

# OPERATION INSTRUCTION & MAINTENANCE MANUAL FOR ROTARY ACTUATOR

## **VALVE AUTOMATION SYSTEM**

- i. VALVE AUTOMATION SYSTEM IS SUITABLE FOR OPERATION WITH COMPRESSED AIR BETWEEN 4-10 BAR. USUALLY THE SIZING IS DONE AT THE AIR PRESSURE AVAILABILITY CONFIRMED BY THE CLIENT
- ii. HEMP-FILAMENTS, JUTE, OR EVEN TEFLON-RIBBONS ARE NORMALLY NOT REQUIRED. AS THE PART CONNECTIOS OF OUR ROTARY ACTUATOR ARE ACCURATELY THREADED BY CHANCE. IF ANY OF THESE OR ANY OTHER TIGHTNING MEDIUMS GET INTO THE OPERATIONAL AREA INSIDE THE ROTARY ACTUATORS, POSSIBLE DAMAGE OF THE ROTARY ACTUATORS SHOULD NOT BE RULED OUT.
- iii. THE MOUNTING HOLE SIZE & BOLT HOLE CIRCLE ARE TO ISO 5211. THE THREADED HOLES ARE ISO METRIC COURSE.
- iv. VALVE USING A MOUNTING KIT, PINION DRIVE, COUPLING DEVICE & VALVE STEM SHOULD BE CENTRED & CONCENTRIC TO PREVENT ANY SIDE LOADING TO THE PINION BEARING & VALVE STEM SEAL AREA.
- v. ENSURE THAT THE COUPLING SHAFT TOBE OPERATED IS IN CLOSE TOLERANCE, BUT FREE SLIDING FIT INTO THE FEMALE DRIVE IN THE ACTUATOR SHAFT
- vi. ROTARY ACTUATOR ALONGWITH SOLENOID VALVE CAN BE MOUNTED IN ANY POSITION.
- vii. WHEN ROTARY ACTUATOR IS USED FOR OPERATION OF BALL/PLUG / BUTTERFLY VALVE FOR STEM OR HIGH TEMPERATURE MEDIA, IT IS ADVISABLE TO INCREASE MOUNTING BRACKET HEIGHT OF ROTARY ACTUATOR FROM VALVE & USE LONGER CONNECTING COUPLING TO AVOID HIGH TEMPERATURE EFFECTING ROTARY ACTUAOR CONSULT US FOR SPECIFIC APPLICATION.

## **INSTALLATION GUIDE**

- 1) DO NOT ALLOW DIRTY AIR OF FLUID TO GET INTO THE ROTARY ACTUATORS USE FR UNIT FOR FILTERS & MOISTURE REMOVAL.
- 2) CLEAN ALL PIPES & TUBE FITTING THROUGHLY WITH SUITABLE MEANS, AS EVEN WHEN BRAND NEW PIPES ARE FITTED. UNCLEAR INTERIOR ARE QUITE COVERED WITH DIRTS & DUSTS. IT IS STRONGLY RECOMMENDED THT THE CONNECTIONS/PIPES SHOULD BE RINSED WITH DEGREASING OR BY ANY GREASE-DISSLOVING LIQUIDS OR AGENTS, BEFORE BEING CONNECTED TO OUR ROTARY ACTUATORS FLUSH ALL PINPING WITH 4 Kgf/Cm AIR FOR ATLEAST ½ HOUR.
- 3) PLEASE DO NOT USE THE ROTARY ACTUATORS AS A MOUNTING-BASE FOR CABLES OR TUBE/PIPE CLAMPS. WE WISH TO IMPRESS UPON YOU THAT, NO ADDITIONAL HOLES ARE TO BE DRILLED ON OUR ROTARY ACTUATORS. IF YOU DRILL HOLES ON THESE ROTARY ACTUATORS, YOU WILL PERHAPS REACH TO THEIR INTERIOR, SOONER THAN YOU PRESUME.
- 4) AVOID IMPACT ON THE ROTARY ACTUATORS THESE MAY HAPPEN DURING TRANSPORTATION OR ERECTION OR MISHANDLING.

- 5) IF YOU GET OVER TRAVEL PROBLEM (0-90) ADJUST THE REQUIRED DEGREE WITH THE HELP OF SOCKET SET SCREW (11) & NUT (12) & STROKE ADJUSTMENT SCREW (19) FITTED ON THE BOTH SIDE OF THE ACTUATOR COVER.
- 6) PLEASE TAKE CARE, DO NOT OPEN THE ACTUATOR WHILE OPERATION IN LINE.

### MAINTAINCE GUIDE

- 1) THE RACK(3) & PINION(4) ARE WELL GREASED BEFORE THEY LEAVE OUR PLANT THE BEARINGS BUSH ARE PTFE(13) & ARE GREASE PACKED BY THE MANUFACTURER YOU HAVE NOT WORRY FOR LUBRICATION OF THIS PARTS FOR A LONG TIME.

#### 2) PROBLEM

#### VERIFY

a) ROTARY ACTUATOR IS  
NOT OPERATING

- A1) COMPRESSED AIR IS NOT AVAILABLE.
- 2) AIR PRESSURE TOO LOW
- 3) BALL/ PLUG/BUTTERFLY VALVE JAMMED. CHECK VALVE OR CONNECTED EQUIPMENT

b) SOLENOID VALVE NOT OPERATING

- B. SOLENOID VALVE NOT OPERATING DUE TO
1. CHECK ELECTRIC SUPPLY TO SOLENOID.
  2. CHECK WITH MANUAL ACTATOR OF SOLENOID VALVE.
  3. CHECK OPERATION OF SOLENOID VALVE INDEPENDENTLY.

c) VALVE NOT FULLY CLOSING

C. CHECK CONNECTIG COUPLING BETWEEN ROTARY ACTUATOR & VALVE PLAY MAY HAVE BEEN DEVELOPED DUE TO LONG USE. ADJUST OVERTRAVEL & INCREASE ROTATION DEGREE VALVE WILL NOW CLOSE FULLY.

D) VALVE OPERATES TOO SLOW

- D1. CHECK THE PRESSURE IF IT IS LEAK.
2. PRESSURE TOO LOW
3. PRESSURE GAUGE FAULTY.

**NOTE:** -IT IS RECOMMENDED TO KEEP INLET PRESSURE OF ACTUATOR AS HIGH AS POSSIBLE HENCE IT IS ADVISED TO SET AFR TO FULL PRESSURE.

### **DISMANTLING OF ROTARY ACTUATOR**

1) WHEN DISASSEMBLING & CARRYING OUT MAINTAINANCE WORK ON THE ACTUATOR IF NEED ARISES TO CHANGE 'O' RING OF RUBBER PARTS/SEALS. WE RECOMMAND THAT SPARE KIT MUST BE USED TO REPLACE ALL 'O' RING, GUIDE RING, SLIDE RING

THIS KIT IS AVAILABLE FROM RAJDEEP. AT THE TIME OF ORIDRING SEAL KIT MENTION ACTUATOR MODEL NO.

2) REMOVAL OF PISTONS-FIRST REMOVE BOTH COVERS BY OPENING FOUR BOLTS(10) CHANGE 'Q' SEALS THEN BY ROTATING THE PININ MOVE THE PISTONS WITH RACK OUTWARDS WHEN THE RACKS ARE DIS ENGAGGED PULL THE PISTONS WITH RACK OUTWARDS. WHEN THE RACKS ARE DIS ENGAGGED PULL THE PISTONS GENTLY OUT OF THE ACTUATOR BODY CHANGE FLAT SEAL (15) DELRIN STRIPS (18)

3) REMOVAL OF PINION(4) FROM THE ACTUATOR, FIRST REMOVE THE OUTSIDE CIRCLIP(13) WASHER(8,9) FROM TOP OF PINION & CAREFULLY REMOVE THE PINIION FROM ACTUATOR BODY THROUGH THE BOTTOM, GENTLY TAP THE TOP OF THE PINION WITH NON METALLIC HAMMER ON PINION DO NOT HAMMER HEAVILY SINCE PINION MAY GET JAMMED IN THE BORE DURING THIS OPERATION. TAKE CARE THAT PINION DOES NOT DAMAGE THE PINION BORES ON REMOVAL, IF NECESSARY DEBUR (ANY BURNS ETC) FROM THE TOP OF THE PINION BEFORE REMOVING IT.

4) DO NOT PLACE DISMANTED PARTS ON ANY DIRTY WORK BENCH OR PLACE OF WORK, BUT PLACE ON A CLEAN PAPER OR CLOTH; IN SAME SEQUENCE AS YOU HAVE DISMANTLED THEM CLEAN WITH LIQUID SOAP SOLUTION.

5) IT IS ADVISABLE TO REPLACE COMPLETE SET OF 'O' RINGS (20, 21, and 16) & 'Q' SEAL FOR COVER FLAT SEAL (15) WHEN THE ROTARY ACTUATOR IS REASSEMBLED

## ASSEMBLY OF ROTARY ACTUATOR

### DOUBLE ACTING ROTARY ACTUATOR

1. CLEAN ALL PARTS WITH SOAP WATER & DRY WITH AIR BLOW.
2. APPLY A LAYER OF GREASE TO THE INNER FACE OF THE ACTUATOR BODY (1) RECOMMENDED GREASE....MP2 OR MP3.
3. ASSEMBLE THE BEARING BUSH (5) IN THE LOCATED GROOVE BODY.
4. WHILE THE TIME OF INSERTING THE PINION IN TO BODY APPLY A LAYER OF GREASE ON THE GEAR PART OF PINION.
5. INSERT THE SMALLER END OF PINION FROM THE BOTTOM OF BODY THROUGH THE LOACTED HOLE IN BODY & FIX ONE DELRIN STRIP ON SECOND END PINION ENTER PROPERLY, HAMMER IT GENTLY ON SECOND END OF PINION.
6. AFTER INSERTING THE PINION ASSEMBLE THR PTFE WASHER (8) METALLIC WASHER (9) AND EXTERNAL CIRCLIP (13) AT LOCATING GROOVE FOR THE PURPOSE OF LOCKING.
7. WHILE INSERTING THE PISTON WITH RACK ENSURE THAT FLAT SEAL (15) DERLIN RING (6) KEY FOR RACK (3) ARE FITTED PROPERLY.
8. INSERT BOTH THE PISTONS WITH RACK SIMULTNEIOUSLY AND ENSURE PROPER ALLIGNMENT WITH PINION.
9. INSERT 'Q' SEAL (14) BOTH SIDE OF ACTUATOR BODY AT LOACTED GROOVE.
10. AFTER INSERTING THE 'Q' SEAL ON BOTH THE SIDE OF THE BODY PUT THE COVERS ON THE BODY INSERT 4 NOS S.H. CAP SCREW PUT DROP OF OIL ON THE THREAD OF THE SCREW TIGHTEN THE SCREWS EQUALLY.
11. FIT THE GRUB SCREW (11) & STROKE ADJUSTMENT SCREW ON BOTH COVER 'O' RNG (16) & PUT ONE FLANGE NUT THIS GRUB SCREW IS FOR +/- 10 DEGREE ADJUSTMENT AFTER FINAL TESTING OF ACTUATOR FIX THIS SCREW AT FINAL POSITION WITH HELP OF FLANGE NUT

### PROCEDURE TO CHANGE THE DIRECTION OF PINION

1. DIS FIRST REMOVE THE SIDE COVERS & DISASSEMBLE THE ACTUATOR AS PER POINT NO 1&2
2. THEN ROTATE THE PINION WITH BY 180° & THEN ASSEMBLE IT AS PER PROCEDURE.

### SINGLE ACTING ROTARY ACTUATOR:

1. FIXED THE SPRING (24,25) IN LOCATED GROOVE IN SPRING RETURN COVER(2) WITH THE HELP OF S.H. CAP SCREW THE NUMBER OF SPRING DEPEND ON AIR PRESSURE.
2. FIT THE STROKE ADJUSTMENT SCREW (12) IN SPRING RETURN COVER (2) FOR 10+ ADJUSTMENT.
3. BEFORE ASSEMBLY OF SPRING RETURN COVER (2) APPLY A LAYER OF GREASE ON SUB ASSEMBLY OF SPRING.
4. SUB ASSEMBLY OF SPRING WITH SPRING RETURN COVER FIT THE SPRING RETURN COVER ON BODY FIT THE SOCKET HEAD CAP SCREW PUT DROP OF OIL ON THREAD OF SCREW TIGHTEN THE SCREW EQUALLY FOUR SIDE.