

KNIFE GATE VALVE

Technical Data & Manual

KGV98 & KGV99 (DN50-600)



TABLE OF CONTENTS

	Technical Data	Page
1.	Introduction	3
2.	KGV - Valve Identification	3
3.	KGV98 - Metal Seated - Dimensions	4
4.	KGV99 - Resilient Seated - Dimensions	5
5.	KGV98 - Material/Parts List	6
6.	KGV98 - Disassembly	6
7.	KGV99 - Material/Parts List	7
8.	KGV99 - Disassembly	7
9.	KGV - Pressure Drop & Flow Rates	8
10.	KGV - Torque Data	9
11.	KGV - V- Port	10
12..	KGCLR Actuation	11
13.	KGCLR Dimensions	13
14.	KGCLR - Parts / Material List	14
15.	KGCLR - Torque & Thrust	15
16	KGCLR - Assembly Data	15
	Manual	
17.	Definition of Terms	16
18.	Qualified Personel	17
19.	Handling Requirements	17
20.	Installation	18
21.	Operation / Actuation	22
22.	Storage	23
23.	Warranty	24
24.	Maintenance & Repair	25
25.	Code Builder	30

1. INTRODUCTION

- 1.1 The KGV Stainless Steel Knife Gate Valve is a high-quality product designed, manufactured, and tested according to MSS SP-81 standards. This valve features a heavy-duty cast stainless steel one-piece body that resists deflection from line loads and internal pressure. The full port non-clogging design ensures smooth flow and reliability.

1.2 Overall Technical Data:

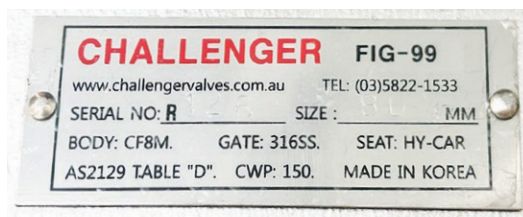
Size Range:	DN50-DN600
Pressure Rating:	PN10
Design, Manufacturing and Testing Standard:	MSS SP-81
Flange Drilling:	AS2129 Table D AS2129 Table E ANSI150
Temperature Range:	Metal Seated: 232°C HY-CAR(NBR): -40°C to 80°C EPDM: -55°C to 120°C VITON: -20°C to 80°C

1.3 Features

- Resilient Seat(KGV99) or Metal seated (KG98) options
- Port Size: Full Port as standard, V-Port option available upon request.
- Heavy Duty Cast Stainless Steel Yoke: Offers inherent structural rigidity and mechanical strength.
- Uni or Bi-directional Operation: Ensures versatility in various applications.
- Double Clevis Pin Design: Provides long-term reliability.
- Heavy Duty Stem Nut: Supports any axial and side loading.
- Fully Guided Gate: Prevents gate deflection with integral guide.
- Adjustable Gland Retainer: Independent of the yoke, ensuring high functionality and reliability.
- Precision Machined Gate: Reduces friction, torque, and maintenance downtime.
- Corrosion-Resistant Stainless Steel Stem: Accompanied by a stainless steel retainer that protects the brass stem nut.
- Various Seat Options Available: To suit different applications.
- Standard Supply: Clockwise closing. Option of Anti Clock Closing

2. VALVE IDENTIFICATION

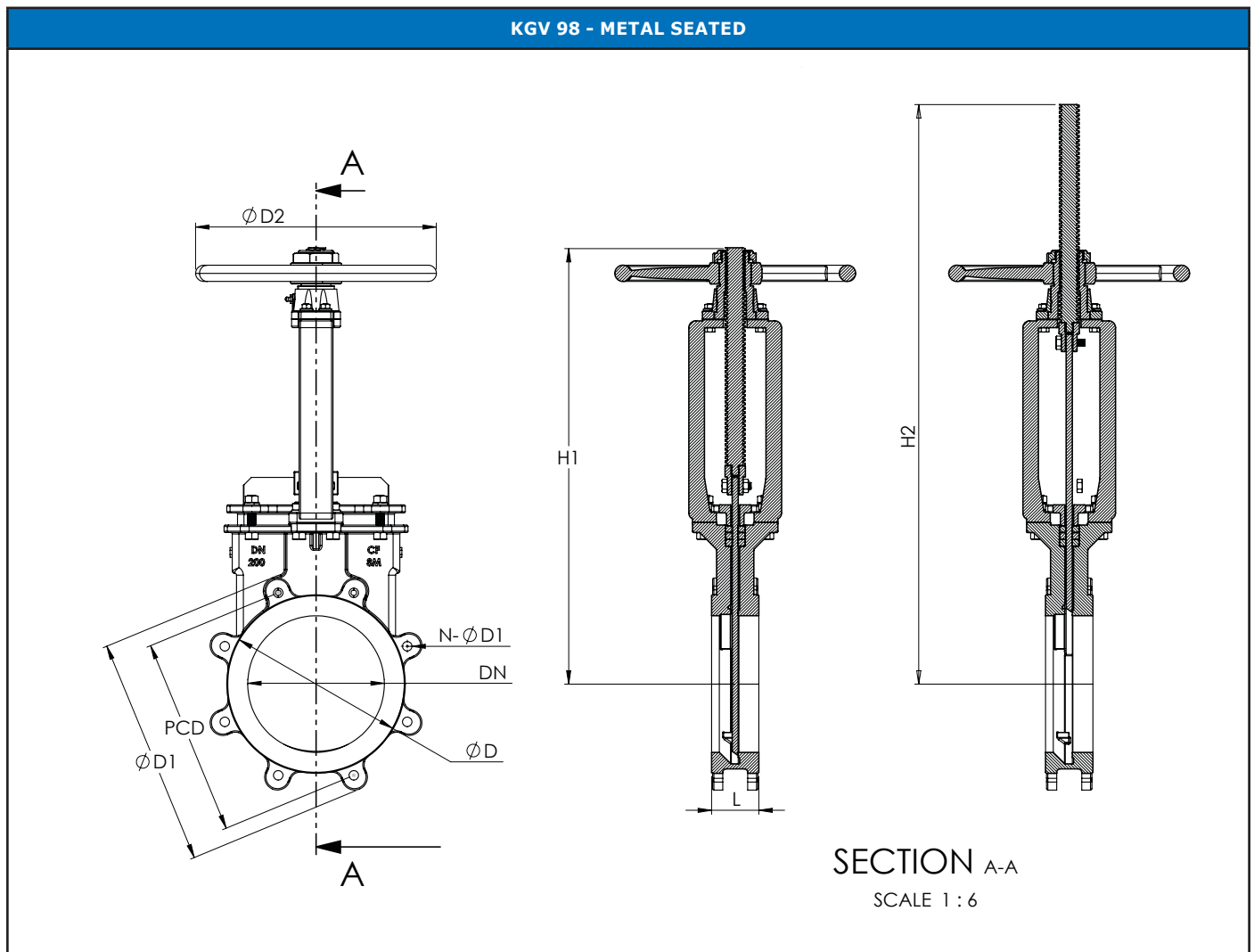
- 2.1 All valves, actuators, or control products are provided with an identification tag that is unique to each device. The following table is a representation of information that may be included on the below tag.



Data	Label	Description
Valve Size:	SIZE:	DN Size of Valve in mm
Serial Number	Serial NO.	Serial Number
Body	BODY:	Body Material
Gate	GATE:	Gate Material
Seat	SEAT:	Seat Material
Flange Standard	Located in the bottom Left	Describes the flange standard the flange is manufactured to.
Cold Working Pressure	CWP:	Cold working pressure in PSI

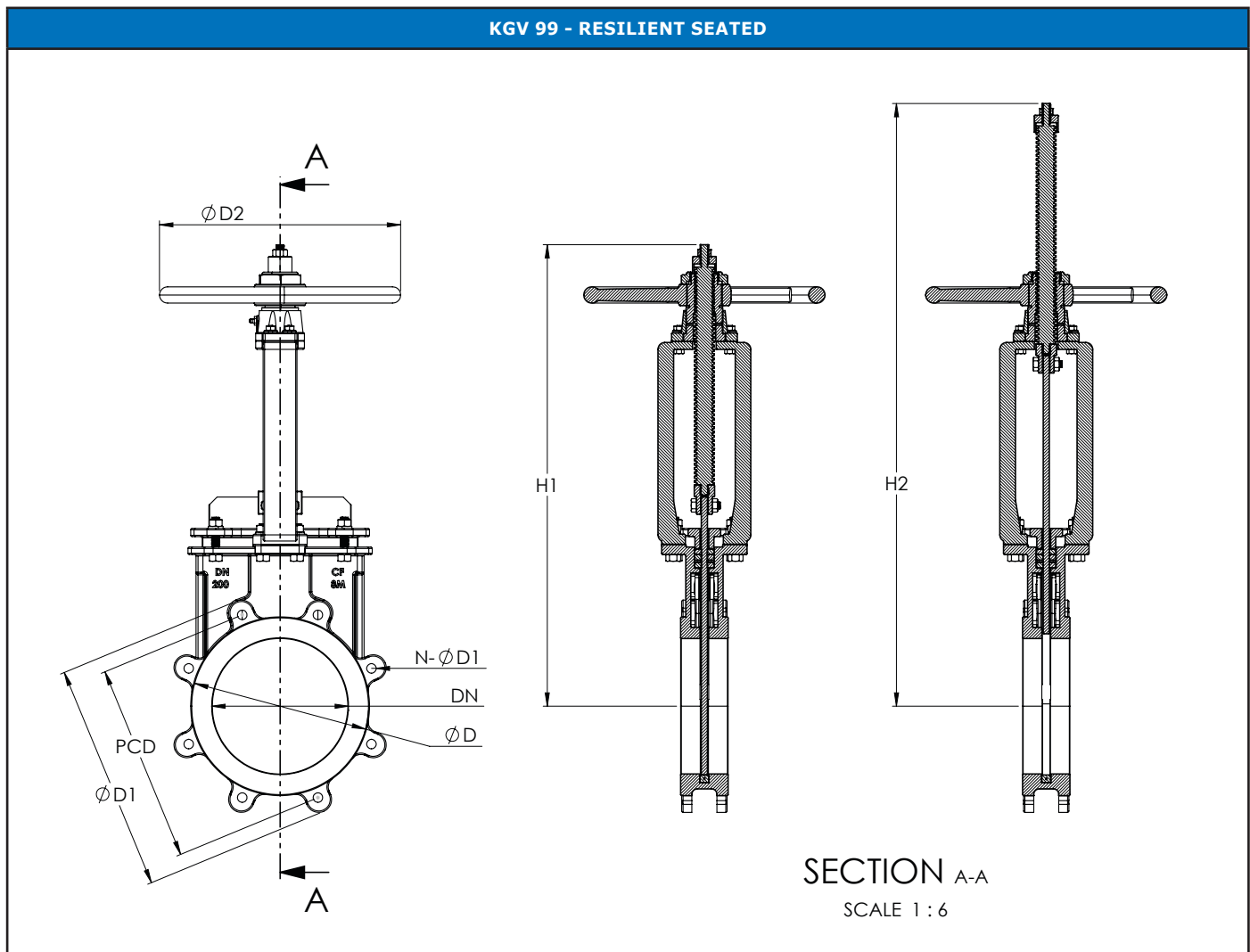
3. KGV98 - METAL SEATED - DIMENSIONS

DIMENSIONS														
DN								N-ØD1			PCD		No. Turns to open	Weight (KG)
	L	ØD	ØD1	ØD2	H1	H2	Tap Depth	AS4087 Table D	AS2129 Table E	ANSI #150	Table D & E	ANSI #150		
50	48	92	152	200	340	400	10	4-M16	4-M16	4-UNC5/8	114	121	14.5	9
80	51	127	190	200	380	460	10	4-M16	4-M16	4-UNC5/8	146	152	18.5	14
100	51	157	228	200	430	540	12	4-M16	8-M16	8-UNC5/8	187	191	26	17
150	57	216	279	300	515	680	17	8-M16	8-M16	8-UNC3/4	210	216	39	25
200	70	270	343	300	635	850	19	8-M16	8-M20	8-UNC3/4	235	241	33.5	38
225	70	295	376	350	730	960	22	8-M16	-	-	292	299	37.5	50
250	70	324	406	350	750	1010	22	8-M20	12-M20	12-UNC7/8	356	362	41.5	55
300	76	381	482	350	850	1150	22	12-M20	12-M24	12-UNC7/8	406	432	50	77
350	76	413	533	400	940	1290	22	12-M24	12-M24	12-UNC1	470	476	55	100
375	89	445	548	500	1060	1450	28	12-M24	-	-	495		59	132
400	89	470	597	500	1085	1495	28	12-M24	12-M24	16-UNC1	521	540	63	141
450	89	533	635	500	1200	1650	28	12-M24	16-M24	16-UNC1-1/8	584	578	71	164
500	114	584	698	500	1310	1850	31	16-M24	16-M24	20-UNC1-1/8	641	635	79	224
600	114	692	812	500	1520	2130	31	16-M27	16-M30	20-UNC1-1/4	756	749	95	285



4. KGV99 - RESILIENT SEATED - DIMENSIONS

DIMENSIONS														
DN								N-ØD1			PCD		No. Turns to open	Weight (KG)
	L	ØD	ØD1	ØD2	H1	H2	Tap Depth	AS4087 Table D	AS2129 Table E	ANSI #150	Table D & E	ANSI #150		
50	48	92	152	200	385	440	10	4-M16	4-M16	4-UNC5/8	114	121	14.5	10
80	51	127	190	200	420	495	10	4-M16	4-M16	4-UNC5/8	146	152	18.5	15
100	51	157	228	200	460	575	12	4-M16	8-M16	8-UNC5/8	187	191	26	18
150	57	216	279	300	570	730	17	8-M16	8-M16	8-UNC3/4	210	216	39	27
200	70	270	343	300	700	905	19	8-M16	8-M20	8-UNC3/4	235	241	33.5	42
225	70	295	376	350	780	1000	22	8-M16	-	-	292	299	37.5	55
250	70	324	406	350	820	1080	22	8-M20	12-M20	12-UNC7/8	356	362	41.5	60
300	76	381	482	350	920	1230	22	12-M20	12-M24	12-UNC7/8	406	432	50	84
350	76	413	533	400	1060	1415	22	12-M24	12-M24	12-UNC1	470	476	55	109
375	89	445	548	500	1170	1530	28	12-M24	-	-	495		59	131
400	89	470	597	500	1200	1610	28	12-M24	12-M24	16-UNC1	521	540	63	154
450	89	533	635	500	1310	1770	28	12-M24	16-M24	16-UNC1-1/8	584	578	71	180
500	114	584	698	500	1450	1960	31	16-M24	16-M24	20-UNC1-1/8	641	635	79	247
600	114	692	812	500	1630	2240	31	16-M27	16-M30	20-UNC1-1/4	756	749	95	310



5. PARTS/MATERIAL LIST - KGV98

PARTS / MATERIAL LIST			
ITEM	COMPONENT	MATERIAL	STANDARD
1	Handwheel Nut	Factory Standard	Nyloc Lock Nut
2	Handwheel	Ductile Iron	ASTM A338 CAST DCI
3	Grease Nipple	Factory Standard	
4	Retainer Bushing	Stainless Steel	ASTM A351 Grade CF8
5	Stem	Stainless Steel	ASTM A276 Grade 304
6	Yoke	Stainless Steel	ASTM A351 Grade CF8
7	Nut	Stainless Steel	
8	Stem Nut	Brass	ASTM B271-06 Grade C85400
9	Washer	Stainless Steel	
10	Lifter/Clevis	Stainless Steel	ASTM A351 Grade CF8
11	Bolt	Stainless Steel	
12	Packing Gland	Stainless Steel	ASTM A351 Grade CF8
13	Packing	Palmetto	
14	Gate	Stainless Steel	ASTM A240 Grade 316L
15	Body	Stainless Steel	ASTM A351 Grade CF8M

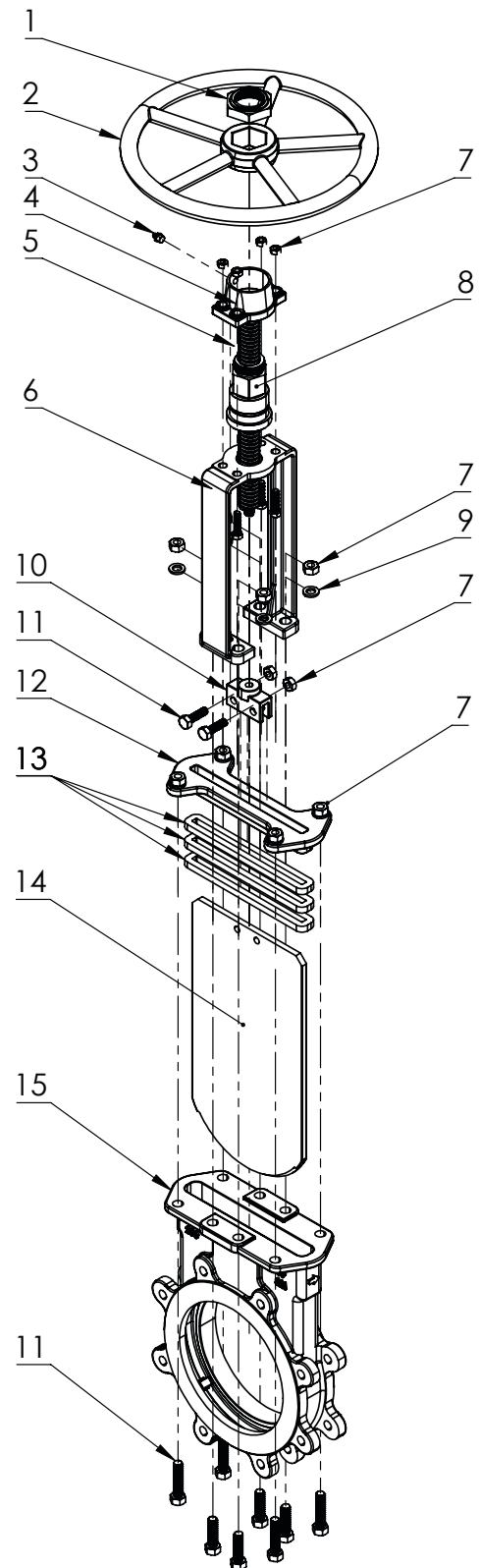
6. DISASSEMBLY - KGV98

6.1 Disassembly

- 6.1.1 Turn handwheel to fully close position.
- 6.1.2 Remove (1) Handwheel Nut
- 6.1.3 Remove (2) Handwheel
- 6.1.4 Unscrew 4 x (7) bolt and nuts and remove (4) Retainer Bushing
- 6.1.5 Unthread (8) Brass Stem Nut
- 6.1.6 Detach (10) Clevis from (14) Gate using 2 x Nuts and Bolts and unthread clevis from (5) Stem
- 6.1.7 The yoke should be unhindered by stem assembly and ready to be removed by undoing 4 x Nuts and Bolts from the (15) main body.
- 6.1.8 Remove the (12) packing gland by undoing 4 x bolts and Nuts.
- 6.1.9 Use a long cork screw or flat head to remove (13) Packing Glands.
- 6.1.10 Slide (14) Gate out of main body.

6.2 Assembly

- 6.2.1 Re-assemble using the steps from 6.1 in reverse.
- 6.2.2 Refer to "Section 26: Maintenance" for correct packing of gland.



7. PARTS / MATERIAL LIST - KGV99

PARTS / MATERIAL LIST			
ITEM	COMPONENT	MATERIAL	STANDARD
1	Travel Locknut	Factory Standard	
2	Travel Nut	Factory Standard	
3	Handwheel Nut	Factory Standard	Nyloc Lock Nut
4	Handwheel	Ductile Iron	ASTM A338 CAST DCI
5	Grease Nipple	Factory Standard	
6	Retainer Bushing	Stainless Steel	ASTM A351 Grade CF8
7	Stem	Stainless Steel	ASTM A276 Grade 304
8	Stem Nut	Brass	ASTM B271-06 Grade C85400
9	Yoke	Stainless Steel	ASTM A351 Grade CF8
10	Nut	Factory Standard	
11	Washer	Factory Standard	
12	Bolt	Factory Standard	
13	Lifter/Clevis	Stainless Steel	ASTM A351 Grade CF8
14	Packing Gland	Stainless Steel	ASTM A351 Grade CF8
15	Packing	Palmetto	
16	Gate	Stainless Steel	ASTM A240 Grade 316L
17	Seat	Stainless Steel	
18	Body	Stainless Steel	ASTM A351 Grade CF8M

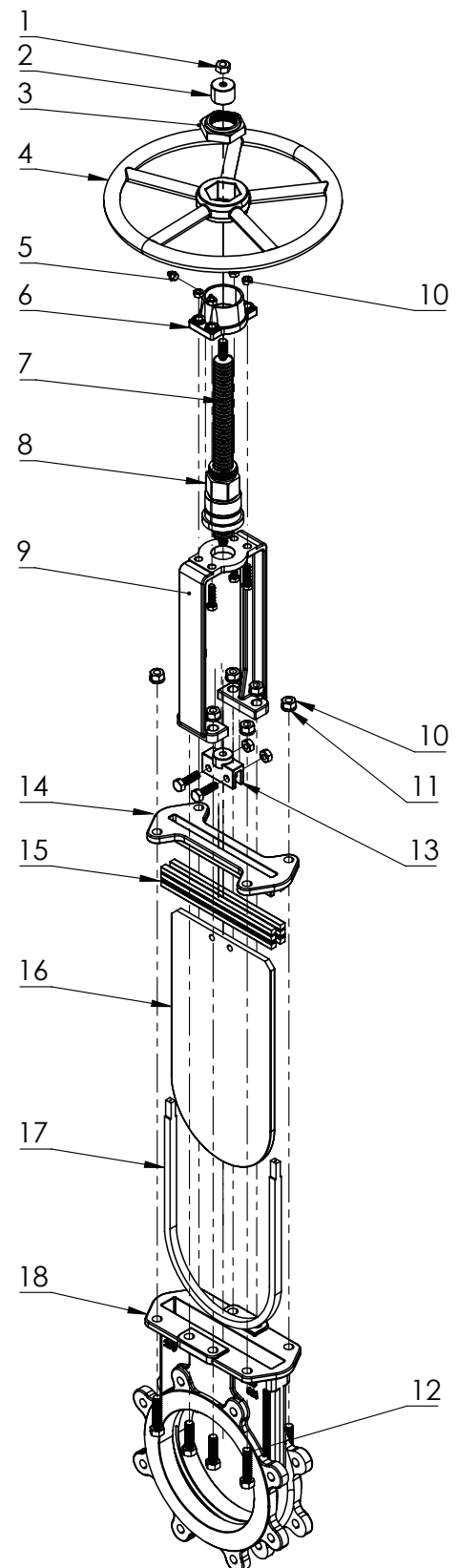
8. DISASSEMBLY - KGV99

8.1 Disassembly

- 8.1.1 Turn handwheel so the gate to 50% open.
- 8.1.2 Remove (1, 2 & 3) threaded fixtures
- 8.1.3 Remove (2) Handwheel
- 8.1.4 Unscrew 4 x (7) bolt and nuts and remove (4) Retainer Bushing
- 8.1.5 Unthread (8) Brass Stem Nut
- 8.1.6 Detach (10) Clevis from (14) Gate using 2 x Nuts and Bolts and unthread clevis from (5) Stem
- 8.1.7 The yoke should be unhindered by stem assembly and ready to be removed by undoing 4 x Nuts and Bolts from the (15) main body.
- 8.1.8 Remove the (12) packing gland by undoing 4 x bolts and Nuts.
- 8.1.9 Use a long cork screw or flat head to remove (13) Packing Glands.
- 8.1.10 Slide (14) Gate out of body.
- 8.1.11 Remove (17) rubber seat from body.

8.2 Assembly

- 8.2.1 Re-assemble using the steps from 6.1 in reverse.
- 8.2.2 Refer to "Section 26: Maintenance" for correct packing of gland.

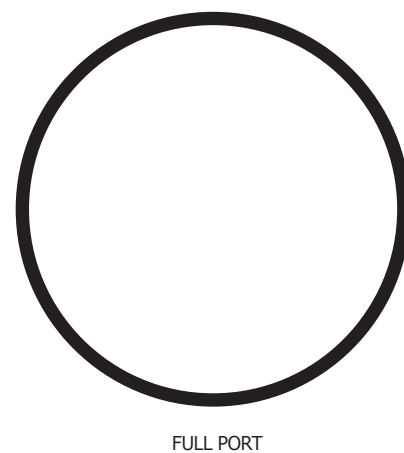
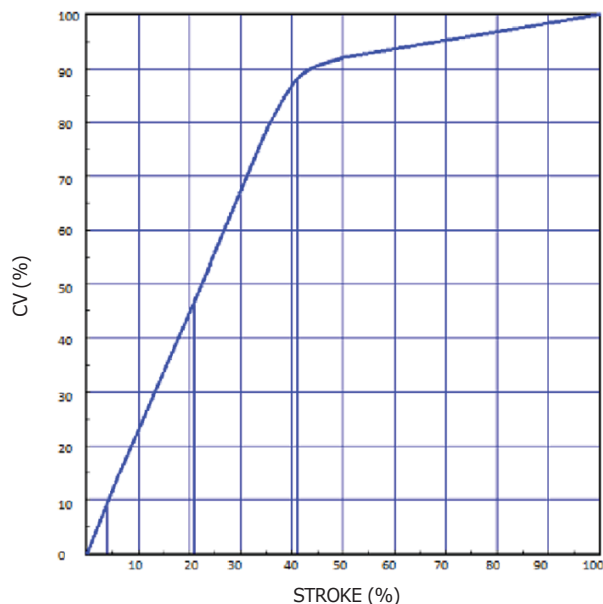


9. PRESSURE DROP & FLOW VALUES

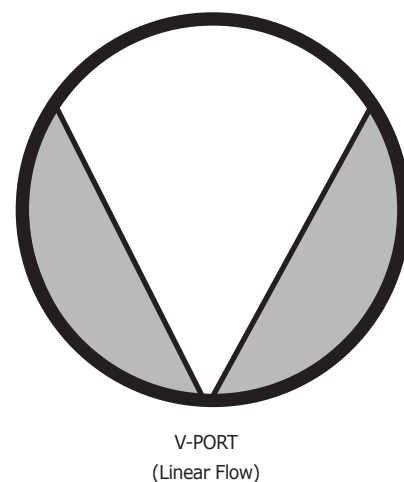
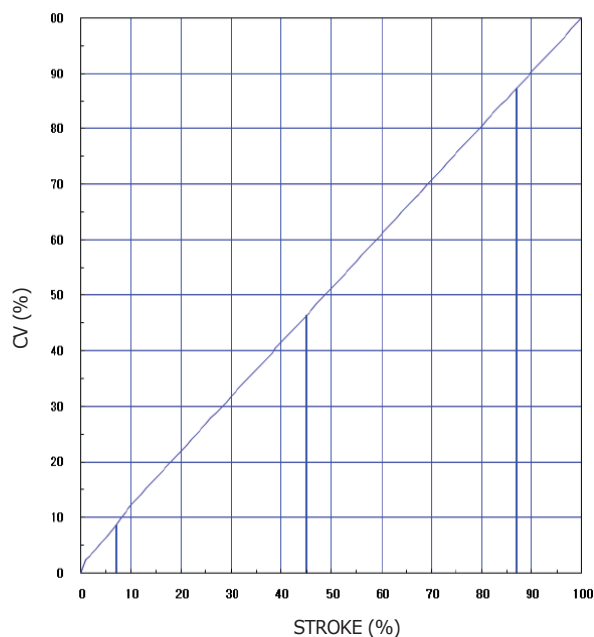
9.1 See Full Port CV chart below for the KGV Series.

CV VALUES		
DN	KG98	KG99*
50	280	284
80	650	642
100	1180	1190
150	2600	2620
200	4221	4854
225	5693	5824
250	6880	6793
300	10370	10395
350	11812	13650
375	14053	15790
400	15592	17930
450	21400	21500
500	26650	26660
600	38910	38950

*Hy-Car Seat



CV VALUES	
DN	KG98
50	84
80	204
100	376
150	883
200	1611
250	2253
300	3387
350	4511
400	6612
450	7712
500	9712
600	14312



9.2 Note: KGV V-Port valves are available to order but are not a stocked item.

9.3 Cv is defined as the volume of water in U.S.G.P.M that will flow through a given restriction or valve opening with a pressure drop of one (1) p.s.i at room temperature.

9.4 Recommended control angles are between 25°-70° open.
Preferred angle for control valve is 60°-65° open.

10. TORQUE & THRUST DATA

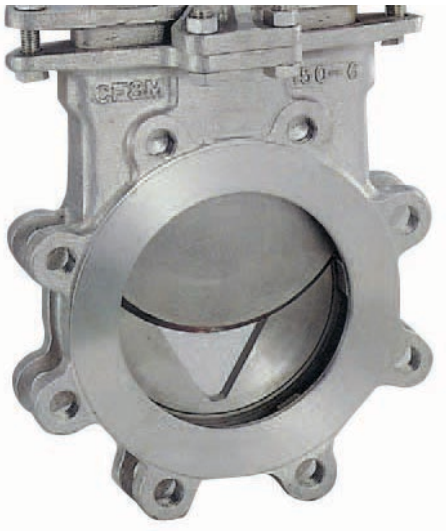
10.1 Torque is the measure of the turning force on an object in Nm. For a Knifegate valve the turning force is determined by the friction of the gate and the seat, bushing friction and fluid dynamic torque.

TORQUE VALUES (NM)			
DN	Pressure (Bar)	Torque	Thrust
50	10	12.1	561
80	10	14.2	657
100	10	16.1	745
150	10	22.7	1052
200	10	31.9	1482
225	10	58.8	1927
250	10	73.2	1409
300	10	93.8	3084
350	10	148.4	3882
375	10	179.8	4705
400	10	183.5	4802
450	10	223.4	5845
500	10	268	7011
600	10	371.1	9711

***TORQUE NOTES:**

Results provided are differential pressure conditions with clean municipal water. Torque figures provided do not include safety margin. For conditions that vary from those noted, apply the following Application Factor Multipliers:

- Operated less than once per day x 1.2
- Dry Service with gas or air x 1.5
- Dry Service with abrasive powder x 1.7
- Lubricant oils x 0.5
- Temperature - lower than -4.5°C x 1.2
- higher than 93°C x 1.2
- Air Cylinder x 2
- Electric Actuator x 3

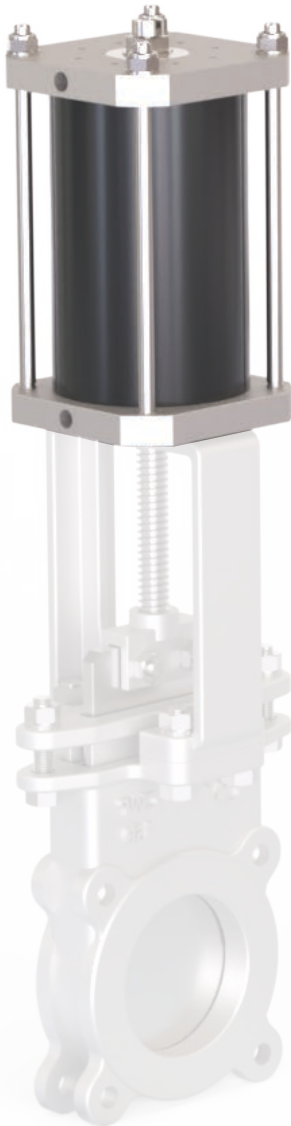


11. V-PORT - OPTION

V-Port Knife Gate Valves are available to order. They're not a stocked item.

11.1 Features

- Sizes: 50-450mm
- Flange Connection: Table D AS2129, Table E AS2129, ANSI150
- Unidirectional
- Pressure Rating: 10 Bar
- V-Port is available in both metal seated and resilient seated models
- Available in 15°, 30°, 60°.
- Available in 316SS

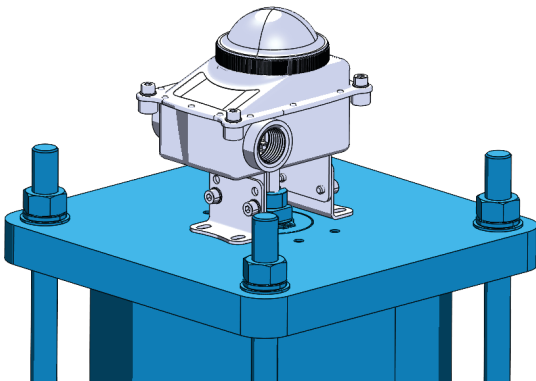


12. **ROTALIN KGCLR - PNEUMATIC ACTUATOR**

12.1 The Australian Made Rotalin Pneumatic Actuator Model KGCLR is a high-performance actuator that provides precise control of valve operations. It is suitable for use in various applications, including chemical processing and water waste treatment industries. Its compact design and high thrust output make it ideal for automation, and its user-friendly interface allows for easy operation and maintenance.

12.2 **Features**

- **Size:** 50-600mm
- **Air Supply Pressure Rating:** 2.6 - 8 BAR (All Sizing based on 5.5 BAR air supply)
- **Temperature Range:** -20° to 80°
- Heavy duty carbon steel powder coated end caps. (Option of 316 stainless steel available)
- Strong fiberglass reinforced plastic barrel. (Option of 316 stainless steel available)
- Heavy duty double clevis pin design provides maintenance free long term reliability.
- The stainless steel shaft and tie rods are corrosion resistant
- The cylinder offers conversion from linear to rotary allowing accessories such as positioners and limit switches to be direct mounted.
- Namur VDI / VDE mounting pattern located on top of the cylinder. (Limit switch or Positioner)
- Direct mounting to Challenger KGV range of Knife Gate Valves.
- Eradicates the need for external linkages and arms which can be fragile and prone to damage.
- The mechanical connection to the cylinders piston and rotating hub allows reaction time to be instant with greater accuracy and less moving parts.
- Material options to suit corrosive and high temperature environments
- The Rotalins design enables easy disassembly and re-fitting of all major components
- Metal on metal contacting components are greased with Teflon based grease to protect against seizing



Direct Namur Mounting

VDI/VDE BRACKET

The VDI/VDE Top mounting pattern allows standard "off the shelf" accessories such as Positioners, switch boxes etc easy attachment using one universal bracket, which is attached via 4 bolts.

UNIVERSAL CONVENIENCE

The VDI/VDE interface combined with the adjustable height accessory slot means rotary cylinders though out your site can use identical control accessories with no change to mounting kits. This saves money on inventory costs and set up time in the field.

CALIBRATION

The Cylinder system comes pre calibrated from the factory, any adjustments to calibration is easy and able to be carried out while in service with out any specialised tools. The Cylinder is available for Challenger Valves complete range of Knife Gate Valve up to 24".

NO LINKAGES

No linkages mean less set up time, less moving parts and less cost. Having a direct contact between valve / cylinder and controller also improves accuracy and strength. The Rotalin mechanism is built for long lasting service in severe environments. Rotalin components are built tough! Epoxy Coated Steel construction with weather protection seals and ACETAL bushing prevents any corrosion and ensure long smooth operation. (Option for Stainless Steel 316)

ACCURATE

The ROTALIN system comprises of a mechanical connection between the cylinders piston rod and the rotating hub which is connected directly to the valves blade. No electrical component which can fail on signal loss, no linkages which are external and sloppy. Reaction time between signal and movement is instant.

ROBUST

The ROTALIN system is fully comprised of 316 Stainless Steel components which are able to withstand the harshest environment. The top ACETAL bushing provides a non metal contact. The internal rotating piece uses high quality thrust bearing for reduced friction and long cycle life.

REPAIR

The ROTALIN mechanism is easily removed for inspection and repair if necessary. On cylinders 300mm bore and over, the Rotalin system can be removed independently of the end cap, making it safe for the operator and with out having the remove the cylinder from service.

SPRING RETURN

The Rotalin is available in either a spring to close or spring to open for use in Fail Safe application.

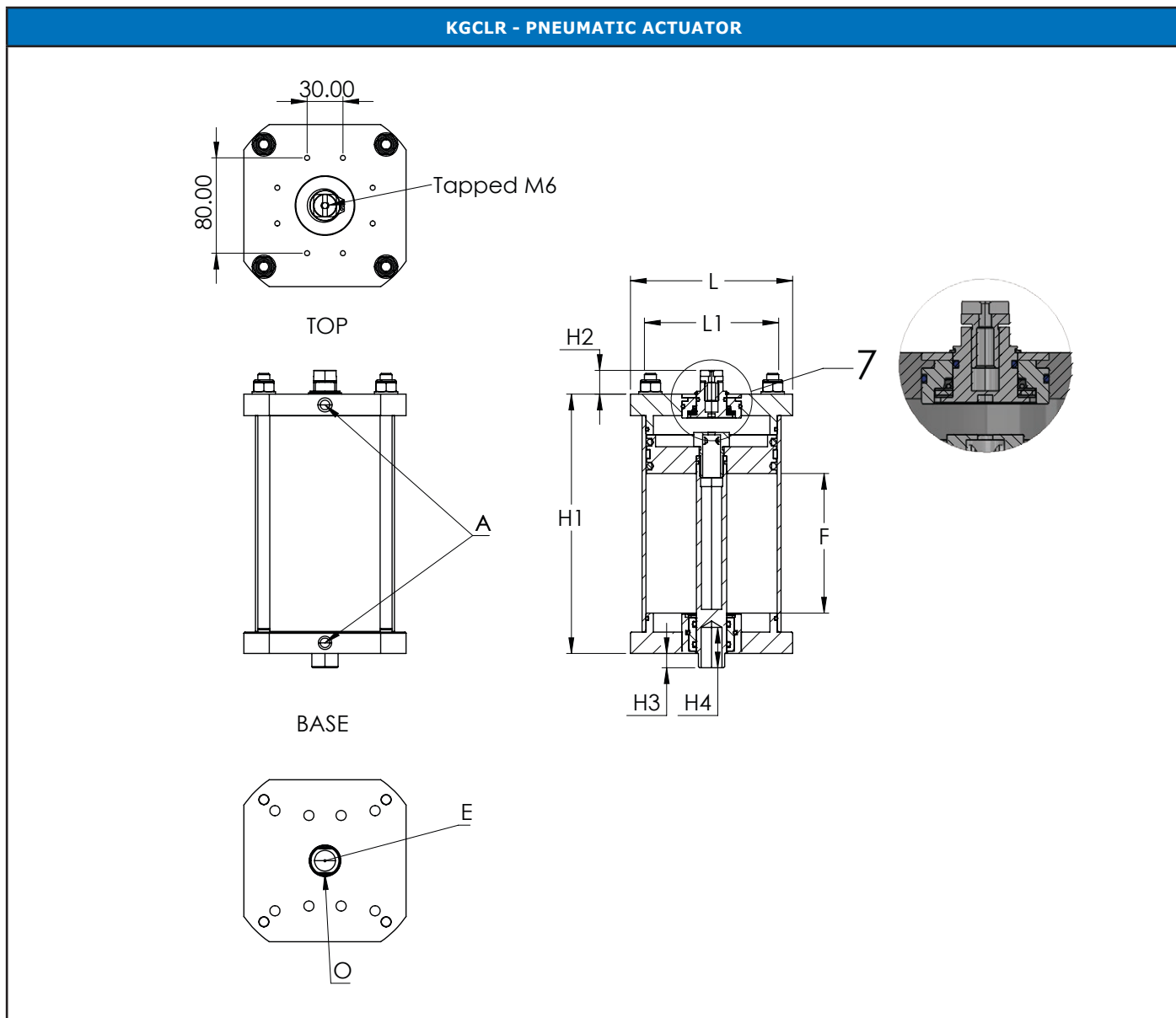
SIZE LIMIT

The ROTALIN system can be used from as small as 50mm stroke and up to 600mm.

CONTROL ACCESSORIES

Any VDI/VDE 3485 rotary accessory, these are the most common and readily available on the market

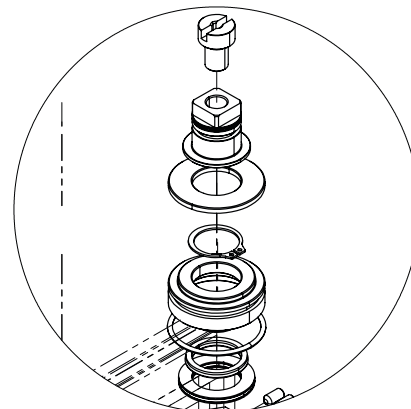
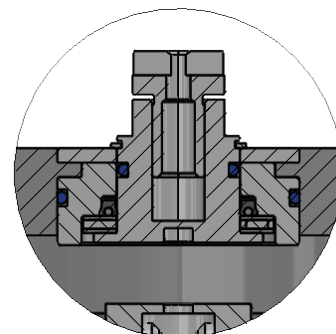
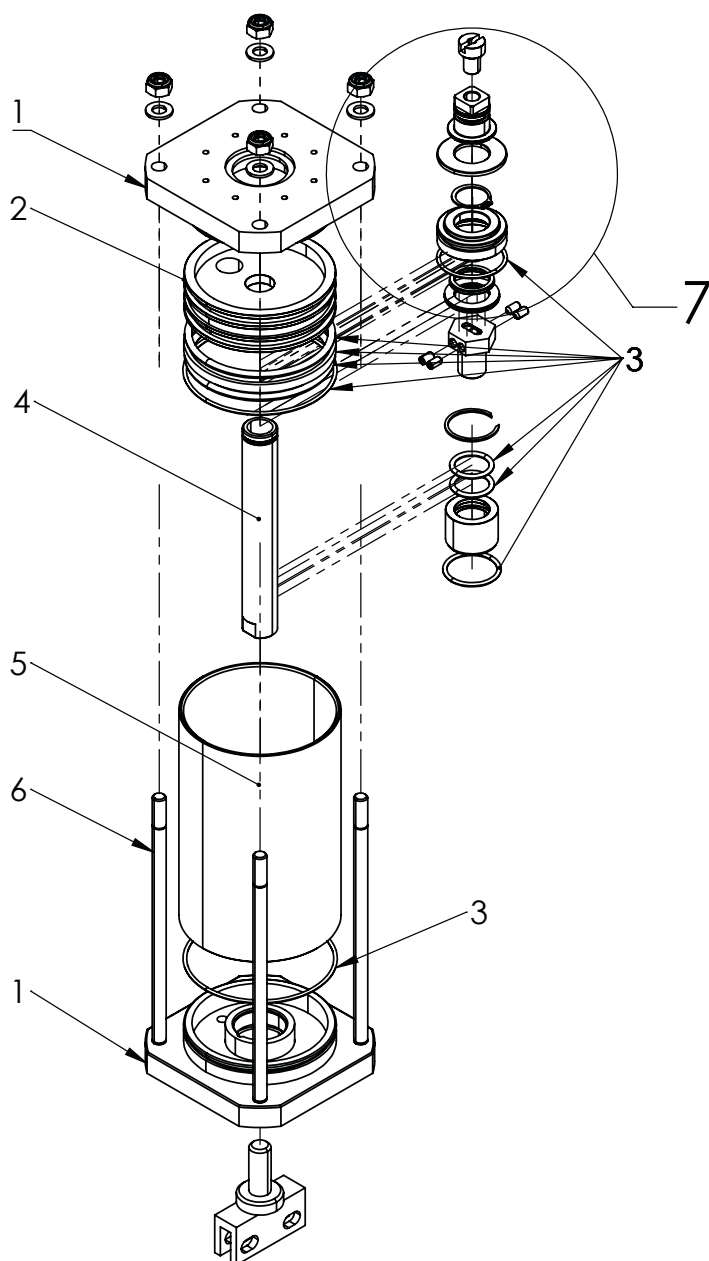
13. KGCLR - DIMENSIONS



ACTUATOR DIMENSIONS											
Actuator Model	H1	H2	H3	H4	L	L1	E	F	A	O	Weight
100	208	20-30	16	45	110	136	5/8" UNF	115	1/4" NPT	25.4	8
150	274	20-30	16	45	162	178	5/8" UNF	170	1/4" NPT	25.4	11
200	420	20-30	16	45	209	230	5/8" UNF	225	3/8" NPT	25.4	28
250	403	20-30	22	50	254	285	1.25" UNF	270	3/8" NPT	40	35
300	493	20-30	22	50	310	344	1.25" UNF	330	3/8" NPT	40	80
350	540	20-30	22	75	354	395	1.25" UNF	380	1/2" NPT	40	95
400	660	20-30	25	75	404	440	1.5" UNF	430	1/2" NPT	50.8	150
450	705	20-30	25	75	439	477	1.5" UNF	480	3/4" NPT	50.8	210
500	807	20-30	25	75	485	544	1.5" UNF	540	3/4" NPT	50.8	260
600	975	20-30	30	75	584	724	2" UNF	650	3/4" NPT	63.5	410

14. KGCLR - PARTS/MATERIAL LIST

PARTS / MATERIAL LIST		
ITEM	COMPONENT	MATERIAL
1	End Caps	Carbon Steel (Powder Coated)
2	Piston	Carbon Steel (Zinc Coated)
3	Seals	NBR (Nitrile)
4	Shaft	316 SS
5	Barrel	FPR (Fibreglass Reinforced Plastic)
6	Tie Rods	316 SS
7	Rotalin System	316 SS

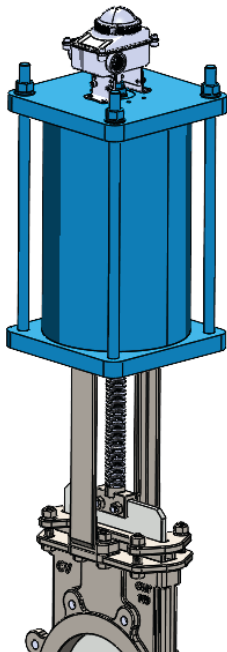


Rotalin System

15. KGCLR TORQUE & THRUST DATA

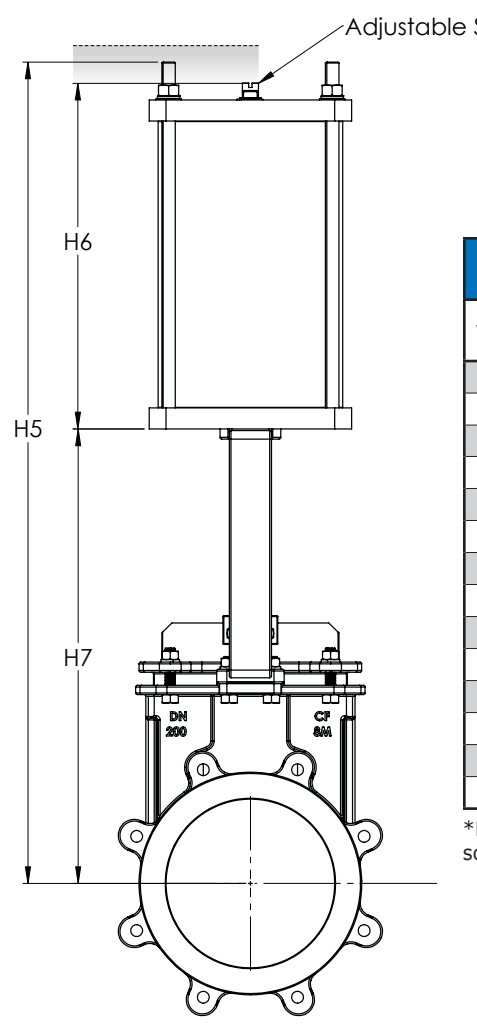
TORQUE & THRUST																			
Actuator Model		100		150		200		250		300		350		400		500		600	
Kpa	lbs/sq"	Newtons	Pound Force	Newtons	Pound Force	Newtons	Pound Force	Newtons	Pound Force	Newtons	Pound Force	Newtons	Pound Force	Newtons	Pound Force	Newtons	Pound Force	Newtons	Pound Force
260	40	2621	589	5546	1247	9554	2148	13562	3049	20819	4680	-	-	35359	7949	54154	12175	-	-
400	60	3932	884	8319	1870	14331	3222	20305	4565	31229	7020	-	-	53039	11923	81229	18262	-	-
550	80	5243	1179	11092	2493	19108	4295	27075	6087	41639	9360	-	-	70719	15898	108309	24350	-	-
650	100	6553	1473	13865	3117	23885	5369	33845	7609	52048	11700	-	-	88399	19872	135388	30438	-	-
800	120	7864	1768	16638	3740	28662	6443	40615	9131	62458	14041	-	-	106078	23846	162463	36525	-	-

16. KGCLR ASSEMBLY DATA



VALVE & ACTUATOR SIZING	
DN	Product Code
50	KGCLR-CS-050
80	KGCLR-CS-100
100	KGCLR-CS-100
150	KGCLR-CS-150
200	KGCLR-CS-200
225	KGCLR-CS-250
250	KGCLR-CS-250
300	KGCLR-CS-300
350	KGCLR-CS-300
375	KGCLR-CS-400
400	KGCLR-CS-400
450	KGCLR-CS-450
500	KGCLR-CS-500
600	KGCLR-CS-600

KGCLR - PNEUMATIC ACTUATOR



Adjustable Screw

H6

H5

H7

ASSEMBLY DIMENSIONS			
Valve Size	H5	H6*	H7
50	500	245	255
80	525	245	285
100	585	245	340
150	731	311	420
200	927	402	525
225	1057	442	615
250	1072	442	630
300	1291	561	730
350	1430	611	819
375	1649	718	931
400	1712	718	994
450	1764	705	1059
500	2052	852	1200
600	2427	1076	1351

*H6 is the length with the adjustable screw at max length

MANUAL

17. **DEFINITION OF TERMS**

- 17.1 This manual encompasses essential details for the secure operation and appropriate maintenance of your Challenger Valve. Make sure you understand the following examples of information which will be used within this document.



DANGER

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



NOTICE

Used without the safety alert symbol, indicates a potential situation which, if not avoided, may result in an undesirable result or state, including property damage.

NOTE:

Provides important information related to a procedure.

SAFETY STATEMENTS:

To prevent unwanted consequences.

18. **QUALIFIED PERSONNEL**

- 18.1 A qualified person (in terms of this document) is one who is familiar with the installation, commissioning, and operation of the device, and who has appropriate qualifications, such as:
- 18.2 Is trained in the proper use and care of personal protective equipment (PPE) in accordance with established safety practices.
- 18.3 Is trained in the commissioning, operation, and maintenance of equipment in hazardous locations - in cases where the device is installed in a potentially explosive (hazardous) location.

19. **HANDLING REQUIREMENTS**

19.1 Packed Valves

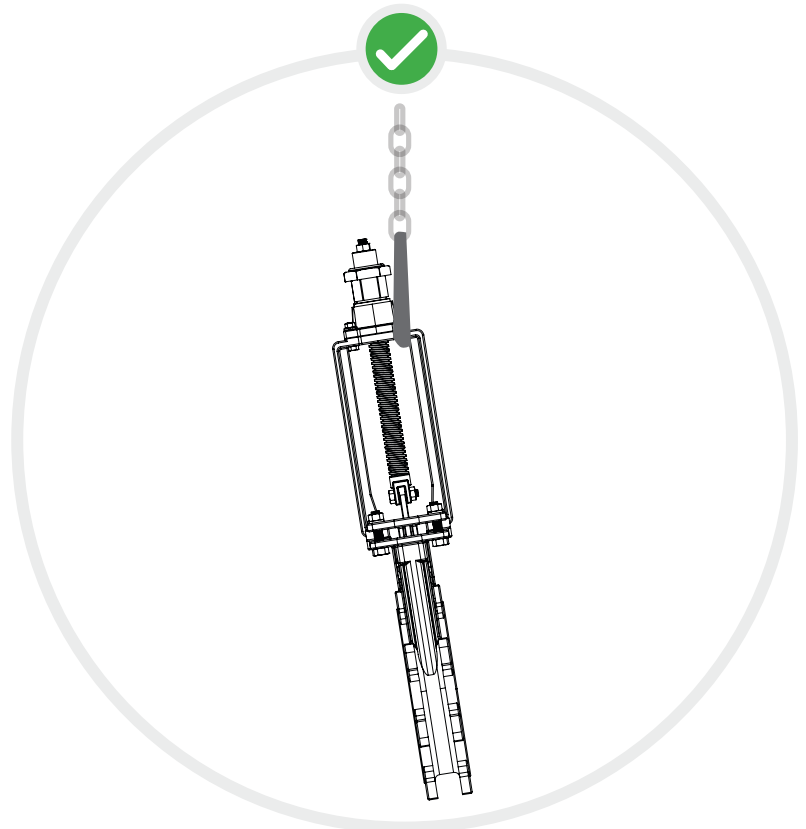
Crates: Lifting and handling of the packed valves in crates will be carried out by a fork lift truck, by means of the appropriate fork hitches. Cases: The lifting of packed valves in cases will be carried out in the lifting points and in the center of gravity position which has been marked. The transportation of all packed material must be carried out safely and following the local safety regulations.

19.2 Unpacked Valves

Lifting and handling of valves should be carried out by using appropriate means and observing the carrying limits. Handling must be carried out on pallets, protecting all machined surfaces to avoid any damage. With large bore valves, rigging the load must be carried out by using the appropriate tools to prevent the valve from falling or moving during the lifting and handling.

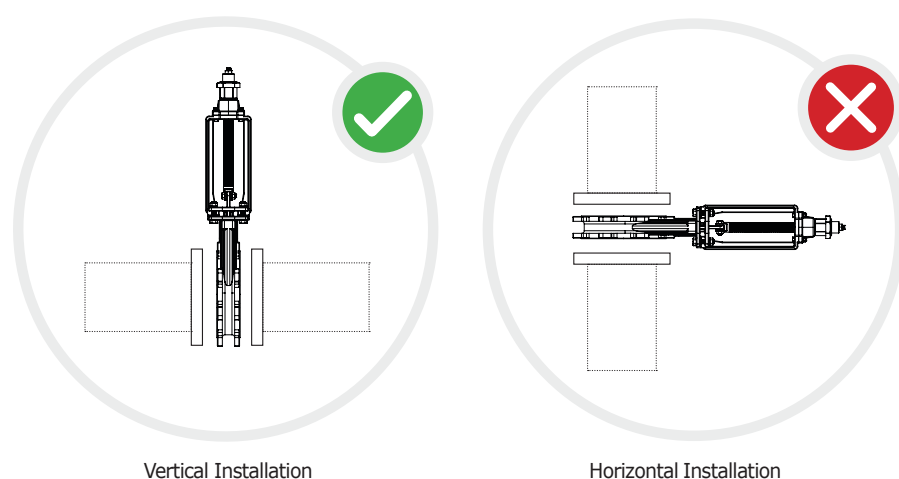
19.3 Lifting Unpacked Valves

- 19.3.1 Remove handwheel or thread lifting apparatus through handwheel.
- 19.3.2 Its recommended to lift valves through the yoke.
- 19.3.3 Refer to AS2317 for working load limits (WLL) and specifics on handling requirement.
- 19.3.4 Avoid contact with any rubber or threaded surfaces when lifting to avoid damage and voiding warranty.



20. INSTALLATION

- 20.1 Refer to section 19 for handling and lifting requirements when placing the valve into position.
- 20.2 Use a gasket material suitable for the pressure, temperature and media and ensure it fits the raised face dimension.
- 20.3 Lubricate seat prior to installation
- 20.4 Place valve between pipe flanges and fit valve using correct length bolts that do not protrude the tap depth in Section 3 and 4. All valves are supplied with drilled and tapped holes that can be installed with studs and cap screws. Follow Figure 1 for correct bolting sequence and Table 1 for correct installation tensions.



Vertical Installation

Horizontal Installation

- 20.5 It is recommended that Knifegate valves are installed vertically, not horizontally.
If it is installed horizontally additional support for the actuator may be required. Consult Challenger Valves for advice.

Table 1: Bolt Installation Tensions

DN Size	Fastener Size	No. of Fasteners	Bolt Torques (Nm)
80	M16	4	50
100	M16	4	50
150	M16	8	50
200	M16	8	50
225	M16	8	60
250	M20	8	102
300	M20	12	115
350	M24	12	210
375	M24	12	210
400	M24	12	210
450	M24	12	425
500	M24	16	730
600	M27	16	730
700	M27	20	400
750	M30	20	400

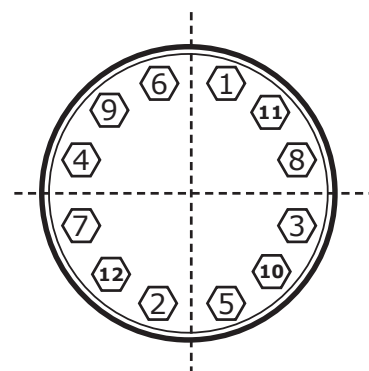
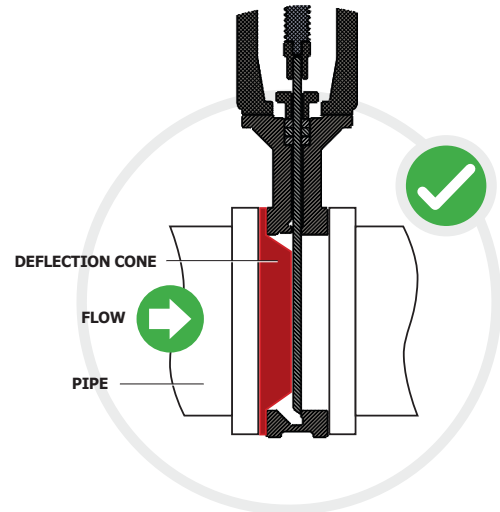


Figure 1: Bolting Sequence

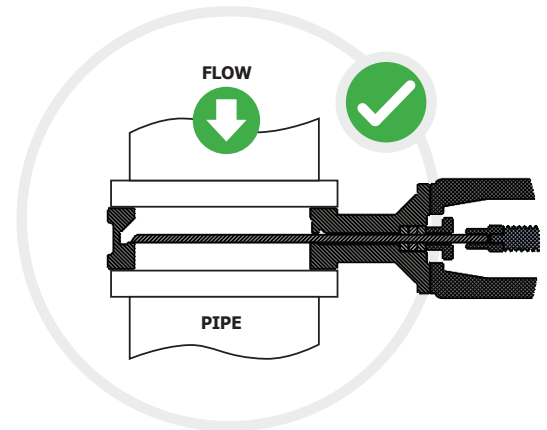
20.8 KGV 98 Metal Seated Valve - Vertical Installation

- If deflection cones are required, contact Challenger Valves.



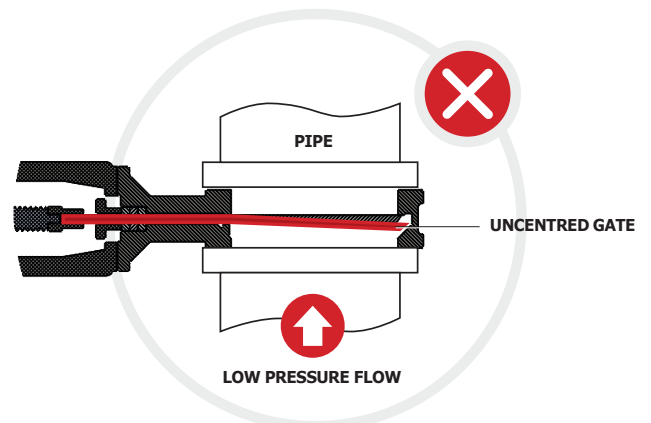
20.6 KGV 98 Metal Seated Valve - Horizontal Installation.

- If installed horizontally ensure liquid flow is towards the metal body seat for correct seal.



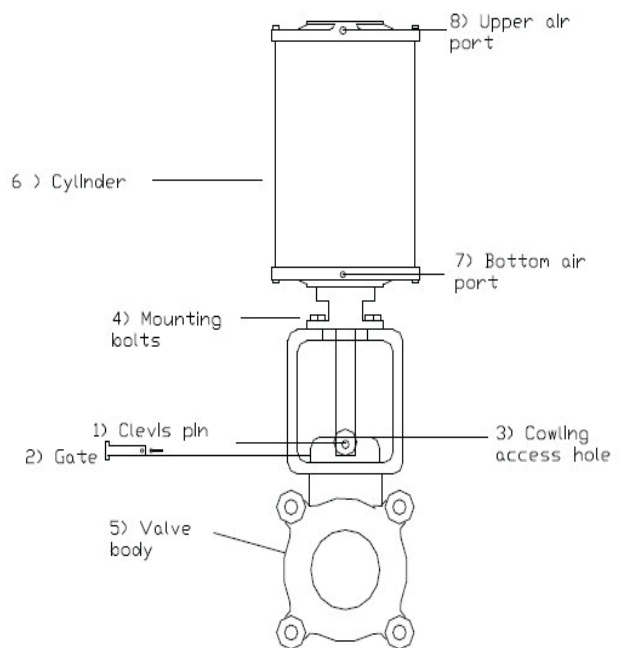
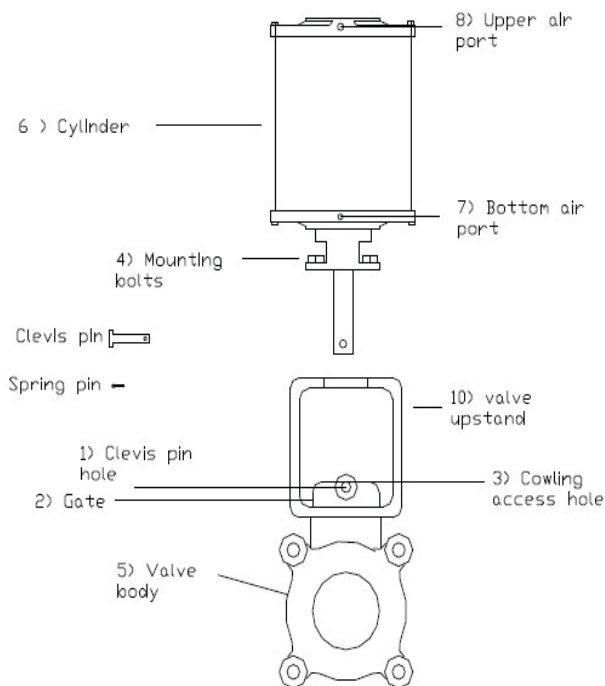
20.7 KGV 98 Metal Seated Valve - Horizontal Installation.

- KGV98 are not suitable to be installed as per image.
- Even though the flow direction is correct, if installed this way the gate may be not centred and leak due to...
- Back pressure/ gravity from outlet side
- Low/no pressure from inlet side
- Physical weight of unguided metal gate on sizes DN250 and larger can cause gate to bow.



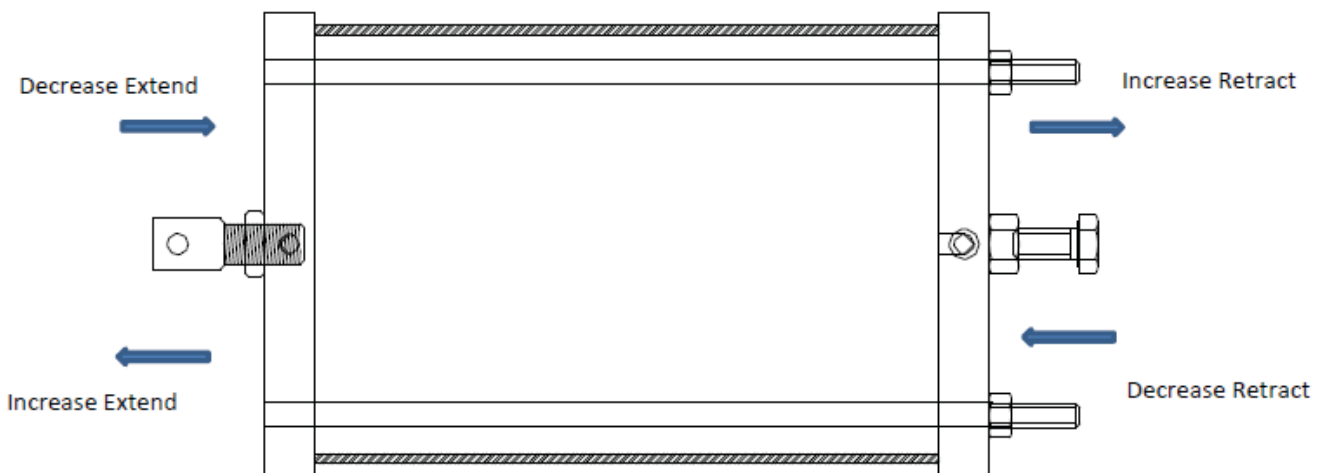
20.9 KGCLR Actuator installation.

- Below shows a typical KGCLR series cylinder and knife gate in position for assembly. The valve should be securely held in the position shown, in a vice or similar device with the cylinder suspended above it from a secure lifting apparatus.
- Insert the clevis pin through the cowling access hole into the cylinder shaft, and through the gate. The fasteners can now be inserted through the clevis pin to secure it in position.
- Secure the cylinder to the up stands by tightening the four mounting bolts(4). Apply air pressure to the bottom air hole and the cylinder will drive the valve to the open position.
- Apply the air again to drive the valve closed to check the operation and the unit is now ready for installation in the field.



20.10 KGCLR Stroke Adjustment

- Stroke can be adjusted both top and bottom. The cylinder must be equipped with a Top travel stop and adjustable clevis.
- 1) Retract stroke: Screw the top adjusting bolt closed to decrease the amount of travel for the RETRACT length.
- 2) Extend stroke: Screw the clevis up or down to adjust the amount of travel in the "extend" direction
- 3) Amount of travel adjustment will vary (approx. 30mm is standard)



- The TOP retract travel bolt is equipped with a locking nut and O-ring seal. Ensure that the O-ring is securely fastened by tightening the lock nut onto the flat washer after the desired adjustment is made,
- The clevis is equipped with a locking nut. Ensure that the nut is securely fastened by tightening the lock nut onto the Piston Rod after the desired adjustment is made.

**NOTICE**

If the valve is placed within a pit, sufficient room must be maintained to allow for the presence of working personnel. The pipeline design should incorporate supporting structures like support frames. Valve inlet and outlet piping should be supported as near to the valve as practical. It is explicitly forbidden for the valve to bare the weight of the pipeline or any external load. Prior to installation of the valve to the pipeline, the flange must be welded to the pipe.

It is strictly prohibited to secure the valve while welding the flange. Foreign material in a knife gate valve can damage the rubber seat when the valve is operated. Be sure valve interiors and adjacent piping are clean and free of foreign material prior to mating a valve-to-pipe-joint connection.

The pipelines must be free from foreign materials, and it is strictly prohibited to leave weld slag, stones, or any other foreign substances in the pipeline that could potentially harm the valve. When installing the knifegate valves, ensure that the seat and the flange faces are clean. To ensure adequate sealing it is important to select the correct type of gasket for the medium concerned, gaskets with the correct flange size must be used.

Closed stop position is set at the factory to provide shutoff. Do not override as too much compression on the rubber seat will damage the rubber.

21. OPERATION / ACTUATION**Manual Operation**

- 21.1 Turn the valve hand wheel to a fully opened and closed position.
- 21.2 Standard Supply is clockwise closing unless specified during the purchasing process

Pneumatic Actuation

- 21.3 Operate the pneumatic actuator to open and closed position.

**NOTICE**

If valves are supplied with electrical accessories like positioner or position indicator, ensure wiring is done as per local electrical safety codes and regulations.

Ensure correct electrical supply is given to electrical accessories for proper functioning and safety of the equipment.

22. STORAGE



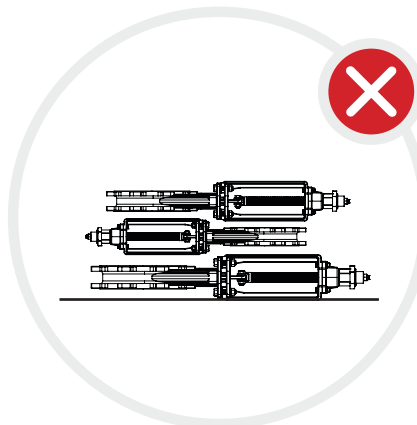
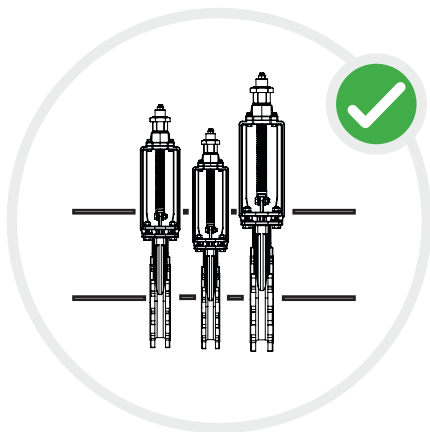
NOTICE

The packaging is designed to protect the valve only during shipping. If you are not installing the valve immediately after delivery, then you must store it according to these requirements.

Failure to follow these procedures could affect product warranty.

22.1 Temporary Storage

- 22.1.1 Temporary storage is described as the housing of valves intended for imminent project construction, with installation anticipated within a relatively brief timeframe, typically ranging from one to three months. Throughout this brief storage period, adherence to the following guidelines is essential:
- 22.1.2 A preferable storage facility is one that is clean, dry, and shielded, such as a warehouse. Valves should be shielded from extreme temperatures.
- 22.1.3 It is imperative to keep valves within their original shipping containers, maintaining the integrity of the initial packaging. However, this packaging approach is not suitable for safeguarding valves intended for outdoor storage, without cover or protection.
- 22.1.4 While storing valves in an uncovered area is acceptable, measures must be taken to counter inclement weather. The valves must be elevated from the ground, positioned on a pallet, shelf, or a suitable surface, and covered with a secure, waterproof tarp.
- 22.1.5 Avoid stacking valves on top of one another to prevent potential damage.



- 22.1.6 Knife Gate valves sizes 250 and larger are recommended to be stored vertically to ensure correct gate alignment and no damage is done to the packing prior to install.

22.2 Extended Storage

22.2.1 Extended storage, referred to as storage exceeding three months, requires adherence to the following guidelines:

22.2.2 The designated storage location must be a well-maintained, dry, and secure warehouse, with a strict avoidance of exposing the valves to extreme temperatures.

22.2.3 Valves are to be preserved in their original shipping container, retaining the initial packaging materials.

22.2.4 Avoid stacking valves on top of each other to prevent potential damage.

Access ports should be securely sealed to deter unauthorized entry and prevent contamination.

Valves and equipment containing elastomers, such as O-rings, must be stored in a climate-controlled warehouse, mandating the following conditions:

- Ambient relative humidity below 75%.
- No direct exposure to ultraviolet light or sunlight.
- Protection against ozone-generating equipment, combustible gases, and vapors.
- Storage at temperatures below 100°F (38°C), away from direct heat sources.
- Zero exposure to ionizing radiation.

22.2.5 Regular storage inspections, conducted semi-annually, are imperative. The results of the inspection, at a minimum, should encompass the evaluation of packaging, dryness, and cleanliness.

22.2.6 It is essential to leave protective caps and covers on the product during storage.

23. **WARRANTY**

23.1 This warranty covers faults in the products construction, material and assembly.

23.2 Products which are within 12 months from the date of purchase and are found to be defective after inspection by a Challenger Valves authorised representative in construction, material or assembly will be repaired or exchanged with an equivalent product free of charge (at the discretion of Challenger Valves)

23.3 The installation of the product is in accordance with the instructions provided.

23.4 The product has not been used in an unsuitable or improper manner.

23.5 The product has not been affected by inadequate or lack of maintenance.

23.6 The product has not been affected by unsuitable media, chemical or electrical influences.

23.7 Pressure does not exceed 10 Bar (1000Kpa)

23.8 Installation is subject to the requirements of the applicable regulatory authority.

24. MAINTENANCE & REPAIR

- 24.1 It is recommended that a regular schedule inspection be made at least every 90 days or before each use if not used regularly.
- 24.2 Ensure bronze bush is properly greased. If possible open and close valve to ensure it is functioning properly.
- 24.3 KGV99 Leaking Seat: How to adjust the nylok retaining nut.
- 24.3.1 Open the gate 5mm - 20mm
 - 24.3.2 Remove hand wheel nut
 - 24.3.3 Back off nylok retaining nut
 - 24.3.4 Loosen Allen key on bronze umbrella nut and wind anti clock one or two turns to allow further closure of the gate
 - 24.3.5 Close gate until new stop position is reached and check for leaks - Tighten Allen key and nylok retaining nut
 - 24.3.6 Be sure to NOT over adjust as excessive pressure can damage seat.

24.4 KGCLR Maintenance

- 24.4.1 Loss of Operation: possible air leakage.

With air applied to either the open or closed PORT, using soapy water, spray around the surface area where the cylinder joins with the End cap. Check for bubbles, inspect and replace end cap O-ring if required. Using a hose and fitting on the opposite port, insert tube into water container, if bubbles present, inspect piston seals and replace if required. - With air applied to bottom shaft seal end plate, spray soapy water around shaft hub area and check for bubbles, replace internal shaft seal if required.

- 24.4.2 Jerky operation: - Check shaft for bend or damage

- Check internal piston attachment is secure.
- Check internal cylinder is properly greased.

24.5 KGCLR Spare Parts List

- 24.5.1 Repair parts can be ordered from the factory.

- Piston O-Rings x2
- End Cap O-Rings x2
- Piston Shaft Seal x1
- Body Seal x1
- Body Wiper Seal x1

24.6 KGV98: How to replace packing Gland

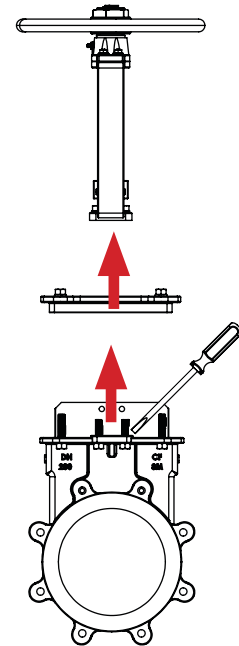
Whats Required:

- Flat Head Screw Driver or Cork Screw Tool
- Hammer
- Flat Bar 30mm x 300mm x 8mm (w/ round edges)
- Liquid Silicone / Lubricant
- Stanley Knife
- Replacement seal (if required)

24.6.1 Make sure valve is in the fully closed position.

24.6.2 Disassemble valve by firstly removing the yoke assembly and then the packing gland by undoing the relevant nuts & bolts

24.6.3 Using a flat head screw driver (or corkscrew tool) pick out the 3 packing seals.

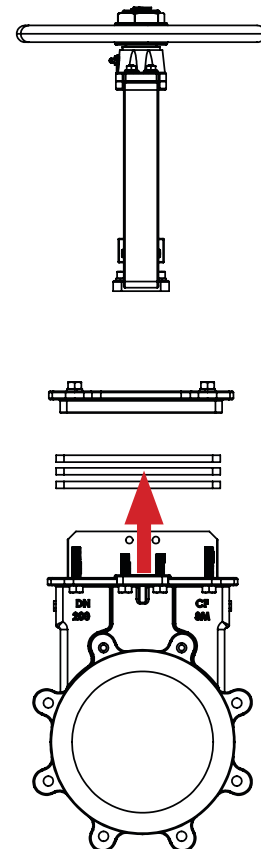


24.6.4 If necessary replace the old packing glands with new ones.

24.6.5 (Depending on the valve size there can be 2-4 glands to replace.)

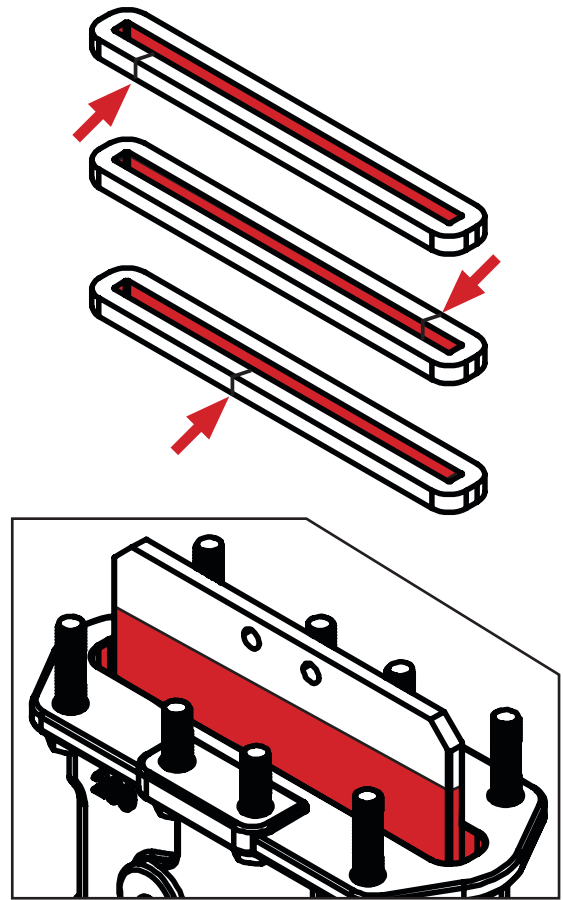
24.6.6 Cut Seals to dimensions as per below table.

Valve Size	Packing Size	Packing Thickness
50mm	170mm x 4PC x 4 Rows	7/16" (11mm)
65mm	200mm x 4PC x 4 Rows	7/16" (11mm)
80mm	215mm x 4PC x 4 Rows	7/16" (11mm)
100mm	300mm x 4PC x 4 Rows	7/16" (11mm)
125mm	340mm x 4PC x 4 Rows	3/8" (10mm)
150mm	395mm x 4PC x 4 Rows	7/16" (11mm)
200mm	490mm x 4PC x 4 Rows	7/16" (11mm)
225mm	560mm x 4PC x 4 Rows	3/8" (10mm)
250mm	600mm x 4PC x 4 Rows	7/16" (11mm)
300mm	700mm x 4PC x 4 Rows	7/16" (11mm)
350mm	790mm x 4PC x 4 Rows	7/16" (11mm)
375mm	850mm x 4PC x 4 Rows	1/2" (13mm)
400mm	900mm x 4PC x 4 Rows	1/2" (13mm)
450mm	1010mm x 4PC x 4 Rows	1/2" (13mm)
500mm	1110mm x 4PC x 4 Rows	1/2" (13mm)
600mm	130mm x 4PC x 4 Rows	1/2" (13mm)
750mm	-	-
900mm	2000mm X 4PC x 4 Rows	9/16" (14mm)



24.6.7 When packing be sure to stagger packing joins to ensure drip tight seal.

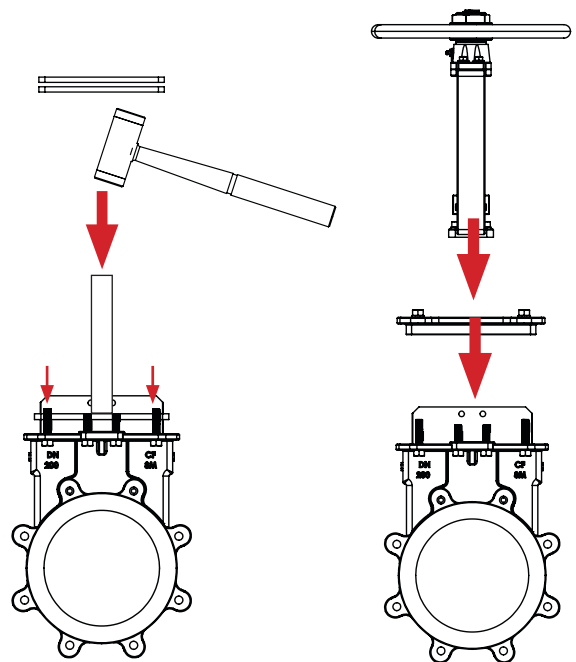
24.6.8 Lubricate inner body and gate faces with soapy water to assist with packing seals.



24.6.9 With the gate full closed, start repacking each layer on both sides of the gate by tapping the glands down using a hammer and flat bar. Work from the center outwards.

24.6.10 Re-assemble valve starting with the packing gland and then the yoke assembly.

24.6.11 Be sure to not overstress the bolt bolting on the packing gland.



24.7 KGV99: How to install a new seat and packing gland.

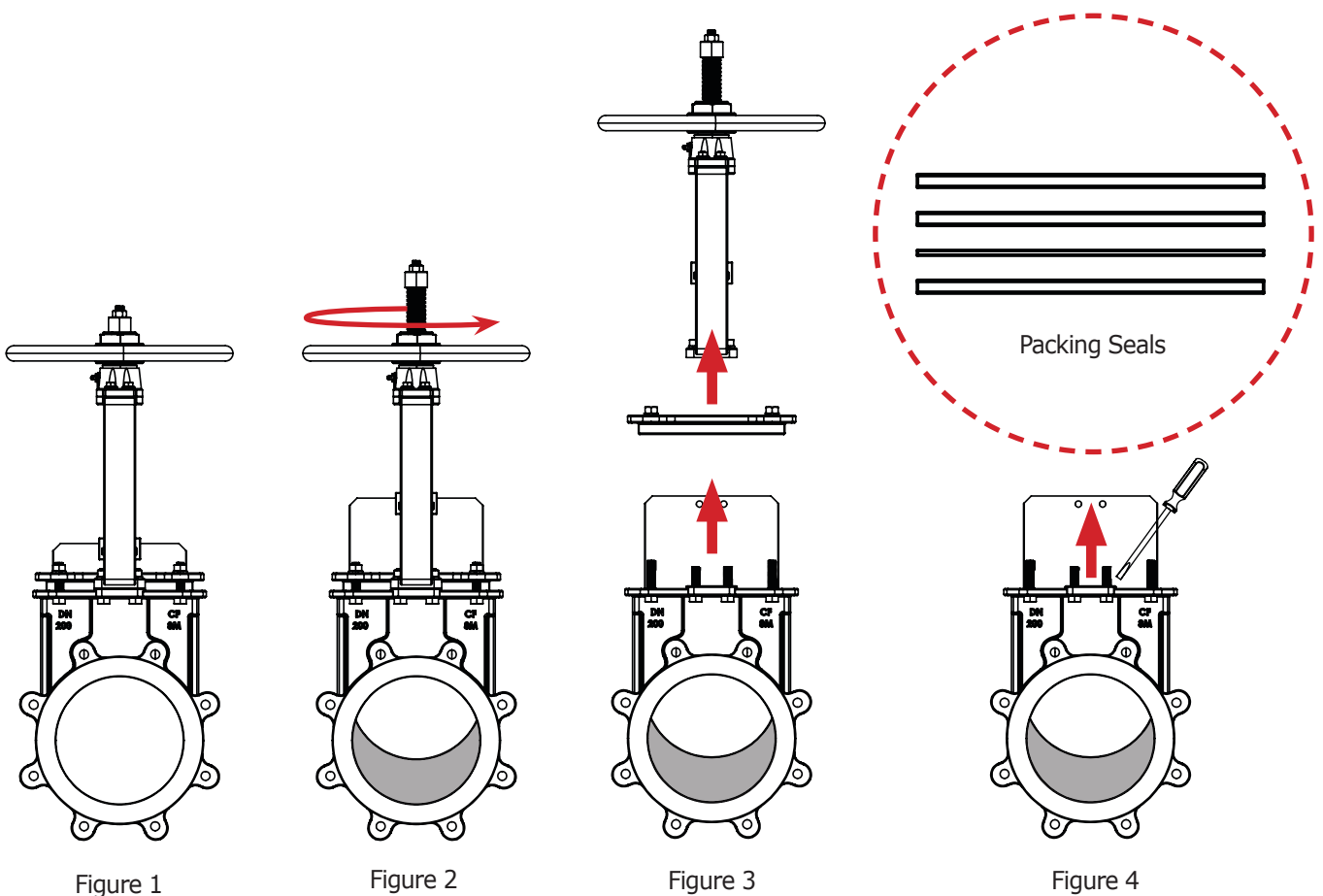
Whats Required:

- Flat Head Screw Driver or Cork Screw Tool
- Hammer
- Flat Bar 30mm x 300mm x 8mm (w/ round edges)
- Liquid Silicone / Lubricant
- Wire Cutters or Saw
- Allen Key
- Stanley Knife
- Replacement seal (if required)
- Round Bar 25mm x 450mm long

24.7.1 Operate valve until it is open 50% to help with removing gate in future steps. (Figure 2)

24.7.2 Disconnect blade clevis, remove yoke assembly and remove packing gland and disassemble valve by firstly removing the yoke assembly and then the packing gland by undoing the relevant nuts & bolts (Figure 3)

24.7.3 Using a flat head screw driver (or corkscrew tool) pick out the packing seals. (removing the gate may assist) (Figure 4)



24.7.4 Remove Gate and Resilient Seat and replace parts if required. (Figure 5)

24.7.5 Lubricate and place seat back into body by bending it into a horseshoe shape. (Figure 6) Use a round bar to push seat firmly in place the ends will extend above the body on both sides evenly.

24.7.6 Lubricate seat surface and gate edges and insert the gate to completely closed position.

24.7.7 Cut packing (as per table 1),lubricate and install Install the packing in both sides of the gate , one row at a time. Feed the ends into the stuffing box. Use the flat bar and hammer to tamp packing into position – working from centre outwards (Figure 7)

24.7.8 Trim seat material on each side of the gate even with packing box. (Use knife and wire cutters)

24.7.9 Be sure to not take up gland follower bolts more than it is necessary.It is best practice to set it once in servie under pressure.

24.7.10 Reassemble packing gland and yoke assembly.

Table 1: Packing Dimensions

Valve Size	Packing Size	Packing Thickness
50mm	85mm x 4PC X 2 Rows	3/8" (10mm)
65mm	100mm x 8PC x 4 Rows	3/8" (10mm)
80mm	115mm x 8PC x 4 Rows	3/8" (10mm)
100mm	150mm x 8PC x 4 Rows	3/8" (10mm)
125mm	170mm x 8PC x 4 Rows	3/8" (10mm)
150mm	195mm x 8PC x 4 Rows	3/8" (10mm)
200mm	250mm x 8PC x 4 Rows	3/8" (10mm)
225mm	270mm x 8PC x 4 Rows	3/8" (10mm)
250mm	305mm x 8PC x 4 Rows	3/8" (10mm)
300mm	360mm x 8PC x 4 Rows	3/8" (10mm)
350mm	410mm x 8PC x 4 Rows	3/8" (10mm)
375mm	430mm x 8PC x 4 Rows	1/2" (13mm)
400mm	465mm x 8PC x 4 Rows	1/2" (13mm)
450mm	510mm x 8PC x 4 Rows	1/2" (13mm)
500mm	575mm x 8PC x 4 Rows	1/2" (13mm)
600mm	665mm x 8PC x 4 Rows	1/2" (13mm)
750mm	810mm x 8PC x 4 Rows	9/16" (14mm)
900mm	2000mm x 8PC x 4 Rows	9/16" (14mm)

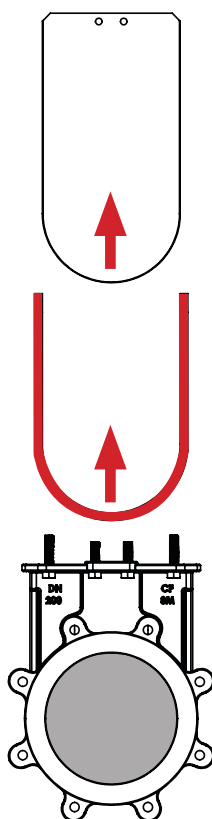


Figure 5

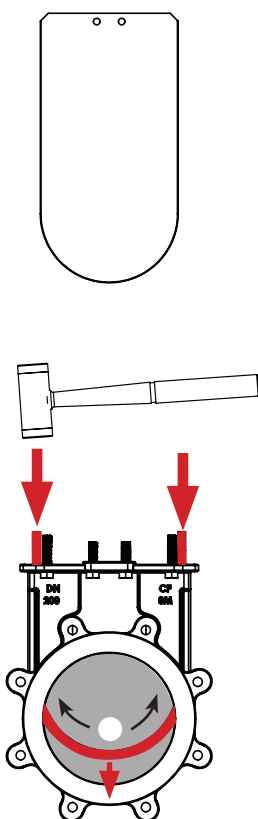


Figure 6

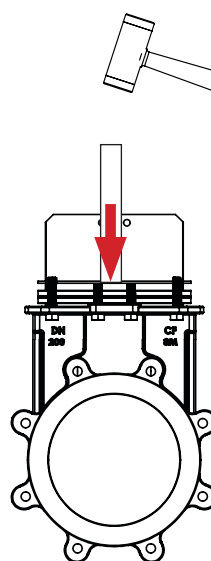


Figure 7

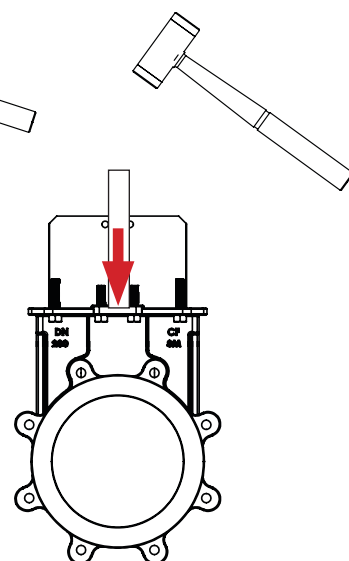


Figure 8

25. CODE BUILDER

Product Code Example:			
KGV	-	99	- E - 0100
SERIES	SEAT	Flange Connection	Size
KGV = Knife Gate Valve	98 = Metal Seated	A = ANSI 150	0050 = 2" (50mm)
	99 = Resilient Seated	D = Table D AS2129	0065 = 2½" (80mm)
		E = Table E AS2129	0080 = 3" (80mm)
			0100 = 4" (100mm)
			0150 = 6" (150mm)
			0200 = 8" (200mm)
			0225 = 9" (225mm)
			0250 = 10" (250mm)
			0300 = 12" (300mm)
			0350 = 14" (350mm)
			0375 = 15" (375mm)
			0400 = 16" (400mm)
			0450 = 18" (450mm)
			0500 = 20" (500mm)
			0600 = 24" (600mm)

CHALLENGER VALVES AND ACTUATORS ARE THE
“**RIGHT CHOICE FOR VALVES AND ACTUATION**” WHEN QUALITY MATTERS.

AUSTRALIAN OWNED & OPERATED SINCE 1984
CHALLENGER SERVICES INDUSTRIES SUCH AS: WATER & WASTE WATER, MIN-
ING, PUMPING, INDUSTRIAL PROCESSING, IRRIGATION, MATERIALS HANDLING
AND CHEMICAL SERVICES.

HEADQUARTERS

CHALLENGER VALVES & ACTUATORS

3 Glenn St, Shepparton, VIC 3630
1800 120 751

Information shown may be subject to change in accordance with Challenger Valves and Actuators
continuing development program. ©Challenger Valves and Actuators 2025



www.challengervalves.com.au