



BY JOHNSON CONTROLS

Service Information

File In/With: N/A

SI0227

New 610

Equipment Affected: YK Centrifugal Chillers with OptiSpeed VSDs

Quick Start Feature – Product Overview and Ordering Information

GENERAL

Quick Start is a software feature recently developed for YK Mod G chillers equipped with OptiSpeed variable speed drives and was designed for critical cooling installations, such as data centers and process applications, where a primary operational goal is to re-establish cooling as quickly as possible after a power failure. The Quick Start feature accomplishes this by minimizing restart time and loading the chiller as quickly as possible. This reduces the deviation from chill water set point and enables the fastest achievement of leaving chill water temperature set point. Once the chiller is running and approaches set point it will return to standard YK control. A chiller with the Quick Start feature enabled will also load faster on initial start and will start an additional chiller in a multiple chiller plant room when required. It is available for retrofit and can be utilized in both Uninterrupted Power Supply (UPS) and non-UPS applications.

The ideal installations for Quick Start are thermal storage applications, pharmaceutical facilities, manufacturing processes, and data centers. Why do these facilities want this feature? In this type of facility cooling requirements remain constant when the chillers are impacted by a power failure. In a data center application a seemingly small delay in getting the chill water temperature back to set point could cause servers to overheat resulting in the web-sites going down. The financial impact could be millions of dollars for each minute of downtime.

A detailed explanation of the Quick Start feature is provided in Form 160.75-TD4. This publication includes the following:

- Feature Overview
- Comparison of Normal Start to Quick Cold Start to Quick Restart. This includes sample graphs of various size chillers and comparative restart times.
- Quick Start Tuning Parameters
- UPS Sizing and Wiring Information

The Quick Start feature has two different starting modes:

- Quick Restart. When a chiller shuts down, if certain conditions are met at the completion of Coastdown (and within 30 seconds thereafter), the chiller is started immediately with no Prelube. The vanes are given a constant open pulse and after the OptiSpeed drive achieves its start frequency, the speed ramp rate is faster than with normal control.
- Quick Normal Start. If the conditions for a Quick Restart are not met, the next time the chiller is started, it has a normal Prelube just like a normal start, however the vanes will begin to open at the beginning of Prelube, instead of waiting until System Run. At the completion of Prelube, the OptiSpeed is started and after the OptiSpeed drive achieves its Start Frequency, the speed ramp rate is faster than with normal control.

Application

In order to use this feature, the chiller must be equipped with a Low Voltage OptiSpeed Drive (in Modbus Protocol Configuration) or a Medium Voltage OptiSpeed Drive.

There are two major delineations of the Quick Start feature.

- 1) Quick Start with no UPS
- 2) Quick Start with UPS

The table below highlights the Quick Start retrofit scenarios.

Retrofit Scenarios	No UPS*	UPS (supplied by others)
YK Mod G Chillers with VSD shipped after 8/14/09	Feature needs to be enabled in the OptiView software	Wiring modifications required to accommodate the UPS
YK Mod G Chillers with VSD shipped before 8/14/09	Requires installation of v21 (C.OPT.01.21.307) or later OptiView software	Requires installation of v21 (C.OPT.01.21.307) or later OptiView software Wiring modifications required to accommodate the UPS
YK Mod F Chiller with VSD where the last 3 digits of the VSD part number are -7XX	Requires installation of v21 (C.OPT.01.21.307) or later OptiView software	Requires installation of v21 (C.OPT.01.21.307) or later OptiView software Wiring modifications required to accommodate the UPS
YK Mod F Chiller with VSD where the last 3 digits of the VSD part number are NOT -7XX	Requires new boards and harness for VSD and panel Requires installation of v21 (C.OPT.01.21.307) or later OptiView software	Requires new boards and harness for VSD and panel Requires installation of v21 (C.OPT.01.21.307) or later OptiView software Wiring modifications required to accommodate the UPS

**The feature needs to be enabled for all retrofit scenarios*

Kits and Components for Quick Start Retrofits

YK Mod G Chillers with VSD shipped after 8/14/09

- Non-UPS: no parts required
- UPS (wiring modification kits for the VSD)
 - Style D: 371-05542-001
 - Vyper (351/292 HP): 371-05542-002
 - Vyper (424 HP): 371-05542-004
 - Vyper (503/608/419 HP): 371-05542-003

YK Mod G Chillers with VSD shipped before 8/14/09

- Non-UPS:
 - Program card (C.OPT.01.21.307 or later): 031-02474-001
- UPS (wiring modification kits for the VSD)
 - Follow instructions for YK Mod G Chillers with VSD shipped after 8/14/09

YK Mod F Chiller with VSD where the last 3 digits of the VSD part number are -7XX

- Non-UPS
 - Program card (C.OPT.01.21.307 or later): 031-02474-001
- UPS (wiring modification kits for the VSD)
 - Follow instructions for YK Mod G Chillers with VSD shipped after 8/14/09

YK Mod F Chiller with VSD where the last 3 digits of the VSD part number are NOT -7XX

- Non-UPS
 - OptiView Microboard: 031-02430-001
 - J20 Adaptor Cable: 571-05166-000
 - J13 (OptiView microboard) to 3TB (OptiSpeed) cable: 375-92455-210
 - VSD Logic Board. Upgrade to 031-02506-001 by ordering one of the following kits:
 - Style D VSD (658/790 HP, 900/1100 HP): 331-02506-601
 - Vyper VSD – 460 volt (292/351 HP, 419/503 HP): 331-02506-602
 - Vyper VSD - 575 volt (424 & 608 HP): 331-02506-603
 - OptiSpeed Wiring Modification Kits for Modbus Communication
 - Style D: 371-05193-001
 - Vyper: 371-05193-002
- UPS (wiring modification kits for the VSD)
 - Follow instructions for YK Mod G Chillers with VSD shipped after 8/14/09

Installation costs will vary based on application and local conditions. The installation tasks noted below should be reviewed with the local branch Operations team to determine JCI technician hours and subcontractor costs (if required).

Pricing

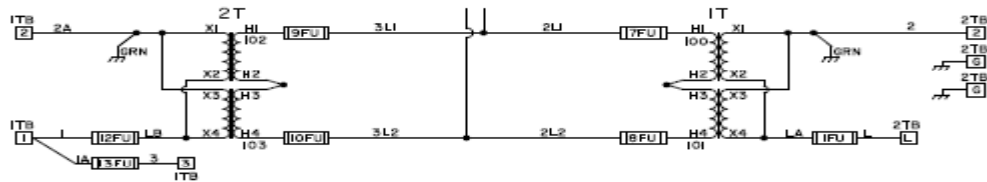
When quoting Quick Start you must be aware of, and take into consideration, the cost of the feature as offered on new equipment. This is specifically true if you are quoting the feature on a newer Mod level chiller (Mod G after 8-14-09) where the feature only requires software activation (non-UPS) and relatively minor wiring modifications for UPS. Below are the approximate branch transfer prices for the feature when provided on a new chiller. Quick Start retrofits should never be priced below these costs.

- Non-UPS (low and medium voltage VSD): \$1000-\$1500
- UPS (currently low voltage only): \$1200 - \$1750 (UPS provided by others)

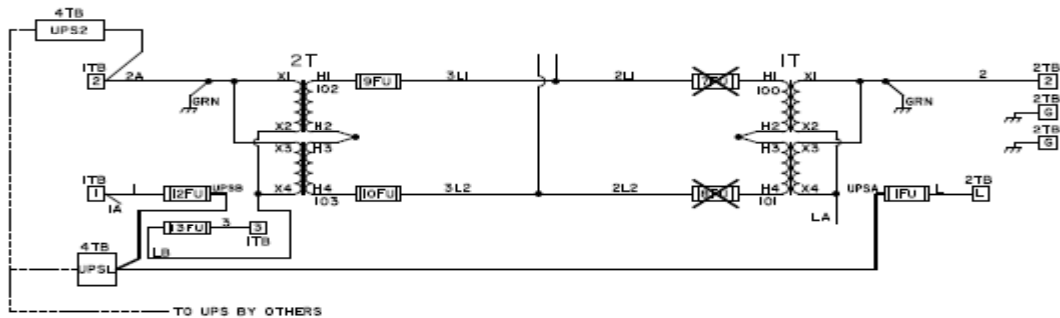
Installation**YK Mod G Chillers with VSD shipped after 8/14/09**

- Non-UPS: no parts required. Enable feature in software as noted below.
- UPS Style D (references to “items” are parts supplied in the kit)
 - Order wiring modification kits for the VSD
 - Remove and discard fuses 7FU and 8FU
 - Remove wire LA from 11FU fuseholder and attach male terminal (item 4) to wire LA
 - Remove wire 1A from 13FU fuseholder and attach male terminal (item 4) to wire 1A
 - Remove wire LB from 12FU fuseholder and attach wire LB to 13FU fuseholder
 - Remove cover plate and gasket from the 2” hole between the 1T and 2T control transformers. Discard blank cover plate. Keep gasket and hardware, they will be reused.
 - Attach new cover plate (item 1) reusing gasket and secure with original hardware.
 - Attach terminal block (item 2) onto studs located on left inside wall above the fuse swing panel and secure using nuts (item 4)
 - Connect stripped end of wire UPS2 (item 3) to left side of terminal block (item 2) at location UPS2. Connect the other end of wire UPS2 to an open location 2 on 1TB terminal block.
 - Connect stripped ends of wires UPSA and UPSB (item 3) to left side of terminal (item 2) at location UPSL. Route wires UPSA and UPSB along harness on the fuse swing panel securing with tie wraps (item 5) where appropriate. Attach wire UPSA to 11FU fuseholder. Attach wire UPSB to 12FU fuseholder.

- o Wiring diagrams are shown below.

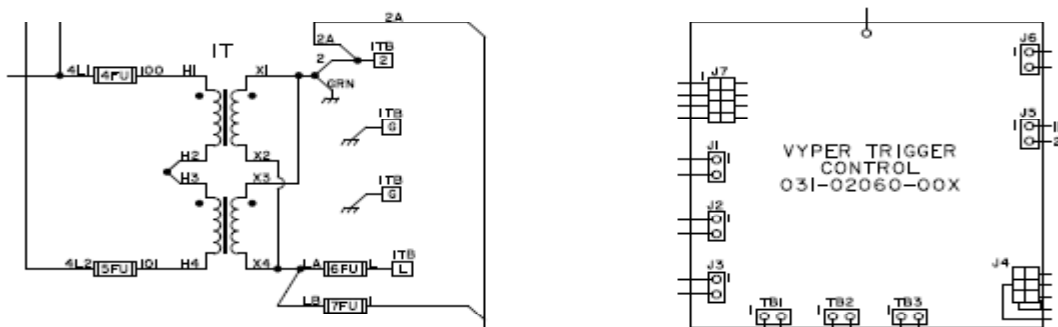


Style D Standard Wiring Configuration

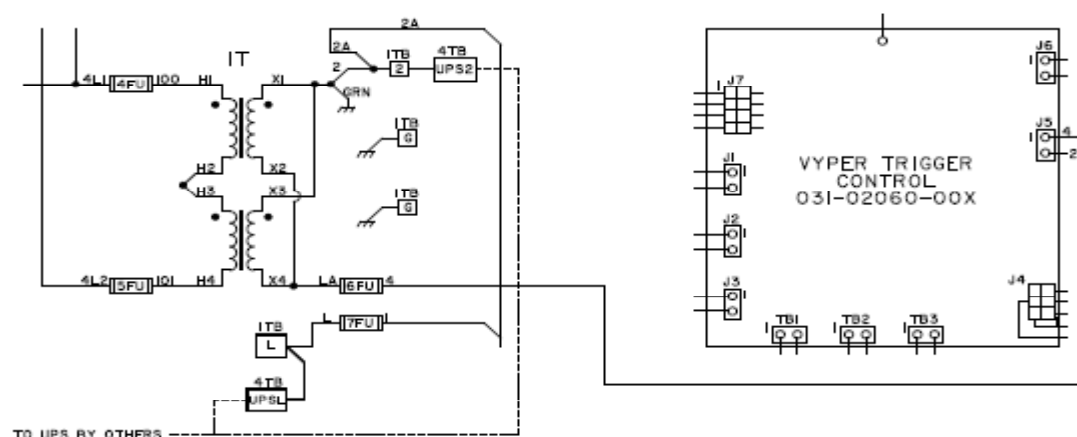


Style D Quick Start Modification for UPS

- UPS Vyper 351/292/424 HP (references to “items” below are parts from the kit)
 - o Order wiring modification kits for the VSD
 - o Remove and discard wire LB from the top of 6FU and 7FU
 - o Remove wire L from the bottom of 6FU and attach wire L to the top of 7FU
 - o Remove and discard fuse 6FU and replace 6FU with item 6
 - o Remove cover plate and gasket from the conduit access. Discard the old cover plate and keep the gasket.
 - o Attach new cover plate (item 1) reusing gasket and secure with original hardware.
 - o Attach terminal block (item 2) onto studs located on left bottom of enclosure and secure using nuts (item 4)
 - o Connect stripped end of wire UPS2 (item 3) to left side of terminal block (item 2) at location UPS2. Connect the other end wire UPSL to terminal L of 1TB terminal block.
 - o Connect stripped end of wire UPSL (item 3) to left side of terminal block (item 2) at location UPSL. Connect the other end of wire UPSL to terminal L of 1TB terminal block.
 - o Connect Faston terminal end of wire 4 (item 3) to the bottom of 6FU. Route wire 4 along main harness to J5 of SCR trigger board (031-02060-XXX) securing with tie wraps (item 5).
 - o Remove plug P5 from the SCR trigger board and extract wire 2J. Insert wire 2J into the open position of plug next to wire 4. Connect the new plug containing wires 4 and 2J into J5 on the SCR trigger board. Cap the plug containing wire 1E with housing (item 7) and tuck into main harness.
 - o Wiring diagrams are shown below.



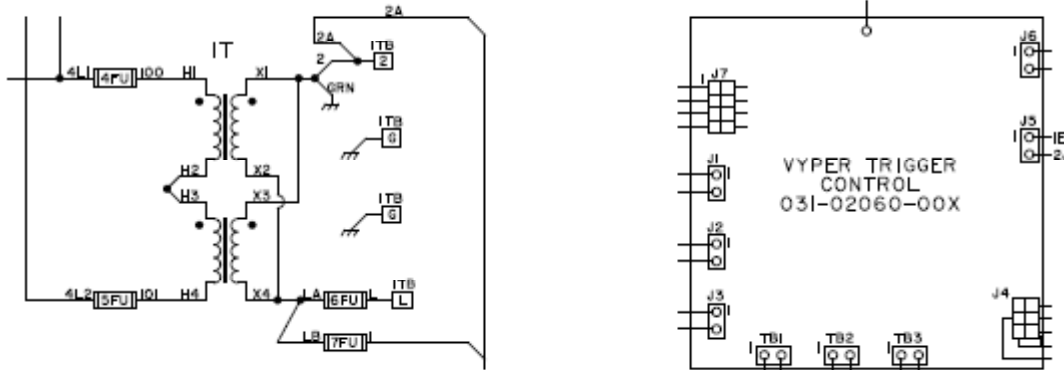
Vyper 351/292/424 HP Standard Wiring Configuration



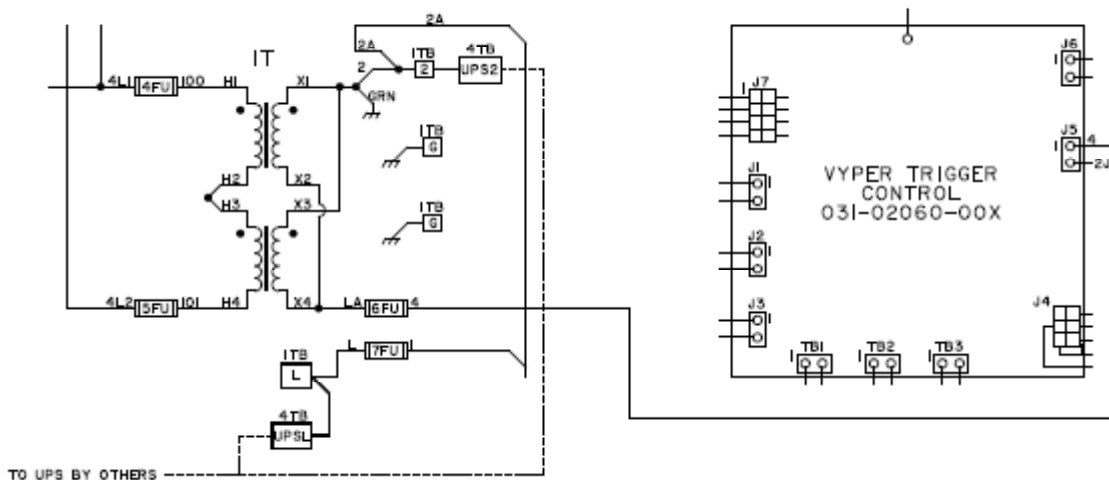
Vyper 351/292/424 HP Quick Start Modification for UPS

- UPS: Vyper 503/608/419 HP (references to “items” are parts supplied in the kit)
 - o Order wiring modification kits for the VSD
 - o Remove and discard wire LB from the top of 6FU and 7FU
 - o Remove wire L from the bottom of 6FU and attach wire L to the top of 7FU
 - o Remove and discard fuse 6FU and replace 6FU with item 6
 - o Remove blank cover plate and gasket from the lower middle left wall of the enclosure. Discard the blank cover plate and keep the gasket and hardware.
 - o Attach new cover plate (item 1) reusing gasket and secure with original hardware.
 - o Attach terminal block (item 2) onto studs located on left bottom of enclosure and secure using nuts (item 4)
 - o Connect stripped end of wire UPS2 (item 3) to left side of terminal block (item 2) at location UPS2. Connect the other end wire UPSL to terminal L of 1TB terminal block.
 - o Connect stripped end of wire UPSL (item 3) to left side of terminal block (item 2) at location UPSL. Connect the other end of wire UPSL to terminal L of 1TB terminal block.
 - o Connect Faston terminal end of wire 4 (item 3) to the bottom of 6FU. Route wire 4 along main harness to J5 of SCR trigger board (031-02060-XXX) securing with tie wraps (item 5).
 - o Remove plug P5 from the SCR trigger board and extract wire 2J. Insert wire 2J into the open position of plug next to wire 4. Connect the new plug containing wires 4 and 2J into J5 on the SCR trigger board. Cap the plug containing wire 1E with housing (item 7) and tuck into main harness.

- o Wiring diagrams are shown below.



Vyper 503/608/419 HP Standard Wiring Configuration



Vyper 503/608/419 HP Quick Start Modification for UPS

YK Mod G Chillers with VSD shipped before 8/14/09

- Non-UPS:
 - o Program card (C.OPT.01.21.307 or later): 031-02474-001
- UPS:
 - o Follow instructions for YK Mod G Chillers with VSD shipped after 8/14/09

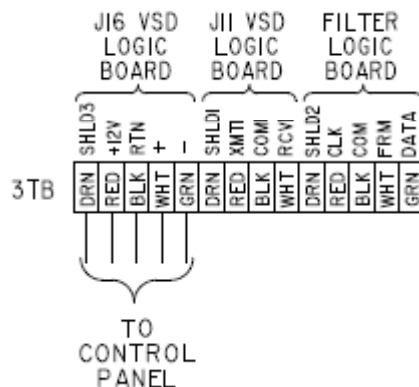
YK Mod F Chiller with VSD where the last 3 digits of the VSD part number are -7XX

- Non-UPS
 - o Program card (C.OPT.01.21.307 or later): 031-02474-001
- UPS:
 - o Follow instructions for YK Mod G Chillers with VSD shipped after 8/14/09

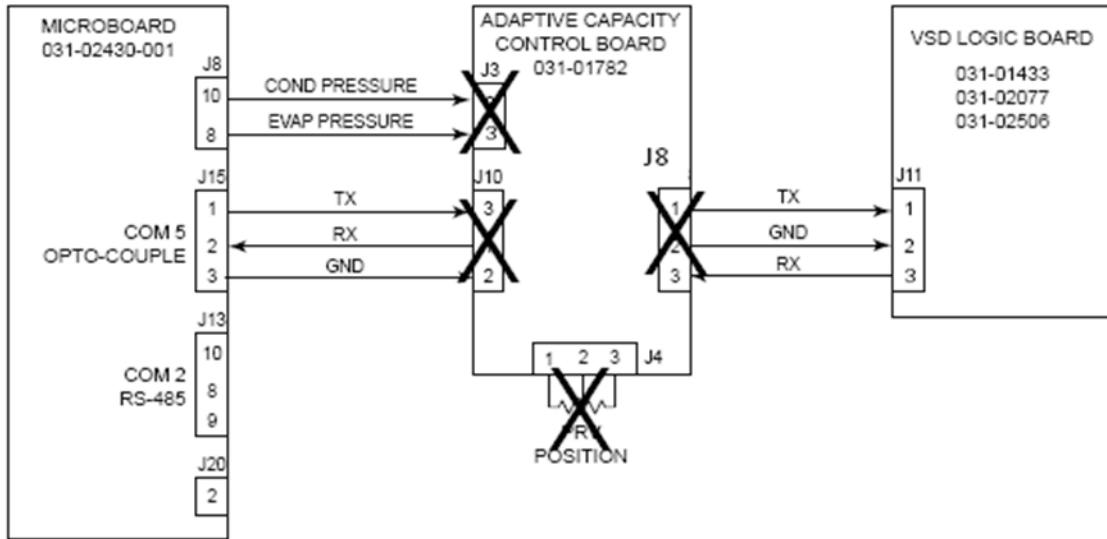
YK Mod F Chiller with VSD where the last 3 digits of the VSD part number are NOT -7XX

- Non-UPS: OptiView to OptiSpeed Wiring

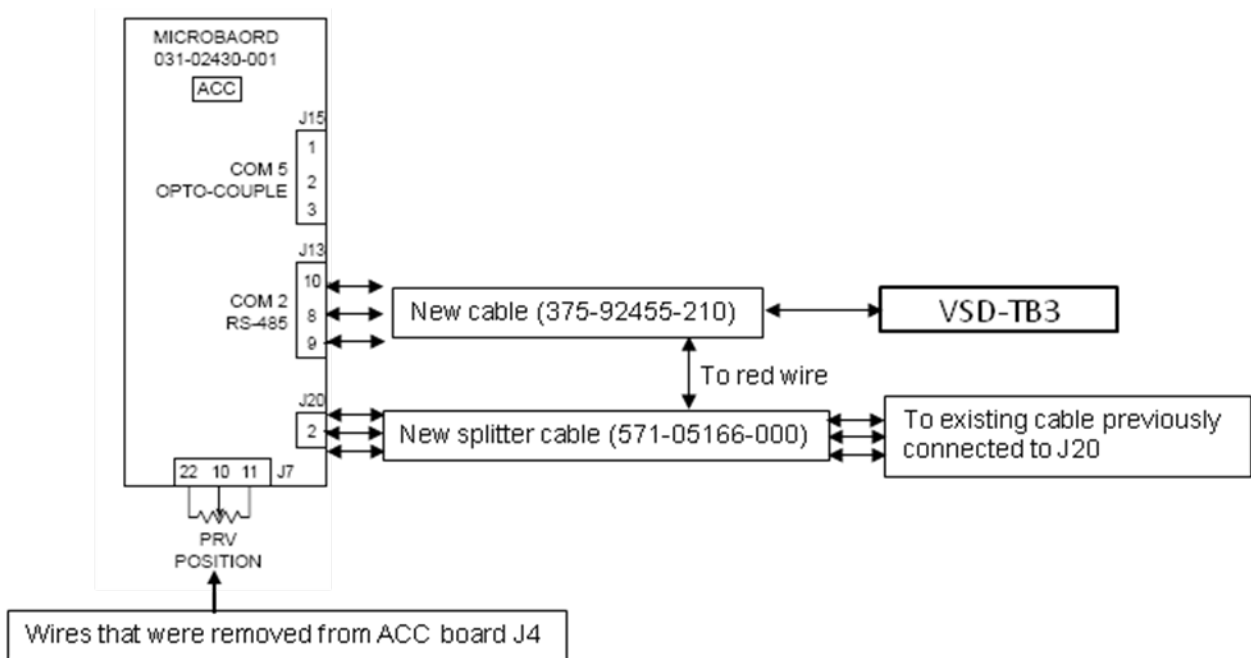
- o Note that references to 3TB below are specific to Style D drives. The Vyper drives use terminal block 2TB.
- o Order wiring modification kits
- o Install 031-02430-001 Microboard
- o Remove J4 connector from ACC board (ACC Board functionality is incorporated in the new 031-02430-001 board). Remove wires/pins from J4 connector and insert into J7 Microboard connector. The following are the new pin locations: J7-22 (red wire), J7-10 (white wire), J7-11 (black wire).
- o Remove J3, J6, J8, J9, and J10 connectors from ACC Board.
- o Remove the J20 cable connector from the 031-02430-001 board.
- o Install the removed J20 connector into the J20 adaptor cable (571-05166-000).
- o Insert the new P20 connector on the J20 adaptor cable into Microboard J20 connector.
- o Install OptiView end of J13-3TB cable (375-92455-210) to J13 (Com 2) connection on Microboard per the following: green wire into J13-10, black wire into J13-9, and white wire into J13-8. Connect the forked lug to panel ground near J13.
- o Remove OptiView wiring from 3TB. Tape off wiring. It may be needed in the future to convert back to York Protocol.
- o Route J13-3TB cable (075-92455-210) to VSD 3TB
- o Install wiring on 3TB per 035-21563-000.



- o Place Microboard JP-17 on pins 1-2
- o Place JP-3 on 031-02506-00x VSD Logic Board on one pin for the York application
- o Install new software into the 031-02430-001 Microboard
- o Set Motor Communications Protocol on set-up screen to Modbus



OptiView to OptiSpeed Wiring (YORK Protocol existing wiring)



OptiView to OptiSpeed Wiring (Modbus Protocol new wiring)

- Non UPS: OptiSpeed Wiring Modifications
 - VSD Logic Board.
- Upgrade to 031-02506-001 by ordering and installing the appropriate kit based on VSD type.
 - Style D Modbus Communication Upgrade.
 - Below is a summary of the wiring modifications. Specific instructions are found on drawing 035-21573-000 in the kit.
 - Install new terminal blocks on 3TB
 - Connect 571-02461-275 shielded cable to J16 on the VSD Logic Board. Connect opposite end to 3TB per 035-21563-000 wiring diagram

- Remove shielded cable from J11 on the VSD Logic Board
- Locate SW3 Dip Switch on VSD Logic Board and slide Position1 and FLTR RCV to the “On” position
- Remove shielded cable J8 on Filter Logic Board (if applicable)
- Install 571-05192-201 shielded cable into J8 of the Filter Logic Board and the opposite end into J15 of the VSD logic board (if applicable)
- o Vyper Modbus Communication Upgrade.
 - Below is a summary of the wiring modifications. Specific instructions are found on drawing 035-21574-000 in the kit.
 - Install new terminal blocks on 3TB
 - Connect 571-03788-274 shielded cable to J16 on the VSD Logic Board. Connect opposite end to 2TB per 035-21565-000 wiring diagram
 - Remove shielded cable from J11 on the VSD Logic Board
 - Locate SW3 Dip Switch on VSD Logic Board and slide Position1 and FLTR RCV to the “On” position
 - Remove shielded cable J8 on Filter Logic Board (if applicable)
 - Install 571-05192-201 shielded cable into J8 of the Filter Logic Board and the opposite end into J15 of the VSD logic board (if applicable)
- UPS
 - o Follow instructions for YK Mod G Chillers with VSD shipped after 8/14/09
- Enabling the Quick Start Feature
 - o Commissioning the Quick Start feature requires that the Service Technician enable the feature in the OptiView software. This requires logging into the panel at the Admin level with the special administrative passcode. The Service Technician can contact Tom Brown at (717) 771-6359 for the passcode. The tech will need the following information when he calls: the date the commissioning is going to be performed and the software version information off of the program card or from the OptiView Diagnostic screen (ex. C.OPT.01.21.307).

Additional Information and Marketing Collateral

The following selling tools have been developed to support your efforts. Copies of these materials can be downloaded from the Chiller Retrofits and Enhancements site on the JCI Portal.

- Quick Start PowerPoint Presentation: This is a great tool for customer presentations.
- Sales Guide – PUBL-6113 (909) : One page color promotional document
- Technical Data Literature Form 160.75-TD4: This form contains additional data and information about quick Start features, restart times, sample pulldown graphs, Quick Start tuning parameters, and UPS sizing and wiring.
- Installation List. Form 160.75 L1.
- Offer Letter

Contacts

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