

FEATURES

CONTROL UPGRADES

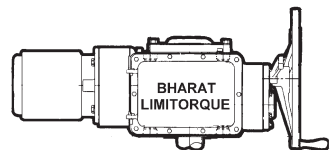
UEC-3-MPC POSITION CONTROLLER WITH 4-20 mA INPUT SIGNAL

The UEC-3 includes the basic software and default settings for accurate positioning and modulating control. Just add the limitorque A/D converter, analog board and feedback potentiometer to convert the UEC-3 into a precise position controller. The UEC-3-MPC includes automatic pulse mode to prevent over shoot at the set point. System operating parameters may be easily re-configured by the user. These include deadband and gain adjustments and selectable 'Lock-in-Last' or 'Fail-to-Close' position on loss of input signal.

DDC-100 TWO-WIRE DISTRIBUTED DIGITAL CONTROL SYSTEM

The UEC-3's SBC (single board computer) provides unrivalled control compared to conventional hard-wired actuator installations. By adding a single plug-in communications card, actuators can be controlled over a twisted-pair redundant loop network form a control room interface. In addition to significant savings in cabling, hardware, labour, etc., the DDC-100 Two Wire Control System provides vastly improved plant visibility, maintenance diagnostic data, and control and data gathering of associated equipment such as pumps, fans and mixers.

Jammed Valve Protection	■
Jammed Valve Auto Forward / Reverse Sequence	■
Anti-Torque Switch Hammer Protection	■
Opto-isolation of Inputs	■
Monitor Relay	■
Internal 24 Volt D.C. Control Supply Output	■
24-125 V.A.C. or D.C. Control Supply Inputs	■
Instantaneous Reversal	■
Local Direction indication on Push button Station	■
Lost Phase Protection	■
Selectable Phase Discriminator / Auto Phase Correction	■
Yellow LED Indicates Phases Correctly Connected	■
Red LED Indicates all Phases Present	■
Selectable Two, Three or Four Wire Control	■
Electrical Interlock / Inhibit Circuits	■
Selectable Open or Close on Emergency Shut-Down	■
Selectable Stay-put on Emergency Shut-Down	■
Motor Thermostat	■
Selectable Position or Torque Seating	■
Selectable Clockwise / Counter Clockwise Motion	■
Variable Duty Cycle (2 speed timer) in Both Directions	■
Simplified Wiring Schematics	■
Comprehensive Diagnostic Port	●
PT20SD-20mA Current Position Transmitter	●
Potentiometer	●
Upgrade to UEC-3-MPC Position Controller	●
Upgrade to DDC-100 Two Wire Control	●
ESD on Irrespective of Mode	●
■ STANDARD	
● OPTIONAL	



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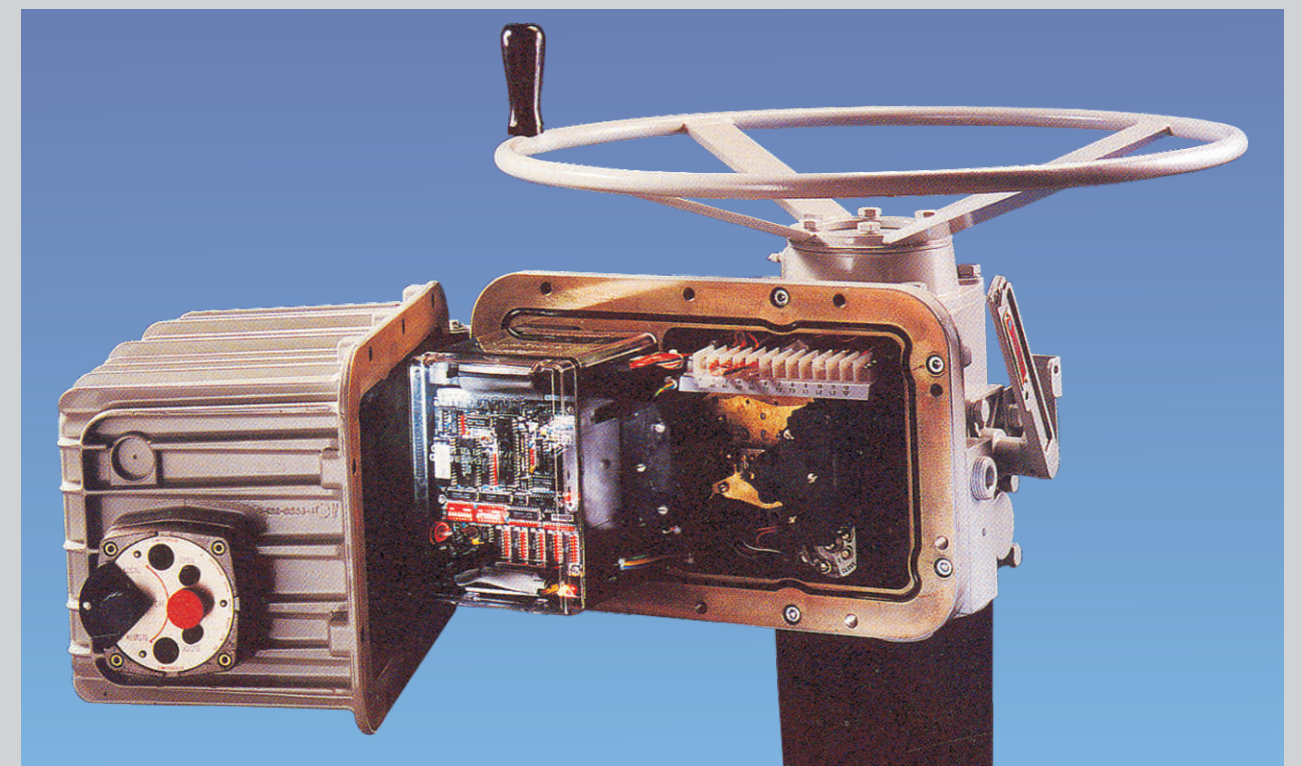
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Bharat Limitorque™

THE UNIVERSAL ELECTRONIC CONTROLLER

The UEC-3 from Limitorque An Intelligent Control System



Bharat Limitorque™

THE UNIVERSAL ELECTRONIC CONTROLLER

The UEC - 3 is a micro-processor based control system for the complete range of Limitorque actuators. It offers a unique combination of features to provide complete flexibility in the design of yours control system while insuring maximum operating integrity.

CLOCKWISE / COUNTER CLOCKWISE TO 'CLOSE' ROTATION

Normally pre-set in the factory but may be changed in the field by DIP switch selection.

REMOTE CONTROL FROM 24-125V AC OR DC SUPPLY

As standard, the users remote control supply may range from 24v to 125V AC or DC

REMOTE CONTROL FROM INTERNAL 24V DC SUPPLY

The use of an internal 24v DC power supply and opto-isolated inputs reduces voltage drop problems, thus allowing control from remote volt-free contacts over long distances, and simplifying the customers control system.

EMERGENCY SHUTDOWN - ESD

A remote signal applied to the UEC-3 will override any existing signal, providing the actuator is in 'remote', and send the valve to its pre-selected shutdown position. DIP switch selectable to give 'CLOSE', 'OPEN', 'STAYPUT' or 'IGNORE' mode. Motor thermostat may be by passed during ESD- selectable by DIP switch if desired ESD can be made possible irrespective of selector switch position i.e. (LOCAL / STOP/ REMOTE) as a special feature.

SELECTABLE 2, 3 or 4 WIRE CONTROL

Simple remote control connections and DIP switch selections provide a variety of control options with a minimum of wiring schematics.

2 WIRE CONTROL

Achieved by using a remote set of make/break contacts (e.g. on/off switch) and only two wires. The actuator will rotate in one direction when contact makes and in the other direction when it breaks. Directional mode may be selected by DIP switch.

3 WIRE CONTROL

Simple three wire connection and DIP switch settings allow the actuator to be configured for:

(a) OPEN and CLOSE inching mode, with intermediate STOP when signal is removed. (b) OPEN and CLOSE maintained mode, with out intermediate STOP but retaining instantaneous reversal.

4 WIRE CONTROL

A four wire connection and appropriate DIP switch settings provide OPEN and CLOSE maintained control, plus Intermediate STOP by pushbutton, as well as the instantaneous reversal feature.

MONITOR RELAY

Monitors various functions of the actuator and provides a remote indication or alarm if a fault occurs and the unit is no longer available for remote control. This relay is normally enregized (1xSPDT contact) but will de-energize if:

* Local/Off/Remote selector switch is not in 'remote' position.

*One or more phases of the 3-phase supply are lost.

*Internal control supply is lost.

*Motor thermostat has tripped.

*Local 'stop' button is depressed.

*Jammed valve detected.

*Contactor fails to energize.

ELECTRICAL INTERLOCK/SEQUENCE CONTROL

The connection of remote contacts and setting of a DIP switch provides the means to either prevent electrical operation completely (functional lockout) or until another operation has been completed (interlock or sequence control). This is effective in either or both the opening and closing directions and in both 'Local' or 'Remote' modes, but will be overridden by an ESD signal.

PROTECTION FEATURES

AUTOPHASE CORRECTION

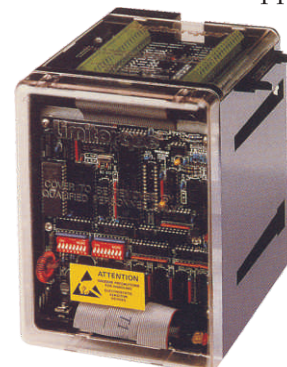
The UEC-3 monitors the rotation of the incoming 3-phase supply and automatically corrects the actuator controls to ensure that the motor always runs in the correct direction throughout the life of the unit. The feature is selectable on/off according to customers preference. A yellow LED illuminates when the phases are correctly connected. A red LED indicates that all three phases are present.

LOST PHASE PROTECTION

If one or more phases are lost the control circuit will be prevented from energizing the contactors. However, if an ESD signal is present, the loss of only one phase will be ignored and the actuator will attempt a shutdown in the direction selected, providing the actuator is already in motion prior to the loss of that phase.

ANTI-HAMMER PROTECTION

Torque switch hammer may occur when a 'maintained' control signal is present and the gearing in the actuator is non-locking, typically in high speed applications. The UEC-3 prevents this by monitoring both the 'close' and 'open' torque switches. Once a torque switch has operated, the control circuit prevents re-energization of the contactors in the same direction until a signal in the reverse direction has been applied.



SURGE SUPPRESSION

High level surge suppression, to prevent damage to the control module or loss of functionality, has been included on all local and remote control input circuits. In compliance with EEC-EMC directive 89/ 336/EEC.

JAMMED VALVE PROTECTION

The UEC-3 logic circuits provide automatic protection against a jammed valve condition in either the open or close position, i.e. the torque required to operate the valve is greater than the stall torque of the actuator. This is detected if the position limit switches fail to reset after a preset time (depending on the actuator speed and the valve travel turns), when the appropriate contactor is automatically de-energized.

AUTO-RETRY ON JAMMED VALVE DETECTION

If a jammed valve is detected, an automatic reverse/forward cycle is initiated to maximize the benefit of the lost motion hammer blow effect in the actuator drive and thus gives it another chance to free the valve. If this retry is unsuccessful, then further electrical operation is inhibited and the operator will need to move the valve manually with the hand wheel. The jammed valve state may be reset by sending a signal in the reverse direction.

INSTANTANEOUS REVERSAL

A time delay of 500 mS, incorporated into the control logic of the reversing contactors, allows the actuator to be reversed without first pressing 'stop'. This also reduces motor current surges and prolongs the life of the contactors.

OPTO-ISOLATED INPUTS

All remote control inputs are 'opto-isolated' in order to protect the actuator logic circuits from high-voltage transients that might occur in the control cabling.

MOTOR OVER LOAD PROTECTION

The motors have two/three thermostats embedded in the windings for protection against overheating. On detection of a thermostat trip, the UEC-3 will automatically de-energize the contactor except in the case of :-

- An ESD signal is present at the terminals, when the actuator will try to complete it's travel to the pre-selected position.
- This action has been enabled by prior DIP switch selection on the UEC-3 board.

SPECIAL FEATURES

2-SPEED OPERATION IN BOTH DIRECTIONS

For the prevention of hydraulic shocks, (e.g. water hammer), etc, a two speed timer is available in the closing and opening directions. It is DIP switch selectable and triggered by an intermediate limit switch which may be set any where in the valve travel. The 'ON' and 'OFF' pulse times are set at default levels of 2.0 seconds 'ON' and 10.0 seconds 'OFF', but may be reconfigured to different intervals.

LOCAL DIRECTION INDICATION

When the actuator is operating, the local pushbutton station LED's will 'flash' to indicate the direction of travel; one LED changing to 'steady' at the end of travel and the other LED turning off.

COMPREHENSIVE DIAGNOSTIC PORT (Optional),

This port has access to the state of a number of circuits on the UEC-3 board and by plugging In a 'hand held' diagnostic tool or PC the operator may quickly diagnose fault conditions, presence of inhibit or ESD signals, etc.



A comprehensive,
electronic valve control
package to protect
equipment
and processes.

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