F)	Static Pressure (Amps / Watts)	
			0.2	0.5			0.2	0.5
S4-3 OFF S4-4 OFF	1015	60	1.8 / 151	2.7 / 230	1243	70	2.6 / 221	3.6 / 314
S4-3 ON S4-4 OFF	947	64	1.7 / 136	2.4 / 206	1160	75	2.3 / 192	3.2 / 278
S4-3 OFF S4-4 ON	1094	56	2.1 / 180	3.0 / 258	1340	65	2.1 / 269	4.2 / 374
S4-3 ON S4-4 ON	1184	51	2.4 / 209	3.4 / 299	1450	60	3.7 / 327	4.7 / 428
CHX3-125								
Dip switch settings	Low fire CFM	Rise (°F)	Static Pressure (Amps / Watts)		High Fire CFM	Rise (°F)	Static Pressure (Amps / Watts)	
			0.2	0.5			0.2	0.5
S4-3 OFF S4-4 OFF	1270	60	2.9 / 247	3.8 / 343	1556	70	4.5 / 406	5.5 / 508
S4-3 ON S4-4 OFF	1185	64	2.5 / 218	3.4 / 300	1452	75	3.9 / 354	4.7 / 436
S4-3 OFF S4-4 ON	1366	56	3.4 / 294	4.4 / 385	1673	65	5.3 / 481	6.3 / 581
S4-3 ON S4-4 ON	1480	51	3.9 / 354	4.9 / 431	1813	60	6.3 / 580	7.5 / 693
=FACTORY SETTING								

NOTE: Electrical data provided for Ultratech motor

All installations and services must be performed by qualified service personnel.

CDX3-75								
Dip switch settings	Low fire CFM	Rise (°F)	Static Pressure (Amps / Watts)		High Fire CFM	Rise (°F)	Static Pressure (Amps / Watts)	
			0.2	0.5			0.2	0.5
S4-3 OFF S4-4 OFF	760	64	1.3 / 104	2.1 / 170	931	70	1.7 / 136	2.6 / 212
S4-3 ON S4-4 OFF	708	69	1.1 / 90	1.9 / 155	867	75	1.5 / 120	2.3 / 197
S4-3 OFF S4-4 ON	826	59	1.4 / 116	2.3 / 197	1012	65	1.9 / 160	2.7 / 231
S4-3 ON S4-4 ON	909	54	1.6 / 128	2.5 / 215	1114	59	2.2 / 190	3.1 / 268
CDX3-100								
Dip switch settings	Low fire CFM	Rise (°F)	Static Pressure (Amps / Watts)		High Fire CFM	Rise (°F)	Static Pressure (Amps / Watts)	
			0.2	0.5			0.2	0.5
S4-3 OFF S4-4 OFF	1015	64	1.5 / 123	2.3 / 182	1243	70	1.8 / 145	2.8 / 242
S4-3 ON S4-4 OFF	947	69	1.3 / 102	2.1 / 176	1160	75	1.6 / 130	2.5 / 218
S4-3 OFF S4-4 ON	1094	60	1.6 / 130	2.5 / 210	1340	65	2.0 / 171	3.0 / 262
S4-3 ON S4-4 ON	1184	55	1.9 / 155	2.8 / 235	1450	60	2.7 / 231	3.8 / 335
CDX3-125								
Dip switch settings	Low fire CFM	Rise (°F)	Static Pressure (Amps / Watts)		High Fire CFM	Rise (°F)	Static Pressure (Amps / Watts)	
			0.2	0.5			0.2	0.5
S4-3 OFF S4-4 OFF	1270	64	2.5 / 205	3.4 / 288	1556	70	3.7 / 320	4.7 / 415
S4-3 ON S4-4 OFF	1185	69	2.2 / 181	3.0 / 250	1452	75	3.4 / 285	4.1 / 365
S4-3 OFF S4-4 ON	1366	60	2.9 / 250	3.8 / 330	1673	65	4.4 / 388	5.4 / 488
S4-3 ON S4-4 ON	1480	55	3.4 / 290	4.2 / 370	1813	60	5.3 / 472	6.4 / 575
=FACTORY SETTING								

NOTE: Electrical data provided for Ultratech motor

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S3 DIP SWITCH - COOLING SPEED SELECTIONS

CHX3-75

SWITCH SETTINGS						COOLING CFM						CONT. FAN CFM
						SINGLE STAGE OR HIGH			LOW STAGE			
						NORMAL CLG	STATIC PRESSURE (AMPS / WATTS)		DEHUM	NORMAL CLG	DEHUM	
0.2	0.5											
TONS	CFM/TON	S3-1	S3-2	S3-3	S3-4							
2	440	ON	OFF	ON	OFF	880	1.8 / 146	2.4 / 206	750	580	490	400
	400	ON	OFF	OFF	OFF	800	1.5 / 121	2.3 / 188	680	530	450	
	360	ON	OFF	OFF	ON	720	1.3 / 104	2.0 / 160	610	480	400	
2.5	440	OFF	OFF	ON	OFF	1100	2.6 / 223	3.5 / 304	940	730	620	500
	400	OFF	OFF	OFF	OFF	1000	2.3 / 193	3.0 / 262	850	660	560	
	360	OFF	OFF	OFF	ON	900	1.8 / 150	2.6 / 218	770	590	500	
3	440	OFF	ON	ON	OFF	1320	3.9 / 343	4.8 / 441	1120	870	740	600
	400	OFF	ON	OFF	OFF	1200	3.2 / 275	4.0 / 355	1020	790	670	
	360	OFF	ON	OFF	ON	1080	2.5 / 213	3.4 / 295	920	710	610	
3.5	440	ON	ON	ON	OFF	1540	5.6 / 508	5.7 / 519	1310	1020	860	700
	400	ON	ON	OFF	OFF	1400	4.4 / 393	5.5 / 494	1190	920	790	
	360	ON	ON	OFF	ON	1260	3.5 / 310	4.6 / 408	1070	830	710	

CHX3-100

SWITCH SETTINGS						COOLING CFM						CONT. FAN CFM
						SINGLE STAGE OR HIGH			LOW STAGE			
						NORMAL CLG	STATIC PRESSURE (AMPS / WATTS)		DEHUM	NORMAL CLG	DEHUM	
0.2	0.5											
TONS	CFM/TON	S3-1	S3-2	S3-3	S3-4							
2.5	440	ON	OFF	ON	OFF	1100	2.0 / 165	2.9 / 250	940	730	620	500
	400	ON	OFF	OFF	OFF	1000	1.8 / 148	2.5 / 217	850	660	560	
	360	ON	OFF	OFF	ON	900	1.5 / 119	2.3 / 191	770	590	500	
3	440	OFF	OFF	ON	OFF	1320	3.0 / 263	3.9 / 351	1120	870	740	600
	400	OFF	OFF	OFF	OFF	1200	2.4 / 202	3.4 / 294	1020	790	670	
	360	OFF	OFF	OFF	ON	1080	2.0 / 161	2.8 / 242	920	710	610	
3.5	440	OFF	ON	ON	OFF	1540	4.0 / 362	5.1 / 470	1310	1020	860	700
	400	OFF	ON	OFF	OFF	1400	3.1 / 274	4.3 / 387	1190	920	790	
	360	OFF	ON	OFF	ON	1260	2.6 / 220	3.6 / 319	1070	830	710	
4	440	ON	ON	ON	OFF	1760	5.4 / 500	6.7 / 623	1500	1160	990	800
	400	ON	ON	OFF	OFF	1600	4.3 / 386	5.5 / 505	1360	1060	900	
	360	ON	ON	OFF	ON	1440	3.4 / 302	4.4 / 393	1220	950	810	

CHX3-125

SWITCH SETTINGS						COOLING CFM						CONT. FAN CFM
						SINGLE STAGE OR HIGH			LOW STAGE			
						NORMAL CLG	STATIC PRESSURE (AMPS / WATTS)		DEHUM	NORMAL CLG	DEHUM	
0.2	0.5											
TONS	CFM/TON	S3-1	S3-2	S3-3	S3-4							
3	440	ON	OFF	ON	OFF	1320	3.2 / 274	4.0 / 358	1120	870	740	600
	400	ON	OFF	OFF	OFF	1200	2.5 / 220	3.4 / 299	1020	790	670	
	360	ON	OFF	OFF	ON	1080	2.2 / 179	2.9 / 255	920	710	610	
3.5	440	OFF	OFF	ON	OFF	1540	4.4 / 385	5.3 / 482	1310	1020	860	700
	400	OFF	OFF	OFF	OFF	1400	3.6 / 314	4.6 / 408	1190	920	790	
	360	OFF	OFF	OFF	ON	1260	2.8 / 250	3.8 / 340	1070	830	710	
4	440	OFF	ON	ON	OFF	1760	5.9 / 551	7.0 / 658	1500	1160	990	800
	400	OFF	ON	OFF	OFF	1600	4.7 / 433	5.7 / 525	1360	1060	900	
	360	OFF	ON	OFF	ON	1440	3.7 / 336	4.6 / 421	1220	950	810	
5	440	ON	ON	ON	OFF	2200	10.1 / 977	10.4 / 1010	1870	1450	1230	1000
	400	ON	ON	OFF	OFF	2000	7.9 / 747	9.2 / 882	1700	1320	1120	
	360	ON	ON	OFF	ON	1800	6.1 / 568	7.2 / 681	1530	1190	1010	

 =FACTORY SETTING

NOTE: Electrical data provided for Ultratech motor

All installations and services must be performed by qualified service personnel.

CDX3-75


SWITCH SETTINGS						COOLING CFM						CONT. FAN CFM
						SINGLE STAGE OR HIGH			LOW STAGE			
						NORMAL CLG	STATIC PRESSURE (AMPS / WATTS)		DEHUM	NORMAL CLG	DEHUM	
0.2	0.5											
TONS	CFM/TON	S3-1	S3-2	S3-3	S3-4	CLG	0.2	0.5	DEHUM	CLG	DEHUM	FAN CFM
2	440	ON	OFF	ON	OFF	880	1.6 / 128	2.4 / 205	750	580	490	400
	400	ON	OFF	OFF	OFF	800	1.4 / 110	2.2 / 185	680	530	450	
	360	ON	OFF	OFF	ON	720	1.2 / 96	2.0 / 164	610	480	400	
2.5	440	OFF	OFF	ON	OFF	1100	2.2 / 189	3.0 / 260	940	730	620	500
	400	OFF	OFF	OFF	OFF	1000	1.9 / 156	2.8 / 242	850	660	560	
	360	OFF	OFF	OFF	ON	900	1.6 / 132	2.5 / 210	770	590	500	
3	440	OFF	ON	ON	OFF	1320	3.2 / 275	4.1 / 358	1120	870	740	600
	400	OFF	ON	OFF	OFF	1200	2.7 / 226	3.5 / 300	1020	790	670	
	360	OFF	ON	OFF	ON	1080	2.2 / 180	3.0 / 260	920	710	610	
3.5	440	ON	ON	ON	OFF	1540	4.5 / 405	5.6 / 509	1310	1020	860	700
	400	ON	ON	OFF	OFF	1400	3.6 / 316	4.6 / 410	1190	920	790	
	360	ON	ON	OFF	ON	1260	2.9 / 250	3.8 / 335	1070	830	710	

CDX3-100

SWITCH SETTINGS						COOLING CFM						CONT. FAN CFM
						SINGLE STAGE OR HIGH			LOW STAGE			
						NORMAL CLG	STATIC PRESSURE (AMPS / WATTS)		DEHUM	NORMAL CLG	DEHUM	
0.2	0.5											
TONS	CFM/TON	S3-1	S3-2	S3-3	S3-4	CLG	0.2	0.5	DEHUM	CLG	DEHUM	FAN CFM
2.5	440	ON	OFF	ON	OFF	1100	1.7 / 142	2.6 / 215	940	730	620	500
	400	ON	OFF	OFF	OFF	1000	1.5 / 120	2.3 / 188	850	660	560	
	360	ON	OFF	OFF	ON	900	1.3 / 102	2.1 / 175	770	590	500	
3	440	OFF	OFF	ON	OFF	1320	2.4 / 205	3.4 / 292	1120	870	740	600
	400	OFF	OFF	OFF	OFF	1200	2.0 / 166	2.9 / 250	1020	790	670	
	360	OFF	OFF	OFF	ON	1080	1.7 / 137	2.5 / 212	920	710	610	
3.5	440	OFF	ON	ON	OFF	1540	3.3 / 288	4.4 / 395	1310	1020	860	700
	400	OFF	ON	OFF	OFF	1400	2.7 / 230	3.8 / 334	1190	920	790	
	360	OFF	ON	OFF	ON	1260	2.2 / 182	3.2 / 272	1070	830	710	
4	440	ON	ON	ON	OFF	1760	4.6 / 412	5.8 / 530	1500	1160	990	800
	400	ON	ON	OFF	OFF	1600	3.6 / 315	4.8 / 433	1360	1060	900	
	360	ON	ON	OFF	ON	1440	2.9 / 250	3.9 / 343	1220	950	810	

CDX3-125

SWITCH SETTINGS						COOLING CFM						CONT. FAN CFM
						SINGLE STAGE OR HIGH			LOW STAGE			
						NORMAL CLG	STATIC PRESSURE (AMPS / WATTS)		DEHUM	NORMAL CLG	DEHUM	
0.2	0.5											
TONS	CFM/TON	S3-1	S3-2	S3-3	S3-4	CLG	0.2	0.5	DEHUM	CLG	DEHUM	FAN CFM
3	440	ON	OFF	ON	OFF	1320	2.5 / 214	3.4 / 298	1120	870	740	600
	400	ON	OFF	OFF	OFF	1200	2.1 / 178	3.0 / 358	1020	790	670	
	360	ON	OFF	OFF	ON	1080	1.8 / 144	2.5 / 213	920	710	610	
3.5	440	OFF	OFF	ON	OFF	1540	3.5 / 310	4.5 / 398	1310	1020	860	700
	400	OFF	OFF	OFF	OFF	1400	2.9 / 245	3.8 / 333	1190	920	790	
	360	OFF	OFF	OFF	ON	1260	2.4 / 196	3.2 / 276	1070	830	710	
4	440	OFF	ON	ON	OFF	1760	4.7 / 426	5.8 / 535	1500	1160	990	800
	400	OFF	ON	OFF	OFF	1600	3.9 / 343	4.8 / 433	1360	1060	900	
	360	OFF	ON	OFF	ON	1440	3.0 / 258	4.0 / 348	1220	950	810	
5	440	ON	ON	ON	OFF	2200	8.2 / 785	9.4 / 900	1870	1450	1230	1000
	400	ON	ON	OFF	OFF	2000	6.4 / 592	7.6 / 718	1700	1320	1120	
	360	ON	ON	OFF	ON	1800	5.0 / 451	6.1 / 564	1530	1190	1010	

 =FACTORY SETTING

NOTE: Electrical data provided for Ultratech motor

All installations and services must be performed by qualified service personnel.

III. ECM TROUBLE SHOOTING

A. GENERAL GUIDELINES TO TROUBLESHOOTING ECM – DRIVEN SYSTEMS

⚠CAUTION: Disconnect power from unit before removing or replacing connectors, or servicing motor. Wait at least 5 minutes after disconnecting power before opening motor.

SYMPTOM	CAUSE/PROCEDURE
Motor rocks slightly when starting	<ul style="list-style-type: none"> This is normal start-up for ECM
Motor won't start <ul style="list-style-type: none"> No movement 	<ul style="list-style-type: none"> Check power at motor Check low voltage (24 VAC R to C) at motor Check low voltage connections (G,Y,W,R,C,) at motor Check for unseated pins in connectors on motor harness Test with a temporary jumper between R – G Check motor for tight shaft Perform motor/control replacement check Run Moisture Check
<ul style="list-style-type: none"> Motor rocks, but won't start 	<ul style="list-style-type: none"> Check for loose or compliant motor mount Make sure blower wheel is tight on shaft Perform motor/control replacement check
Motor oscillates up & down while being tested off of blower	<ul style="list-style-type: none"> It is normal for motor to oscillate with no load on shaft.
Motor starts, but runs erratically <ul style="list-style-type: none"> Varies up and down or intermittent 	<ul style="list-style-type: none"> Check line voltage for variation or “sag” Check low voltage connections (G,Y,W,R,C,) at motor, unseated pins in motor harness connectors Check “Bk” for erratic CFM command (in variable speed applications) Check-out system controls – T’stat? Perform Moisture Check
<ul style="list-style-type: none"> “Hunts” or “puffs” at high CFM (speed) 	<ul style="list-style-type: none"> Does removing panel or filter reduce “puffing”? <ul style="list-style-type: none"> ➤ Reduce restriction ➤ Reduce max airflow
<ul style="list-style-type: none"> Stays at low CFM despite system call for cool or heat CFM 	<ul style="list-style-type: none"> Check low voltage (T’stat) wires and connections Verify fan is not in delay mode – wait until delay complete “R” missing/not connected at motor Perform motor/control replacement check
<ul style="list-style-type: none"> Stays at high CFM 	<ul style="list-style-type: none"> “R” missing/not connected at motor Is fan in delay mode? – wait until delay time complete Perform motor/control replacement check
<ul style="list-style-type: none"> Blower won't shut off 	<ul style="list-style-type: none"> Current leakage from controls into G,Y or W? Check for Triac switched t’stat or solid state relay
Excessive noise	<ul style="list-style-type: none"> Determine if it's air noise, cabinet, duct or motor noise – interview customer, if necessary
<ul style="list-style-type: none"> Noisy blower or cabinet 	<ul style="list-style-type: none"> Check for loose blower housing, panels, etc. High static creating high blower speed? <ul style="list-style-type: none"> ➤ Check for air whistling thru seams in ducts,

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	<ul style="list-style-type: none"> ➤ cabinets or panels ➤ Check for cabinet/duct deformation
<ul style="list-style-type: none"> • “Hunts” or “puffs” at high CFM (speed) 	<ul style="list-style-type: none"> • Does removing panel or filter reduce “puffing”? <ul style="list-style-type: none"> ➤ Reduce restriction ➤ Reduce max airflow
Evidence of Moisture	
<ul style="list-style-type: none"> • Motor failure or malfunction has occurred and moisture is present 	<ul style="list-style-type: none"> • Replace motor and perform Moisture Check
<ul style="list-style-type: none"> • Evidence of moisture present inside air mover 	<ul style="list-style-type: none"> • Perform Moisture Check

<u>DO</u>	<u>DON'T</u>
<ul style="list-style-type: none"> • Check-out motor, controls, wiring and connections thoroughly before replacing motor 	<ul style="list-style-type: none"> • Automatically assume the motor is bad.
<ul style="list-style-type: none"> • Orient connectors down so water can't get in <ul style="list-style-type: none"> ➤ Install “drip loops” 	<ul style="list-style-type: none"> • Locate connectors above 7 and 4 o'clock positions
<ul style="list-style-type: none"> • Use authorized motor and control model #'s for replacement 	<ul style="list-style-type: none"> • Replace one motor or control model # with another (unless an authorized replacement)
<ul style="list-style-type: none"> • Keep static pressure to a minimum: <ul style="list-style-type: none"> ➤ Recommend high efficiency, low static filters ➤ Recommend keeping filters clean ➤ Design ductwork for min static, max comfort ➤ Look for and recommend ductwork improvement, where necessary, in replacement 	<ul style="list-style-type: none"> • Use high pressure drop filters – some have ½” H₂O drop! • Use restricted returns
<ul style="list-style-type: none"> • Size the equipment wisely 	<ul style="list-style-type: none"> • Oversize system then compensate with low airflow
<ul style="list-style-type: none"> • Check orientation before inserting motor connectors 	<ul style="list-style-type: none"> • Plug in power connector backwards • Force plugs

Moisture Check

- Connectors are orientated “down” (or as recommended by equipment manufacturer)
- Arrange harnesses with “drip loop” under motor
- Is condensate drain plugged?
- Check for low airflow (too much latent capacity)
- Check for undercharged condition
- Check and plug leaks in return ducts, cabinet

Comfort Check

- Check proper airflow settings
- Low static pressure for lowest noise
- Set low continuous-fan CFM
- T'stat in bad location?

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CONTROL HARNESS CONNECTOR	
PIN	DESCRIPTION
1	C1
2	W/W1
3	C2
4	DELAY
5	COOL
6	Y1
7	ADJUST
8	OUT-
9	O
10	BK/PWM
11	HEAT
12	R
13	EM/W2
14	Y/Y2
15	G
16	OUT+

CONTROL HARNESS CONNECTOR
(VIEWED FROM WIRE END)

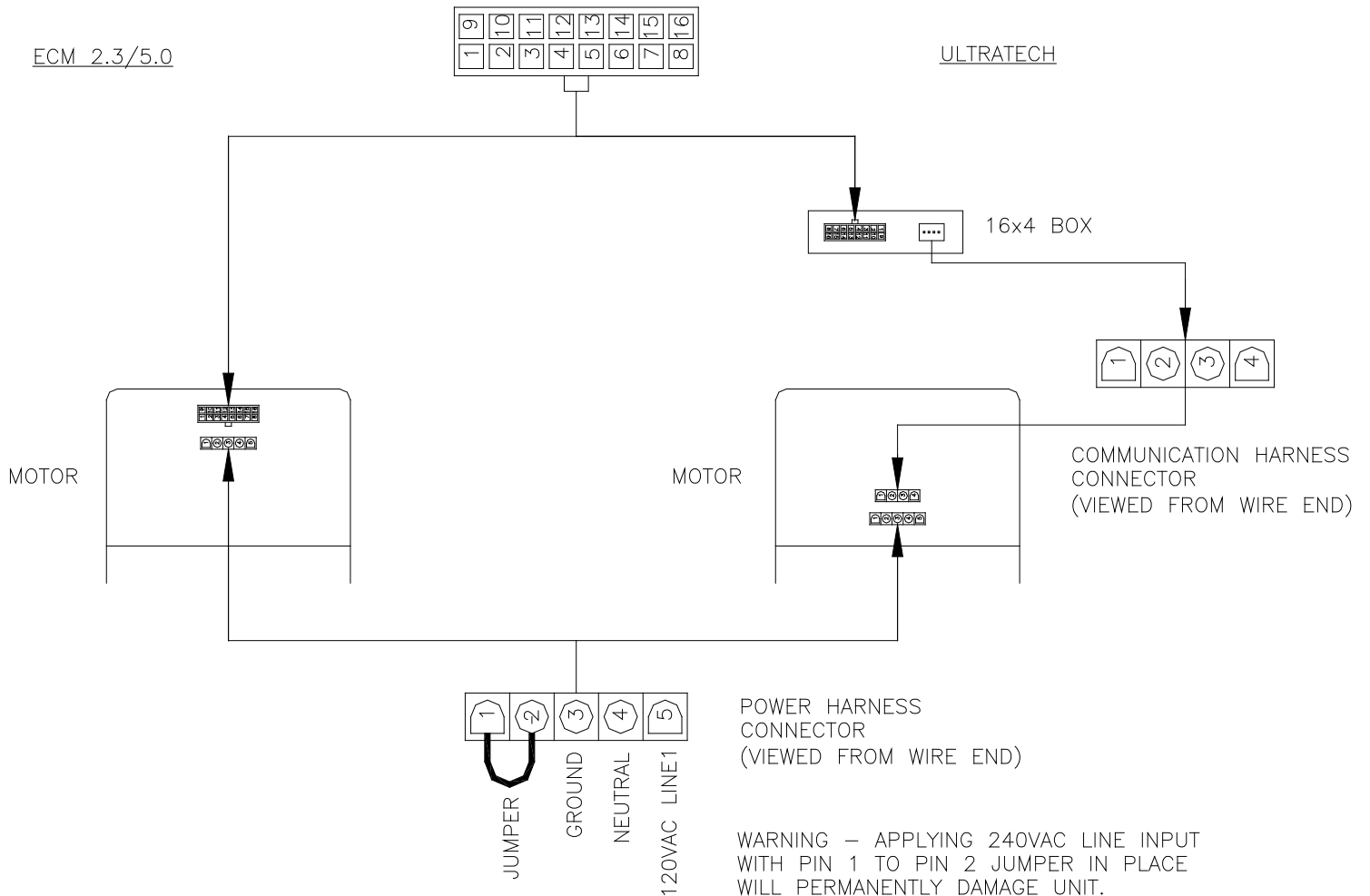


Figure 2: ECM PIN CONNECTORS

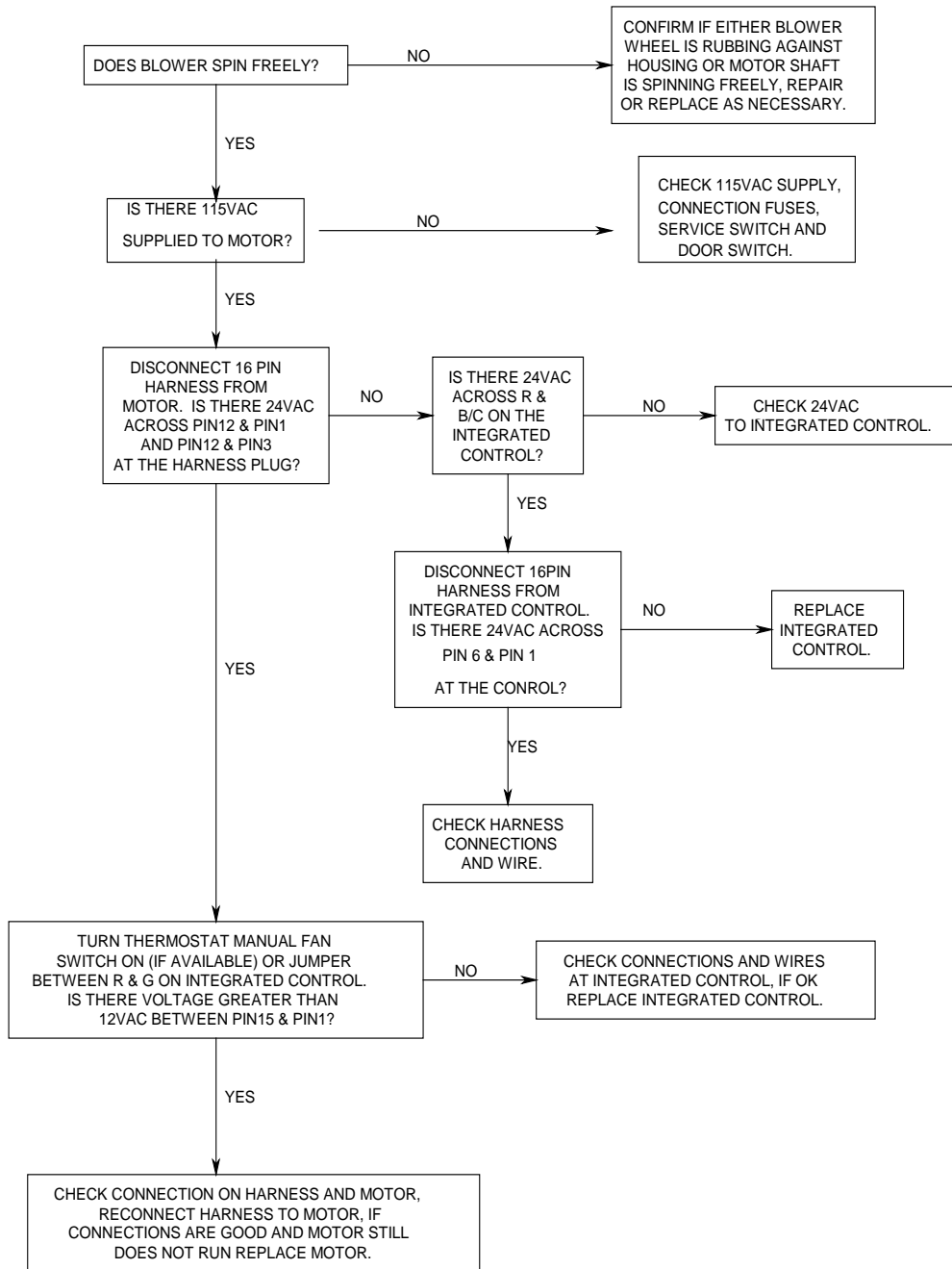
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B. TROUBLESHOOTING CHARTS

ECM 2.3/5.0

THIS GUIDE SHOULD BE USED IN THE CASE OF A STOPPED OR MALFUNCTIONING ECM BLOWER MOTOR. THE FOLLOWING SHOULD HELP ESTABLISH THE TYPE OF MALFUNCTION OR DEVIATION FROM THE NORMAL BLOWER OPERATION.

TO USE THIS DIAGRAM, YOU JUST NEED TO FOLLOW THE INSTRUCTIONS IN THE BOXES.

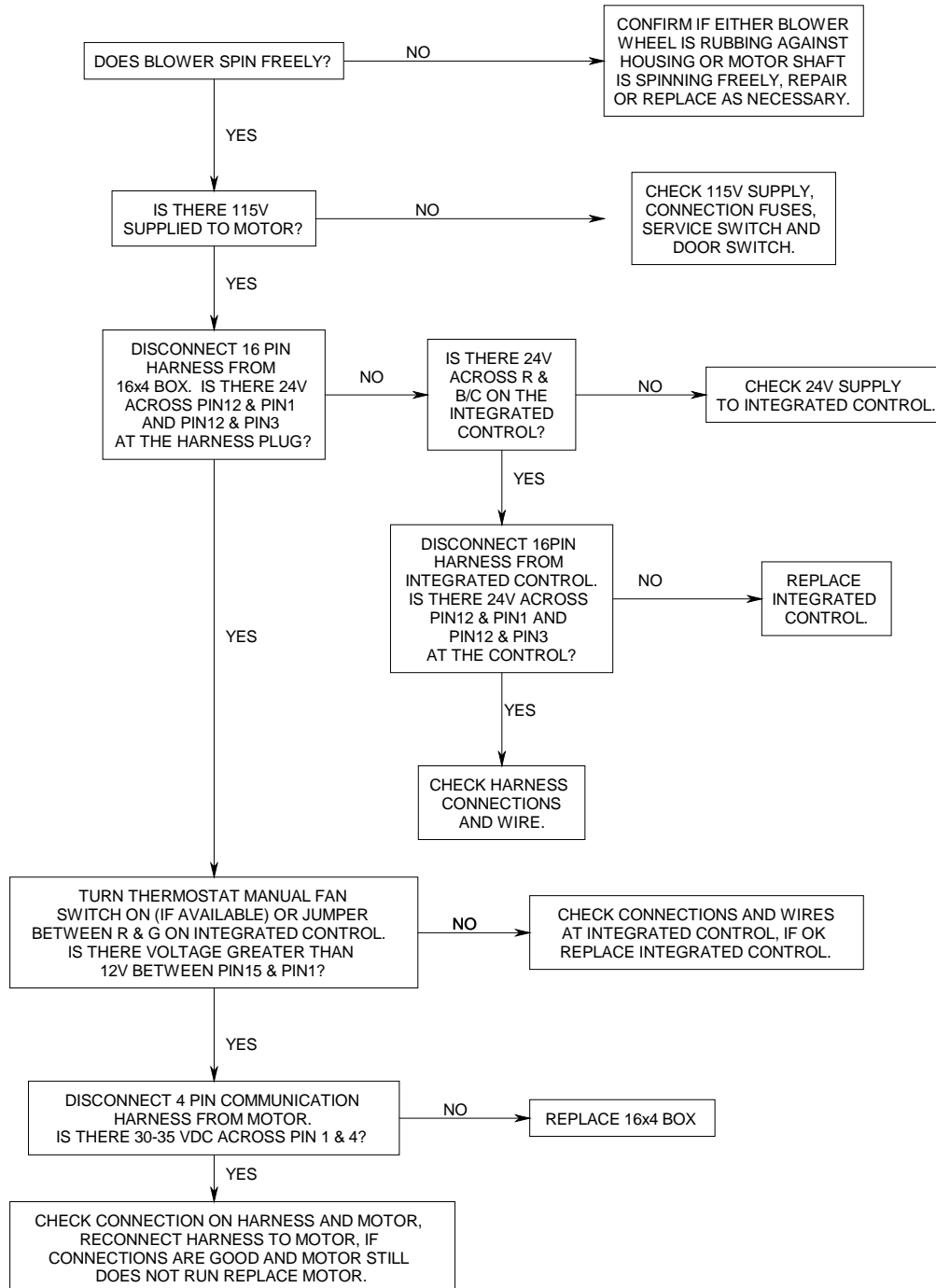


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ULTRATECH

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NOTE: In an emergency, a PSC motor can be installed in place of the ECM motor for a **temporary repair** only. The PSC motor will run **continuously at one speed only**. The PSC motor can be connected directly to the CIRC-H and the CIRC-N terminals on the W/R integrated control. For more information contact Thermo Products Technical Service at 1-800-348-5130.