

ELECTRIC ACTUATORS**GENERAL:**

Actuators shall be designed for valve operation to ensure proper function in accordance with specifications given below and complying to EN15714-2 or equivalent. All standards, specifications and codes of practice referred to herein shall be the latest editions including all applicable official amendments and revisions.

This sub-section of specification is applicable for following types of electric actuators:

a) Modulating duty electric actuators:

These shall be provided as per standard practice of OEM of equipment, meeting other requirements of specifications. For specifications of Blade pitch actuators of this chapter.

b) Electric actuators for valves/ dampers/ gates (other than covered above):

These actuators shall be Non-Intrusive type electric actuators. The interface of these actuators with DDCMIS shall be of two types viz. with Hardwired interface and with HART interface. The common requirements of both these type of actuators are specified at clause b.1, specific requirements of Non-Intrusive hardwired actuators are specified at clause b.2 and specific requirements of Non-Intrusive HART actuators are specified at clause b.3.

b.1. COMMON REQUIREMENTS FOR NON INTRUSIVE ELECTRIC ACTUATORS**TYPE:**

The actuators shall have integral starters with built in SPP (Single Phasing Preventer). 415 V, 3 phase 3 wire power supply shall be given to the actuator from switch board as applicable through a switch fuse unit. Control voltage of the motor starter shall be 110 V AC / 24 V DC, derived suitably from 415V power supply.

The actuators shall be Non- Intrusive electric actuator. All actuator settings including torque, limit shall be possible without opening the actuator cover and LCD indication shall be available integral to actuator body.

RATING:

(a) Supply Voltage & frequency: 415V +/- 10%, 3 Phase, 3 Wire & 50HZ +/-5%.

(b) Sizing: Open/Close at rated speed against designed differential pressure at 90% of rated voltage.

For ON/OFF type: Three successive open-close operations or 15 minutes, whichever is higher.

For inching type: 150 starts per hour or required cycles, whichever is higher.

CONSTRUCTION:

(a) Enclosure: Totally enclosed weatherproof, minimum IP-68 degree of protection.

(b) Manual Wheel: Shall disengage automatically during motor operation.

MOTOR:

- (a) Type: Squirrel cage induction motor suitable for Direct on Line (DOL) starting.
- (b) Enclosure: Totally enclosed, self-ventilated.
- (c) Insulation Class F. Temperature rise 70 Deg C. over 50 Deg C ambient.
- (d) Bearings: Double shielded, grease lubricated antifriction.
- (e) Earth Terminals: Two
- (f) Protection: Single Phasing Protection, Over heating protection through Thermostat (as applicable) and wrong phase sequence protection shall be provided over and above other protection features standard to bidder's design. Suitable means shall be provided to diagnose the type of fault locally.

POSITION/TORQUE TRANSMITTER:

The Position/ Limit measurement shall be done using absolute encoders which will give information of position/ limit in both the directions. Electronic measurement of torque shall be provided.

LOCAL OPERATION:

It shall be possible to operate the actuator locally also. Lockable local/remote selection shall be provided on the actuator.

LCD DISPLAY:

A local LCD display shall be provided to give information regarding actuator alarms, status and valve position indications as a minimum in local.

WIRING:

Suitable voltage grade copper wire.

TERMINAL BLOCK:

For power cables, the grade of TBs shall be minimum 650V.

ACCESSORIES:

All required accessories (if applicable) for calibration / settings/ configuration of various parameters of actuator shall be provided.

b.2. SPECIFIC REQUIREMENTS FOR NON INTRUSIVE HARDWIRED ACTUATORS**INTERFACES:**

For ON-OFF and INCHING type actuators interface with the control system shall be through hardwired signal only.

- (a) Open/Close command, open/ close status and disturbance monitoring signal (common contact for Overload, Thermostat, control supply failure, L/R selector switch at local & other protections operated) shall be provided hardwired.
- (b) The actuator shall be able to accept open/close command at 24V DC with max. 2.5VA load from control system. Accordingly suitable isolated interface in the actuator shall be provided.
- (c) Open/close command termination logic shall be suitably built inside actuator.

TERMINAL BOX:

Suitable terminals/ connectors, integral to actuator, for terminating instrumentation & power cables shall be provided. Necessary glands for power cables and instrumentation cables shall be provided.

b.3. SPECIFIC REQUIREMENTS FOR NON INTRUSIVE HART ACTUATORS

INTERFACES:

For ON-OFF and INCHING type actuators interface with the control system shall be through HART network.

- (a) Open/ close commands, open/ close feedback status, disturbance signal etc. shall be available to the Control System through the HART network along with diagnostics. The detailed diagnostics including the actuator operating data shall be available to the DDCMIS through the HART network.
- (b) All actuators shall be HART compatible. However the exact protocol shall be based on finalized protocol of DDCMIS. If HART DP protocol is envisaged then actuator shall have two (redundant) HART DP ports for connecting the redundant HART DP cables. That is if one HART cable is cut or not working/ not available, then complete actuator functionality shall be available through the second redundant cable without any manual intervention.
- (c) Open/close command termination logic shall be suitably built inside actuator.

TERMINAL BOX:

Suitable terminals/ connectors, integral to actuator, for terminating HART cables and power cables shall be provided. Necessary glands for power cables and armored HART cables shall be provided.

b.4. SPECIFIC REQUIREMENTS FOR BLADE PITCH ACTUATORS

Sl No.	Description	Requirement
1.	Duty	Continuous duty / Modulation,
2.	Operating Ambient Temperature	-20 to +60 Deg C or better
3.	Enclosure Protection	IP 68
4.	Resolution/ Precision	0.1%- 0.2% or better of total travel
5.	Supply Voltage & frequency	415V +/- 10%, 3 Phase, 50HZ +/-5% or 230V +/- 10%, Single Phase, 50Hz +/- 5%
6.	Motor Suitable for	Continuous Duty
7.	Motor insulation Class	F
8.	Analog Control	4-20mA, (24VDC)
9.	Position Transmitter	4-20mA (24VDC)
10.	Integral Starter	Yes
11.	Terminal Block	For power cables, the grade of TBs shall be minimum 600V
12.	Accessories (if applicable)	for calibration / settings/ configuration of various parameters of actuator shall be provided
13.	Hand wheel	Yes
14.	Standard Compliance	EN 15714-2 Class D or equivalent