SPECIFICATIONS
Dynamic Torque Controller

GENERAL INFORMATION

Pentair® Dynamic Torque Controller™ (DTC) module will monitor in real time 3-phase voltage, current, and frequency input power to a 3-phase squirrel-cage induction motor coupled to a pump.

The DTC will detect the build up of blockages/rags on the inlet, outlet, and in the impeller housing of a pump.

The clean cycle will consist of a series of forward, reverse, and stopping actions. The reversing operation must be between 1-20 seconds and the pump should come to a rest before reversing.

The clean cycle must be triggered on any or all of the following: start up, high/low torque demand, timed operation, or digital.

On start up, the clean cycle can be adjusted to be different from the clean performed during a normal run command.

The device will trip out when a number of consecutive attempts to clean has been attempted. This is a configurable setting. The device must also have the option to either trip the pump or continue pumping with an alarm.

The DTC will be powered by a 110-240Vac 50-60Hz auxiliary supply.

The DTC must be capable of taking multi-voltage inputs from 110-240Vac.

The DTC must have one normally closed volt free fault contact and one normally open/closed fault contact.

The DTC must have one additional output configured to control soft starters.

Protective features on the DTC must have built-in advanced motor protection in the form of:

- IEC60947-4 thermal overload protection
- Over/Under voltage
- Over/Under current
- Frequency out of tolerance
- Current imbalance and phase failure
- DTC over temperature protection

The DTC will replace the existing thermal overload protection within the existing starter section.

The DTC will include a diagnostic and testing system for monitoring operating conditions.

The DTC will be listed by and bear the label of Underwriters Laboratories (UL) and Canadian Standards Association (CSA).

The DTC will be capable of operating at reduced power during AC input voltage dips of up to 20% and be capable of sustaining a complete loss of ac input power for minimum of 5 cycles.

The DTC must be suitable to control VFD's, soft starters, delta-wye, and in line starters. On soft starters, delta-wye, and in line additional reversing contactor will be fitted.

Added contactors need to be suitable for multiple starts.

When the DTC is used with soft starts, the DTC must have the facility to ramp down (in a controlled manner) the motor before reversing.

The DTC Device must have Modbus 485 RTU communications medium.

The DTC will be TS35 DIN rail mountable.

The DTC will have removable terminal blocks to allow easy replacement of units.

PARAMETERS

Programmable parameters:

- Motor rated current
- Motor rated voltage
- Motor rated frequency
- Clean trigger points
- Clean durations: forward, reverse, and stopping times
- Direction changes
- Overloads and protection parameters

Operating parameters:

- Output current
- Output voltage
- Output frequency
- Trip cause
- Motor run time
- Output voltage
- Total 3-phase output power in kW
- Kilowatt-hour meter
- Number of cleans attempted
- Number of motor starts
- Run time per day (365 day log)
- Average current per day (365 day log)
- Average power per day kW (365 day log)
- KW/Hr per day (365 day log)

The DTC must log an alarm history for at least 170 time-and-date stamped events. These include:

- Clean event
- Trip events
- Alarms
- Other significant events

The DTC be accompanied by one(1) copy of the manufacturer's application software enabling configuration of all parameters and viewing of diagnostics via a portable computer.

The DTC and all its components will be rated for operation under the following environmental conditions, without the use of any air conditioning equipment:

- Ambient temperature of 0ºC to 45ºC
- Relative humidity of 0 to 95% noncondensing

The DTC dimensions will not exceed the following:

EQUIPMENT	WIDTH (IN)	DEPTH (IN)	HEIGHT (IN)
DTC Device	1.4	4.75	4.5

WIRING AND TERMINATIONS

- All conductor insulation will be rated 600 V ac. Minimum conductor size for control circuits will be No. 14 AWG.
- Wire bundles will be secured with either wire ties or high temperature plastic wireway anchored to the assembly.
- DTC Device will be as manufactured by Clearwater Controls or approved equal.
- PCB's will be conformal coated and prepared for H2S environments

TESTING

GENERAL INFORMATION

Factory and field testing of all DTC devices specified in this section of the Special Provisions will be as specified herein and in Section 16A.

Prior to assembly, all modules will be separately tested.

The following tests will be performed on each DTC device:

- Functional testing to determine proper operation of the following devices:
  - Indicating LEDs and alarms
  - Protective devices
  - Local control devices
- Testing the DTC operation in response to the input from an external source of 4 to 20 mA.
- Function testing to determine that the clean cycle is triggered under appropriate circumstances

Certified test reports, in triplicate, will be submitted to the customer.

FIELD TESTS

The DTC manufacturer will provide the services of an approved service partner to install and commission the DTC, and perform their testing and startup at the job site. The services will be performed by personnel fully trained in the operation and maintenance of the specified equipment. All required test equipment will be provided by the service partner manufacturer.

DTC testing will include verification that all interfaces with external devices and equipment are functional, including, but not limited to plant control system inputs and outputs, equipment protective interlocks, etc.

1101 Myers Parkway | Ashland, Ohio, USA 44805 | Ph: 855-274-8948 | Orders Fax: 800.321.8793 | pentair.com

P1023 (07-21-21)