MACQUARIE University

Commissioning Methodologies (CM) – MUBS-12
Modulating Valve + Actuator Testing Method
Statement

Client:	Project Name:		Project No:	
Area:	Drawing No's:	Date:		Sheet: 1 of 3
Check Conducted By:	Signature:	Check Approved By:	Signature:	

INTRODUCTION

AO - Analogue Output: (Modulating Valve + Actuator)

The on-site commissioning procedure aims to check the operation of all Modulating Valve + Actuators to verify their wiring and operation.

For each point, a change of status of the equipment should be simulated or produced, and the monitoring function of the Systems is be verified on the software online tool. For each control point, the corresponding equipment's should be controlled by the software online tool to manually command outputs to be driven to the desired value. The following procedures describe the best practice steps to commissioning each device to verify its correct operation.

It is expected that the point's lists are used to record the results of the point to point commissioning.

Procedure recommended general checks

1. Visibly check installation against approved shop drawings
2. Check that general construction and standard of finish is acceptable
3. Record name point information and compare against the approved specification
4. Confirm no damage to the electric components
5. Check cabling for insulation stripped back satisfactorily, no stray copper strands and terminals are tight with no loose wires
6. Check power supply is isolated, has the correct power source, voltage, cable sizing

Procedure recommended for testing operation

Each test should be performed in both manual and automatic modes.

1. Generate the appropriate control command to run the equipment under normal operating conditions.

    If the modulating valve + actuator point displays the desired value then this test has been successful and "S" should be recorded in the commissioning schedule/inspection and test plans. If the modulating valve + actuator point does not display the desired value or the equipment does not operate correctly then this test has failed and "F" should be recorded in the commissioning schedule/inspection and test plans.

2. While the modulating valve + actuator analogue output point displays the desired value, generate a change of value signal from the operator terminal.

If the modulating valve + actuator point changes value to expected value and the equipment responds accordingly then the test has been successful and "S" should be recorded in the commissioning test result sheets and the time taken for the analogue output point to change value. If the analogue output point does not change to the expected value or the equipment does not operate correctly the test has failed and "F" should be recorded in the commissioning schedule/inspection and test plans.

3. While the modulating valve + actuator point is displaying the desired value simulate a fault condition at the equipment or the FPU. E.g. open circuit a data cable. (This test need only be performed on actuators with feedback wiring).

    If the modulating valve + actuator point changes state and reports a fault condition and an alarm is generated on the alarm summary then this test has been successful and "S" should be recorded in the commissioning schedule/inspection and test plans. If the analogue output point does not change to fault condition or if an alarm is not generated on the alarm summary then this test has failed and "F" should be recorded in the commissioning schedule/inspection and test plans.

    At the conclusion of the test return the equipment and the BMCS to displaying the status, condition and desired values for normal operating conditions.

4. At When a point is commissioned tick the Checked Out box which will indicate the user, time and date checked out, then add comments in the Checkout Notes box (Status, Fault, VFC...)

 GENERAL:

Confirm 0-10V has been checked at the device, 0-100% OK Confirms 0% in program and 100% in program correlates to the action of the device in the field, Open / Closed OK Confirms visual check of position of modulating valve + actuator.

Check that the modulating valve + actuator drives fully open, fully closed and 50%. Once this is verified write Open / Closed OK in the Checkout Notes.

Check stroke on modulating valve + actuator and mark the position switch on the actuator with a black marker so it is clear which way the actuator is stroked.

REFERENCE STANDARDS

CIBSE Commissioning Code C – Automatic Controls

CHECKLIST

Modulating Valve + Actuator Testing				
BMCS Drawing Number				
	ITEM	VERIFICATION METHOD	RESULT	RESULT
1	Check installation against approved shop drawings	Site Inspection		
2	Check that general construction and standard of finish is acceptable	Site Inspection		
3	Record name point information and compare against the approved specification	Site Inspection		
4	Confirm no damage to the electric components	Site Inspection		
5	Check cabling for insulation stripped back satisfactorily, no stray copper strands and terminals are tight with no loose wires	Site Inspection		
6	Check power supply is isolated, has the correct power source, voltage, cable sizing	Site Inspection		
7	Check jumper setting on controller output is set to 0-10V.	Site Inspection		
8	Check point is configured for 0-10 V, or 2-10 V in the point's checkout, depending on the type of actuator you are using.	Data / Point Sheet Record		
9	Check the min and max scale parameters in the point setup are set to 0 and 100	Data / Point Sheet Record		
10	Check for 0, 5 and 10 volts. Once this is verified write 0-10V OK in the Checkout Notes.	Data / Point Sheet Record		
11	Check locked values in the program correlate to the action at the device. 100% in program = fully open in the field	Data / Point Sheet Record		
12	Once this is verified write 0-100% OK in the Checkout Notes.			
Certified By Sub Contractor (initial): Date:				
Confirmed By (Head Contractor / Client) (initial): Date:				