LESLIE CONTROLS, INC.
A subsidiary of CIRCOR International, Inc.
12501 Telecom Drive, Tampa Florida 33637

Installation, Operating, and Maintenance Instructions Parts List

10/9.5.1.2

Rev. 2

CONTROL VLAVES

Low Pressure, Single Ported, Cage Trim

Classes DLO-2, DDLO-2 125# & 250# Cast Iron
Classes DLOS-2 & DDLOS-2 150# & 300# Cast Steel
Classes DLOS-2 & DDLOS-2 150# & 300# Stainless Steel

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SECTION I – INSTALLATION

1. VALVE POSITION

Install control valve in the highest horizontal line of piping in an accessible location and with arrow on side of valve body in direction of fluid flow. Control valve may be placed in any position, but upright is preferable for ease of maintenance.

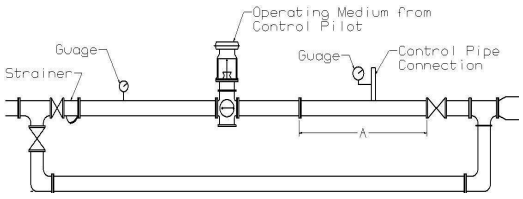


Figure 1 - Typical Installation Expand as required for fluid flow

2. PROBLEM PREVENTING PROCEDURES

- Provide removal space above, below and around control valve for easy removal of parts during maintenance. See Dwg. 10/9.4.1 or 10/9.4.3 for dimensions.
- Blow or flush out pipelines thoroughly before installing control valve.
- Protect control valve and following equipment with a SELF-CLEANING STRAINER.
- Install stop valves and gauges in inlet and outlet lines to provide means for checking adjustment and operation of equipment.
- Provide proper inlet and outlet drainage in steam service to prevent water hammer or possible erosion in equipment.
- Adhere to good piping practice. Install a bypass around the control valve.

3.
Connect operating medium tubing from control pilot, instrument or loading device to diaphragm chamber connection of control valve or to valve positioner, if one is in use. Maximum allowable operating pressure for diaphragm actuators is 60 psig.

4.
Recommended Piping for Control of Compressible Fluids at Values of 25% or Less of Inlet Pressure.

CAUTION!

The piping system must be adequately designed and supported to prevent extraordinary loads to the pressure

Expand outlet pipe to twice control valve inlet pipe size. Use tapered expander.

- Connect control pipe for control pilot ahead of outlet stop valve and at least 2’ to 3’ downstream from end of expander.
- Make control pipe connection at least 18” to 2’ from outlet stop valve, any elbow or other flow direction changing fitting.

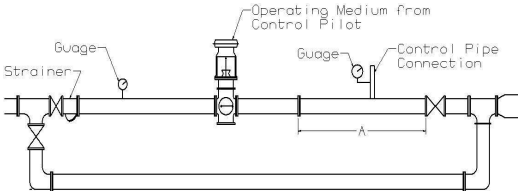


Figure 2 - Typical Control Valve Station for Control of Compressible Fluids at 25% or Less of Inlet Pressure. Expand further as required for fluid flow.

NOTE: *Where sensing impulse is taken 2’ to 3’ downstream from control valve (expander), dimension “A” minimum of 6’ to 10’ will provide lowest noise and velocity factors, accurate pressure sensing and reasonable bypass length.*

SECTION II – OPERATION

1.
Close inlet and outlet stop valves.

2.
Check that control valve responds properly through rated travel in relation to changes in operating pressure on the diaphragm. Rated travel is shown by position of travel indicator on valve stem relative to travel indicator scale on yoke.

3.
Manually operate control valves fitted with manual operating devices through rated travel to check freedom of movement. Return manual operating device to its standby position.

4.
Place control valve in operation in accordance with instructions furnished with control pilot or operating device.

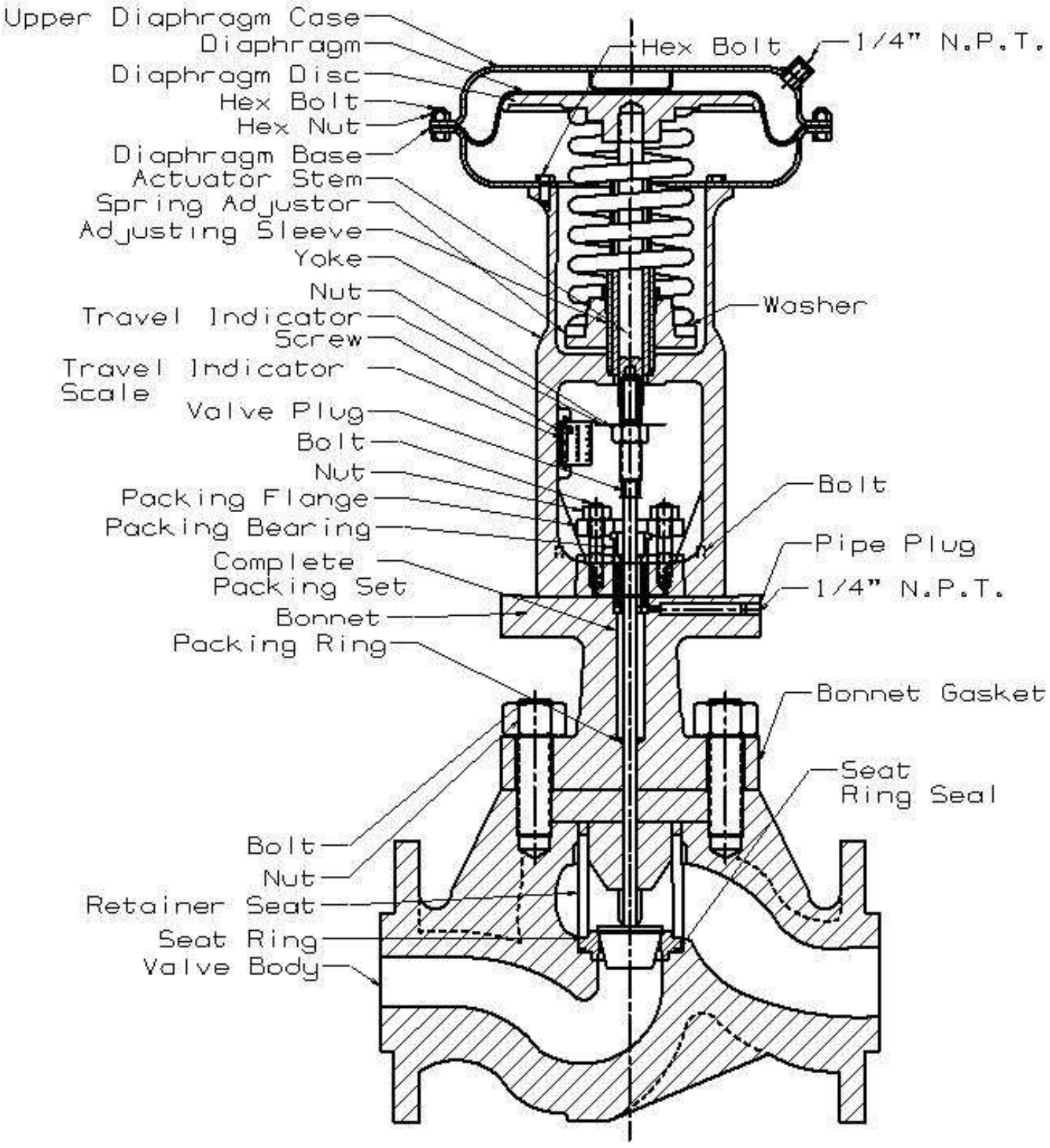


Figure 3 - Typical Valve Cutaway

SECTION III – MAINTENANCE

To reduce maintenance time refer to proper drawing and follow steps shown below for applicable operation.

RENEWING VALVE PLUG STEM PACKING
(See Fig. 3, Fig. 4 and 5)

Renew valve plug stem packing if control valve has been in service beyond normal maintenance and packing shows signs of wear. Wear will be indicated by leakage at the packing gland. Minor leakage of graphite packing can be corrected by tightening the packing flange.

CAUTION!

Over-tightening of the packing flange adjustments can cause erratic operation of the valve.

Where LESLIE (BRAIDED TEFLON GRAPHITE) packing is in use, additional packing rings can be installed to overcome minor leakage without dismantling the control valve or breaking valve plug connection.

Shut down inlet and outlet stop valves and check that valve body is not under pressure. Remove nuts and lift packing flange and packing bearing a sufficient height on valve plug stem to apply a split packing ring around diameter of valve plug stem. Lower packing bearing over the new ring, lower packing flange and tighten sufficiently with nuts to stop leakage.

To replace LESLIE "TEFLON" packing set or a complete GRAPHITE 11 packing set, the control valve must be dismantled.

Installation of Stem Packing

Stuffing box interior and valve plug stem must be clean, smooth and free from imperfections that may cause new packing to leak.

BRAIDED PTFE/GRAPHITE TYPE PACKING

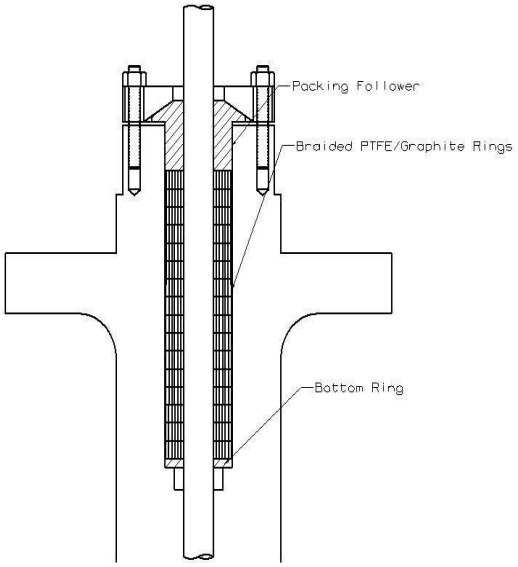


Figure 4 - Installation Sequence

1. Place metal ring in stuffing box making sure it bottoms in box followed by spring and second metal ring. Install bottom Teflon adaptor chevron, four Teflon packing chevrons and top Teflon adaptor chevron in accordance with Fig. 6.

2. Install packing follower, packing flange and nuts. Tighten stuffing box nuts until follower bottoms on bonnet.

PTFE CHEVRON TYPE PACKING

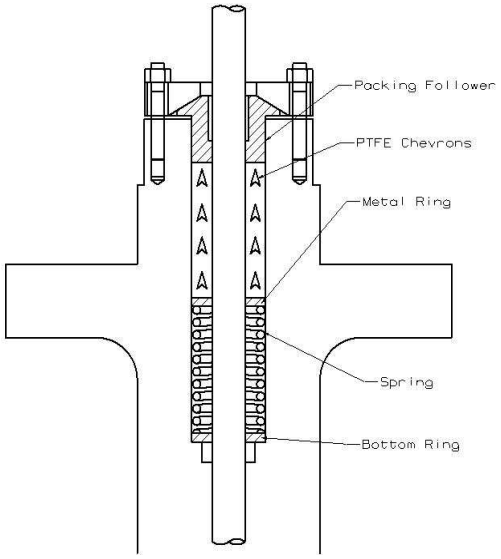


Figure 5 - Installation Sequence

LAMINATED GRAPHITE PACKING

Packing tools are available from Leslie Controls and should be used to insure proper installation of packing. Packing tool reference numbers are shown on Dwg. 10/0.5.9, which also shows how to make the tools.

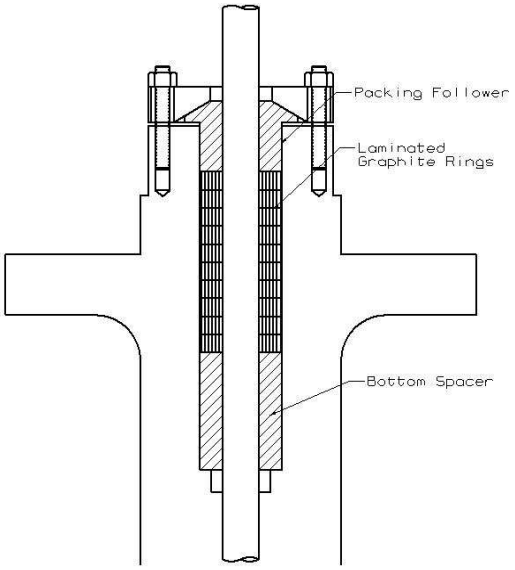


Figure 6 - Installation Sequence

INSTALLATION

Place spacers and packing rings over stem and into packing box in order shown on drawing, one at a time, seating each firmly and using care not to tear rings on the stem threads. Adjust packing gland nuts equally-finger tight plus 1/6 turn (one flat of nut).

ADJUSTMENT

During start-up some leakage may be observed. Do not readjust packing-allow at least 15 minutes for pressure/temperature stabilization to occur. If leakage continues adjust a maximum of 1/6 turn at a time. If pressure is raised considerably, the packing may leak slightly. Do not readjust-leakage will stop when new pressure/temperature stabilization is reached.

BREAK-IN

For best results it is recommended that after packing installation and adjustment the valve be fully stroked approximately 20 times to break-in the packing and reduce stem friction.

WARNING

Injury or death can occur due to failure to completely isolate valve from all sources of pressure before beginning disassembly. Do not proceed until valve has been completely isolated from the process and vented to atmosphere.

DISASSEMBLY OF ACTUATOR FROM VALVE BODY ASSEMBLY
(See Fig. 6, 6A, 7 and 9 in Appendix)

1. Close inlet and outlet stop valve and relieve all pressure from piping involved. Remove all compression from adjusting spring(s).

2. NORMALLY OPEN VALVES-DLO(S)-2. Relieve air pressure from diaphragm of actuator. Remove the tubing from upper diaphragm case.

3. NORMALLY CLOSED VALVES-DDLO(S)-2. Supply sufficient air to the actuator diaphragm to keep valve plug from touching seat while disengaging valve plug stem from actuator stem.

4. Loosen valve stem nut. Use wrench on plug stem flats and turn valve plug out of actuator stem until stems separate. Remove the tubing from lower diaphragm case.

5. Remove cap screws holding actuator to bonnet and lift off actuator.

DISASSEMBLY VALVE BODY SUBASSEMBLY (VBSA)
(See Fig. 6 and 6A in Appendix)

1. Remove actuator from VBSA as previously described in Disassembly of Actuator from Valve Body Subassembly.

2. Remove bonnet nuts (10). Also bolts (11) for DLOS only.

3. Lift bonnet assembly including valve plug (2) from valve body (1).

4. Remove valve plug (2), packing bearing (12) and old packing set (17). Include spring (15) for Teflon packing set.

5. Remove bonnet gasket (8), seat retainer (5), seat ring (4) and seal (3). If necessary, remove seat ring by forcing a wooden dowel into seat bore and lifting.

CLEANING

1. Clean all parts thoroughly. Polish valve plug stem with crocus cloth. It should be smooth and free of scratches in packing area. Use approved, non-residue forming solvent for cleaning. Wipe dry with clean cloth.

2. Inspect all parts and replace any excessively worn or damaged part.

3. Install a new packing set of braided Teflon graphite or Teflon chevron rings as shown on packing installation sketch Fig. 3, 4 or 5. See previous section on renewing valve plug stem packing.

4. The packing bearings have a long wearing life material which under normal usage should not require replacement, however, if damaged or worn the packing bearing (12) and/or the bonnet (6) must be replaced. (Lower bearing in bonnet is not supplied separately.)

5. The gasket (8) and seal (3) should be replaced each time the valve body subassembly is disassembled for cleaning.

All LESLIE control valves are made of the finest material obtainable, time-tested and backed by over seventy-five years of know-how. Machining is done by expert craftsmen and each valve is inspected and service tested before shipment to you.

REASSEMBLY VALVE BODY SUBASSEMBLY LAPPING VALVE PLUG AND SEAT

1. Insert raised face of seat ring (4) into seat retainer cage (5) and place these into bore of valve body bridge.

2. Place new bonnet gasket (8) into body recess.

3. With light pressure and turning motion assemble valve plug (2) to the bonnet (6) being careful not to damage bearings or packing set (17).

4. Apply very thin film of superfine lapping compound to the valve plug seating surface.

5. Assemble bonnet (6) complete with valve plug (2) to valve body (1) applying nuts (10) only finger tight to studs or bolts (11). The bonnet acts as a guide when grinding valve plug.

6. Use wrench on flats of valve plug stem for turning valve plug (2). Do not bear down on valve plug stem when lapping. Weight of parts is sufficient to cause lapping action.

7. As lapping progresses lift valve plug off seat occasionally and rotate 45° to keep compound evenly distributed. Remove all traces of compound after lapping. Excessive lapping should be avoided.

8. Remove bonnet nuts (10), bonnet assembly, and all body assembly parts. Then remove all traces of lapping compound from both valve plug (2) and seat ring (4). Check that a fine continuous ring of contact has been made on both seats. The contact ring should be visible but without depth.

9. Apply silicone grease to seat ring seal (3) and insert seal into groove of seat ring (4).

10. Insert raised face of seat ring (4) into seat retainer cage (5) and place these into bore of valve body bridge. Seat ring (4) sealing face must be firmly seated in place.

11. Place the bonnet gasket (8) in body recess and add the bonnet assembly. Apply nuts (10) to bolts or studs (11) and tighten evenly for metal to metal joint.

12. Place actuator back on bonnet. CAUTION: *For reverse acting actuators only, air pressure must be supplied to the diaphragm chamber sufficient to cause actuator stem to lift its full travel so valve plug threads may later be engaged.*

13. Place packing flange (13) with concaved side of hole facing down thru window of

actuator over valve plug stem and bolts (9) to top of packing bearing (12). Secure with two nuts (7) finger tightened.

14. Secure Actuator flange to bonnet flange with Cap Screws.

15. With wrench on flats of valve stem, lift valve plug (2) and with counter-clockwise motion engage threads in upper stem (31) of actuator until valve plug can be turned no more.

SETTING VALVE TRAVEL
CLASSES: DLO-2 AND DLOS DIRECT ACTING ACTUATOR
(See Fig. 7 in Appendix)

1. Connect controlled air line to diaphragm case connector.

2. Supply 3 PSIG air pressure to actuator diaphragm.

3. Compress actuator spring by turning spring adjustor (35) until travel indicator (37) just starts to move when air pressure is raised above 3 PSIG.

NOTE: *Alternately add compression and check starting pressure slightly above 3 PSIG until correct adjustment is attained. After each check return air pressure to 3 PSIG.*

4. Actuator spring preload adjustment can be made either with or without pressure in valve body. Once correct compression is made no further adjustment is necessary.

5. With valve plug and coupling threads engaged supply 20 PSIG operating pressure to actuator diaphragm. Valve will move to closed position. Observe travel obtained as shown by travel indicator and indicator scale. Read- just as follows:

6. OVERTRAVEL – If travel is too great, loosen stem locknut and turn valve plug stem out of coupling the amount necessary to obtain correct travel.

7. UNDERTRAVEL – (Travel is too short) This is not possible if prior step 15 was done and correct parts were used.

8. When correct travel has been obtained reduce operating pressure sufficiently to move valve plug away from seat ring. Then turn valve stem one full turn out of upper stem threads. Secure locknut.

9. The one full turn toward the seat ring, made after obtaining travel, provides the positive closing force required to obtain tight valve closure. In all cases be sure to make this final adjustment.

10. Tighten locknut. Reconnect operating medium tubing from the sensing element or manual loading device to the diaphragm case.

SETTING VALVE TRAVEL

CLASSES: DDLO & DDLOS REVERSE ACTING ACTUATOR
(See Fig. 9 in Appendix)

1. Connect controlled air line to diaphragm case connection.

2. Supply 3 PSIG air pressure to actuator diaphragm.

3. Compress actuator spring until travel indicator begins to move when air pressure is raised above 3 PSIG.

NOTE: *Alternately add compression and check starting pressure slightly above 3 PSIG until correct adjustment is attained. After each check return air pressure to 3 PSIG.*

4. The valve plug is closed against upward fluid thrust by actuator spring force. Total compression placed on actuator spring must be sufficient to provide the 3 PSIG preload plug force required to close the valve.

5. If preload adjustment is made with no pressure in valve body, then, when the control valve is placed in operation, additional compression must be placed on the actuator spring to provide valve closure force. With proper adjustment valve will

close tightly and will not begin to open until the 3 PSIG operation pressure is exceeded.

NOTE A: *A control valve which has been adjusted to provide 3 PSIG starting pressure plus valve closure force (with pressure in body) will have a considerably higher start-pressure than 3 PSIG, when tested at 0 body pressure.*

NOTE B: *Air pressures quoted are relative. Actual pressures required in operation may vary with pressure drop conditions existing and/or actuator springs used.*

6. Loosen lock nut. Apply air to diaphragm. Turn valve plug stem into upper stem threads until valve plug is out of contact with seat ring, when air is removed from diaphragm. Then turn valve plug stem out of coupling threads until valve plug just contacts seat ring again.

7. Supply sufficient operating pressure to actuator diaphragm to move valve plug away from seat ring. Then turn valve plug stem one full turn out of actuator upper stem threads. Diaphragm disc determines travel. With proper diaphragm disc correct travel will result from adjustment.

8. OVERTRAVEL – If travel is too great, loosen and turn valve plug stem out of upper stem (35) and the amount necessary to obtain correct travel.

9. UNDERTRAVEL – If travel is too short, loosen lock nut and turn valve plug stem further into upper stem (35) the amount necessary to obtain correct travel.

10. When correct travel has been obtained increase operating pressure sufficiently to move valve plug away from seat ring. Then turn valve plug stem one full turn out of upper stem threads.

11. The one full turn toward the seat ring, made after obtaining travel, provides the positive closing force required to obtain tight valve closure in single ported valves. In all cases be sure to make this final adjustment.

12. Tighten locknut. Reconnect operating medium tubing from the sensing element or manual loading device to the diaphragm case.

DISASSEMBLY

REPLACING DIAPHRAGM, STEM SEALS, ETC.
(See Fig. 7 and 9 in Appendix)

1. Shut inlet and outlet stop valves for fluid supply lines and air supply to actuator connection.

2. Disconnect tubing at diaphragm case connection.

3. Remove compression on spring by turning spring adjustor until spring is free. See label on yoke for proper directions of rotation.

REPLACING DIAPHRAGM DIRECT ACTING ACTUATOR ONLY
(See Fig. 7 in Appendix)
Follow steps 1 to 3

4. Remove diaphragm case nuts and bolts, diaphragm case upper and diaphragm.

5. Replace diaphragm with a new one then reposition diaphragm case upper bolts and nuts. Tighten all nuts.

REPLACING DIAPHRAGM AND/OR STEM SEALS REVERSE ACTING ACTUATOR
(See Fig. 9 in Appendix)

6. Insert a lock rod through hole in the yoke and into hole in actuator stem. (Secure actuator stem with wrench if stem has no hole.)

7. Dismantle upper diaphragm case and Hand Operating Device (if so fitted) from actuator as described in instructions.

8. Remove the lock nut (16), diaphragm disc (17), diaphragm (20) and collar (22).

9. 35R – Remove 8 cap screws from lower diaphragm case, lift off case and remove stem seal.

   55R & 85R – Take out screws from seal ring. Remove seal ring, stem seal, and stem collar.

10. Examine gasket. Replace seal if necessary to obtain an air-tight seal.

11. Clean all metal parts. Remove any rust, dirt or sharp edges that might damage stem seal.

12. Lubricate spring washer(s) (33 & 34), spring adjustor (35) and actuator stem threads with anti-seize compound.

REASSEMBLY

1. 55R & 85R – Place the new stem seal in position and install the seal ring with the lip upward. Tighten screws. Press stem seal down until flush with spacer, install lower diaphragm case and tighten nuts.

2. When reassembling, place a block under the actuator stem to hold the stem high enough so that clearance between the stem seal bead and the groove is not greater than 1/8 inch. Line up the actuator stem in the center of the opening in the lower diaphragm case so that the stem seal bead will enter the groove in the stem collar when the lock nut is tightened.

3. Place the stem collar over the actuator stem with the groove upward followed by the diaphragm and the diaphragm disc. Be sure that the center hole in the diaphragm fits properly over the raised lip of the collar.

4. Install the lock nut and tighten. REMOVE THE LOCK ROD.

5. Install the upper diaphragm case and Hand Operating Device (if fitted) to actuator and tighten the nuts and bolts.

ALL ACTUATORS

Reset valve for proper travel and spring preload as previously described, by compressing actuator adjusting spring(s) sufficiently to move diaphragm(s) up against actuator stop. Align travel indicator plate and tighten screws. Plate scale indicates rated valve travel.

SECTION IV – PARTS LIST

DIAPHRAGM CONTROL VALVE

CLASS DLOS-2, DLOAS-2

CLASS DDLOS-2, DDLOAS-2

CAST STEEL

CAST IRON

CAST STAINLESS STEEL

1” – 2” THREADED & SWE

1” – 4” FLANGED ANSI 150 & 300

1” – 4” FLANGED DIN ND-16, & ND-40

(DIMENSIONS IN INCHES/MILLIMETERS)

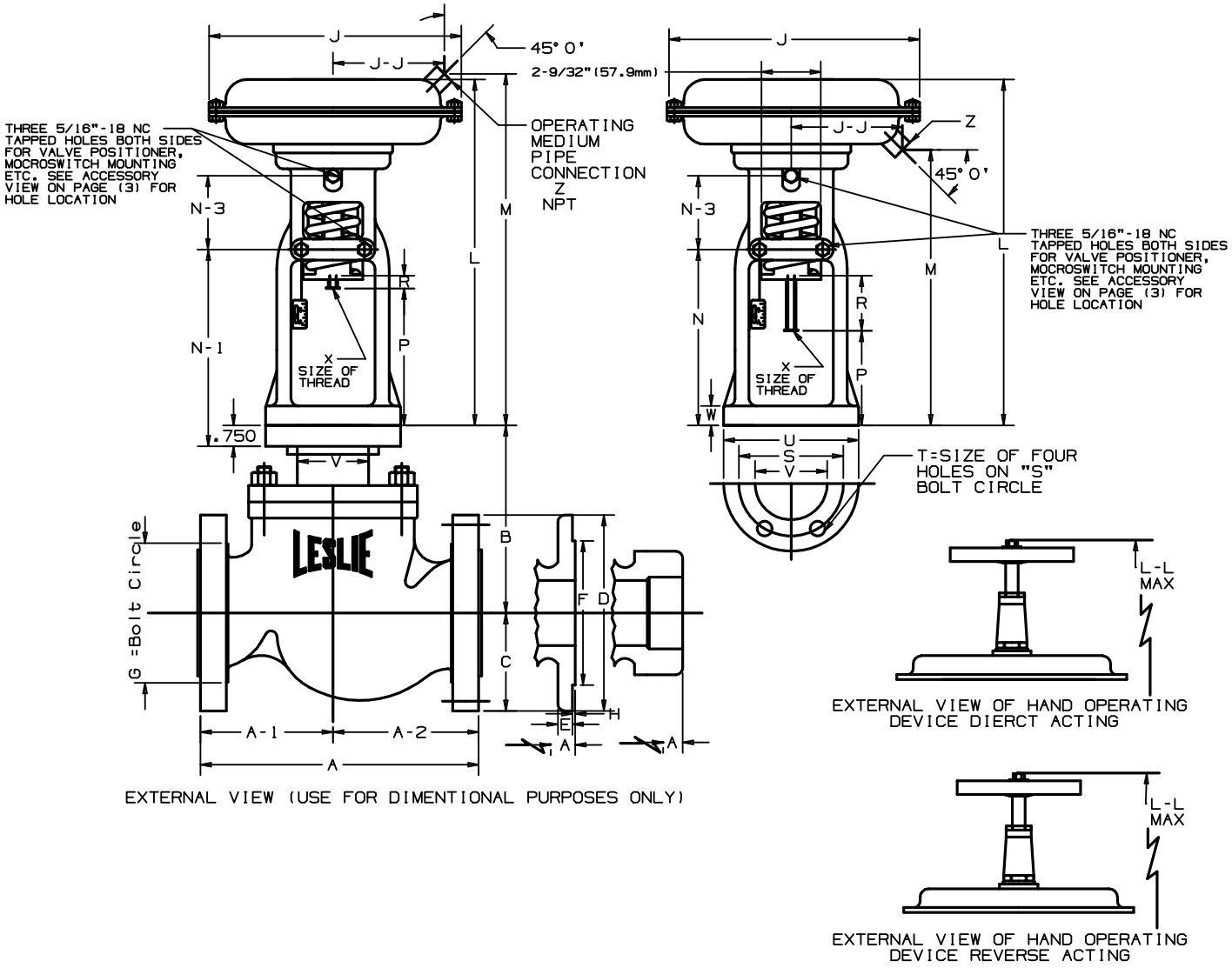
LESLIE
DIAPHRAGM CONTROL VALVE

CLASS DLOS-2 CAST STEEL, IRON AND STAINLESS STEEL WITH DIAPHRAGM ACTUATORS

DIRECT ACTING

CLASS DDLOS-2 CAST STEEL, IRON AND STAINLESS STEEL WITH DIAPHRAGM ACTUATORS

REVERSE ACTING



MAXIMUM ALLOWABLE AIR PRESSURE FOR ALL DIAPHRAGM ACTUATORS IS 60 PSIG

DIRECT ACTING DIAPHRAGM ACTUATORS AND HAND OPERATING DEVICE

DIMENSIONS IN INCHES AND MILLIMETERS

SIZE DIAPH ACTUATOR		J	J-J	L	M	N-1	P	R	S	T	U	V	W	X	Z	NET WT. lb/kg*		L-L (MAX)	NET WT. lb/kg* WITH H.O.D.	
																ALUM	CAST IRON	HAND OPER DEVICE	ALUM.	CAST IRON
35	in	9-1/4	3-15/16	12-3/8	12-3/8	6-1/4	5-1/2	1-3/8	3-13/16	9/16	4-13/16	2.687	11/16	3/8-24	¼ NPT	20 lb	35 lb	17-7/8	23 lb	38 lb
	mm	235.0	100.0	314.3	314.3	158.8	139.7	34.9	96.8	14.3	122.2	68.2	17.5			9.1 kg	15.9 kg	454.0	10.4 kg	17.2 kg
55	in	12	5-1/16	15-1/4	15-1/4	7	5-1/2	1-3/8	3-13/16	9/16	4-13/16	2.687	1	3/8-24	¼ NPT	23 lb	50 lb	24-7/8	28 lb	55 lb
	mm	304.8	128.6	387.4	387.4	177.8	139.7	34.9	96.8	14.3	122.2	68.2	25.4			10.4 kg	22.7 kg	631.8	12.7 kg	24.9 kg
55A	in	12	5-1/16	15-1/4	15-1/4	7	5-1/2	1-3/8	3-13/16	9/16	4-13/16	2.687	1	½-20	¼ NPT	23 lb	50 lb	24-7/8	28 lb	55 lb
	mm	304.8	128.6	387.4	387.4	177.8	139.7	34.9	96.8	14.3	122.2	68.2	25.4			10.4 kg	22.7 kg	631.8	12.7 kg	24.9 kg
85	in	14-3/4	6-1/4	19-5/8	19-5/8	8-1/2	6-7/16	1-3/4	3-13/16	9/16	4-13/16	2.687	1-1/4	½-20	¼ NPT	43 lb	96 lb	29-1/4	48 lb	101 lb
	mm	374.7	158.8	498.5	498.5	215.9	163.5	44.5	96.8	14.3	122.2	68.2	31.8			19.5 kg	43.5 kg	743.0	21.8 kg	45.8 kg

*Approximate

REVERSE ACTING DIAPHRAGM ACTUATORS AND HAND OPERATING DEVICE

DIMENSIONS IN INCHES AND MILLIMETERS

ACTUATOR SIZE		J	J-J	L	M	N-1	P	R	S	T	U	V	W	X	Z	NET WT. lb/kg*		L-L (MAX)	NET WT. lb/kg* WITH H.O.D.	
																CAST IRON	ALUM	HAND OPER DEVICE	CAST IRON	ALUM
35R	in	9-1/4	3-15/16	12-3/8	9-7/8	6-1/4	4	1-3/4	3-13/16	9/16	4-13/16	2.687	11/16	3/8-24	¼ NPT	35 lb	20 lb	16-3/4	38 lb	23 lb
	mm	235.0	100.0	314.3	250.8	158.8	101.6	44.5	96.8	14.3	122.2	68.2	17.5			15.9 kg	9.1 kg	425.5	17.2 kg	10.4 kg
55R	in	12	5-1/16	18	14-1/4	6-7/8	4	1-3/4	3-13/16	9/16	4-13/16	2.687	1	3/8-24	¼ NPT	60 lb	30 lb	26-3/8	65 lb	35 lb
	mm	304.8	128.6	457.2	362.0	174.6	101.6	44.5	96.8	14.3	122.2	68.2	25.4			27.2 kg	13.6 kg	669.9	29.5 kg	15.9 kg
55AR	in	12	5-1/16	18	14-1/4	6-7/8	4	1-3/4	3-13/16	9/16	4-13/16	2.687	1	½-20	¼ NPT	60 lb	30 lb	26-3/8	65 lb	35 lb
	mm	304.8	128.6	457.2	362.0	174.6	101.6	44.5	96.8	14.3	122.2	68.2	25.4			27.2 kg	13.6 kg	669.9	29.5 kg	15.9 kg
85R	in	14-3/4	6-1/4	23-1/4	18-3/4	8-9/16	4-5/16	2-1/4	3-13/16	9/16	4-13/16	2.687	1-1/4	½-20	¼ NPT	117 lb	54 lb	31-5/8	122 lb	59 lb
	mm	374.7	158.8	590.6	476.3	217.5	109.5	57.2	96.8	14.3	122.2	68.2	31.8			53.1 kg	24.5 kg	803.3	55.3 kg	26.8 kg

*Approximat

DIAPHRAGM CONTROL VALVE – CAST STEEL & STAINLESS STEEL BODY

DIMENSIONS IN INCHES

SIZE	A	A-1	A-2	B	C	D	E	F	G	H	No. of Holes	Hole Size	ApproxNet Wt. lb.
THREADED													
1	7-3/4	4-1/8	3-5/8	5-3/16	2-1/4	-	-	-	-	-	-	-	16
1-1/2	9-1/4	4-5/8	4-5/8	7-1/2	2-3/8	-	-	-	-	-	-	-	27
2	10-1/2	5-1/4	5-1/4	7-3/4	3-1/32	-	-	-	-	-	-	-	34
150 LB. ANSI FLANGE STANDARD													
½	-	-	-	5-3/16	-	-	-	-	-	-	-	-	-
¾	-	-	-	7-1/2	-	-	-	-	-	-	-	-	-
1	7-1/4	3-7/8	3-3/8	7-3/4	2-1/4	4-1/4	3/8	2	3-1/8	1/16	4	¾	19
1-1/2	8-3/4	4-3/8	4-5/8	8-3/16	2-1/2	5	5/8	2-7/8	3-7/8	1/16	4	¾	35
2	10	5	5	8-1/2	3-1/2	6	9/16	3-5/8	4-3/4	1/16	4	¾	41
2-1/2	10-7/8	5-13/16	5-1/16	10-5/16	3-17/32	7	5/8	4-1/8	5-1/2	1/16	4	¾	57
3	11-3/4	5-7/8	5-7/8	10-5/16	3-3/4	7-1/2	1-1/16	5	6	1/16	4	¾	77
4	13-7/8	6-15/16	6-15/16	10-5/16	4-27/32	9	7/8	6-3/16	7-1/2	1/16	8	¾	121
300 LB. ANSI FLANGE STANDARD													
½	-	-	-	-	-	-	-	-	-	-	-	-	-
¾	-	-	-	-	-	-	-	-	-	-	-	-	-
1	7-3/4	4-1/8	3-5/8	5-3/16	2-1/4	4-7/8	5/8	2	3-1/2	1/16	4	¾	21
1-1/2	9-1/4	4-5/8	4-5/8	7-1/2	3-1/16	6-1/8	¾	2-7/8	4-1/2	1/16	4	7/8	37
2	10-1/2	5	5	7-3/4	3-1/32	6-1/2	13/16	3-5/8	5	1/16	8	¾	45
2-1/2	11-1/2	6-1/8	5-3/8	8-3/16	3-17/32	7-1/2	15/16	4-1/8	5-7/8	1/16	8	7/8	66
3	12-1/2	6-1/4	6-1/4	8-1/2	4-1/8	8-1/4	1-1/16	5	6-5/8	1/16	8	7/8	88
4	14-1/2	7-1/4	7-1/4	10-5/16	4-27/32	10	1-3/16	6-3/16	7-7/8	1/16	8	7/8	140

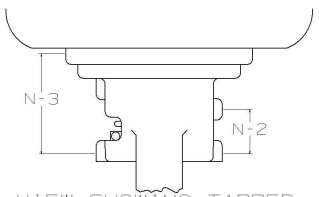
		MAX. TRAVEL
35(R)	in	¾
	mm	19.0
55(R)	in	1-1/2
	mm	38.1
85(R)	in	2-1/8
	mm	54.0

DIAPHRAGM CONTROL VALVE – CAST STEEL & STAINLESS STEEL BODY

DIMENSIONS IN MILLIMETERS

SIZE	A	A-1	A-2	B	C	D	E	F	G	H	No. of Holes	Hole Size	Approx. Net Wt. kg.
THREADED													
25	196.9	104.8	92.1	142.4	57.2	-	-	-	-	-	-	-	7.3
40	235.0	117.5	117.5	190.5	60.3	-	-	-	-	-	-	-	12.3
50	266.7	133.4	133.4	196.9	77.0	-	-	-	-	-	-	-	15.5
DIN 2543 FLANGE STANDARD ND-16													
15	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-
25	197.6	105	92.4	142.4	57.2	115	16	68	85	2	4	14	8.6
40	230	115	115	190.5	63.5	150	15	88	110	3	4	18	15.9
50	262.7	131.3	131.3	196.9	77.8	165	17	102	125	3	4	18	18.6
65	290	154.8	135.2	200.6	89.7	185	15	122	145	3	4	18	25.9
80	310	155	155	215.9	95.3	200	17	138	160	3	8	18	35
100	350	175	175	261.9	123	220	17	158	180	3	8	18	55
DIN 2545 FLANGE STANDARD ND-40													
15	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-
25	197.6	105	92.4	142.4	57.2	115	16	68	85	2	4	14	9.5
40	230	115	115	190.5	77.8	150	15	88	110	3	4	18	16.8
50	262.7	131.3	131.3	196.9	77	165	17	102	125	3	4	18	20.5
65	290	154.8	135.2	200.6	89.7	185	19	122	145	3	8	18	30
80	310	155	155	215.9	104.8	200	21	138	160	3	8	18	40
100	350	175	175	261.9	123	235	21	162	190	3	8	23	63.6

SIZE		N-2	N-3
35(R)	in	2-1/2	2-1/2
	mm	63.5	63.5
55(R)	in	2-1/2	3
	mm	63.5	76.2
85(R)	in	2-1/2	4-1/8
	mm	63.5	104.8



VIEW SHOWING TAPPED HOLE LOCATION FOR VALVE POSITIONER, MICRO-SWITCH MOUNTING, ETC.

CONTROL VALVE – CAST IRON BODY

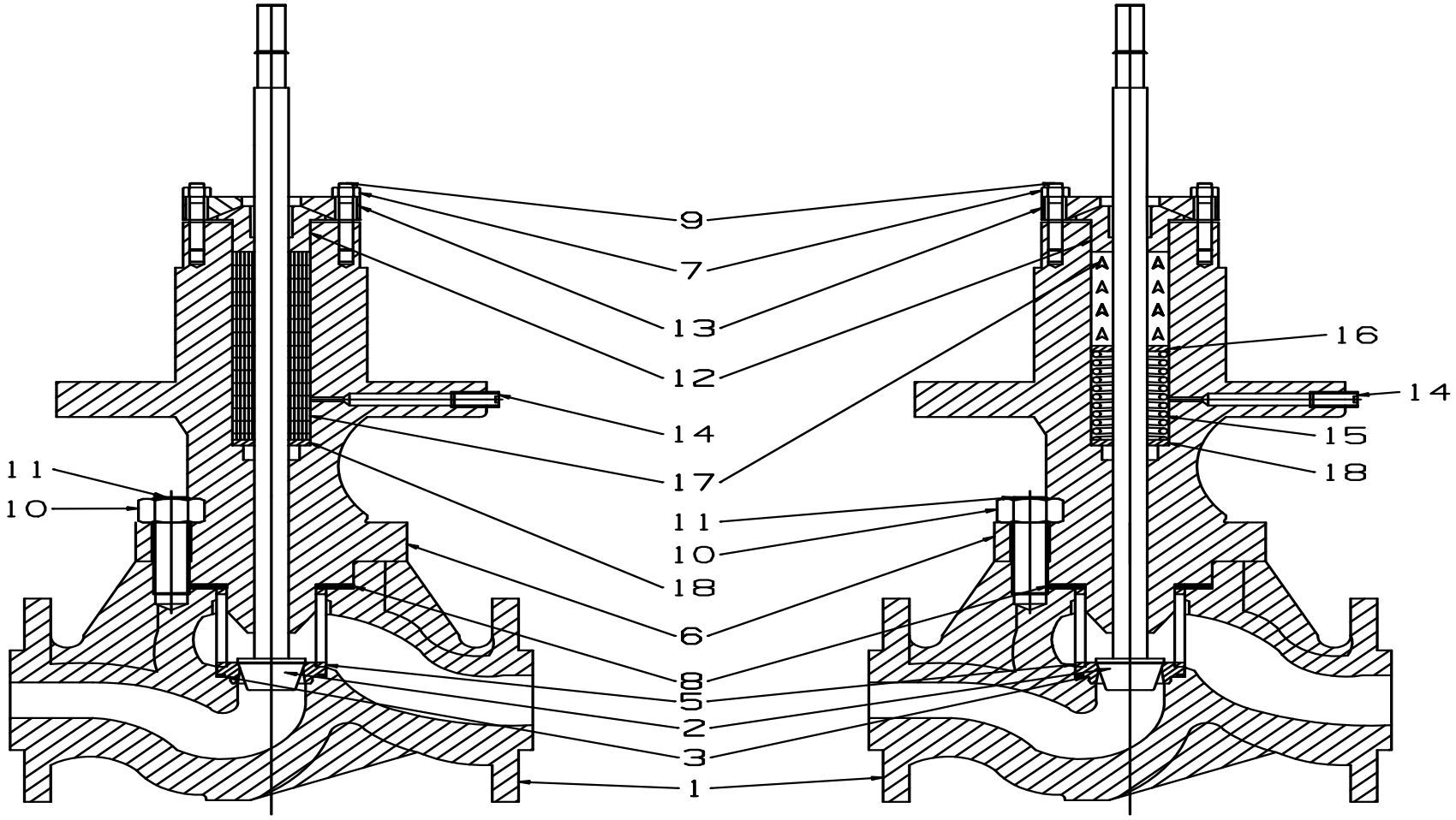
DIMENSIONS IN INCHES													
SIZE	A	A-1	A-2	B	C	D	E	F	G	H	No. of Holes	Hole Size	Approx. Net wt. lb.
THREADED (CAST IRON)													
½	7-3/4	4-1/8	3-5/8	5-3/16	2-3/8	-	-	-	-	-	-	-	17
¾	7-3/4	4-1/8	3-5/8	5-3/16	2-3/8	-	-	-	-	-	-	-	17
1	7-3/4	4-1/8	3-5/8	5-3/16	2-3/8	-	-	-	-	-	-	-	17
1-1/2	9-1/4	4-5/8	4-5/8	7-1/2	2-3/8	-	-	-	-	-	-	-	28
2	10-1/2	5-1/4	5-1/4	7-3/4	3	-	-	-	-	-	-	-	35
125 LB. ANSI FLANGE STANDARD (CAST IRON)													
1	7-1/4	3-7/8	3-3/8	5-3/16	2-1/8	4-1/4	7/16	-	3-1/8	-	4	5/8	19
1-1/2	8-3/4	4-3/8	4-3/8	7-1/2	2-1/2	5	9/16	-	3-7/8	-	4	5/8	35
2	10-1/2	5	5	7-3/4	3	6	5/8	-	4-3/4	-	4	¾	41
2-1/2	10-7/8	5-13/16	5-1/16	8-3/16	3-1/2	7	11/16	-	5-1/2	-	4	¾	58
3	11-3/4	5-7/8	5-7/8	8-1/2	3-3/4	7-1/2	¾	-	6	-	4	¾	80
4	13-7/8	6-15/16	6-15/16	10-5/16	4-1/2	9	15/16	-	7-1/2	-	8	¾	135
250 LB. ANSI FLANGE STANDARD (CAST IRON)													
1	7-3/4	4-1/8	3-5/8	5-3/16	2-1/8	4-7/8	5/8	2-11/16	3-1/2	1/16	4	¾	21
1-1/2	9-1/4	4-5/8	4-5/8	7-1/2	3-1/16	6-1/8	¾	3-9/16	4-1/2	1/16	4	7/8	37
2	10-1/2	5-1/4	5-1/4	7-3/4	3-1/4	6-1/2	13/16	4-3/16	5	1/16	8	¾	45
2-1/2	11-1/2	6-1/8	5-3/8	8-3/16	3-3/4	7-1/2	15/16	4-15/16	5-7/8	1/16	8	7/8	64
3	12-1/2	6-1/4	6-1/4	8-1/2	4-1/8	8-1/4	1-1/16	5-11/16	6-5/8	1/16	8	7/8	91
4	14-1/2	7-1/4	7-1/4	10-5/16	5	10	1-3/16	6-15/16	7-7/8	1/16	8	7/8	152

CONTROL VALVE – CAST IRON BODY

DIMENSIONS IN MILLIMETERS													
SIZE	A	A-1	A-2	B	C	D	E	F	G	H	No. of Holes	Hole Size	Approx. Net Wt. kg.
THREADED (CAST IRON)													
15	196.9	104.8	92.1	142.4	60.3	-	-	-	-	-	-	-	7.7
20	196.9	104.8	92.1	142.4	60.3	-	-	-	-	-	-	-	7.7
25	196.9	104.8	92.1	142.4	60.3	-	-	-	-	-	-	-	7.7
40	235.0	117.5	117.5	190.5	60.3	-	-	-	-	-	-	-	12.7
50	266.7	133.4	133.4	196.9	76.2	-	-	-	-	-	-	-	15.9
DIN 2532/DIN 2533 FLANGE STANDARD (CAST IRON) ND-10/ND-16													
15	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-
25	194.5	103.6	90.9	142.4	54	115	14	68	85	2	4	14	12.7
40	230.2	115.1	-	190.5	63.5	150	15	88	110	3	4	18	15.9
50	262.7	131.4	131.4	196.9	76.2	165	17	102	125	3	4	18	18.6
65	290	154.8	135.2	200.6	88.9	185	17	122	145	3	4	18	26.4
80	310	155	155	215.9	95.3	200	19	138	160	3	8	18	36.3
100	385	175	175	261.9	114.3	220	21	158	180	3	8	18	61.3
DIN 2534/DIN 2535 FLANGE STANDARD (CAST IRON) ND-25/ND-40													
15	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-
25	197.6	105.2	92.5	142.4	54	115	16	68	85	2	4	14	9.5
40	234.2	117.1	-	190.5	77.8	150	17	88	110	3	4	18	16.8
50	266.7	133.4	133.4	196.9	82.6	165	19	102	125	3	4	18	20.5
65	290	154.8	135.2	200.6	95.3	185	21	122	145	3	8	18	29
80	310	155	155	215.9	104.8	200	23	138	160	3	8	18	41.4
100	393	175	175	261.9	127	235	25	162	190	3	8	22	69

LESLIE DIAPHRAGM CONTROL VALVE

CLASS D(D)LOS-2, CLASS D(D)LOAS-2 AND CLASS D(D)LO-2, D(D)LOA-2
MAIN BODY SUBASSY (CAST IRON, CAST CARBON STEEL OR STAINLESS STEEL)



1 / 2” THRU 4” VALVE
(WITH BRAIDED TEFLON GRAPHITE PACKING)

1 / 2” THRU 4” VAVLE
(WITH TEFLON CHEVRON PACKING)

DIAPHRAGM CONTROL VALVE PARTS LIST

WHEN ORDERING PARTS, PLEASE GIVE PART NAME AND PART REF. NO. FROM TABLE BELOW. USE PART NUMBER ONLY TO LOCATE PART ON DRAWING.

PART NO.	PART NAME	MATERIAL	MATERIAL SPEC.	QTY/ UNIT	REFERENCE NUMBERS							
					½"	¾"	1"	1-1/2"	2"	2-1/2"	3"	4"
1★	Valve Body, Threaded	Cast Steel	ASTM A-216	1	A654170	A654180	A651860	A652960	A653320	--	--	--
1★	Valve Body, 150 Flanged	Cast Steel	GRWCB	1	3	3	3	3	3	A654040	A654360	A654850
1★	Valve Body, 300 Flanged	Cast Steel	ASTM A-216	1	--	--	A651870	A652940	A653330	3	3	3
			GRWCB		--	--	3	3	3	A654050	A654370	A654860
			ASTM A-216				A651880	A652950	A653340	3	3	3
			GRWCB				3	3	3			
1★	Valve Body, DIN 2543 ND 16	Cast Steel	ASTM A-216	1	--	--	A658040	A658050	A658060	A658070	A658090	A658110
1★	Valve Body, DIN 2545 ND 40	Cast Steel	GRWCB	1	--	--	3	3	3	3	3	3
1★	Valve Body, Threaded	Stainless Steel	ASTM A-216	1	A654170	A654180	A658040	A658050	A658060	A658080	A658100	A658120
			GRWCB		5	5	3	3	3	3	3	3
			ASTM A-296				A651860	A652960	A653320	--	--	--
			GRW316				5	5	5			
1★	Valve Body, 150 Flanged	Stainless Steel	ASTM A-296 GR 316	1	--	--	A651870	A652940	A653330	A654040	A654360	A654850
1★	Valve Body, 300 Flanged	Stainless Steel	ASTM A-296 GR 316	1	--	--	5	5	5	5	5	5
1★	Valve Body, DIN 2543 ND16	Stainless Steel	ASTM A-296 GR 316	1	--	--	A651880	A652950	A653340	A654050	A654370	A654860
							5	5	5	5	5	5
							A658040	A658050	A658060	A658070	A658090	A658110
							5	5	5	5	5	5
1★	Valve Body, DIN 2545 ND 40	Stainless Steel	ASTM A-296 GR 316	1	--	--	A658040	A658050	A658060	A658080	A658100	A658120
2★	Valve Body, Threaded	Cast Iron	ASTM A-126 CLB	1	A65429	A65430	5	5	5	5	5	5
2★	Valve Body, 125 Flanged	Cast Iron	ASTM A-126 CLB	1	--	--	A65268	A65293	A65337	--	--	--
							A65269	A65291	A65335	A65402	A65438	A65487
2★	Valve Body, 250 Flanged	Cast Iron	ASTM A-126 CLB	1	--	--	A65270	A65292	A65336	A65403	A65439	A65448
2★	Valve Body, DIN 2533 ND 16	Cast Iron	ASTM A-126 CLB	1	--	--	A65903	A65905	A65907	A65909	A65911	A65929
2★	Valve Body, DIN 2535 ND 40	Cast Iron	ASTM A-126 CLB	1	--	--	A65904	A65906	A65908	A65910	A65912	A65930
2★	Valve Plug, Linear, Full Trim	Stainless Steel	AISI TYPE 316	1	A69327	A69339	A69345	A69367	A69373	A69379	A69389	A69395
2★	Valve Plug, Linear, Res. Trim	Stainless Steel	AISI TYPE 316	1	A69331	A69344	A69353	A69371	A69377	A69383	A69393	A69399
2★	Valve Plug, Linear, ¼" Trim	Stainless Steel	AISI TYPE 316	1	A69323	A69323	A69323	--	--	--	--	--
2★	Valve Plug, Linear, ½" Trim	Stainless Steel	AISI TYPE 316	1	--	A69327	A69327	--	--	--	--	--
2★	Valve Plug, Linear, ¾" Trim	Stainless Steel	AISI TYPE 316	1	--	--	A69339	A69341	--	--	--	--
2★	Valve Plug, Linear, 1" Trim	Stainless Steel	AISI TYPE 316	1	--	--	--	--	A69348	--	--	--
2★	Valve Plug, Linear, 1-1/2" Trim	Stainless Steel	AISI TYPE 316	1	--	--	--	--	--	A69385	A69385	--
2★	Valve Plug, Linear, 2" Trim	Stainless Steel	AISI TYPE 316	1	--	--	--	--	--	--	--	A69401
2★	Valve Plug, Microtaper ¼" (NOTE 1)	Stainless Steel	AISI TYPE 316	1	A69322	A69322	A69322	--	--	--	--	--
2★	Valve Plug, EQ% Full Trim	Stainless Steel	AISI TYPE 316	1	A69329	A69333	A69349	A69369	A69375	A69381	A69391	A69397
2★	Valve Plug, Res. Trim	Stainless Steel	AISI TYPE 316	1	A69332	A69343	A69354	A69372	A69378	A69384	A69394	A69400
2★	Valve Plug, EQ% ¼" Trim	Stainless Steel	AISI TYPE 316	1	A69325	A69325	A69325	--	--	--	--	--
2★	Valve Plug., EQ% ½" Trim	Stainless Steel	AISI TYPE 316	1	--	A69329	A69329	--	--	--	--	--
2★	Valve Plug, EQ% ¾" Trim	Stainless Steel	AISI TYPE 316	1	--	--	A69333	A69336	--	--	--	--
2★	Valve Plug, EQ% 1" Trim	Stainless Steel	AISI TYPE 316	1	--	--	--	--	A69351	--	--	--
2★	Valve Plug, EQ% 1-1/2" Trim	Stainless Steel	AISI TYPE 316	1	--	--	--	--	--	A69387	A69387	--
2★	Valve Plug, EQ% 2" Trim	Stainless Steel	AISI TYPE 316	1	--	--	--	--	--	--	--	A69403
2★	Valve Plug, Linear, Full Trim	St. Steel Stell.	AISI TYPE 316	1	A69328	A69338	A69346	A69368	A69374	A69380	A69390	A69396
2★	Valve Plug, Linear, ¼" Trim	St. Steel Stell.	AISI TYPE 316	1	A69324	A69324	A69324	--	--	--	--	--
2★	Valve Plug, Linear, ½" Trim	St. Steel Stell.	AISI TYPE 316	1	--	A69328	A69328	--	--	--	--	--
2★	Valve Plug, Linear, ¾" Trim	St. Steel Stell.	AISI TYPE 316	1	--	--	A69338	A69342	--	--	--	--
2★	Valve Plug, Linear, 1" Trim	St. Steel Stell.	AISI TYPE 316	1	--	--	--	--	A69347	--	--	--
2★	Valve Plug, Linear, 1-1/2" Trim	St. Steel Stell.	AISI TYPE 316	1	--	--	--	--	--	A69386	A69386	--
2★	Valve Plug, Linear, 2" Trim	St. Steel Stell.	AISI TYPE 316	1	--	--	--	--	--	--	--	A69402
2★	Valve Plug, EQ% Full Trim	St. Steel Stell.	AISI TYPE 316	1	A69330	A69334	A69350	A69370	A69376	A69382	A69392	A69398
2★	Valve Plug, EQ% ¼" Trim	St. Steel Stell.	AISI TYPE 316	1	A69326	A69326	A69326	--	--	--	--	--
2★	Valve Plug, EQ% ½" Trim	St. Steel Stell.	AISI TYPE 316	1	--	A69330	A69330	--	--	--	--	--
2★	Valve Plug, EQ% ¾" Trim	St. Steel Stell.	AISI TYPE 316	1	--	--	A69334	A69337	--	--	--	--
2★	Valve Plug, EQ% 1" Trim	St. Steel Stell.	AISI TYPE 316	1	--	--	--	--	A69352	--	--	--
2★	Valve Plug, EQ% 1-1/2" Trim	St. Steel Stell.	AISI TYPE 316	1	--	--	--	--	--	A69388	A69388	--
2★	Valve Plug, EQ% 2" Trim	St. Steel Stell.	AISI TYPE 316	1	--	--	--	--	--	--	--	A69404
3†	Seat Ring Gasket (To 450˚F)	RTFE	COMMERCIAL	1	A79477	A79477	A79477	A79478	A79479	A79480	A79481	A79482
3†	Seat Ring Gasket (Above 450˚F) ■	Inconel 600/Grap.	COMMERCIAL	1	A72654	A72654	A72654	A72655	A72516	A72656	A72657	A72658
3†	S.R. Gasket for Resilient Trim only	Fluorocarbon	COMMERCIAL	1	A65361	A65361	A65361	A65362	A65363	A66218	A65479	A65480
4★	Seat Ring, Full Trim	Stainless Steel	AISI TYPE 316	1	A72565	A72569	A72566	A72573	A72493	A72563	A72554	A72558
4★	Seat Ring, ¼" Trim	Stainless Steel	AISI TYPE 316	1	A72567	A72567	A72567	--	--	--	--	--
4★	Seat Ring, ½" Trim	Stainless Steel	AISI TYPE 316	1	--	A72565	A72565	--	--	--	--	--
4★	Seat Ring, ¾" Trim	Stainless Steel	AISI TYPE 316	1	--	--	A72569	A72572	--	--	--	--
4★	Seat Ring, 1" Trim	Stainless Steel	AISI TYPE 316	1	--	--	--	--	A72494	--	--	--
4★	Seat Ring, 1-1/2" Trim	Stainless Steel	AISI TYPE 316	1	--	--	--	--	--	A72560	A72555	--
4★	Seat Ring, 2" Trim	Stainless Steel	AISI TYPE 316	1	--	--	--	--	--	--	--	A74410
4★	Seat Ring, Full Trim	St. Steel Stell.	AISI TYPE 316	1	A72571	A72564	A72570	A72574	A72495	A72561	A72557	A72559
4★	Seat Ring, ¼" Trim	St. Steel Stell.	AISI TYPE 316	1	A72568	A72568	A72568	--	--	--	--	--
4★	Seat Ring, ½" Trim	St. Steel Stell.	AISI TYPE 316	1	--	A72571	A72571	--	--	--	--	--
4★	Seat Ring, ¾" Trim	St. Steel Stell.	AISI TYPE 316	1	--	--	A72564	A72575	--	--	--	--
4★	Seat Ring, 1" Trim	St. Steel Stell.	AISI TYPE 316	1	--	--	--	--	A72492	--	--	--
4★	Seat Ring, 1-1/2" Trim	St. Steel Stell.	AISI TYPE 316	1	--	--	--	--	--	A72562	A72556	--
4★	Seat Ring, 2" Trim	St. Steel Stell.	AISI TYPE 316	1	--	--	--	--	--	--	--	A74409
4★	Seat Ring, Res. Trim	Stainless Steel	AISI TYPE 316	1	A65717	A65718	A65719	A65720	A65721	A65722	A65723	A65724
5★	Seat Retainer Cage	Stainless Steel	ASTM A351	1	A652640	A652640	A652640	A652990	A653030	A654120	A653740	A653750
6	Bonnet	Cast Steel	GRCF8M	1	5	5	5	5	5	5	5	5
			ASTM A216 GRWCB		A72597	A72597	A72597	A72594	A72514	A72599	A72601	A72603
6	Bonnet (For C.I. Body)	Note 2		1	A72597	A72597	A72597	A72594	A72514	A72599	A72601	A72603
6	Bonnet (For SS Body)	316 SS	ASTM A351CF8M	1	A691160	A691160	A691160	A691180	A75879	A691220	A72430	A72925
7	Packing Nut	Stainless Steel	AISI TYPE 304	2	5	5	5	5	A23194	5	A23194	A23194
					A23194	A23194	A23194	A23194		A23194		
8†	Bonnet Gasket	Inconel 600/Grap.	COMMERCIAL	1	A72659	A72659	A72659	A72660	A72661	A72662	A72663	A72664
9	Packing Stud	Steel	AISI A-193GRB7	2	A57572	A57572	A57572	A57572	A57572	A57572	A57572	A57572
10	Nut	Steel Stell.	ASTM A194GB2H	8	A13243	A13243	A13243	A03676	A03676	A03677	A03677	A03678
11	Stud	Steel Stell.	ASTM A-193 GRB7	4	A44867	A44867	A44687	A23209	A23207	A11083	A09393	A42747
11	Stud Bolt	Steel	ASTM A-193 GRB7	4	A69471	A69471	A69471	A69472	A69472	A69473	A69474	A69475
12	Packing Bearing	Stainless Steel	AISI TYPE 316	1	A65370	A65370	A65370	A65370	A65371	A65371	A65371	A65371

13	Packing Flange	Steel	AISI 1144	1	A69405	A69405	A69405	A69405	A69405	A69405	A69405	A69405
14	Pipe Plug	Steel	COMMERCIAL	1	A66166	A66166	A66166	A66166	A66166	A66166	A66166	A66166
15†	Packing Spring Teflon Packing	Monel 400	COMMERCIAL	1	A65353	A65363	A65353	A65353	A65355	A65355	A65355	A65355
16	Washer, Teflon Packing	Monel 400	COMMERCIAL	1	A63926	A63926	A63926	A63926	A65368	A65368	A65368	A65368
17†	Packing Set, Teflon Chevron	Teflon	COMMERCIAL	1	A28015	A28015	A28015	A28015	A69460	A69460	A69460	A69460
17†	Packing Set Braided Teflon Grpht	Teflon/Graphite	COMMERCIAL	1	A69423	A69423	A69423	A69423	A69424	A69424	A69424	A69424
17†	Packing Set, Hi-Temp	Graphite Type II	COMMERCIAL	1	A72363	A72363	A72363	A72363	A72647	A72647	A72647	A72647
17†▲	Packing Set, Hi-Temp	Graphite Type II	COMMERCIAL	1	A70380	A70380	A70380	A70380	A72653	A72653	A72653	A72653
18	Packing Ring, Teflon	Stainless Steel	AISI TYPE 302	1	A23192	A23192	A23192	A23192	A66909	A66909	A66909	A66909
18	Packing Spacer, Graphite Packing	Stainless Steel	AISI TYPE 302	1	A72626	A72626	A72626	A72626	A72627	A72627	A72627	A72627
18▲	Packing Spacer	Stainless Steel	AISI TYPE 302	1	A72646	A72646	A72646	A72646	A66909	A66909	A66909	A66909

* Resilient Seat Only

† Recommended Spare Parts

★ These parts should be on hand, plus recommended spare parts when overhauling this equipment

▲ For use with Bleedport option only

■ Not used with Iron Body

NOTE 1: Microtaper valve plug furnished only as valve plug and seat set. Not available separately.

NOTE 2: Bonnet material is cast steel ASTM A215WCB for ½" – 3' valves. Material is C.I. A126CLB for 4" valves.

DIRECT ACTING

WHEN ORDERING PARTS, PLEASE GIVE PART NAME AND PART REFERENCE NUMBER FROM TABLE BELOW. USE PART NUMBER ONLY TO LOCATE PART ON DRAWING.

PART NO.	PART NAME	MATERIAL	QTY PER UNIT	REFERENCE NUMBER – EACH SIZE		
				35	55 & 55A	85
1	Nut	Steel	1	13243	13243	13243
2	Lock Washer	Steel	1	10392	10392	10392
3	Handwheel	Cast Aluminum	1	43064	23649	23649
4	Handscrew	Stainless Steel	1	43016	49228	49228
5	Packing Gland	(NOTE 1)	1	38644	34859	34859
6*	Packing Ring	Molded Rings	1	69609	33551	33551
7	Washer	(NOTE 1)	1	38658	35760	35760
8*	O-Ring	Synthetic Rubber	1	38664-94	27293-94	27293-94
9	Bonnet, Compl., Iron Actuator	(NOTE 2)	1	38635	42228	42228
9	Bonnet, Compl., Alum. Actuator	(NOTE 3)	1	39069	42228	42228
15	Handscrew Disc, Compl. (NOTE 6)	Stainless Steel	1	43008	42077	42077
16*	Gasket	Sheet Packing	1	38657-95	37845-95	37845-95
17	Lock Nut, Iron Actuator	(NOTE 2)	1	38655	37710	37710
17	Lock Nut, Aluminum Actuator	(NOTE 3)	1	39070	37710	37710
18	Diaphragm Case, Upper	Pressed Steel	1	38661	37764	37770

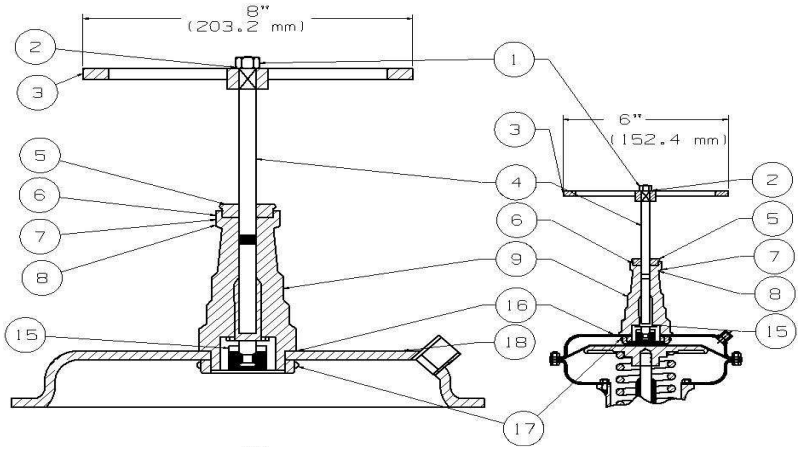
PART NO.	PART NAME	MATERIAL	QTY PER UNIT	REFERENCE NUMBER – EACH SIZE			
				35	55	55A	85
20*	Diaphragm Case, Upper	Pressed Steel	1	38369	37795	37795	37791
21	Diaphragm	Synthetic Rubber	1	38399-94	37810-94	37810-94	37819-94
22	Nut	Steel	(NOTE 7)	13901	26585	26585	26585
23	Bolt	Steel	(NOTE 7)	38420	37797	37797	37797
24	Diaphragm Disc (NOTE 4)	Cast Iron	1	38393	37838	37838	37843
24	Diaphragm Disc (NOTE 5)	Cast Aluminum	1	38877	37839	37839	37844
25	Diaphragm Case, Lower	Pressed Steel	1	38345	37672	37672	37678
26	Cap Screw	Steel	(NOTE 8)	38420	37796	37796	23400
28	Adjusting Spring	Steel, Plated	1	(SEE TABLE)			
29	Inner Adjusting Spring	Steel, Plated	1	--	--	(SEE TABLE)	
30	Limit Stop	Steel	1	(SEE TABLE)			
31	Upper Stem	Stainless Steel	1	38398	23263	61386	24273
32	Yoke (NOTE 10) (NOTE 4)	Cast Iron	1	38335	37693	37693	37995
32	Yoke (NOTE 10) (NOTE 5)	Cast Aluminum	1	38876	37692	37692	37994
33	Washer, Inner Spring (NOTE 9)	Stainless Steel	1	--	--	--	--
34	Washer	Stainless Steel	1	38401	23260	23260	24271
35	Adjusting Nut (NOTE 4)	Cast Iron	1	38394	23262	23262	24274
35	Adjusting Nut (NOTE 5)	Cast Bronze	1	58349	27978	27978	30081
36	Adjusting Sleeve	Stainless Steel	1	38397	37694	37694	37766
37	Travel Indicator	Stainless Steel	1	38405	38920	15672	38921
38	Travel Indicator Scale	Aluminum	1	38404	(SEE TABLE)		
39	Screw	Steel, Cad. Plated	(NOTE 11)	34728	34728	34728	34728

* RECOMMENDED SPARE PARTS

NOTE 1 – Material is Brass for size 35 Actuator and Aluminum for 55, 55A and 85 Actuators
NOTE 2 - Material is Cast Iron for 35 Actuator and Cast Aluminum for 55, 55A and 85 Actuators.
NOTE 3 – Material is Cast Bronze for 35 Actuator and Cast Aluminum for 55, 55A and 85 Actuators.
NOTE 4 – Used on Cast Iron Actuators only.
NOTE 5 – Used on Cast Aluminum Actuators only.
NOTE 6 – Includes one each, Handscrew Disc, Retainer Insert and two each Split ring.
NOTE 7 – Quantities are: Twelve (12) for the 35 size, Fourteen (14) for the 55 and 55A sizes, Sixteen (16) for the 85 sizes.
NOTE 8 – Quantities are: Eight (8) for the 35, 55 & 55A sizes and Six (6) for the 85 size Actuators.
NOTE 9 – Used only when Inner Adjusting Spring, Part No. 29 is used.
NOTE 10 – Yoke, Part No. 32, is furnished complete with Adjusting Sleeve, Part No. 36.
NOTE 11 – Quantities are: One (1) for 35 Actuator and Two (2) for all other sizes.

NOTE: Part Numbers 10, 11, 12, 13, 14, 19 and 27 have been deleted. For Part Numbers 28, 29, 30 and 38 see back page.

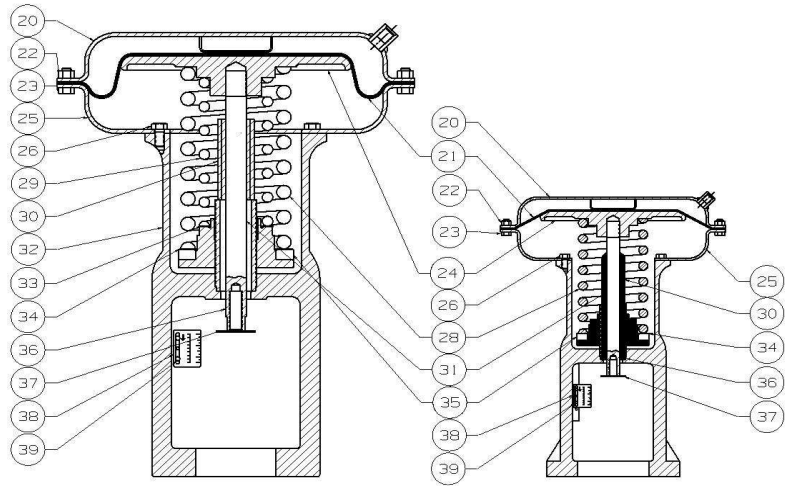
HAND OPERATING DEVICE



VIEW SHOWING SIZES 55, 55A, &85 HAND OPERATING DEIVICES

VIEW SHOWING SIZE 35 HAND OPERATING DEVICE

DIAPHRAGM ACTUATOR



VIEW SHOWING SIZES 55, 55A, & 85 DIAPHRAGM ACTUATORS

VEIW SHOWING SIZE 35 DIAPHRAGM ACTUATOR

REVERSE ACTING

WHEN ORDERING PARTS, PLEASE GIVE PART NAME AND PART REFERENCE NUMBER FROM TABLE BELOW. USE PART NUMBER ONLY TO LOCATE PART ON DRAWING.

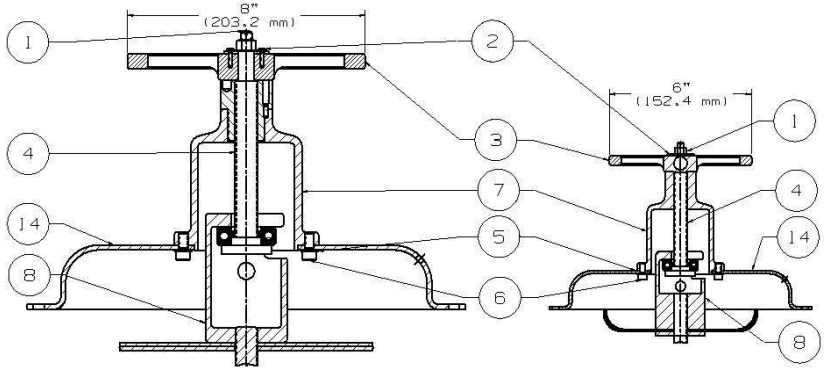
PART NO.	PART NAME	MATERIAL	QTY PER UNIT	REFERENCE NUMBER – EACH SIZE		
				35	55R & 55AR	85R
1	Nut	Steel	1	13243	13243	13243
2	Lockwasher	Steel	1	10392	10392	10392
3	Handwheel, Complete	Cast Aluminum	1	43064	42226	42226
4	Handscrew Bearing	Stainless Steel	1	43043	51456	51456
5	Assembly	Steel	(NOTE 3)	11467	13077	13077
6	Lockwasher	Stainless Steel	(NOTE 3)	17186	41933	41933
	Screw					
7	Bonnet, Complete (NOTE 4)	(NOTE 1)	1	38720	42224	42224
7	Bonnet, Complete (NOTE 5)	(NOTE 2)	1	39077	42224	42224
8	Diaphragm Nut	Steel	1	38696	42220	41793
14	Diaphragm Case, Upper	Pressed Steel	1	38748	41788	41787

PART NO.	PART NAME	MATERIAL	QTY PER UNIT	REFERENCE NUMBERS – EACH SIZE			
				35R	55R	55AR	85R
15	Diaphragm Case, Upper	Pressed Steel	1	38392	37832	37832	37833
16	Nut	Steel	1	24005	36229	36229	36229
17	Diaphragm Disc	(NOTE 6)	1		(SEE		
18	Nut	Steel	(NOTE 7)	13901	TABLE)	26585	26585
					26585		
19	Bolt	Steel	(NOTE 7)	38420	37797	37797	37797
20*	Diaphragm	Synthetic Rubber	1	38400-94	37809-94	37809-94	37818-94
21	Diaphragm Case, Lower	Pressed Steel	1	38391	37774	37774	38081
22	Collar, Comp. (NOTE 4)	(NOTE 11)	1	38412	37760	37760	38113
22	Collar, Comp. (NOTE 5)	(NOTE 11)	1	38412	37760	37760	38113
23	Cap Screw	Steel	(NOTE 8)	38420	37796	37796	23400
26*	Diaphragm Base Gasket	Synthetic Rubber	1	--	37761-95	37761-95	38107-95
27	Stem Seal Ring	Steel	1	--	37731	37731	37731
28	Screw	Stainless Steel	6	--	30501	30501	30501
29*	Stem Seal	Synthetic Rubber	1	38417-94	37740-95	37740-95	37740-95
30	Top Spring Seat	(NOTE 9)	1	--	(NOTE 9)	(NOTE 9)	(NOTE 9)
31	Stem Seat Collar	Cold Rolled Steel	1	38416	28177	28177	28177
34	Yoke (NOTE 4)	Cast Iron	1	38343	37728	37728	37973
34	Yoke (NOTE 5)	Cast Aluminum	1	38940	37727	37727	37972
35	Upper Stem	Stainless Steel	1	38408	37758	61387	38085
36	Adjusting Spring	Steel, Blk. Japanned	1		(SEE		
37	Inner Adjusting Spring	Steel, Blk. Japanned	1		TABLE)		
38	Washer, Inner Adj Spg (NOTE 10)	Stainless Steel	1	--	(SEE TABLE)	--	25393
					--		
39	Washer	Stainless Steel	1	38401	23260	23260	24271
40	Adjusting Nut (NOTE 4)	Case Iron	1	38395	31641	31641	28174
40	Adjusting Nut (NOTE 5)	Cast Bronze	1	58350	30623	30623	31592
41	Indicator Disc	Stainless Steel	1	38406	38920	1 5 6 7 2	38921
42	Indicator Scale	Aluminum	1	38404		(SEE TABLE)	
43	Screw	Steel, Plated	(NOTE 12)	34728	34728	3 4 7 2 8	34728
45	Washer	Steel	1	39784	--	--	--

* RECOMMENDED SPARE PARTS

NOTE 1 – Material is Cast Iron for size 35R Actuator and Case Aluminum for 55R, 55AR and 85R Iron Actuators.
NOTE 2 – Material is Cast Bronze for 35R Actuator and Cast Aluminum for 55R, 55AR and 85R Actuators.
NOTE 3 – Quantities are: Four (4) for 35R Actuator and Six (6) for 55R, 55AR and 85R Actuator.
NOTE 4 – Used on Cast Iron Actuators only.
NOTE 5 – Used on Cast Aluminum Actuators only.
NOTE 6 – Material is Steel for the 35R, 55R and 85R Iron Actuator.
NOTE 7 – Quantities are: Twelve (12) for the 35R size, Fourteen (14) for the 55R & 55AR sizes, Sixteen (16) for the 85R sizes.
NOTE 8 – Quantities are: Eight (8) for the 35R, 55R & 55AR sizes and Six (6) for the 85R size Actuators.
NOTE 9 – Material is Steel for the 55R & 55AR, Ref. No. 37802; Cast Iron for the 85R Iron Actuator, Ref. No. 38116 and Cast Aluminum for the 85R Aluminum Actuator, Ref. No. 38117.
NOTE 10 – Used only when Inner Adjusting Spring, Part No. 37 is used.
NOTE 11 – Material is Steel for 35R Iron Actuators, Aluminum Alloy for 55R, 55AR and 85R Aluminum and Iron Actuators.
NOTE 12 – Quantity is One (1) for 35R size and Two (2) for all other size Actuators.
NOTE: - Part Numbers 24, 32 and 33 have been deleted. For Part Numbers 17, 36, 37 and 42 see back page.

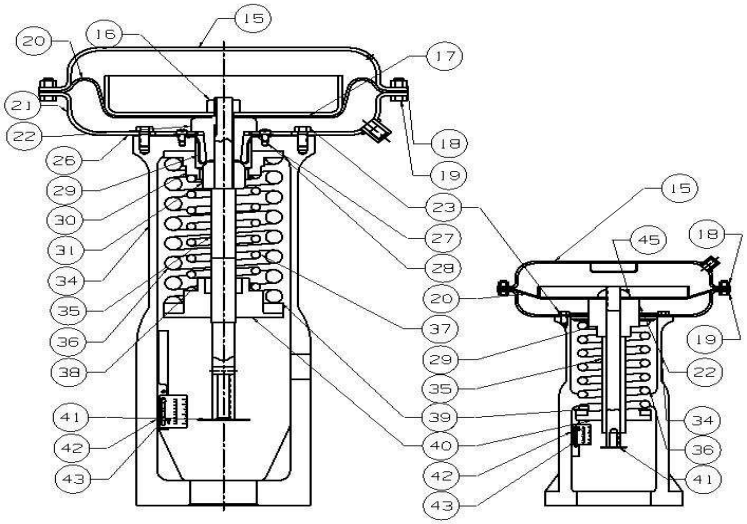
HAND OPERATING DEVICE



VIEW SHOWING SIZES 55R, 55AR, &8[illegible] HAND OPERATING DEIVICES

VIEW SHOWING SIZE 35R HAND OPERATING DEVICE

DIAPHRAGM ACTUATOR



VIEW SHOWING SIZES 55R, 55AR, & 85R DIAPHRAGM ACTUATORS

VEIW SHOWING SIZE 35R DIAPHRAGM ACTUATOR

FOR DIRECT ACTING ACTUATOR

PART NO. 30 LIIT STOP				
VALVE TRAVEL		ACTUATOR SIZE		
		35	55 & 55A	85
5/8 in	15.9 mm	38403	44077	24482
¾ in	19.1 mm	--	23393	46890
7/8 in	22.2 mm	--	23393	24482
1 in	25.4 mm	--	23394	24483
1-1/8 in	28.6 mm	--	23395	23366
1-1/4 in	31.8 mm	--	23395	23366
1-1/2 in	38.1 mm	--	23997	23367
2 in	50.8 mm	--	--	23368

FOR REVERSE ACTING ACTUATOR

PART NO. 17 DIAPHRAGM DISC			
VALVE TRAVEL	ACTUATOR SIZE		
	35	55R & 55AR	85R
5/8 in	38351	37683	37686
¾ in	38351	37683	37686
7/8 in	--	37683	37686
1 in	--	37683	37686
1-1/4 in	--	49950	38699
1-1/2 in	--	37684	38699
2 in	--	--	37685

ADJUSTING SPRING, INNER ADJUSTING SPRINGS AND TRAVEL INDICATOR SCALES ARE THE SAME FOR EITHER DIRECT OR REVERSE ACTING ACTUATORS

PART NO. 28 PART NO. 36 ADJUSTING SPRING **				
VALVE TRAVEL		ACTUATOR SIZE		
		35®	55® & 55A®	85®
5/8 in	15.9 mm	38422	41969	35014
¾ in	19.1 mm	38422	41968	37719
7/8 in	22.2 mm	--	23239	24299
1 in	25.4 mm	--	24296	35014
1-1/8 in	28.6 mm	--	43078	41970
1-1/4 in	31.8 mm	--	24297	24299
1-1/2 in	38.1 mm	--	24298	24300
2 in	50.8 mm	--	--	24301

** Springs listed are based on Standard Spring that will give the nearest range to 3-15 psi for the travel indicated. This is based on zero pressure drop through valve. For various pressure drops or ranges, these Springs can be interchanged any way in each particular size. Consult Leslie Controls when special range is required.

PART NO. 29 PART NO. 37 INNER ADJUSTING SPRING		
VALVE TRAVEL		ACTUATOR SIZE
		85®
5/8 in	15.9 mm	37718
7/8 in	22.2 mm	24481
1 in	25.4 mm	--
1-1/4 in	31.8 mm	--
1-1/2 in	38.1 mm	--

PART NO. 38 PART NO. 42 TRAVEL INDICATOR SCALE		
INDICATOR SCALES SUBJECT TO ACTUATOR MAXIMUM TRAVEL LIMIT		
VALVE TRAVEL		REF. NO.
¼ in	6.4 mm	48224
3/8 in	9.5 mm	48048
½ in	12.7 mm	48047
5/8 in	15.9 mm	38904
¾ in	19.1 mm	38905
7/8 in	22.2 mm	38906
1 in	25.4 mm	38907
1-1/8 in	28.6 mm	38908
1-1/4 in	31.8 mm	38909
1-1/2 in	38.1 mm	38910
1-3/4 in	44.5 mm	49641
2 in	50.8 mm	38911

LESLIE CONTROLS, INC.

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It is solely responsibility of system designer and user to select products and materials suitable for their specific application requirements and to ensure proper installation, operation and maintenance of these products. Assistance shall be afforded with selection of materials based on technical information supplied to Leslie Controls Inc.; however, system designer and user retain final responsibility. Designer should consider applicable Codes, material compatibility, product ratings and application details in selection and application. Improper selection, application or use of products described herein can cause personal injury or property damage. If designer or user intends to use product for an application or use other than originally specified, he must reconfirm tat selection is suitable for new operating conditions. Life expectancy for this product defaults to warranty period of sales contract.