

KOSO HAMMEL DAHL

BULLETIN D / R SERIES

FEATURES

- *Rolling diaphragm provides excellent sensitivity and provides maximum constant effective area, which translates into improved linearity.*
- *Modular construction provides maximum part interchangeability between direct and reverse-acting models and between selected case sizes — field reversibility is easily accomplished.*
- *High spring rates improve control valve stability.*
- *Minimal guiding assures low hysteresis in reverse-acting models — near zero hysteresis in direct-acting models.*
- *Stainless steel stems are standard for maximum performance in corrosive environments.*

Temperature Limits:

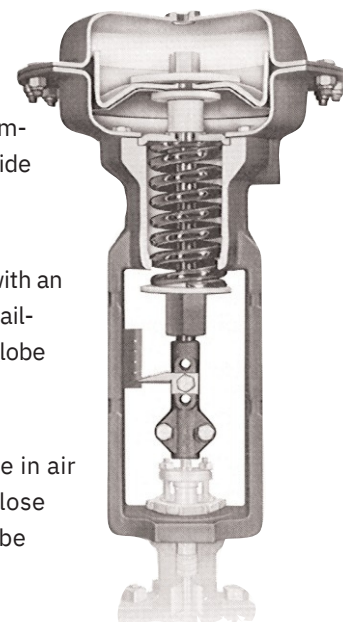
D/R Series Spring-Diaphragm Pneumatic Linear Actuators

D/R Series actuators are linear spring diaphragm pneumatic actuators designed for reliable operation of control valves. The D/R is a rugged unit available in a combination of case sizes, strokes and springs to satisfy a wide range of applications.

The Type D, direct-acting actuator, strokes downward with an increase in air pressure. An opposing spring provides a fail-open response when attached to push-down-to-close globe control valves.

With the Type R, reverse-acting actuator, an increase in air pressure retracts the actuator stem, providing fail-close response when attached to push-down-to-close globe control valves.

For valves requiring longer travel and higher thrusts, the A46 and A47 are available. The A46 is a direct-acting actuator, while the A47 is a reverse-acting model.



Specifications

Diaphragm Cases:	Pressed steel
Stem:	303 SS
Diaphragm:	Dacron reinforced nitrile
Spring Barrel:	Cast Iron
Max. Case Pressure:	D/R Series: 65* psi (4.5 bar) A46/A47: 45 psi (3.1 bar)
Temperature Limits:	-40° F to +180° F (-40° C to +82° C)
Standard Air Connection:	3/8-inch NPT

*Model DC (140 sq in) is limited to 45 psi (3.1 bar).

Top-Mounted Overrides/Limit Stops

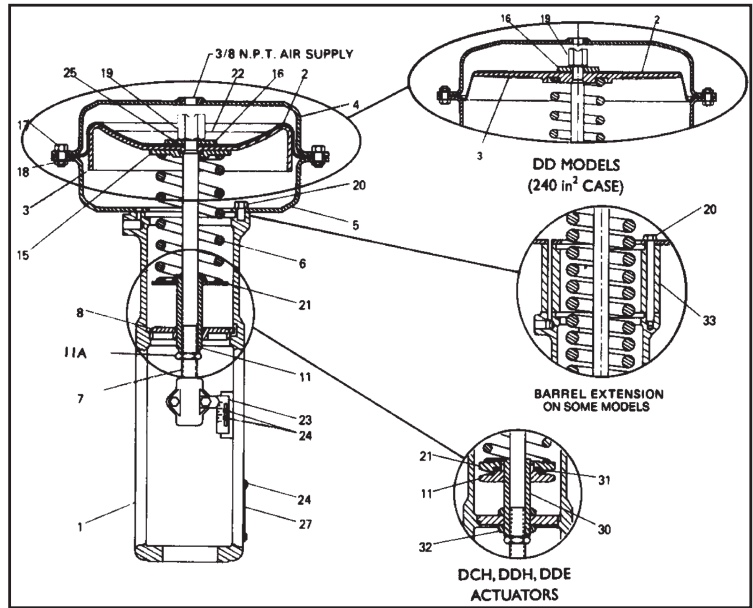
When applications require, Type I override/limit stops (lift stops) are designed to (1) limit the degree of valve opening with either direct or reverse-acting actuators or (2) manually override direct-acting actuators. This type of stop is available with D/RA, D/RB and D/RC actuators. With direct-acting actuators, a built-in stop nut to limit stem lift is furnished as a standard feature.

Optionally available with RA, RB and RC reverse-acting actuators is a Type II override limit stop for use in overriding or limiting the degree of valve closing.

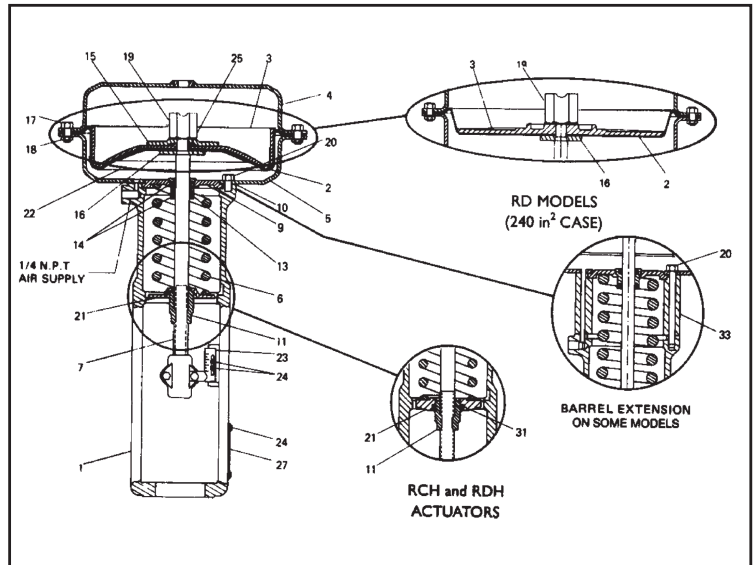
Bill of Materials and Parts

Parts For Models DA, DB, DC and DD – Direct-Acting

Part No.	Part Name	Material
1	Spring Barrel	Cast Iron
2	Diaphragm	Nitrile/Dacron
3	Piston	Carbon Steel
4	Upper Diaphragm Case	Carbon Steel
5	Lower Diaphragm Case	Carbon Steel
6	Spring	Carbon Steel
7	Spring Stem	303 Stainless Steel
8	Barrel Bridge	Stainless Steel
9	Packing Box Flange	Carbon Steel
10	Lower Case Gasket	Neoprene
11	Spring Adjuster	Carbon Steel
12	Down Travel Stop (not shown)	Carbon Steel
13	Packing Box	Brass
14	Packing Box O-Ring	Buna-N
15	Piston Back-up Plate	Carbon Steel
16	Diaphragm Button	Carbon Steel
17	Hex Head Cap Screw	Carbon Steel
18	Hex Nut	Carbon Steel
19	Up Travel Stop	Carbon Steel
20	Hex Head Cap Screw	Carbon Steel
21	Spring Adjuster Button	Carbon Steel
22	Diaphragm Disc	Carbon Steel
23	Travel Indicator Scale	Stainless Steel
24	Self Tap Screw	Carbon Steel
25	Diaphragm O-Ring	Buna-N
27	Identification Tag	Stainless Steel
28	Stop Nut	Carbon Steel
30	Spring Adjuster Screw	Carbon Steel
31	Spring Adjuster Thrust Bearing	Hardened Steel
32	Jam Nut	Carbon Steel
33	Spring Barrel Extension	Carbon Steel
34	Hex Head Cap Screw	Carbon Steel



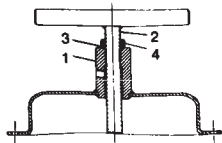
Parts For Models RA, RB, RC and RD – Reverse-Acting



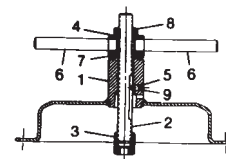
Type II Override/Limit Stop Assembly For Reverse-Acting Actuator

Type I Override/Limit Stop Assembly

Part No.	Name
1	Override/Limit Stop Diaphragm Case Assembly
2	Stem Assembly
3	Thread Sealing Washer*
4	Hex Nut



Part No.	Name
1	Limit Stop Diaphragm Case Assembly
2	Jacking Screw
3	Stem Nut
4	“T” Bar Hub
5	Set Screw
6	“T” Bar Handle
7	Thrust Washer
8	Hex Nut
9	Set Screw, Socket Jam

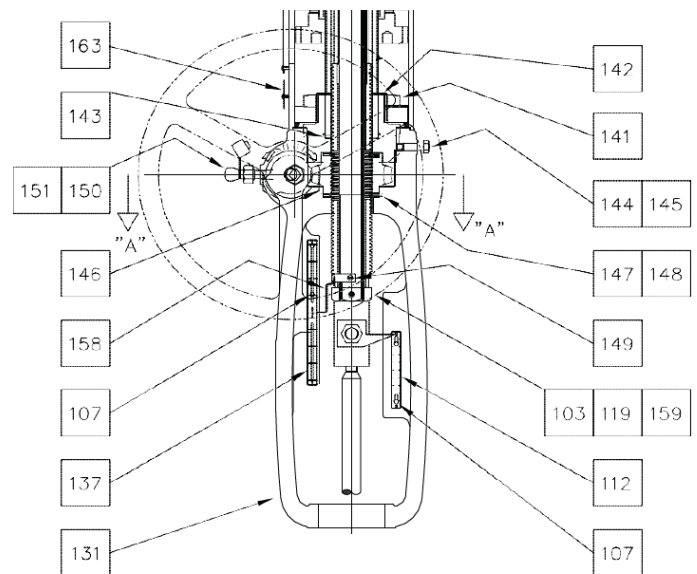
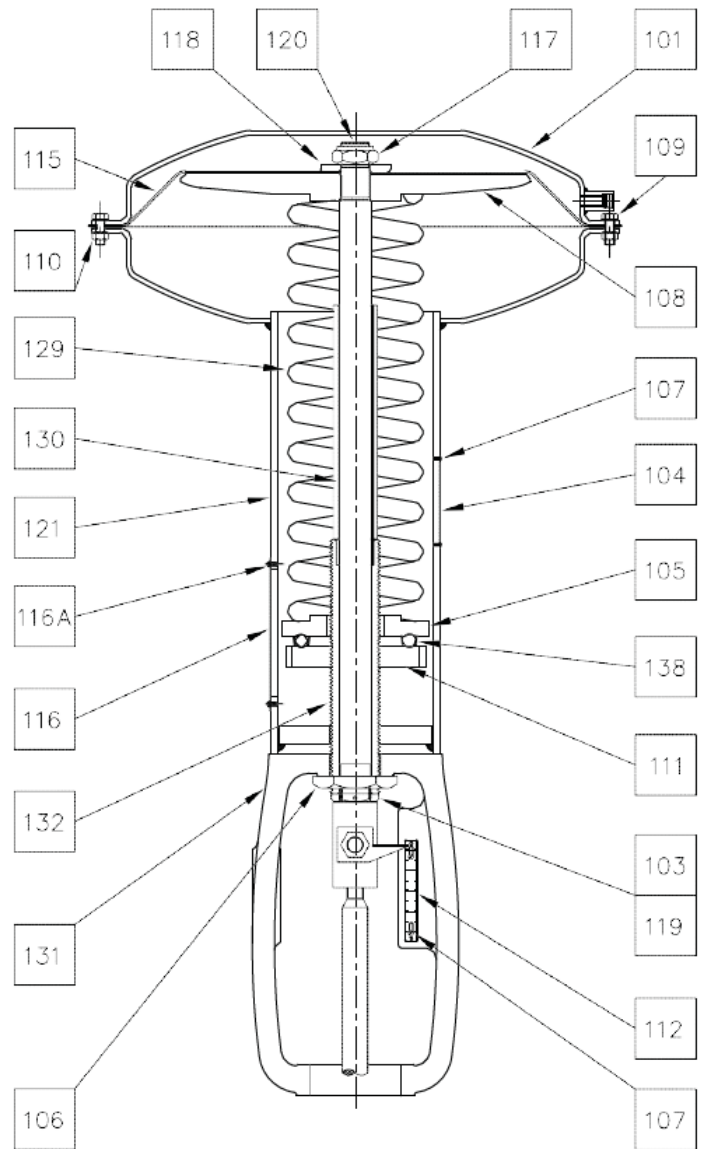


*Direct-acting actuators only

Bill of Materials and Parts

Parts For Models A46 – Direct-Acting

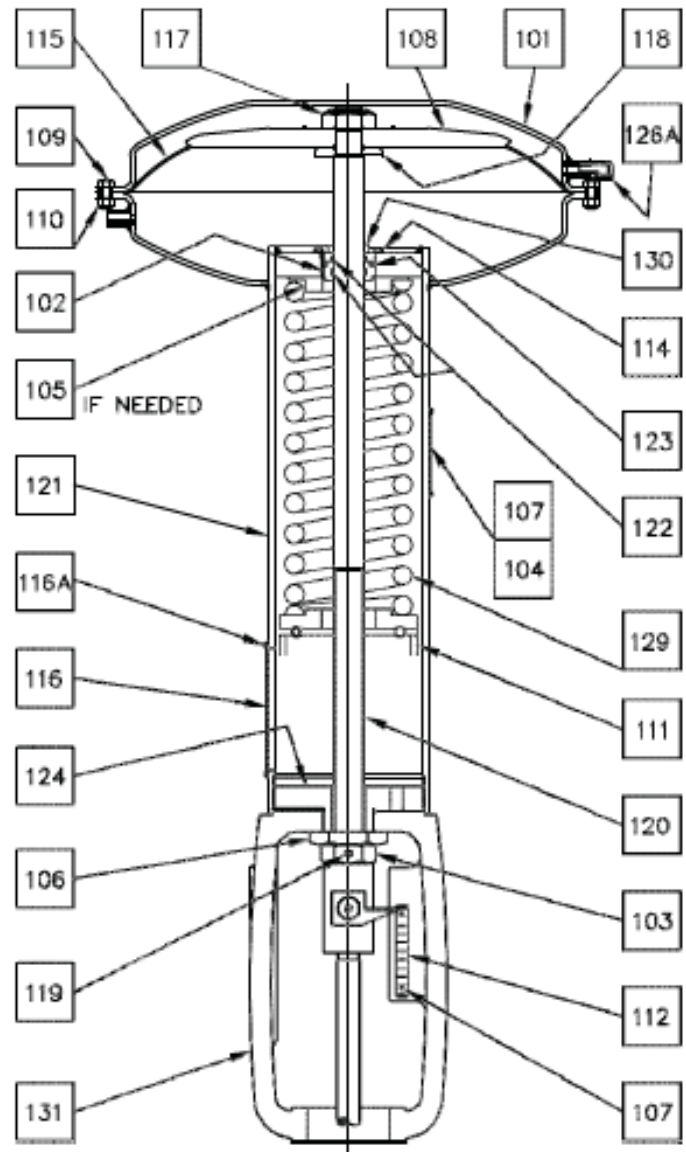
Part No.	Part Name	Material
81	LIFT EYE BOLT (not shown)	STEEL
100	STEM CONNECTOR	STEEL
101	DIAPHRAGM CASE ASSY.	STEEL
103	HEX NUT 1¼-12	STEEL
104	I.D. PLATEGLOBE VALVE	300 SS
105	SPRING SEAT	STEEL
106	HEX NUT 2-12	STEEL
107	NAME PLATESCREWS	316 SS
108	DIAPHRAGMPLATE	CAST IRON
109	HHC SCREW ¾ -16x1.00"	STEEL
110	HEX NUT ¾ -16	STEEL
111	SPRING ADJUSTER	CAST IRON
112	TRAVEL IND. SCALE 3.50"	300 SS
115	MOLDED DIAPHRAGM CASE	BUNA-N
116	DUST COVER	300 SS
116A	SCREW RD HD, ½x2 x ¼"	STEEL
117	LOCK NUT 1½ -12UNF-3B	STEEL
118	DIAPHRAGMWASHER	STEEL
119	SOCKET HEAD SETSCREW	STEEL
120	ACTUATOR STEM	STEEL
121	SPRING BARREL CASEASSY	STEEL
129	ACTUATOR SPRING	STEEL
130	TRAVEL STOP	STEEL
131	YOKE	CAST IRON
132	SPRING ADJUSTING SCREW	STEEL
138	BALL THURST RETAINER	STEEL
Side-Mounted Handwheel Parts		
136	JACKING SCREW ASSY	STEEL
137	HANDWHEELTRAVEL IND.SCALE	300 SS
141	CLAMP NUT 3 ½ -12	STEEL
142	BEARING RETAINER	STEEL
143	JACK SCREW KEY	STEEL
144	SCREW ¾ -16x1 ¼	STEEL
145	SPLIT LOCKWASHER, ¾" LIGHT S.Z.P.	STEEL
146	WORM GEAR	CAST IRON
147	THRUST BEARING	STEEL
148	THRUST RACE	STEEL
149	TRAVEL IND. SCREW, 6-32 x ¾ S.Z.P.	STEEL
150	GREASE FITTING	STEEL
151	GREASE CAP,POLYETHYLENE	POLYETHYLENE
158	TRAVEL INDICATOR	BRASS
159	SET SCREW DISC	COPPER
163	COVER PLATE	ALUMINUM
999	SPRING ADJUSTER ASSY, 2.63"-12UN-2B	STEEL



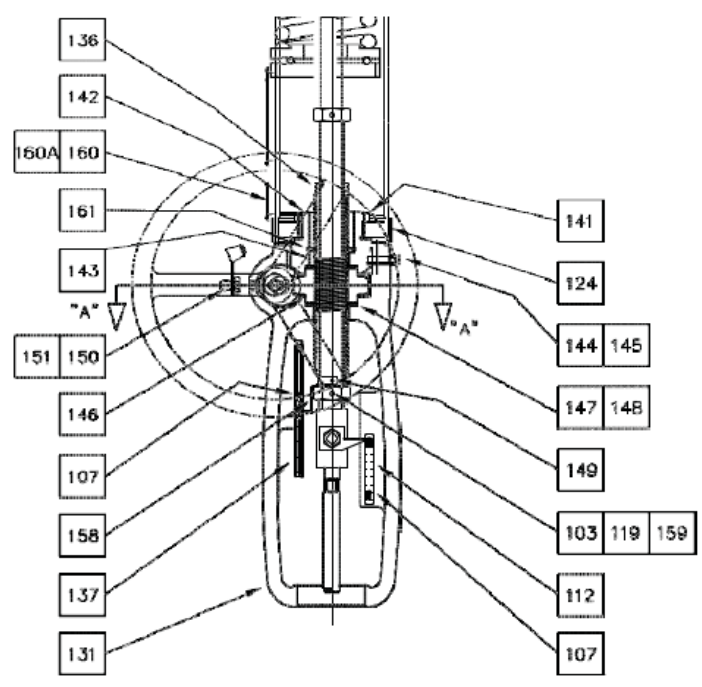
Bill of Materials and Parts

Parts For Models A47 – Reverse-Acting

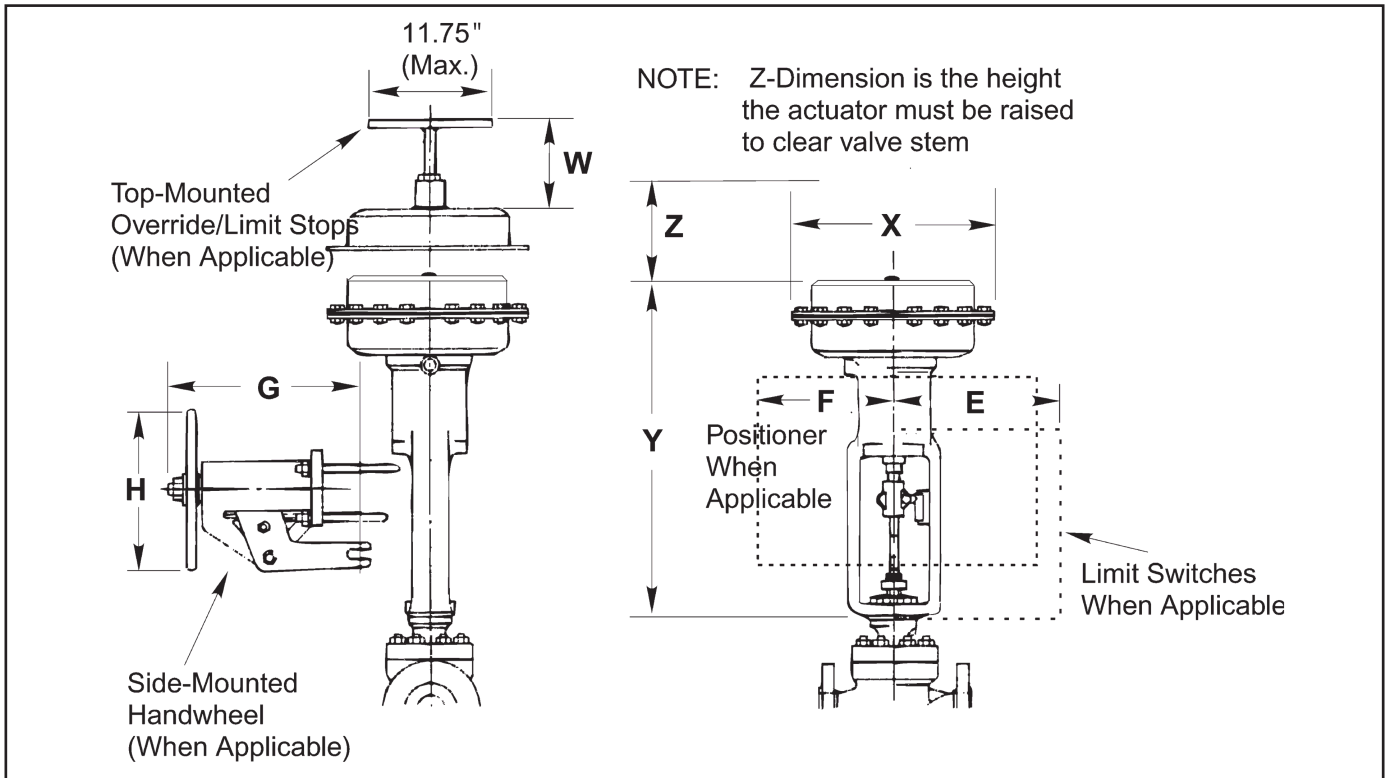
Part No.	Part Name	Material
81	LIFT EYE BOLT (not shown)	STEEL
101	DIAPHRAGM CASE ASSY.	STEEL
102	PACKING BOX	BRASS
103	HEX NUT 1¼-12	STEEL
104	I.D PLATE GLOBE VALVE	300 SS
105	SPRING SEAT	STEEL
106	HEX NUT 2-12	STEEL
107	NAME PLATE SCREWS	316 SS
108	DIAPHRAGM PLATE	CAST IRON
109	HHC SCREW ¾ -16x1.00"	STEEL
110	HEX NUT ¾ -16	STEEL
111	SPRING ADJUSTER	CAST IRON
112	TRAVEL IND. SCALE 3.50"	300 SS
114	SCREW 10-32x ¾	STEEL
115	MOLDED DIAPHRAGM CASE	BUNA-N
116	DUST COVER	300 SS
116A	SCREW RD HD, ⅝ ₃₂ x ¼"	STEEL
117	LOCK NUT 1½ -12UNF-3B	STEEL
118	DIAPHRAGM WASHER	STEEL
119	SOCKETHEAD SET SCREW	STEEL
120	ACTUATOR STEM	STEEL
121	SPRING BARREL CASE ASSY	STEEL
122	"O"RING	BUNA-N
123	"O"RING	BUNA-N
124	LOWER BRIDGE	CAST IRON
126A	AIR VENT ¼" N.P.T.	STEEL
129	ACTUATOR SPRING	STEEL
130	TRAVEL STOP	STEEL
131	YOKE	CAST IRON



Side-Mounted Handwheel Parts		
136	JACKING SCREW	STEEL
137	HANDWHEEL TRAVEL IND.SCALE	STEEL
141	CLAMP NUT 3 ½-12	STEEL
142	BEARING RETAINER	STEEL
143	JACK SCREW KEY	STEEL
144	SCREW ¾ -16x1 ¼ ₁₆	STEEL
145	SPLIT LOCKWASHER, ¾" LIGHT	STEEL
146	WORM GEAR	CAST IRON
147	THRUST BEARING	STEEL
148	THRUST RACE	STEEL
149	TRAVEL IND.SCREW, 6-32x¾ S.Z.P.	STEEL
150	GREASE FITTING	STEEL
151	GREASE CAP	POLYETHYLENE
158	TRAVEL INDICATOR	BRASS
159	SETSCREWDISC	COPPER
160	COVER PLATE	ALUMINUM
160A	SCREW 4-40x.25"LG	STEEL
161	RETAINING RING	STEEL



DIMENSIONS



Actuator Model	Third & Forth Position Code	Actuator Dimensions inches (mm)			Accessory Dimensions – inches (mm)					Approx. Weight lb (kg)
		X	Y	Z (Max)	W Jackscrew	E (Max L.S.)	F (Max Posit.)	G (Max Hdwhl)	H (Norm Dia.)	
DA/RA	DC, DD	12.00 (305)	18.75 (476)	6.50 (165)	5.88 (149)	8.00 (203)	12.00 (305)	12.00 (305)	10.00 (254)	45 (21)
DA/RA	C6, C8, DF, D5	12.00 (305)	21.63 (549)	6.50 (165)	5.88 (149)	9.00 (229)	12.00 (305)	12.00 (305)	10.00 (254)	45 (21)
DA/RA	C3, C4, D3, D4	12.00 (305)	23.10 (587)	6.50 (165)	5.88 (149)	9.00 (229)	12.00 (305)	12.00 (305)	10.00 (254)	52 (24)
DB/RB	C3, C4, D3, D4	13.81 (351)	23.35 (593)	6.50 (165)	5.75 (146)	8.00 (203)	12.00 (305)	12.00 (305)	10.00 (254)	67 (31)
DB/RB	CA, CB, DC, DD, E1, E2, EE	13.81 (351)	22.88 (581)	6.50 (165)	5.75 (146)	9.00 (229)	13.00 (330)	12.00 (305)	10.00 (254)	67 (31)
DC/RC	CA, CB	17.00 (432)	23.88 (607)	6.50 (165)	5.75 (146)	9.00 (229)	14.00 (356)	12.00 (305)	10.00 (254)	82 (38)
DC/RC	C3, C4, EA, EB	17.00 (432)	27.25 (692)	6.50 (165)	5.63 (143)	9.00 (229)	14.00 (356)	12.00 (305)	10.00 (254)	95 (43)
DC/RC	HF, H1, H2	17.00 (432)	32.50 (826)	8.50 (216)	5.75 (146)	9.00 (229)	14.00 (356)	12.00 (305)	10.00 (254)	105 (48)
DC/RC	D3, E3, E4	17.00 (432)	33.35 (847)	10.00 (254)	5.75 (146)	10.00 (254)	15.00 (381)	16.00 (406)	15.00 (381)	105 (48)
DD/RD	EA, EB, EC, ED	22.00 (559)	32.88 (835)	8.50 (216)	–	10.00 (254)	15.00 (381)	16.00 (406)	10.00 (254)	130 (59)
DD/RD	H1, H2	22.00 (559)	33.25 (845)	10.00 (254)	–	10.00 (254)	15.00 (381)	16.00 (406)	15.00 (381)	130 (59)
A46A	–	21.00 (534)	38.50 (978)	10.00 (254)	–	10.00 (254)	15.00 (381)	–	–	160 (73)
A46B*	–	21.00 (534)	47.00 (1194)	10.00 (254)	–	10.00 (254)	15.00 (381)	6.50 (165)	15.00 (381)	175 (80)
A47A	–	21.00 (534)	42.25 (1073)	10.00 (254)	–	10.00 (254)	15.00 (381)	–	–	175 (80)
A47B*	–	21.00 (534)	53.50 (1359)	10.00 (254)	–	10.00 (254)	15.00 (381)	6.50 (165)	15.00 (381)	190 (86)

*Integral handwheel is offset; minimal radial clearance is 9.25" (235mm).

How To Order

For actuator selection, refer to KOSO Hammel Dahl actuator selection guide. For options not shown or to enter an order, contact your local sales representative.

D/R Series

1	Model
D	Direct-acting—Stem extends with increased air pressure
R	Reverse-acting—Stem retracts with increasing air pressure

2, 3	Case Size/ Mount/ Travel					
Case Size	Mount	Travel				
		0.750	1.000	1.125	1.500	2.250
56	2.125	AA	AD	AC	—	—
	2.812	—	—	AB	—	—
84	2.125	BA	BD	BC	—	—
	2.812	—	—	BB	BE	—
140	2.125	—	CD	CC	—	—
	2.812	—	—	CB	CE	—
	3.562	—	—	—	—	CH
240	2.812	—	—	—	DE	—
	3.562	—	—	—	—	DH

4, 5	Spring Span & Adjuster
	Refer to Actuator Selection Guide for proper combination.

6	Variations
A	None
B	Type I Top-Mounted Override/Limit Stop*
C	Type II Top-Mounted Override/Limit Stop*
D	3/4-inch NPT Air Connections
Z	Special Actuator (See Factory)

*Refer to page 1 for limitations.

Subject to change without prior notice.

Side-Mounted Bolt-on Handwheel

The SM-1 or SM-2 side-mounted bolt on handwheel is available for D/RA, D/RB, D/RC and D/RD series actuators as shown in the following table.

To Mount On	Code	Model
DA or RA	All	SM-1
DB or RB	All	SM-1
DC or RC	All, except	SM-2
DD or RD	list below *	SM-2

*RCDDHA, RCC2HA, RCCBHA, RCCBHA, RCE2HA, RCEBHA, RDE2LA,

RDEBLA - Use SM-1 with Extra Heavy arm assembly

RCH2LA and RDH2LA cannot have side mounted handwheels

06/22

A46/A47 Series

1	Model
A46	Direct acting - Stem extends with increased air pressure
A47	Reverse acting - Stem retracts with increased air pressure

2	Variations
A	Standard
B	Integral side mounted handwheel

3	Case Size
K	200 in ² nominal effective area

4	Mount
F	3.563 in. mount

5	Travel
8	3.5 in. travel

6	Spring Range
A	3 - 15 spring (standard for A46 direct acting actuator)
B	6 - 30 spring (standard for A47 reverse acting actuator)

7	Options
B	Standard construction

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CONTROL VALVES

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