

AB Cycle Timer Replacement Kit Installation Instructions

Model: CTR-001B

Installation Manual

AB/CTR-03-5

Version: 2.0

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AB/CTR-03-5

All information, illustrations, photos, and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

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1. Installation Instructions

The AB Cycle Timer Replacement Kit No. CTR-001B is designed as a service replacement part for the standard 44-029 cam-type cycle timer, which was factory installed into all AB Series Grain Dryers prior to 1987. This kit supersedes CTR-001 and CTR-001A.

The operation of the CTR-001B cycle timer is similar to that of the original timer, with an added advantage of allowing easier adjustment of the High-Heat, Low-Heat and Cool cycle timer functions. Please read the following information and retain this bullet-in within your manual for future parts and circuit reference.

Beginning with the CTR-001B kit introduced in June of 1997, an electric time delay relay is being used in place of the thermal time delay tube 115C30 (TDR2) previously used. This change improves the resetting operation of the three (3) cycle timers used in the CTR-001 kit. The new electronic time delay relay also has the advantage of being adjustable from 1 to 100 seconds, thus permitting the unload auger cleanout time to be field set.

NOTE: *Make sure to follow the charts and recommendations within the Dryer manual, except for the instructions and diagrams within this bullet-in.*

Timer Functions

Dry Timer: The DRY TIMER sets the total drying time desired, as suggested by the “Cycle Time Chart” in the Operator’s Manual. The DRY TIME period is the sum of the High-Heat time setting plus the Low-Heat time.

High-Heat Timer: The HIGH-HEAT time setting is the initial time period of the total dry time setting. The LOW-HEAT time is the remaining interval between the end of the High-Heat to the end of the Dry Time setting.

Cool Timer: The selected COOLING time will occur at the completion of the Dry Time (if not being held by the “MC” thermostat).

Operating Information

When operating with these newer timers, refer to the suggested total time listings shown within the CYCLE TIME CHART of the manual for the “INITIAL CYCLE TIMES” and “TOTAL DRYING TIME”. Then, instead of adjusting one cycle timer as listed in the manual, simply adjust each of the (3) three timers as suggested in the following instructions.

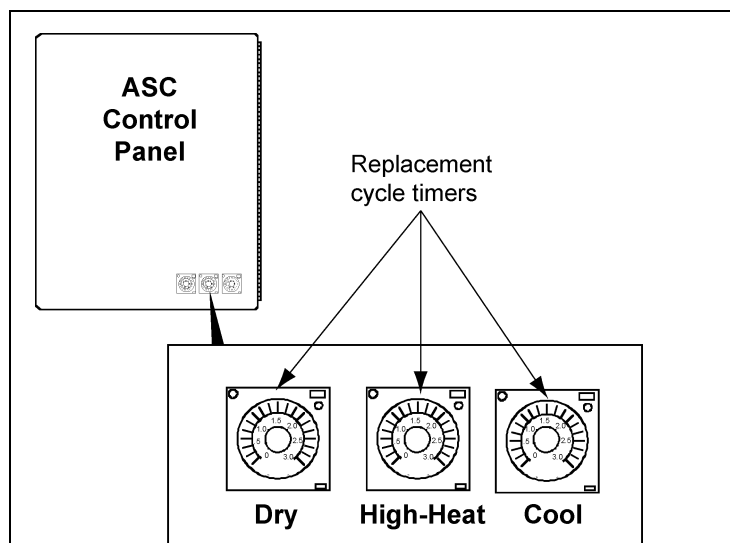


Figure 1A Typical CTR-001B Timer Installation

High-Heat Timer

As a general recommendation, the HIGH-HEAT timer setting should be approximately 2/3 of the DRY TIMER setting. This adjustment would allow the remaining 1/3 of the drying time for the LOW HEAT portion of the drying cycle.

EXAMPLE: If the Cycle Time Chart in the Dryer Manual listed a 60 minutes total drying time, this would require a 60 minutes Dry Timer setting and a 40 minutes High-Heat setting. A 90 minutes drying time would consist of 90 minutes DRY TIME and an approximate 60 minutes High-Heat setting. (See Figure 1B.)

Cool Timer

For normal Dry and Cool operation, the Cool timer should be set as suggested by the Operator's Manual (see lower box in Cycle Time Chart). Cool time is normally 18 to 20 minutes, depending on the model of dryer.

For Full-Heat operation, the Cool timer should be set to approximately one minute, with Burner switch in the ON position. If partial cooling or extra cooling is desired, the Cool timer can be readjusted as desired and the Burner switch must be in the AUTO position.

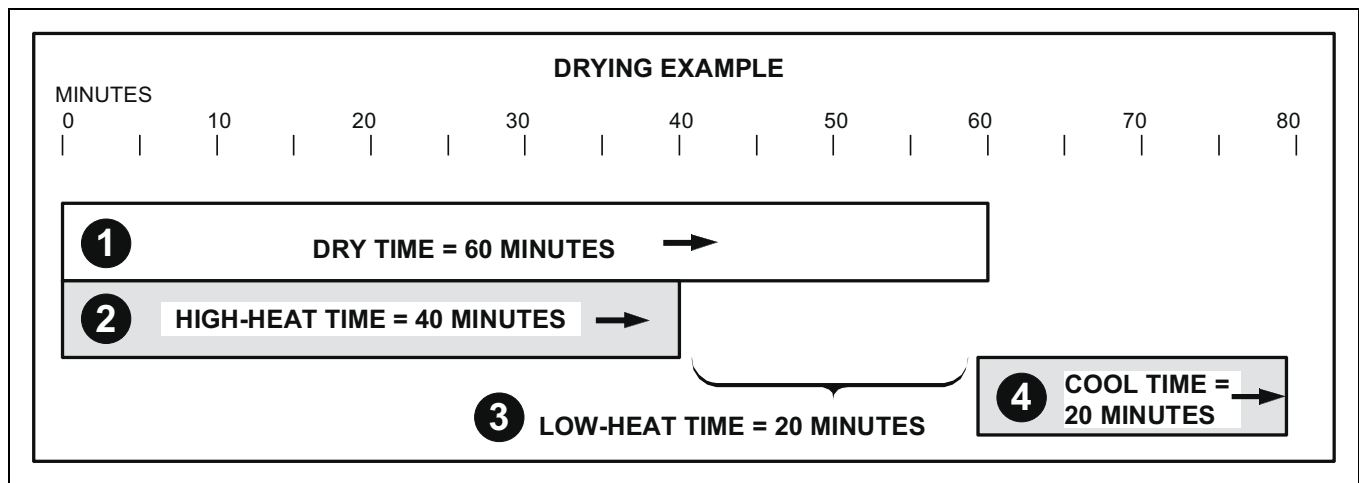


Figure 1B

Timer Settings and Adjustment

Current factory production AB Series Dryers are shipped with the Dry, High-Heat and Cool cycle timers set in the 3h (3 hours) mode of operation. It may be desirable to change the range of the Cool timer to the 30m (30 minutes) mode to allow more accurate setting of the Cool time, typically 18 to 20 minutes. See ADJUSTING the TIME RANGE and HERTZ ahead for how to change the range setting.

Timer Mode

For proper operation of the timer adjust the set screw above MODE to "G".

1. Installation Instructions

Timer Setting

To adjust the time, simply rotate the outer dial face to the desired setting when the timer is not energized. The No. 1 mark equals 1/3 of the selected range (for example, 1/3 of the 30-min. range = 10 min.). The timer normally begins timing when power is applied to the control circuit Start button and the dryer has been filled with grain. Cycle progress is tracked during operation by the “inprogress” indicator. If the dryer is shut down by pressing the control circuit Stop button or by a safety circuit shut down, the Dry timer will retain its memory and resume its cycle when the dryer is turned back ON. If the dryer is turned OFF due to the fan breaker being turned OFF, main power to the dryer being disconnected or the ASC panel Timer Reset button being pressed, the Dry timer’s “inprogress” memory will be lost because it is held by power from the 5A control fuse.

NOTE: *When timer is energized, the time setting may be immediately decreased manually, but cannot be increased until after timer has been de-energized and becomes reset at the end of the unload cycle or by pressing the timer reset button.*

Adjusting the Time Range and Scale

To adjust the time RANGE (not the time setting) of the Omron timer:

1. Use a small screwdriver to rotate the time range adjustment screw to the desired range (30m or 3h).
2. Adjust the time scale by adjusting the time scale adjustment screw.



Figure 1C Omron Cycle Timer

Ref #	Description
A	Set Time Indicator (Does not move during cycle)
B	Time Range Adjustment
C	Time Scale Adjustment
D	Mode Adjustment Set to MODE G

See the “Resetting the Omron Timers After a Safety Shut Down” chart [on Page 7](#) for important shut down information.

Resetting the Omron Timers After a Safety Shut Down

Stage of Operation	Timer's Reaction	Required Operator Correction
Loading	-	-
High-Heat	High-Heat and Dry Times stay where they stopped.	Restart dryer and continue the high-heat drying cycle, press the Manual Restart button on the ASC panel.
Low Heat	High-Heat and Dry Timers stay where they stopped.	Restart and continue low-heat drying cycle. Press the Manual Restart button.
Cooling	All three (3) timers stay where they stopped.	The Cool Timer will resume the cool cycle. Restart dryer and press the Manual Restart button.
Unloading	All three (3) timers stay where they stopped.	NOTE: <i>Dryer will continue unloading after panel is re-energized.</i>

NOTE: Upon main power failure, all timer memory is lost. Turn Dry and Cool timers down to zero and unload enough grain to get a good representative sample. Test the grain for moisture and then check the dryer manual's Cycle Time Chart for the correct Dry timer setting required to reach the target moisture level. When the batch is completed, reset timers to their normal settings.

Timer Installation

The following steps outline the procedure for replacing the early cam-type timer (Part # 44-029) with the CTR-001B timer kit.

1. Shut OFF the main power supply and turn dryer circuit breakers OFF.
2. Open the ASC deadfront and disconnect wiring connector at old cycle timer.
3. Remove screws, nuts and bolts which retain cycle timer and its base within the ASC box.
Remove and discard old cycle timer and its mounting base.
4. Use hole template (last page of this bullet-in), then carefully mark the required new hole opening and mounting screw locations within the ASC deadfront. Use care when locating the template, to avoid possible parts interference after timers are installed in place. Depending on model of dryer and method of cutting the hole opening, it may be advisable to open deadfront and locate template on inside surface. Drill the four (4) mounting plate screw holes using a 0.136" (#29) diameter drill bit. If a saber saw is used, drill 3/8" holes at the corners to avoid breaking blade when turning saw at hole corner.
5. Mount the timer plate on the outside of the ASC deadfront and secure it in place by installing the four (4) #8 pan-head screws.
6. Reconnect wiring connector half from new timers to old connector half.

1. Installation Instructions

7. Refer to appropriate enclosed wiring diagram *on Pages 14-16* and connect the loose yellow and blue wire ends as outlined:

Dryer	Blue Lead Connection	Yellow Lead Connection
AB-120, 180, 8, 12	R2 Relay Terminal #7	Control Strip Terminal 6
AB-18	R2 Relay Terminal #10	Control Strip Terminal 6
AB-250	R2 Relay Terminal #7	Control Strip Terminal 5
AB-350, 500	R2 Relay Terminal #10	Control Strip Terminal 12

NOTE: When replacing CTR-001 timer kits (Crouzet timers) with CTR-001B (Omron timers), the Timer Reset switch wire connected to R1 relay terminal 6 must be moved to R1 relay terminal 8, as shown in the schematics in this Bulletin.

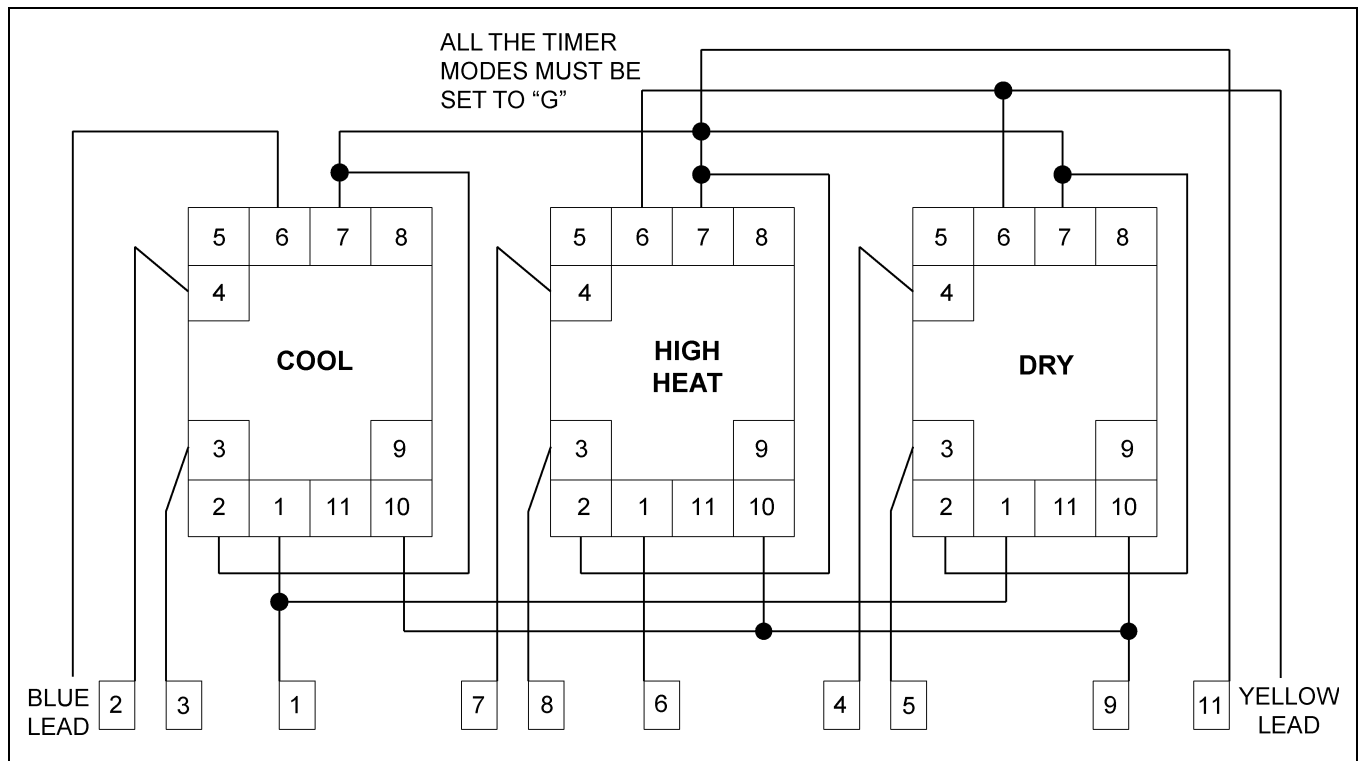


Figure 1D Omron Timer H3CR-AP Wiring Diagram - Rear View

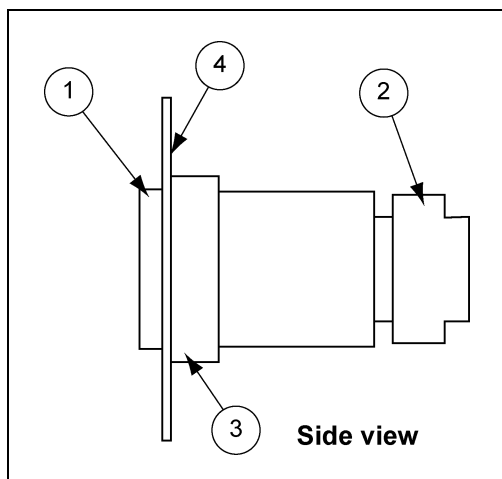


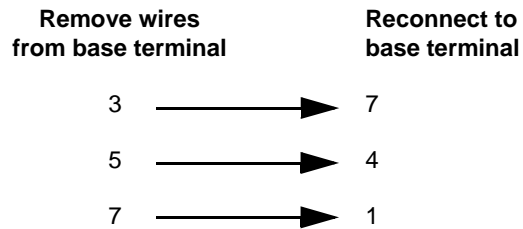
Figure 1E Cycle Timer Replacement Kit (CTR-001B)

Cycle Timer Replacement Kit (CTR-001B) Parts List

Ref #	Part #	Description	Qty
1	D03-1270	Timer, 3 min./30 min./3 hr	3
2	056-1983-8	Socket 11-Pin Base	3
3	056-1984-6	Adapter Panel Mounting	1
4	401-3806-7	Adapter Plate	1
N/S	056-2109-9	Electronic TDR2	1

1. Installation Instructions

- The electronic timer (056-2109-9) included in the CTR-001B kit is interchangeable with the existing time delay vacuum tube (115C30 - TDR2). Simply insert the electronic time delay relay into the base used by the existing time delay relay and make the following wire relocations to the base:



- With the CTR-001B kit installed, the existing TDR1 relay is no longer required. Pull TDR1 relay from its base and discard relay (as a future reminder that TDR1 is no longer functional). The base, however, is not removed, as some of the wires connected to the terminal must remain in the circuit.
- Re-check that the Time Range adjustment set screw on each timer is set to the appropriate range setting and that parts and wiring connections are secured properly. Test operate the new timers. Refer to earlier instructions for method of setting the timers and how to check and adjust the timers range of operation.

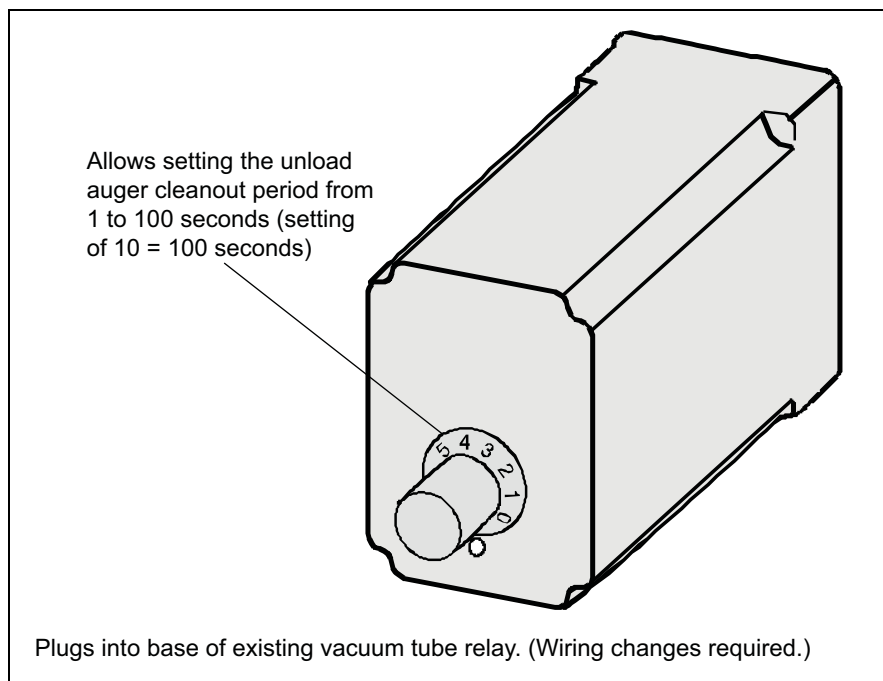


Figure 1F *Electronic Time Delay Relay (TDR2)*

2. Drying Time Tables

Drying Time Table - AB-120 and AB-180

Drying Time Table, Small Grains - AB-120 and AB-180						
Wheat, Milo to 13% - Dry and Cool (175/140°F Plenum temperatures) Soybeans, Rough Rice - Dry and Cool (140/120°F Plenum temperatures)						
% Moisture Reduction	Total Dry Time		AB-120A Capacity BPH		AB-180A Capacity BPH	
	Min.	Hrs.	Dry	Wet	Dry	Wet
3	27	0.45	125	129	175	254
5	42	0.70	99	105	141	273
7	57	0.95	82	89	118	342
Wheat, Milo to 13% - Dry and Cool (175/140°F Plenum temperatures) Soybeans, Rough Rice to 13% - Full heat (140/120°F Plenum temperatures) Set Cool Timer to one minute.						
% Moisture Reduction	Total Dry Time		AB-120A Capacity BPH		AB-180A Capacity BPH	
	Min.	Hrs.	Dry	Wet	Dry	Wet
3	35	0.58	151	158	209	217
5	50	0.83	115	122	162	172
7	60	1.00	99	106	141	163
<p>1. Suggested drying times are based on (High-Heat/Low-Heat) plenum temperatures shown. Lower drying temperatures may be required for lower initial moistures.</p> <p>2. Actual drying time varies with grain's physiological factors (normal size, chemical composition, need variety, seasonal weather), weather conditions during drying and other operating variables, lower final moisture significantly increases drying time.</p> <p>3. High-Heat timer should be set at 2/3 of Dry Timer setting.</p> <p>4. Dry/Cool capacity based on 18 minutes cool time. Capacity includes load and unload times for standard auger capacities:</p> <p style="padding-left: 40px;">AB-120 1500 BPH load 900 BPH unload</p> <p style="padding-left: 40px;">AB-180 1500 BPH load 1160 BPH unload</p>						

Drying Time Table - AB-250, AB-350 and AB-500

Drying Time Table, Small Grains - AB-250, AB-350 and AB-500								
Wheat, Milo to 13% - Dry and Cool (175/140°F Plenum temperatures) Soybeans, Rough Rice to 13% - Dry and Cool (140/120°F Plenum temperatures)								
% Moisture Reduction	Total Dry Time		AB-250A Capacity BPH		AB-350A Capacity BPH		AB-500A Capacity BPH	
	Min.	Hrs.	Dry	Wet	Dry	Wet	Dry	Wet
3	27	0.46	237	245	313	324	424	439
5	42	0.70	192	203	266	271	350	371
7	57	0.96	161	175	216	235	299	324
Wheat, Milo to 13% - Dry and Cool (175/140°F Plenum temperatures) Soybeans, Rough Rice to 13% - Full heat (140/120°F Plenum temperatures) Set Cool Timer to one minute.								
% Moisture Reduction	Total Dry Time		AB-250A Capacity BPH		AB-350A Capacity BPH		AB-500A Capacity BPH	
	Min.	Hrs.	Dry	Wet	Dry	Wet	Dry	Wet
3	35	0.58	292	303	381	395	510	526
5	50	0.83	228	240	300	316	406	431
7	60	1.00	197	214	262	286	358	369
<p>1. Suggested drying times are based on (High-Heat/Low-Heat) plenum temperatures shown. Lower drying temperatures may be required for lower initial moistures.</p> <p>2. Actual drying time varies with grain's physiological factors (normal size, chemical composition, need variety, seasonal weather), weather conditions during drying and other operating variables, lower final moisture significantly increases drying time.</p> <p>3. High-Heat timer should be set at 2/3 of Dry Timer setting.</p> <p>4. Dry/Cool capacity based on 18 minutes cool time. Capacity includes load and unload times for standard auger capacities:</p> <p style="padding-left: 40px;">AB-250 1785 BPH load 1900 BPH unload</p> <p style="padding-left: 40px;">AB-350 2095 BPH load 2090 BPH unload</p> <p style="padding-left: 40px;">AB-500 2520 BPH load 2520 BPH unload</p>								

2. Drying Time Tables

Drying Time Table - AB-120A and AB-180A

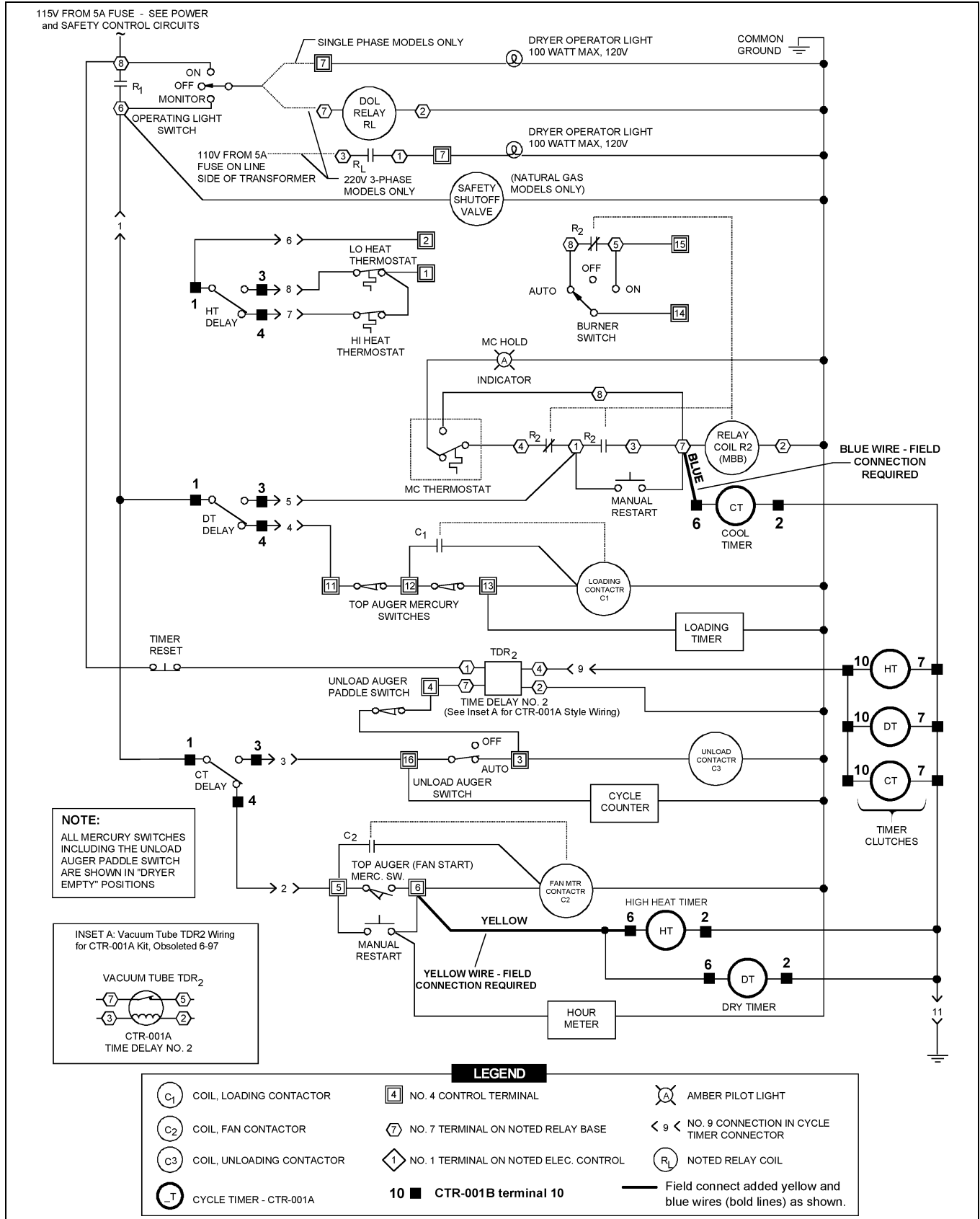
Drying Time Table - AB-120A and AB-180A						
Shelled Corn to 15% - Dry and Cool (230/170°F plenum temperatures)						
% Moisture Reduction	Total Dry Time		AB-120A Capacity BPH		AB-180A Capacity BPH	
	Min.	Hrs.	Dry	Wet	Dry	Wet
2	17	0.28	151	154	209	214
4	27	0.45	125	131	175	184
5	32	0.53	115	122	162	172
6	37	0.62	106	114	151	162
8	47	0.78	93	102	132	146
10	58	0.97	81	92	117	132
12	73	1.22	69	81	100	117
14	91	1.52	59	71	86	103
15	102	1.70	54	66	79	96
16	116	1.92	49	61	72	89
18	145	2.42	41	52	60	76
Shelled Corn to 15% final - Full Heat (230/170°F plenum temperatures) Set Cool Timer to one minute.						
% Moisture Reduction	Total Dry Time		AB-120A Capacity BPH		AB-180A Capacity BPH	
	Min.	Hrs.	Dry	Wet	Dry	Wet
2	15	0.25	259	265	342	350
4	25	0.42	190	200	260	272
5	29	0.46	172	183	237	252
6	33	0.55	157	169	218	234
8	42	0.70	131	145	184	203
10	51	0.65	113	128	160	161
12	66	1.10	91	106	131	152
14	83	1.38	75	90	108	130
15	94	1.57	67	82	98	119
16	106	1.77	61	75	89	109
18	133	2.22	49	63	72	92
20	163	2.72	41	54	60	79
<p>1. Suggested drying times are based on (High-Heat/Low-Heat) plenum temperatures shown. Lower drying temperatures may be required for lower initial moistures.</p> <p>2. Actual drying time varies with grain's physiological factors (normal size, chemical composition, need variety, seasonal weather), weather conditions during drying and other operating variables, lower final moisture significantly increases drying time.</p> <p>3. High-Heat timer should be set at 2/3 of Dry Timer setting.</p> <p>4. Dry/Cool capacity based on 18 minutes cool time. Capacity includes load and unloadtimes for standard auger capacities: AB-120 1600 BPH load 900 BPH unload AB-180 1500 BPH load 1160 BPH unload</p>						

Drying Time Table - AB-250A, AB-350A and AB-500A

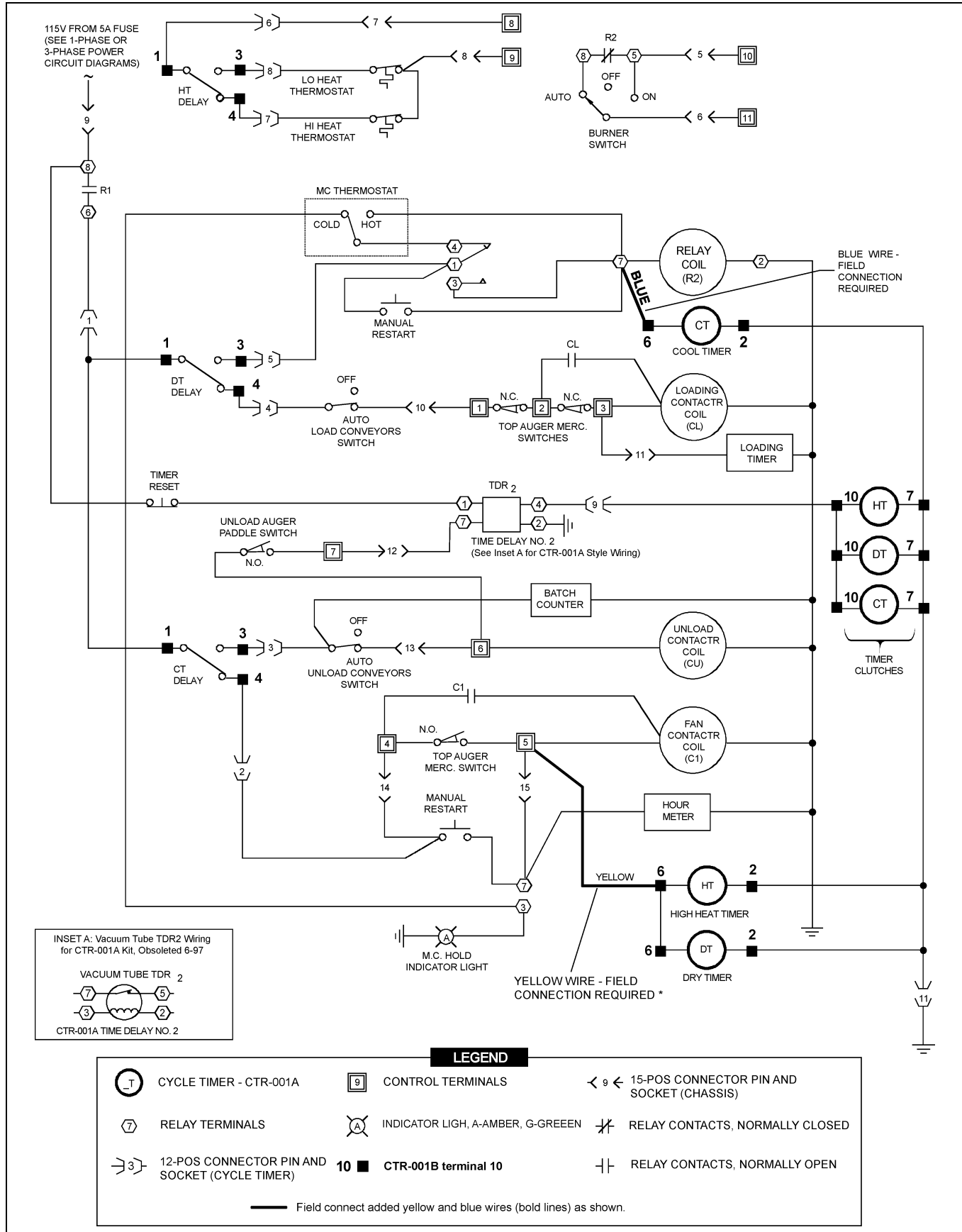
Drying Time Table, Small Grains - AB-250A, AB-350A and AB-500A								
Shelled Corn to 15% - Dry and Cool (230/170°F plenum temperatures)								
% Moisture Reduction	Total Dry Time		AB-250A Capacity BPH		AB-350A Capacity BPH		AB-500A Capacity BPH	
	Min.	Hrs.	Dry	Wet.	Dry	Wet.	Dry	Wet.
2	17	0.28	281	268	368	377	474	486
4	28	0.47	233	246	306	324	404	424
5	33	0.55	216	230	287	305	379	402
6	38	0.63	202	217	269	289	358	383
8	49	0.80	178	196	238	263	318	351
10	60	1.00	156	177	210	236	282	320
12	75	1.25	135	157	182	212	247	288
14	93	1.55	116	139	156	189	215	258
15	105	1.75	106	129	145	178	198	241
16	118	1.97	97	120	133	164	183	225
18	148	2.47	81	103	112	142	154	196
Shelled Corn to 15% final - Full Heat (230/170°F plenum temperatures) Set Cool Timer to one minute.								
% Moisture Reduction	Total Dry Time		AB-250A Capacity BPH		AB-350A Capacity BPH		AB-500A Capacity BPH	
	Min.	Hrs.	Dry	Wet	Dry	Wet	Dry	Wet
2	15	0.25	479	491	599	613	773	792
4	26	0.43	355	372	458	476	602	632
5	30	0.50	324	344	419	446	668	592
6	34	0.67	296	321	388	416	519	558
8	43	0.72	253	279	333	366	449	496
10	54	0.80	213	242	284	321	386	437
12	68	1.13	178	207	236	276	327	380
14	85	1.42	148	177	200	239	276	330
15	96	1.60	134	162	161	220	250	304
16	108	1.80	121	149	164	202	228	280
18	136	2.27	96	125	136	171	188	238
20	167	2.76	82	107	112	147	167	208
<p>1. Suggested drying times are based on (High-Heat/Low-Heat) plenum temperatures shown. Lower drying temperatures may be required for lower initial moistures.</p> <p>2. Actual drying time varies with grain's physiological factors (normal size, chemical composition, need variety, seasonal weather), weather conditions during drying and other operating variables, lower final moisture significantly increases drying time.</p> <p>3. High-Heat timer should be set at 2/3 of Dry Timer setting.</p> <p>4. Dry/Cool capacity based on 18 minutes cool time. Capacity includes load and unload times for standard auger capacities:</p> <p>AB-250 1785 BPH load 1900 BPH unload</p> <p>AB-350 2095 BPH load 2090 BPH unload</p> <p>AB-500 2520 BPH load 2520 BPH unload</p>								

3. Wiring Diagrams

AB-8, AB-12, AB-120 and AB-180 General Control Circuit with CTR-001B Timers

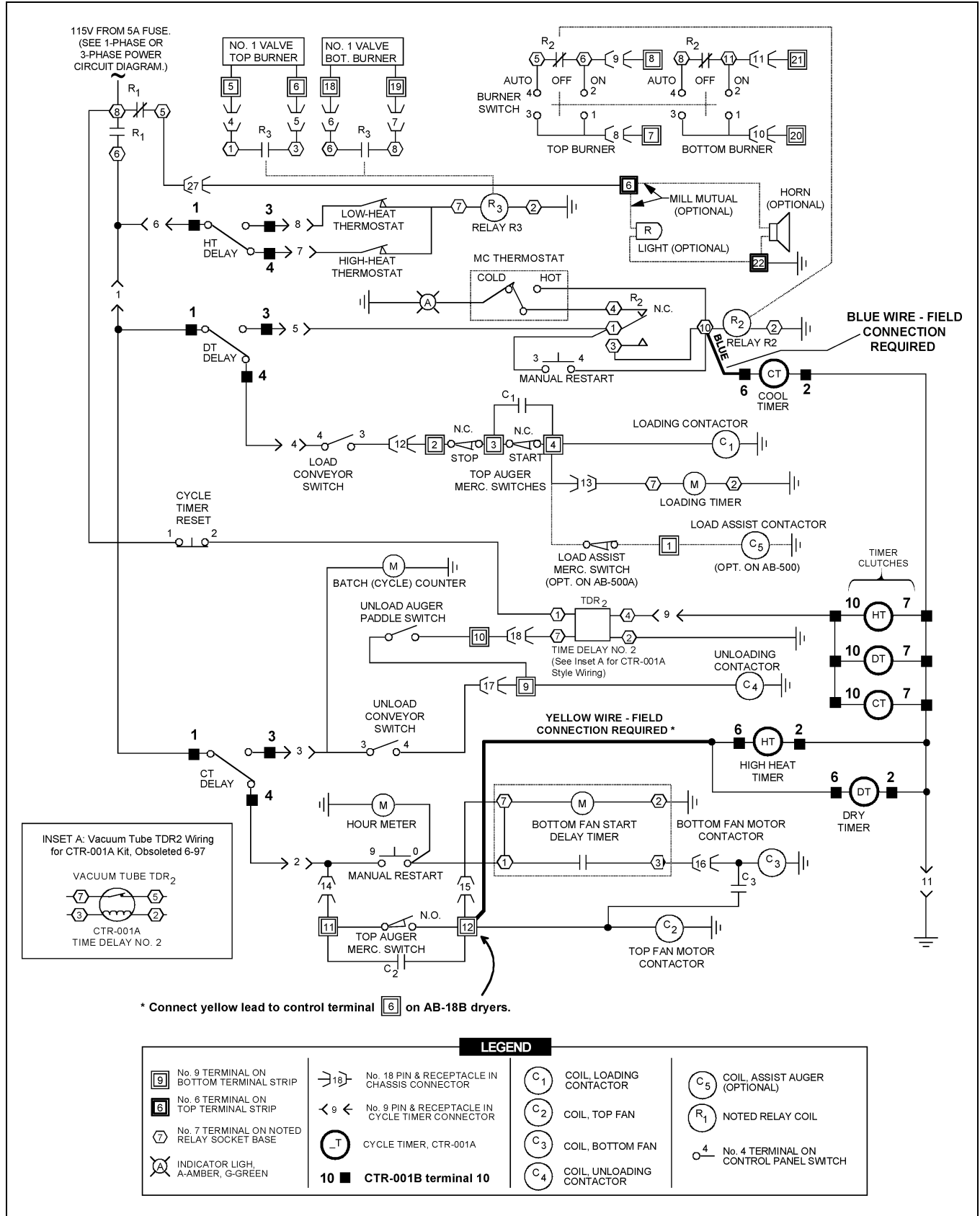


AB-250 General Control Circuit with CTR-001B Timers



3. Wiring Diagrams

AB-18B*, AB-350A and AB-500A General Control Circuit with CTR-001B Timers



GSI Group, LLC Limited Warranty

The GSI Group, LLC ("GSI") warrants products which it manufactures to be free of defects in materials and workmanship under normal usage and conditions for a period of 12 months after sale to the original end-user or if a foreign sale, 14 months from arrival at port of discharge, whichever is earlier. The end-user's sole remedy (and GSI's only obligation) is to repair or replace, at GSI's option and expense, products that in GSI's judgment, contain a material defect in materials or workmanship. Expenses incurred by or on behalf of the end-user without prior written authorization from the GSI Warranty Group shall be the sole responsibility of the end-user.

Warranty Extensions:

The Limited Warranty period is extended for the following products:

	Product	Warranty Period	
AP Fans and Flooring	Performer Series Direct Drive Fan Motor	3 Years	* Warranty prorated from list price: 0 to 3 years - no cost to end-user 3 to 5 years - end-user pays 25% 5 to 7 years - end-user pays 50% 7 to 10 years - end-user pays 75%
	All Fiberglass Housings	Lifetime	
	All Fiberglass Propellers	Lifetime	
AP and Cumberland	Flex-Flo/Pan Feeding System Motors	2 Years	
Cumberland Feeding/Watering Systems	Feeder System Pan Assemblies	5 Years **	** Warranty prorated from list price: 0 to 3 years - no cost to end-user 3 to 5 years - end-user pays 50%
	Feed Tubes (1-3/4" and 2.00")	10 Years *	
	Centerless Augers	10 Years *	
	Watering Nipples	10 Years *	
Grain Systems	Grain Bin Structural Design	5 Years	
Grain Systems Farm Fans Zimmerman	Portable and Tower Dryers	2 Years	† Motors, burner components and moving parts not included. Portable dryer screens included. Tower dryer screens not included.
	Portable and Tower Dryer Frames and Internal Infrastructure †	5 Years	

GSI further warrants that the portable and tower dryer frame and basket, excluding all auger and auger drive components, shall be free from defects in materials for a period of time beginning on the twelfth (12th) month from the date of purchase and continuing until the sixtieth (60th) month from the date of purchase (extended warranty period). During the extended warranty period, GSI will replace the frame or basket components that prove to be defective under normal conditions of use without charge, excluding the labor, transportation, and/or shipping costs incurred in the performance of this extended warranty.

Conditions and Limitations:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY DESCRIPTION SET FORTH ABOVE. SPECIFICALLY, GSI MAKES NO FURTHER WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH: (I) PRODUCT MANUFACTURED OR SOLD BY GSI OR (II) ANY ADVICE, INSTRUCTION, RECOMMENDATION OR SUGGESTION PROVIDED BY AN AGENT, REPRESENTATIVE OR EMPLOYEE OF GSI REGARDING OR RELATED TO THE CONFIGURATION, INSTALLATION, LAYOUT, SUITABILITY FOR A PARTICULAR PURPOSE, OR DESIGN OF SUCH PRODUCTS.

GSI shall not be liable for any direct, indirect, incidental or consequential damages, including, without limitation, loss of anticipated profits or benefits. The sole and exclusive remedy is set forth in the Limited Warranty, which shall not exceed the amount paid for the product purchased. This warranty is not transferable and applies only to the original end-user. GSI shall have no obligation or responsibility for any representations or warranties made by or on behalf of any dealer, agent or distributor.

GSI assumes no responsibility for claims resulting from construction defects or unauthorized modifications to products which it manufactured. Modifications to products not specifically delineated in the manual accompanying the equipment at initial sale will void the Limited Warranty.

This Limited Warranty shall not extend to products or parts which have been damaged by negligent use, misuse, alteration, accident or which have been improperly/inadequately maintained. This Limited Warranty extends solely to products manufactured by GSI.

Prior to installation, the end-user has the responsibility to comply with federal, state and local codes which apply to the location and installation of products manufactured or sold by GSI.

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(revised January 2014)

This equipment shall be installed in accordance with the current installation codes and applicable regulations, which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.



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