 <b>PRODUCT DRAWING</b>	Supersedes: 160.80-PW4 (1099) <span style="float: right;">FORM 160.80-PW4 (600)</span> <b>WIRING DIAGRAM – FIELD CONNECTIONS</b> <b>MILLENNIUM® YS (STYLE E) ROTARY SCREW CHILLER</b> <b>OPTIVIEW CONTROL CENTER</b> <b>WITH YORK STYLE B SOLID STATE STARTER</b>
YORK INTERNATIONAL CORPORATION P.O. Box 1592, YORK, PA 17405	
CONTRACTOR _____ ORDER NO. _____ YORK CONTRACT NO. _____ YORK ORDER NO. _____	PURCHASER _____ JOB NAME _____ LOCATION _____ ENGINEER _____
<input type="checkbox"/> REFERENCE    DATE _____	<input type="checkbox"/> APPROVAL    DATE _____
<input type="checkbox"/> CONSTRUCTION    DATE _____	

**JOB DATA:**

CHILLER MODEL NO. YS \_\_\_\_\_ NUMBER OF UNITS \_\_\_\_\_  
 STYLE B SOLID STATE STARTER, MODEL NO. \_\_\_\_\_ SSS- \_\_\_\_\_ L B  
 MOTOR/STARTER POWER \_\_\_\_\_ VOLTS, 3-PHASE, \_\_\_\_\_ HERTZ  
 OPTIONAL FACTORY INSTALLED DISCONNECT SWITCH \_\_\_\_\_ AMPS OR  
 OPTIONAL FACTORY INSTALLED CIRCUIT BREAKER WITH GROUND FAULT PROTECTION \_\_\_\_\_ AMPS

**NOTES:**

1. All field wiring shall be in accordance with the current edition of the National Electrical Code (N.E.C.) as well as all other applicable codes and specifications.
2. Solid State Starter shall be grounded in accordance with the 1999 N.E.C. (paragraph 250-118) for equipment grounding. Where a separate grounding conductor is used, it must be a copper conductor only and sized per the 1999 N.E.C. (Table 250-122). Per 1999 N.E.C. (Paragraph 250-(f)(11), where multiple parallel conduits are used, each must contain a grounding conductor. See Note 8 for grounding lug wire range.
3. Wiring, electrical conduit, junction boxes, fused disconnect switches (FDS), or circuit breakers, starters (M), push-button stations (PB), manual-off-automatic switch (S), flow switch (FLS), and control relays furnished by others unless otherwise specified.
4. Items marked with an \* are furnished by York International Corporation.
5. Items marked with an \*\* are available from York International Corporation at additional cost.
6. OptiView Control Center power supply 115V – 50/60 Hz, 1.5 KVA capacity for control center only, is supplied by a control power transformer (1T) mounted on the side of the Solid State Starter as shown. It is factory wired.
7. Starter power conduit connection (cut holes to suit) locations, motor full load amperes (FLA), locked rotor amperes and inrush amperes per Product Drawing 160.80-PA1. Flexible conduit must be used for final connections to starter. Multiple conduits shall contain an equal number of wires from each phase in each conduit to prevent overheating per

1999 N.E.C. (Paragraph 300-20(a)). Use copper conductors only; DO NOT USE aluminum conductors. See note 8 for factory furnished starter terminal lug wire ranges and conduit connection provisions.

8. The following terminal lugs are factory furnished for field wiring connections when a factory-installed disconnect switch is not supplied. All lugs are rated AL9CU.

Starter Model Number without Disconnect/ Circuit Breaker Option	Line Side Lugs		Grounding Lug
	Quantity per Terminal	Wire Range	Wire Range, Quantity AL9CU
SSS 7L	1	#4-600 kcmil	#14-1/0, one bbl
SSS 14L	2	#2-600 kcmil	#14-1/0, two bbl
SSS 26L	3	#2-600 kcmil	#4-600kcmil, two bbl or
SSS 33L	4	#2-600 kcmil	1/0-250 kcmil, four bbl

The following terminal lugs are factory furnished for field wiring connections when a factory-installed disconnect switch or circuit breaker with ground fault protection is supplied.

Starter Model Number and Available Disconnect Switch / Circuit Breaker Amp Rating (See Note 17(a) )	Line Side Lugs			Grounding Lug
	Quantity per Terminal	Wire Range	Lug Rating	Wire Range, Quantity AL9CU
SSS 7L, 250A	1	#6-350 kcmil	AL7CU	#14-1/0, 1 bbl
SSS 7L, 400A	2	3/0-250 kcmil	AL7CU	
SSS 14L, 400A	2	3/0-250 kcmil	AL7CU	#14-1/0, 2 bbl
SSS 14L, 600A	2	250-500 kcmil	AL9CU	
SSS 26L, 1200A/1000A	4	4/0-500 kcmil	AL9CU	#4-600kcmil, 2 bbl or 1/0-250 kcmil, 4 bbl
SSS 33L, 1200A	4	4/0-500 kcmil	AL9CU	

- 9. Condenser water pump motor starter (3M) holding coil to be furnished for 115V – 50/60 Hz. The power requirements for the water pump starter (3M) must be a max. of 1 Amp holding and 10 Amps inrush. If power requirements exceed this value, furnish coil for line voltage, and control relay with 115V coil.
- 10. Units shipped knocked down require field connection of harnesses to control panel and power wiring between compressor motor and starter. These harnesses and power wiring are furnished by York International Corporation for field assembly and consist of proper lengths of flexible conduit with necessary connectors, and contain the wires (shown in Note 13) properly terminated and marked.
- 11. Wire #14 AWG copper for one way distance of less than 175 feet. Wire #12 AWG copper for one way distance of more than 175 feet, but less than 300 feet.
- 12. Wiring diagram for YORK OptiView Control Center, Form 160.80-PW2. Field wiring modifications per Form 160.80-PW5. Wiring diagram for YORK Solid State Starter Form 160.80-PW6.
- 13. The following interconnecting wires are factory supplied when a YORK Solid State Starter is used. (See Forms 160.80-PW2 and 160.80-PW6.
  - a. Starter to control center – L, 2, 16, 24, and 53; 3 and 2 conductor shielded cables.
  - b. Starter to cooling pump – 2, 108, GRD.
- 14. Full load amperes for 1.5 KVA control power transformer (furnished by York International Corporation and factory wired) to be used with Notes 15, 16 and 17 are:

3-Phase Voltage	Hz	Control Power (1T) Transformer (Amps)
200/208	60	7.5
220/230/240	60	6.8
440/460/480	60	3.4
550/575/600	60	2.7
380/400/415	50 / 60	3.9

- 15. If an optional circuit breaker is not provided, the branch circuit overcurrent protection device(s) for the YORK Solid State Starter must be a time delay type with a maximum rating which is sized in accordance with the N.E.C., and shall not exceed the smaller of the two ratings listed following, (a) or (b):

- a. The next standard fuse/breaker rating equal to or below:  
 $2.25 \text{ (Compressor-Motor FLA) + Control Transformer Amps}$
- b. A rating limited by the starter size as follows:

Starter Model No.	Max. Fuse/Breaker Size (Amps)
SSS 7L	500
SSS 14L	1000
SSS 26L	1600
SSS 33L	2000

Where 2.25 factor is per 1999 N.E.C. [Paragraphs 440-22(a) and (b)]; FLA is per Note 7; control power transformer Amps per Note 14.

- 16. The YORK Solid State Starter power wiring ampacity shall be calculated as follows.

Model YS minimum circuit ampacity:  
 $\text{Ampacity} = 1.25 \text{ (Compressor-Motor FLA) + Control Transformer Amps}$

Where 125% factor per 1999 N.E.C. (Para. 440-33); FLA is per Note 7; control power transformer Amps per Note 14.

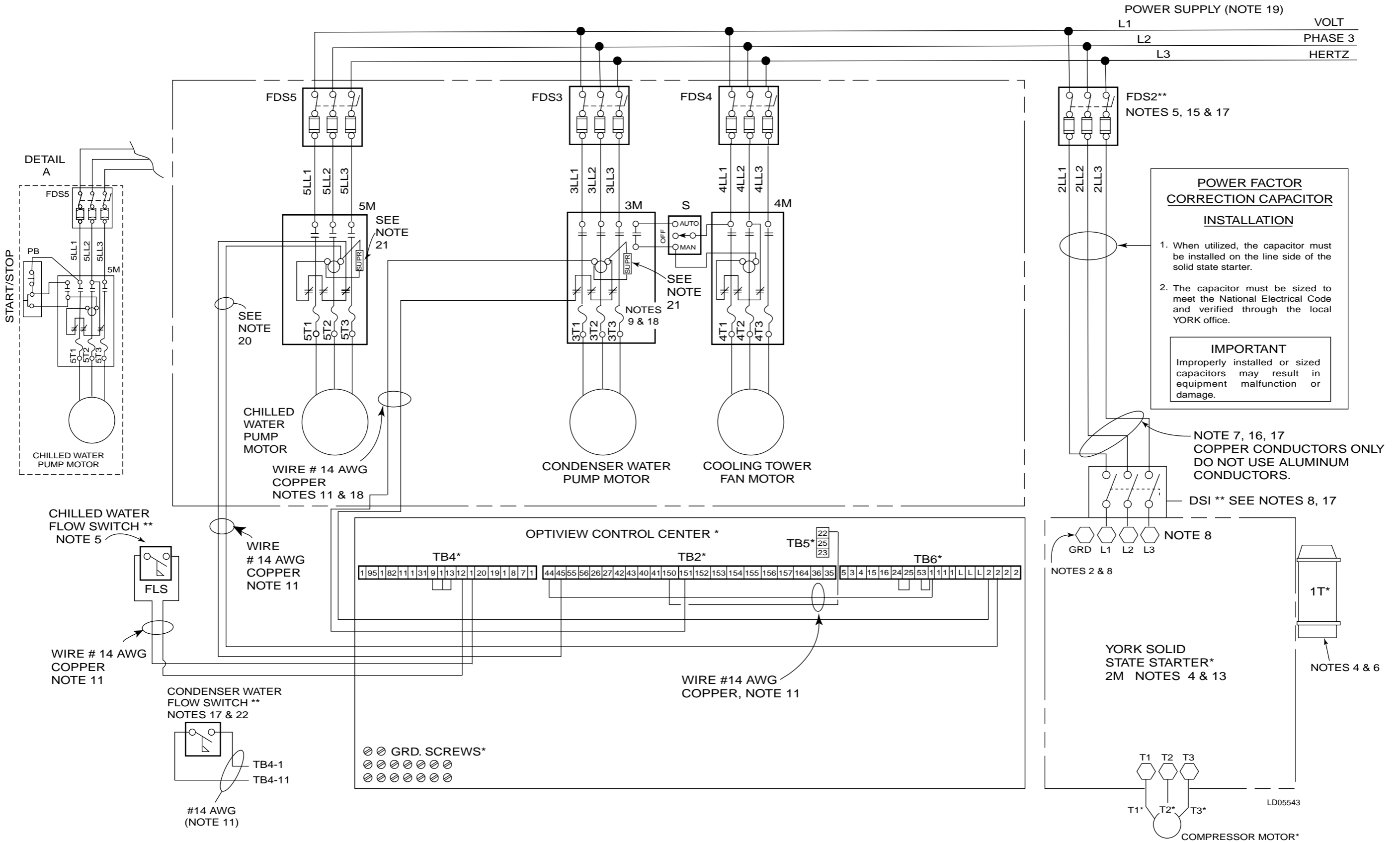
- 17. If the fused disconnect switch (FDS2) is not located in sight (1999 N.E.C. Para. 440-14) of the YORK Style "B" Solid State Starter, a non-fused disconnect switch (not shown) shall be located in sight of the Solid State Starter between FDS2 and the Solid State Starter. The ampere rating shall be determined as follows for the disconnect switch of FDS2: The larger of

- a.  $\text{Amp Rating} = 1.15 \text{ (Compressor-Motor FLA + Control Power Transformer Amps)}$   
or
- b. The size required to mount the fuses determined in Note 15 (if a fused disconnect is employed).

Where 115% factor is per 1999 N.E.C. (Para. 440-12b (2)); FLA is per Note 7 and control power transformer Amps per Note 14. An optional factory mounted and wired disconnect switch or circuit breaker is available within the Mod "B" SSS (see Note 8).

- 18. Control circuit wiring for 3M condenser water pump motor starter is shown for cooling only application.

### WIRING DIAGRAM FIELD CONNECTIONS – SOLID STATE STARTER



19. The main power transformer should be adequately sized such that the transformer voltage drop does not exceed 10% during unit start-up. Also, the supply voltage, at starter input terminals, during start-up must be maintained above the minimum value specified in the table. Note that while the YORK chiller will perform acceptably during startup with this amount of voltage drop, the performance of other equipment connected to the supply transformer could be adversely affected.

Three Phase Voltage	Hz	Minimum Voltage at Starter Input Terminals During Start-up
200/208	60	170
230/240	60	196
440/460/480	60	391
575/600	60	489
380	50 / 60	323
400	50	340
415	50	353

20. Automatic control of the chilled water pump by the Control Center is shown. Chilled water pump motor starter (5M) holding coil to be furnished for 115V – 50/60 Hz. The power requirements for the water pump starter (5M) must be a maximum of 2 Amps inductive at 115VAC. If power requirements exceed this value, furnish coil for line voltage, and control relay with 115V coil.

Two chilled water pump operating modes are available via the CHW Pump programming dip switch (SW1, position 8) on the micro board. With the switch in the "OFF" position, the chilled water pump operates for 30 seconds prior to compressor start, during compressor operation, coastdown, and LWT cycling shutdowns. With the switch in the "ON" position, the chilled water pump operates as above plus it operates during MULTI-UNIT and REMOTE/LOCAL cycling shutdowns.

For manual chilled water pump control, connect a manual start/stop switch as shown in Detail A.

21. Each 115VAC field-connected inductive load, i.e. relay coil, motor starter coil, etc. shall have a transient suppressor wired (by others) in parallel with

its coil, physically located at the coil. Spare transient suppressors are factory supplied in a bag attached to the keypad cable clamp in the OptiView Control Center.

22. The Condenser Flow Switch is optional. If not present, a jumper must be installed between TB11 and TB4-1.
23. The short circuit withstand capacity, as described in U.L. Standard 508, in symmetrical RMS Current is listed in the following table for each of the field wiring option kits.

MODEL	OPTION KIT	KA RATING (SYMMETRICAL A, RMS)	
		480V MAX	600V MAX
SSS7L	LUG	18	18
	250 A DISCONNECT SW.	18	18
	400 A DISCONNECT SW.	18	18
	250 A CIRCUIT BREAKER	65	22
SSS14L	400 A CIRCUIT BREAKER	65	22
	LUG	30	30
	250 A DISCONNECT SW.	30	22
	400 A DISCONNECT SW.	30	22
SSS26L	600 A DISCONNECT SW.	30	30
	250 A CIRCUIT BREAKER	65	22
	400 A CIRCUIT BREAKER	65	22
	600 A CIRCUIT BREAKER	65	35
SSS33L	LUG	42	42
	1200 A DISCONNECT SW.	42	42
SSS33L	1000 A CIRCUIT BREAKER	65	50
	LUG	42	42
SSS33L	1200 A CIRCUIT BREAKER	65	50

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STARTER MODEL NO.	NO. OF CONDUITS MAX. TRADE CONDUIT SIZE
7L, 14L	(2) 3"
26L, 33L	(4) 3"

