 PRODUCT DRAWING	Supersedes: 160.49-PW10 (897) FORM 160.49-PW10 (1097) WIRING DIAGRAM MILLENNIUM MODEL YK CHILLERS (STYLES C & D) FIELD CONNECTIONS WITH ELECTRO-MECHANICAL STARTER
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. YK _____
 NO. OF UNITS _____
 COMPRESSOR MOTOR ___ VOLTS, 3-PHASE ___ HZ
 OIL PUMP MOTOR _____ VOLTS, 3-PHASE ___ HZ

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 NO. OF UNITS _____
 COMPRESSOR MOTOR ___ VOLTS, 3-PHASE ___ HZ
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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. Compressor motor frame shall be grounded in accordance with N.E.C. (Table 250-95) for equipment grounding, using copper conductor only. Motor terminal box is furnished with one 3/8" hex head cap screw and lock washer (ground lug is not furnished) for grounding. Ground the control center with ground screw furnished, using copper conductor only.
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), control relays, and control power transformer (CPT) furnished by others unless otherwise specified.
4. Items marked * furnished by York International Corporation.
5. Items marked ** available from York International Corporation at additional cost.
6. Motor starter must be furnished in accordance with Form 160.45-PA5.1.
7. Control power supply 115V-50/60Hz, 15 ampere capacity for control center only should be supplied by a control power transformer (CPT) wired as shown. CPT should be incorporated in the chiller starter (2M) – see Note 6.
8. Motor power conduit connection location, motor full load amperes (FLA) and type starting per Product Drawing Form 160.49-PA1. Multiple conduits should contain an equal number of wires from each phase in each conduit to prevent overheating. Use copper conductors only; do not use aluminum conductors. Flexible final connections should be used to provide vibration isolation.

9. Wiring diagram for YORK MicroComputer Control Center Form 160.49-PW7. Field wiring modifications per Form 160.49-PW10.
10. Condenser water pump motor starter (3M) holding coil to be furnished for 115V-50/60Hz. The power requirements for the total of the condenser water pump starter (3M) and the chiller starter (2M) condenser must be a max. of 2 Amps holding and 10 Amps inrush. If power requirements exceed this value, furnish coil for line voltage, and control relay with 115V coil. See Note 27.
11. Units shipped knocked down require field connection of harness to control panel. These harnesses are furnished by York International Corporation for field assembly and consist of proper lengths of flexible conduit with necessary connectors, and contain the wires properly terminated and marked.
12. Motor leads shown for star delta starter (200 to 600 volts). For 3 lead starting arrangements, see diagram on motor data plate. Only three lead type of starting used above 600 volts. Connect full voltage (run) interlock of compressor-motor starter to terminals 3 - 4.
13. Wire #14AWG copper for one way distance of less than 175 feet. Wire #12AWG copper for one way distance of more than 175 feet but less than 300 feet.
14. Units installed in Canada must have a field supplied CSA approved 30 Amp disconnect switch and 15 Amp dual element fuse mounted external to control panel for 115 volt control supply.
15. Oil pump motor auxiliary power supply (FDS1) – See Product Drawing Form 160.49-PW7 for specified voltage and fusing. For 200 through 600 VAC compressor motor, the oil pump motor voltage is the same as compressor motor voltage and is wired (by others) as shown; three phase oil pump power supply can also be fed thru either a 3-pole, 30 Amp fuse block or a 3-pole circuit breaker from the compressor motor starter as shown in Form 160.45-PA5.1, Fig. 3.5(a). For high voltage compressor motors (2300 through 4160VAC), the oil pump motor voltage shall be selected by the customer at one of the available voltages (200 through 600VAC) shown in Form 160.49-PW7 and wired to a separate supply (not shown on wiring diagram).
16. Control circuit wiring for 3M condenser water pump motor starter is shown for cooling only application.
17. Wiring shown from 200 to 600 volt starter (2M) is required only for optional safety devices in starter

which will stop compressor (terminals [1] and [53]) and for optional safety devices in the starter which will cycle the compressor and/or optional OFF-AUTO switch (terminals [1] and [13]). When optional safety devices are installed, remove jumper between [1] and [53]. When optional cycling devices are installed, remove jumper between [1] and [13].

For 2300 to 4160 volt U.L. to C.S.A. approved units only, compressor-motor starter (2M) overloads (normally closed) must be connected (by others) between terminals [1] and [53]. Remove the factory supplied jumper between [1] and [53] when installing overloads or other safety devices. For 200 to 600 volt units, a jumper is provided between terminals [1] and [53]. See Control Center Wiring Diagram, Form 160.49-PW7 and Motor Starter, Form 160.45-PA5.1.

18. High voltage (2300 to 4160 volts) compressor-motor starters of NEMA Class E-2 (when used) have high interrupting capacity current limiting fuses plus an integral non-load disconnect function and thus do not require the use of FDS2.
19. Low voltage motors (up to and including 600 volts) are furnished with six leads. High voltage (2300 to 4160 volts) motors have three leads up to 900 HP. 1000 HP and above motors that are dual 2300/4000V 60 Hz have 6 leads, jumpered to give 3 lead type starting. Motor leads are furnished with a crimp type connector having a clearance hole for a 3/8" bolt. Motor terminal lugs are not furnished.
20. Starter to motor power wiring ampacity shall be calculated as follows:
 - A. Six lead type of starting (star-delta) – minimum circuit ampacity per conductor (one of six):

$$\text{Ampacity} = .721 \times \text{compressor-motor amps}$$
 - B. Three lead type of starting (across-the-line, auto-transformer, primary reactor or primary resistor) - minimum circuit ampacity per conductor (one of three):

$$\text{Ampacity} = 1.25 \times \text{compressor-motor amps}$$

Where 125% factor is per N.E.C. (para. 440-33); .721 is 125% factor x 57.7% voltage (only star-delta starter); Compressor-motor amps (See Note 8) are FLA.
21. The fused disconnect switch (FDS2), for the compressor-motor starter, minimum ampere rating shall be determined as follows for 200 to 600 volts:

$$\text{Amp rating} = 1.15 (\text{compressor-motor amps} + \text{oil pump motor amps} + \text{control power transformer amps})$$

Where 115% factor is per N.E.C. (para. 440-12b(2)); Compressor-motor amps (see Note 8) are FLA; when the oil pump motor power supply is furnished from the compressor-motor/starter (2M), oil pump motor amps are per Note 22, if another power supply is used (FDS1), enter zero; the control transformer is furnished with the compressor-motor starter (2M), control power transformer amps are per Note 22.

- 22. 60 and 50 Hz oil pump motors are 2HP for all compressor codes. The full load amperes for oil pump motor and 2.0 KVA control power transformer to be used with Notes 21, 23 & 25 are:

3-Phase Voltage	Hz	Oil Pump Motor (amps) 2 HP	Control Power (CPT) Transformer (amps)
208	60	6.8	10.0
220/230/240	60	6.7	9.1
380	60	3.9	5.3
416	60	3.4	4.8
440/460/480	60	3.4	4.6
550/575/600	60	2.7	3.6
2300	60	—	0.9
4000/4160	60	—	0.5
220	50	6.2	9.1
346	50	3.9	5.8
380/400/415	50	3.6	5.3
440	50	3.1	4.5

- 23. Starter line-side power wiring ampacity shall be calculated as follows: minimum circuit ampacity:

$$\text{Ampacity} = 1.25 (\text{compressor-motor amps}) + \text{oil pump motor amps} + \text{control power transformer amps.}$$

Where 125% factor is per N.E.C. (para. 440-33); compressor-motor amps (see Note 8) are FLA; when the oil pump motor power (200 thru 600 volts only) supply is fed thru the starter (2M), per Note 15 (not shown on diagram), amps are per Note 22 – If another power supply (FDS1) is used or compressor motor voltage is 2300 to 4160 volts, enter zero; the control power transformer is furnished with the compressor-motor starter (2M), control power transformer amps are per Note 22.

- 24. Power factor correction capacitors, when utilized, must be sized to meet the N.E.C. and verified through the local York International office. Improperly installed or sized capacitors may result in equipment malfunction or damage.

- 25. The branch circuit over-current protection device(s) for the 200 thru 600 volt starter (2M) must be a time delay with a minimum rating equal to the next standard fuse/breaker rating above the following amps:

$$\text{Amps} = 1.5 (\text{compressor-motor amps}) + \text{oil pump motor amps} + \text{control power transformer amps.}$$

Where 150% factor is per U.L. Standard 465 (7th Edition); compressor-motor amps (see Note 8) are FLA; when the oil pump motor power supply is fed thru the starter 2M, per Note 15 (not shown on diagram), amps are per Note 22, if another power supply (FDS1) is used, enter zero; the control power transformer is furnished with the compressor-motor/starter (2M), control power transformer amps are per Note 22.

Fusing and fuse size must be coordinated with starter manufacturer.

The use of circuit breakers with open transition starter is NOT recommended; this combination could result in nuisance tripout on starting.

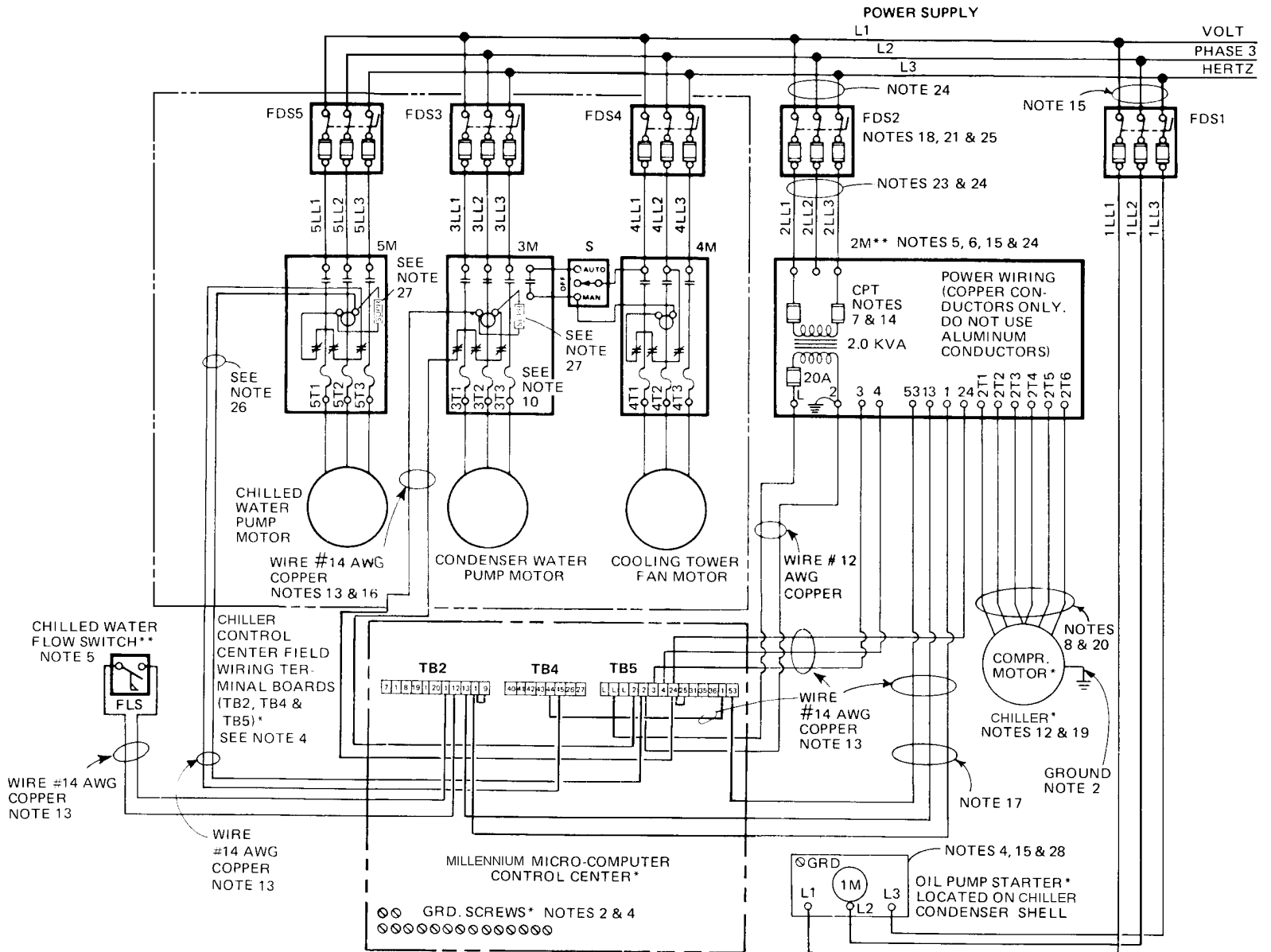
Starter overload relay trip time is shown in para. 3.10 on Product Drawing Form 160.45-PA5.1.

- 26. Automatic control on 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 holding and 10 Amps inrush. If power requirements exceed this value, furnish coil for line voltage, and control relay with 115V coil. See Note 27.

For manual chilled water pump control, connect a manual start/stop switch as shown for the Hot Water Pump Motor in the Field Connections diagram.

- 27. 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 top of the hinged panel in the MicroComputer Control Center.
- 28. Three phase oil pump motor must be properly phased. L1, L2 & L3 corresponding to phase sequence A, B & C.

WIRING DIAGRAM FIELD CONNECTIONS (ELECTRO MECHANICAL STARTER)



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