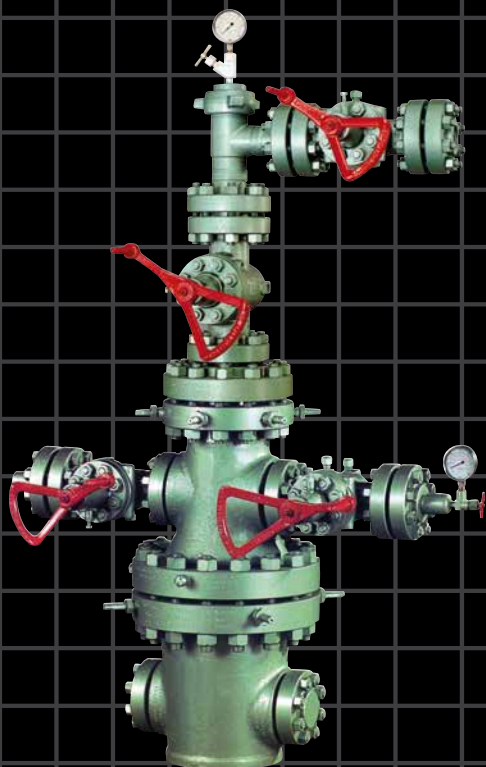


API6A CHOKE H2 & FCV STYLE



**AUSTRALIAN
PIPELINE VALVE®**



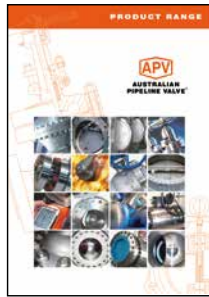
AUSTRALIAN PIPELINE VALVE®

COMPLETE PRODUCT LINE

“Australian Pipeline Valve produces isolation, control and flow reversal protection products for severe and critical service media in utility, steam, pipelines, oil & gas and process industries. APV valves and pipeline products form the most competitive portfolio in the market.”



AUSTRALIAN PIPELINE VALVE BRAND RANGE - CATALOGUES



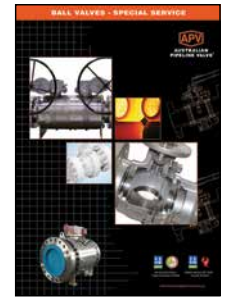
Product Brochure



Ball Valves Floating & Trunnion Mounted



Ball Valves Floating Small Bore



Ball Valves Special Service



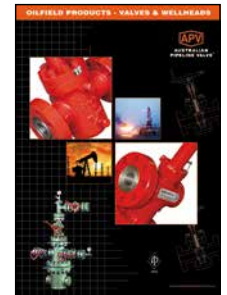
Gate, Globe & Check Valves - Cast Steel



Gate, Globe & Check Valves - Forged Steel



Plug Valves Lubricated, Sleeved & Lined

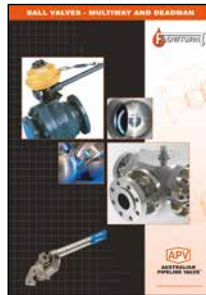


Oilfield Products Valves & Wellheads

APV FAMILY OF BRANDS RANGE - CATALOGUES



Diamond Gear Gearboxes



Flowturn Ball Valves Multiway & Deadman



Flowturn Gate, Globe & Check Valves



Flowturn Instrument Valves



Flowturn Strainers & Sight Glasses



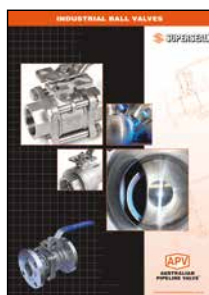
Steamco Steam Valves



Supercheck Wafer Check Valves



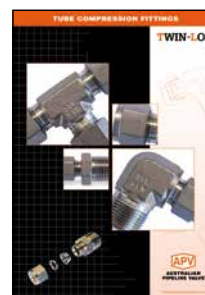
Superseal Butterfly Valves



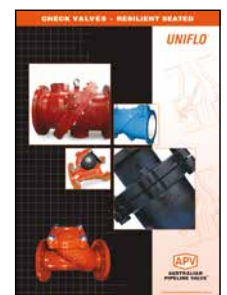
Superseal Industrial Ball Valves



Torqturn Actuators



TwinLok Tube Fittings



Uniflo Check Valves

Contact us for your local stockist/distributor

INDEX



Introduction	2
Safety Information	3-4
1.0 Installation H2 & FCV Chokes	4-6
1.1 Installation positions	4
1.2 Preparation for installation	4
1.3 End connections - installation	5-6
2.0 Operation H2 & FCV Chokes	7
3.0 Routine Maintenance H2 Chokes	6-7
4.0 Preventative Maintenance & Repair H2 Chokes	7-11
4.1 Preparation	7
4.2 Disassembly & repair Type H2 adjustable choke 3,000 to 10,000 psi	7-8
4.3 Assembly Type H2 adjustable choke 3,000 to 10,000 psi	8-9
4.4 Servicing/repair Type H2 positive choke 3,000 to 15,000 psi	9-11
5.0 Repair Instructions FCV Series	12-14
6.0 Replacement Parts H2 & FCV Chokes	14-15
6.1 Individual parts	14
6.2 Bonnet assembly	15
6.3 Adaption kits	15
Appendix - API6A Material service categories & rating levels	16-19



© Copyright Australian Pipeline Valve 1990 - 2013 Edition

Catalogues, photos, brochures and technical publications are the exclusive property of Australian Pipeline Valve.

Any unauthorised reproduction in total or in part, shall result in prosecution. Products and data sheets in this publication are subject to change at anytime without notice. Australian Pipeline Valve reserves the right to carry out amendments to products and materials.

INTRODUCTION

The majority of this information is common knowledge to experienced valve & choke users. When properly installed in applications for which they were designed, Australian Pipeline Valve (APV) chokes will give long reliable service. This instruction is only a guide for installation and operation on standard service and covers general maintenance and minor repairs. A professional APV approved engineering facility should be utilised for reconditioning or major repairs.



Note

We do recommend however that this entire document be read prior to proceeding with any installation or repair. Australian Pipeline Valve and its parent company take no responsibility for damage or injury to people, property or equipment. It is the sole responsibility of the user to ensure only specially trained valve repair experts perform repairs under the supervision of a qualified supervisor.

RESPONSIBILITY FOR VALVE APPLICATION

The User is responsible for ordering the correct chokes. The user is responsible for ensuring APV Valves are selected and installed in conformance with the current pressure rating and design temperature requirements. Prior to installation, the chokes and nameplates should be checked for proper identification to ensure the choke is of the proper type, material and is of a suitable pressure class and temperature rating to satisfy the requirements of the service application.



Caution

Do not use valves in applications where either the pressure or temperature is higher than the allowable working values. Also chokes should not be used in service media if not compatible with the choke material of construction, as this will cause chemical attacks, leakage, choke failure.

RECEIVING INSPECTION AND HANDLING

Valves should be inspected upon receipt to ensure:

- Conformance with all purchase order requirements.
- Correct type, pressure class, size, body and trim materials and end connections.
- Any damage caused during shipping and handling to end connections, hand wheel or stem.



Caution

The User is advised that specifying an incorrect choke for the application may result in injuries or property damage. Selecting the correct choke type, rating, material and connections, in conformance with the required performance requirements is important for proper application and is the sole responsibility of the user.

SAFETY INFORMATION

The following general safety information should be taken in account in addition to the specific warnings and cautions specified in this manual. They are recommended precautions that must be understood and applied during operation and maintenance of the equipment covered in this I.O.M



Caution

To avoid injury, never attempt to disassemble a choke while there is pressure in the line. Ensure both upstream and downstream pressures are removed. Disassemble with caution in case all pressures are not relieved. Even when replacing stem packing, caution is necessary to avoid possible injury.



Caution

To prevent choke bending, damage, inefficient operation, or early maintenance problems, support piping on each side of the choke. Warning, certain gases and fluids could cause damage to human health, the environment or property hence the necessary safety precautions to prevent risk should be taken.



Caution

- *A choke is a pressurised mechanism containing energised fluids under pressure and consequently should be handled with appropriate care.*
- *Choke surface temperature may be dangerously too hot or too cold for skin contact.*
- *Upon disassembly, attention should be paid to the possibility of releasing dangerous and or ignitable accumulated fluids.*
- *Ensure adequate ventilation is available for service.*

This manual provides instructions for storing, general servicing, installation and removal of chokes.

APV and it's resellers refuse any liability for damage to people, property or plant as well as loss of production and loss of income under any circumstances but especially if caused by: Incorrect installation or utilisation of the choke or if the choke installed is not fit for intended purpose. It is the sole responsibility of the user to ensure the choke type and materials are correctly specified.

DURING OPERATION TAKE INTO ACCOUNT THE FOLLOWING WARNINGS:

- a- Graphite/Graphoil packing and body gasket is very brittle, any impacting, twisting or bending should be avoided.
- b- The choke's internal parts such as disc, stem, seats, seals, gaskets shall be handled with care avoiding scratches or surface damage.
- c- All tools and equipment for handling the internal parts shall be soft coated or else take extreme care, especially on machined mating surfaces and with soft parts.
- d- Valves can be fitted with gaskets or seals in PTFE, Buna, Viton, etc., hence high temperatures will damage sealing components.

For all operations make reference to position number on part list of the applicable drawing listed.

1.0 INSTALLATION H2 & FCV

Install choke in system using proper size mating flanges or threaded end connections and appropriate gasket seal rings or thread sealant.



Caution

Piping (where applicable) should be properly aligned and supported to reduce mechanical loading on the end connections.

1.1 INSTALLATION POSITIONS

Choke valves are uni-directional and therefore may be installed in the direction of flow indicated on the body.

1.2 PREPARATION FOR INSTALLATION

- Remove protective end caps or plugs and inspect valve ends for damage to threads, socket weld bores or flange faces.



Caution

Ensure sufficient clearance for the stem in the full open position may cause the choke to be inoperable. Inadequate clearance for choke may add mechanical loading to the choke ends. Sufficient clearance should be allowed for threaded chokes to be 'swung' during installation.

- Thoroughly clean adjacent piping system to remove any foreign material that could cause damage to seating surfaces during valve operation.
- Verify that the space available for installation is adequate to allow the valve to be installed and to be operated.

1.3 END CONNECTIONS - INSTALLATION

1.3.1 Threaded Ends

Check condition of threads on mating pipe.

Apply joint compound to the male end of joint only. This will prevent compound from entering the choke flowpath.

1.3.2 Flanged Ends

Check to see that mating flanges are dimensionally compatible with the flanges on the choke and ensure sealing surfaces are free of debris.

Install the correct studs and nuts for the application and place the flange gasket between the flange facings.



Stud nuts should be tightened in a an opposing criss-cross pattern in equal increments to ensure proper gasket compression.

1.3.3 Buttweld Ends

Clean the weld ends as necessary and weld into the line using an approved weld procedure. Make sure the pipe and body material given on the nameplate is compatible with the welding procedure.



Chokes under 2" (50 NB) should be lightly closed during welding to prevent damage to the seating surfaces and stem caused by thermal expansion during the weld process.

1.3.4 Choke Installation by Welding

Leave chokes assembled and in the lightly closed position during installation, welding and post-weld heat treatment. This will prevent the valve seat from floating or distorting during the process. After welding completion, open the choke and flush line to clean out any foreign matter.

The responsibility for welding of the chokes is that of those performing the welding.



Caution

Stem seal leakage could result in personal injury. Choke stem area is tested prior to shipping but may require regreasing (H2 only) or changing to meet specific service conditions.



Caution

Personal injury may result from sudden release of any process pressure. APV recommends the use of protective clothing, gloves and eyewear when performing any installation or maintenance.

Isolate the choke from the system and relieve pressure prior to performing maintenance.

Disconnect any operating line providing air pressure, control signals or electrical power to actuators.



Caution

Check the stem sealing area for pressurised process fluids even after the choke has been removed from the line, particularly when removing seals, stem bleed or grease plugs..



Caution

If a gasket seal is disturbed while removing or adjusting gasketed parts, APV recommends installing a new gasket while reassembling. A proper seal is required to ensure optimum operation.

2.0 OPERATION H2 & FCV

As the choke is opened, numbers will appear, indicating the equivalent orifice setting of the choke, in 64th of an inch or/and percentage open. Once the choke has been set as the desired orifice size, thumbscrew (H2 model only) should be tightened to secure that setting. Flow may now be released through the choke. Should further adjustment be necessary, simply loosen the thumbscrew, turn the handwheel in the direction needed to correct the flow, then re-tighten thumbscrew.

3.0 ROUTINE MAINTENANCE H2

Regularly operate and inspect to ensure the choke functions properly and there is no leakage. Should there be stem area leakage, inject some plastic packing into the stem if the optional plastic injection fitting is provided.



Caution

If the choke is to be disassembled while installed in a piping system, it must be isolated from the system pressure and flow. With the choke at an open setting, internal pressure must be bled to 0 psi.

4.0 PREVENTATIVE MAINTENANCE & REPAIR H2

4.1 PREPARATION

Note: It is not necessary to remove the choke from the tree (or the manifold) to perform the procedures outlined below.

- 1) Close all valves necessary to isolate the choke being serviced from well pressures.
- 2) Place a warning tag on each valve closed in Step 1 above, to prevent the opening of the valves while maintenance is in progress.

4.2 DISASSEMBLY & REPAIR TYPE H2 ADJUSTABLE CHOKE 3,000 TO 10,000 PSI

4.2.1 Choke Body

- a) Ensure that the choke needle is fully retracted.
- b) Loosen the bleed plug to vent the body cavity. Slowly loosen the bonnet nut.
- c) Once the pressure has been completely bled off, back off the bonnet nut and remove the bonnet assembly.



Caution

Never stand in front of the choke when removing the bonnet assembly, always stand to the side. Pressure may be trapped inside the choke. Wear protective eye goggles.

- d) Remove the seat assembly.
- e) Inspect the following critical areas on the choke body:
 - i) Bonnet-to-body seal surface: - Ensure that the surface is clean and free from nicks and scratches.
 - ii) Bore of the choke body that surrounds the bonnet: - Ensure the bore is clean and free from burrs.
 - iii) Seat threads of the choke body: - This area is susceptible to wear and erosion. The threads should be free from burrs and trash. If the threads are worn or eroded, the body should be returned to APV for repair.
- f) Clean the choke body OD threads, seat threads and bonnet bore. Apply a coat of grease to these areas before re-installation.

4.2.2 Bonnet Nut

- a) Remove the bonnet nut from the blanking plug/bonnet assembly.
- b) Visually inspect the bonnet nut OD and hammer lugs for abuse. If any of the lugs are beaten down into the OD of the nut, the nut should be replaced.
- c) Clean the threads with solvent and wire brush. This area is susceptible to wear and corrosion.
- d) After inspection, grease threads with heavy grease before re-installation.

4.2.3 Blanking Plug/Bonnet Assembly

- a) Inspect the bonnet-to-body seal surface on the OD of the blanking plug/bonnet body. Ensure that the surface is free from burrs or nicks.
- b) Inspect the O-ring/bonnet gasket and groove in the bonnet each time the bonnet is removed from the choke body. Remove any nicks or burrs with fine emery cloth.
- c) Apply a light coat of grease or heavy oil to seal surface of choke body and an O-ring/bonnet gasket before re-installation.

4.3 ASSEMBLY TYPE H2 ADJUSTABLE CHOKE 3,000 TO 10,000 PSI

4.3.1 Preparation

- a) Prior to assembly, all components should be thoroughly cleaned of all debris and lubricants. This includes all threads, holes, grooves and vents.
- b) Visually inspect all parts for damage after cleaning, but before assembly.

4.3.2 Bonnet Assembly

- a) Lightly grease the O-ring groove and packing bore of the bonnet body. Heavily grease the threads in the bonnet body.
- b) Lightly grease the O-ring and install in groove of bonnet body.
- c) Place bonnet body on a flat surface with packing bore up. Lubricate the J-Packing and junk rings with light grease or heavy oil. Install the metal junk ring, back-up ring, (part of packing seat), J-Packing, support ring, and retainer ring.

4.3.3 Needle Installation

- a) Lubricate the needle threads with heavy grease. Grease the sealing surface with light grease or heavy oil. Place the bonnet on it's side and slowly slide the needle thread end first, through the packing end of the bonnet body. Engage the threads of the needle with the threads of the bonnet body. Temporarily install handwheel on the needle and install needle in bonnet body by rotating handwheel counter-clockwise. After installation, remove the handwheel.
- b) Slide the indicator over the handwheel end of the needle. Install setscrew in the indicator hand tight.
- c) Lubricate the threads of the bonnet but with heavy grease. Slide bonnet nut over bonnet body until it bottoms out against the bonnet flange.
- d) Rotate bonnet body until the needle locking screw hole faces up. Insert the plug into the hole. Grease and install the needle locking screw into the tapped hole hand tight.
- e) Install the handwheel, hex bolt or nut, and washer to needle.

4.3.4 Seat Installation

- a) Lubricate the seat threads in the choke body with heavy grease.
- b) Inspect the new seats.
- c) Ensure the gasket is clean and flat against the should of the seat.
- d) Centre the gasket on the seat by bending down the lugs on the gasket.
- e) Apply a light coat of grease to the seat threads and gasket.
- f) Install the new seat using the appropriate wrench and torque to put 677.9 Nm (500 ft·lbs).



Caution

The needle should be backed well into the bonnet assembly before installing the bonnet assembly on the choke body to ensure that it does not damage the seat during installation.

- g) Lubricate the bonnet seal surface of the choke body with light grease and the bonnet nut threads with a heavy grease.
- h) Install bonnet assembly in choke body. Make up bonnet nut hand tight. Using a hammer, tighten the bonnet nut completely.

4.3.5 Calibrating the choke

- a) After the bonnet nut is tight, run the needle in against the seat, align the zero setting on the indicator with notch on the bonnet body and tighten the indicator set screw. Do not tighten the bonnet to needle set screw until the choke is positioned at the desired setting.

4.4 SERVICING/REPAIR TYPE H2 POSITIVE CHOKE 3,000 TO 15,000 PSI WP

4.4.1 Preparation

- a) Prior to assembly, all components should be thoroughly cleaned of all debris and lubricants. This includes all threads, holes, grooves and vents.
- b) Visually inspect all parts for damage after cleaning, but before assembly.

4.4.2 Flow Bean Replacement

Note: The volume of the flow through the positive choke will change depending on the size and condition of the flow bean. Replace the flow bean if it is worn or if another size is required.

Parts Required:

1. Flow bean, appropriate size and material.
2. Flow bean gasket.

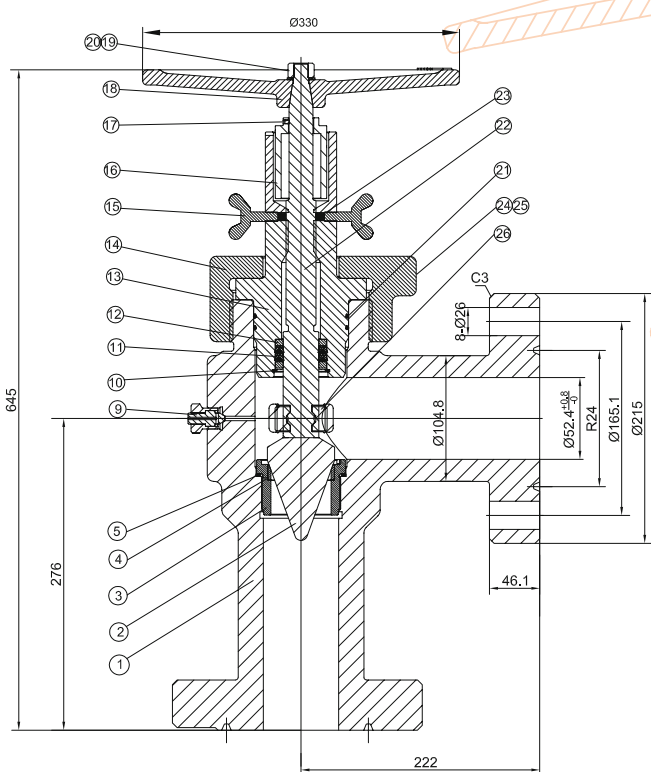
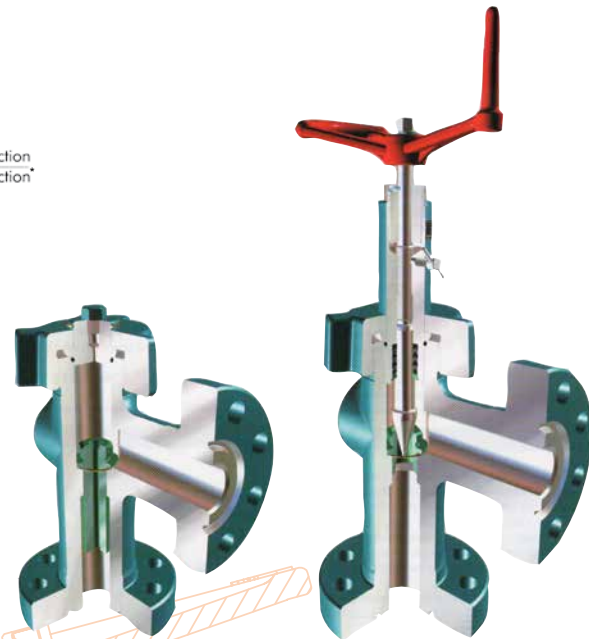
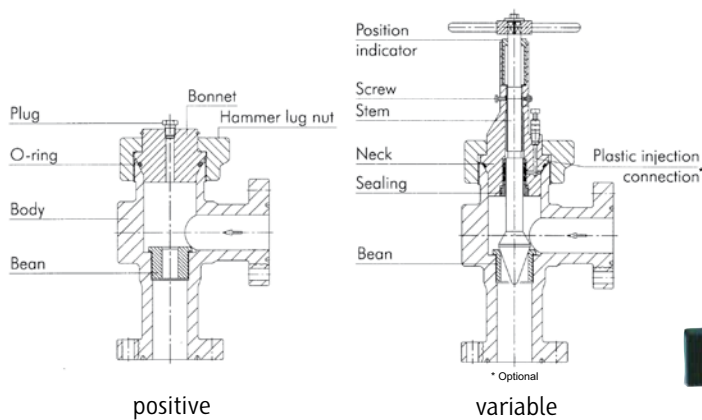
- a) Using a hammer, loosen the bonnet nut.
- b) Remove the blanking plug assembly. The pipe plug, retainer ring, blanking plug and O-ring will come out in the bonnet nut as an assembly.

- c) Remove the blanking plug O-ring.
- d) Inspect the O-ring for damage. Replace if necessary.
- e) Remove the flow bean using the appropriate wrench.

4.4.3 Flow Bean Installation

- a) Inspect the new flow bean.
- b) Ensure that the gasket is clean and flat against the shoulder of the flow bean.
- c) Centre the gasket on the flow bean by bending down the lugs on the gasket.
- d) Apply a light coat of grease to the flow bean threads and gasket.
- e) Install the new flow bean using the appropriate wrench and torque to 677 Nm (500 ft·lbs).
- f) Install the O-ring onto the blanking plug.
- g) Inspect the body and bonnet nut threads.
- h) Apply a light coat of grease to the seal area, the external threads of the choke body and the threads of the bonnet nut.
- i) Install the blanking plug assembly onto the choke.
- j) Using a hammer, tighten the bonnet nut completely.

TYPICAL PARTS FOR TYPE 'H2' 3,000 – 5,000 PSI



Item	Name	Material	Quantity	Remark
1	BODY	ZG30CrMo(A487 4C, 60K)	1	
2	DISC	Hard Alloy Steel	1	HRA87.5
3	SEAT BODY	410	1	
4	SEAT	Hard Alloy Steel	1	HRA87.5
5	RING	PTFE	1	
9	PLUG	Stainless Steel	1	
10	RETAINER WASHER	65Mn	1	
11	PACKING	VITON AED	2	
12	PACKING WASHER	S.S	2	
13	BONNET	ZG30CrMo(AISI4130, 60K)	1	
14	UNION	ZG30CrMo(A487 4C, 60K)	1	
15	LOCK SCREW	C.S	2	
16	INDICATION PLATE	5052	1	
17	SCREW	22H	3	
18	HANDWHEEL	QT400-18	1	
19	NUT	A194 2HM	1	
20	WASHER	C.S	1	
21	O-RING	VITON	2	
22	STEM	17-4PH	1	NITRIDING
23	PLUG	H62	2	
24	RVET	1Cr18Ni9Ti	1	
25	NAME PLATE	1Cr18Ni9Ti	2	
26	CONNECTOR	17-4PH	1	

CHOKE VALVE 2-1/16 5000 H2 STYLE

This is an indicative drawing only, parts vary for different sizes, ratings and trim styles.

5.0 REPAIR INSTRUCTIONS FCV



Redressing the FCV Removing the Trim

Note: Notice that the handle has a notch for setting and reading the adjustment of the valve. Directly above and below this notch (when the valve is closed) are the set screws.

1. Remove the valve from the line.
2. Open the valve two full turns.
3. Bleed all pressure from the valve.

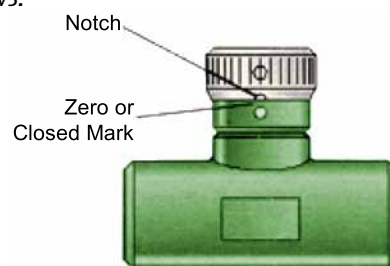


FIGURE 1.



Caution

Beware of escaping gas under pressure. Wear eye protection and warn others in the vicinity. Isolate the choke by first closing other valves before removing from the line. Then bleed any remaining pressure from the choke before removing from the line.

3. Remove the locking screw from the handle and loosen the remaining set screws with a allen key wrench.
4. Remove the handle. The primary set screw should be loosened three full turns to clear stem. Remove the flow indicator ring.
5. Use an adjustment spanner with 1/4" diameter pin (Pt.#10525-S) to remove the packing gland, stem, spring, spacer and washers (Figure 2).

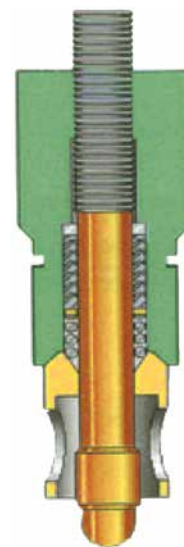


FIGURE 2.

Removing the Packing

1. Unscrew the stem and remove it from the packing gland. The spacer, spring, and washer will now be free for removal.
2. Push the packing out of the gland with a screwdriver. Remove one or two packing rings at a time until all are removed.

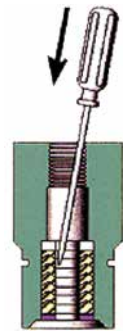


FIGURE 3.



Caution

Be very careful not to scratch the packing bore.

Installing the Packing

Note: Use special tool 13647-S to install the packing. This tool is customised to exactly fit the packing.

1. Be sure the bore is not scratched or pitted. Grease it with Lubriplate 630AA.
2. Put Lubriplate between each chevron. With the gland upside down, push each packing chevron ring in place.
3. Apply Lubriplate to the end of the 13647-S tool. The Lubriplate end of the 13647-S will pick up the chevron seals (Figure 4).

Note: The first chevron seal pushed into the gland must have a flat bottom.

4. Push the chevron seals into the bore one at a time (Figure 5).

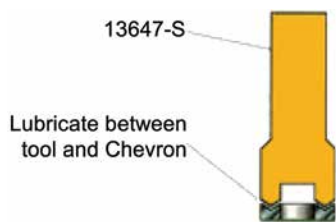


FIGURE 4.

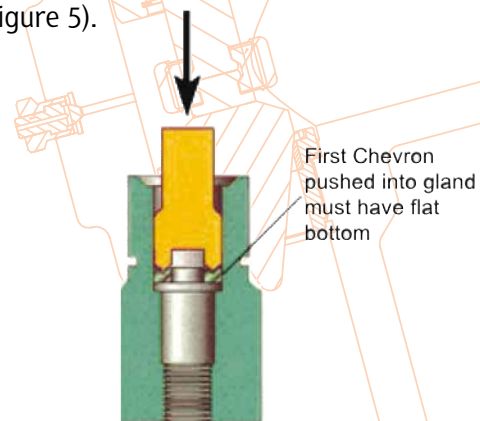


FIGURE 5.

5. Fit the spring washer, spring, and spacer over the packing as shown. Maintain $8/64$ " to $15/64$ " spring compression by removing no more than one packing chevron and/or adding spacer washers above or below the spring (Figure 6).
6. Lubriplate the stem and push it through the spacer, spring, spring washer, and packing. Taking care not to damage the stem seating surface, thread the top of the stem into the gland.

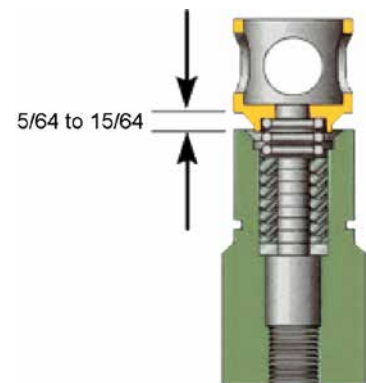


FIGURE 6.

Seat & Stem Maintenance

1. Ensure that the stem and seat are lapped and coated with grease.
2. Put the O-ring in the seat using Lubriplate and install it in the body with the O-ring side down.
3. Re-fit handle to the stem with one set screw. Ensure the screw is set on the stem flat. Turn the stem to the full-up position and wipe the O-ring and the O.D. of the gland with grease before screwing the packing gland into the body with an adjustable spanner.
4. Touch the seat with the gland and stop. Unscrew one-half turn. Run the stem down to assume alignment of the seat. Run the stem up two turns and then tighten the gland securely. Run the stem down snug against the seat.
5. Remove the handle and place the indicator ring on the packing gland.
6. Replace the handle. Raise or lower the handle so that its bottom edge is even with the zero mark on the indicator. Tighten the first set screw to lock the handle to the stem. Lock the flow indicator ring to the packing gland. Use the second handle set screw to lock the first handle set screw.

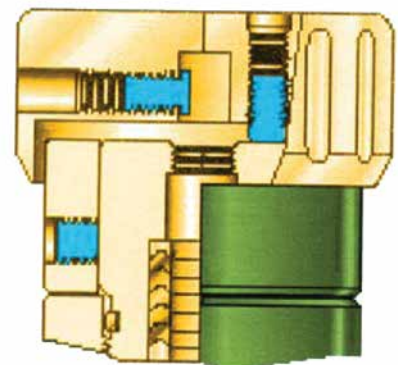


FIGURE 7.

6.0 REPLACEMENT PARTS H2 & FCV

APV manufactures a complete line of replacement parts for all our chokes. Available replacement parts include:

6.1 INDIVIDUAL PARTS

- Seats
- Blanking Caps
- Packing Assemblies
- Stems
- Cage Nipples
- Flow Beans
- Bonnets
- Hammer Lug Nuts
- Bean Wrenches

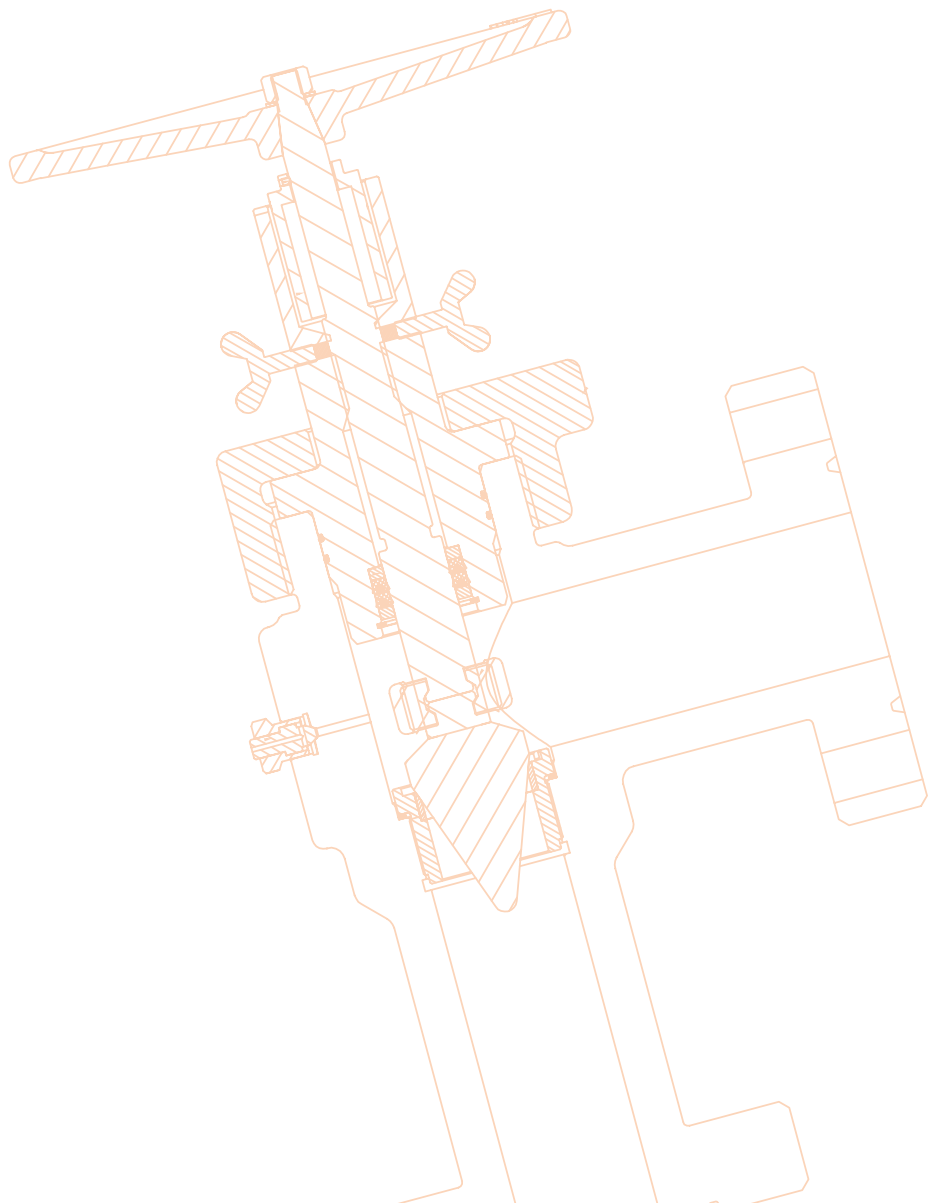
6.2 BONNET ASSEMBLY

- Bonnet
- Stem
- Indicator
- Handwheel
- Seals & Fittings
- Lug Nut (Optional)

6.3 ADAPTION KITS

(For converting adjustable chokes to positive)

- Blanking Cap
- Retainer
- Seal
- Lug Nut
- Flow Bean (Optional)



APPENDIX

API6A MATERIAL SERVICE CATEGORIES & RATING LEVELS

Overview Standards

Australian Pipeline Valve (APV) standards comply with technical specification API-6A. The description for APV equipment consists of a general description, working pressure, temperature rating, material class rating, product specification level (PSL) and performance requirement (PR). These ratings are defined in the following API-6A tables.

To comply with API-6A, APV offers:

- Pressure ratings in psi: 2000, 3000, 5000, 10,000 & 15,000. Temperature ratings: L, P, R, S, T, U, V, X & Y.
- Material class: AA, BB, CC, DD, EE, FF & HH.
- Product specification level: 1, 2, 3 & 4 (PSL 1, 2, 3, 4).
- Performance requirement: 1 & 2.

RECOMMENDED MINIMUM PSL FOR PRIMARY PARTS

NACE	No	Yes	Yes	Yes	No	Yes
High H2S Concentrate	No	No	Yes	No	No	Yes
Close Proximity*	No	No	No	Yes	Yes	Yes
Rated Working Pressure, PSI						
	PSL	PSL	PSL	PSL	PSL	PSL
5,000	1	1	2	2	1	3
10,000	2	2	3	3	3	4
15,000 and up	3	3	4	4	4	4

*See paragraph A5 of API-6A 17a. Ed.

PR1 is standard

PR2 also available (increased cycle times on test required)

API MATERIAL REQUIREMENTS

MATERIAL CLASS	MINIMUM MATERIAL REQUIREMENTS	
	BODY, BONNET & FLANGE	PRESSURE CONTROLLING PARTS
AA - General Service	Carbon or low allow steel	Carbon or low allow steel
BB - General Service	Carbon or low allow steel	Stainless Steel
CC - General Service	Stainless Steel	Stainless Steel
DD - Sour Service ^a	Carbon or low allow steel ^b	Carbon or low allow steel ^b
EE - Sour Service ^a	Carbon or low allow steel ^b	Stainless Steel ^b
FF - Sour Service ^a	Stainless Steel ^b	Stainless Steel ^b
HH - Sour Service ^a	CRAs ^{bcd}	CRAs ^{bcd}

As per API6A (ISO 10423) 2013:

^a As defined by ISO 15156 (all parts) (NACE MR0175) (See API6A)

^b In compliance with ISO 15156 (all parts) (NACE MR0175) (see API6A)

^c CRA required on retained fluid-wetted surfaces only; CRA cladding of low-alloy or stainless steel is permitted (See API6A)

^d CRA as defined in API6A; ISO 15156 (all parts) (NACE MR0175; see API6A) definition of CRA does not apply.

API TEMPERATURE REQUIREMENTS

TEMPERATURE CLASSIFICATION	OPERATING RANGE					
	F°			C°		
	MIN.		MAX.	MIN.		MAX.
K	-75	to	180	-60	to	82
L	-50	to	180	-46	to	82
N	-50	to	140	-46	to	60
P	-20	to	180	-29	to	82
R*	Room Temperature*					
S	0	to	140	-18	to	60
T	0	to	180	-18	to	82
U	0	to	250	-18	to	121
V	35	to	250	2	to	121
X*	0	to	350	-18	to	177
Y*	0	to	650	-18	to	343

* No longer referenced in API6A/ISO 10423-2013

API PRESSURE/TEMPERATURE RATINGS (Y)*

	TEMPERATURE IN °F								
	0 to 250	300	350	400	450	500	550	600	650
Rated Working Pressure PSI	2000	1955	1905	1860	1810	1735	1635	1540	1430
	3000	2930	2860	2785	2715	2605	2455	2310	2145
	5000	4880	4765	4645	4525	4340	4090	3850	3575

* Based on 'Y' Temp. Due to elastomers, Gate Valves & Chokes are temp 'T' as standard hence consult separate chart.

PSL (PRODUCT SPECIFICATION LEVEL) MATERIAL REQUIREMENTS

PSL Material Control is found in API Specification 6A, Specification for Wellhead and Christmas Tree Equipment Section 400

PSL (PRODUCT SPECIFICATION LEVEL) QUALITY CONTROL

PSL Material Control is found in API Specification 6A, Specification for Wellhead and Christmas Tree Equipment Section 400

PSL (PERFORMANCE REQUIREMENTS) LEVELS

There are two Performance Requirement Levels, PR1 and PR2. The latter represents more rigorous performance requirements. See API Specification 6A, Section 300 and Section 900. Section 905 covers valves (905.3 - Flowline Valves, 9.5.5 - Actuated Valves).

API6A TRIM TYPES

TRIM CODE	API SPEC, 6A RETAINED FLUID RATING	TRIM TYPE
T-21	AA	STANDARD TRIM For essentially non corrosive liquids or gases. Typical are crude and reined oils, natural or refined gases and processed hydrocarbons. Typical uses are wellheads, manifolds flowlines, and other similar installations requiring a through conduit valve. The temperature limitations are 0° to 250°F (-17.7°C to 121°C).
T-22	BB	STAINLESS TRIM For substantially the same service as T-21 but where the corrosion resistance of 13% Chrome Stainless Steel internal parts are desirable. Also usable for mildly corrosive fluids and gases where limited corrosion of the internal body surfaces can be tolerated. The temperature limitations are 0° to 250°F (-17°C to 121°C). Recommended when partial pressure of CO2 is greater than 7.3.
T-23	CC	FULL STAINLESS STEEL TRIM For any liquid or gaseous product for which the resistance of the 13% Chrome Stainless is adequate. Also used where the resistance of Stainless Steel is desirable from the standpoint of product purity. The temperature limitations are 0° to 250°F (-17.7°C to 121°C). Recommended when partial pressure of CO2 is greater than 30.
T-24	DD	SOUR GAS & OIL
S-24	EE	Primarily for sour gas and oil where resistance to Hydrogen Sulfide embrittlement is required. Also suitable for other chemicals, products or hydrocarbons when H2S is present. May be used when CO2 is present in smaller amount then H2S. The temperature limitations are 0° to 250°F (-17.7°C to 121°C).
T-26	FF	STAINLESS SOUR GAS AND OIL TRIM Primarily for sour gas and oil when the CO2 exceeds the H2S content. It is intended to provide resistance to the metal loss type of corrosion usually associated with CO2, plus resistance to Hydrogen Sulphide embrittlement. The temperature limitations are 0° to 250°F (-17.7°C to 121°C).
T-27		WATERFLOW (UNINHIBITED) Primarily for use in untreated or uninhibited brackish saline water typically associated with oilfield waterflood projects and/or disposal wells in which the internal plastic coating of the body surfaces provides resistance to salt water corrosion. The internal parts are also resistant to Sulfide embrittlement and corrosion. The temperature limitation are 0° to 250°F (-17.7°C to 121°C).
T-36	AA	LOW TEMPERATURE – STANDARD TRIM – GENERAL OILFIELD For essentially non-corrosive liquids or gases. Typical examples are crude and refined oils, natural or refined gases and processed hydrocarbons. Typical uses are wellheads, manifolds, flowlines and other similar installations requiring a through conduit valve. The temperature limitations are -50° to 180°F. (-45°C to 82°C).
T-37	DD	LOW TEMPERATURE – SOUR GAS AND OIL
S-37	EE	Primarily for sour gas and oil where resistance to Hydrogen Sulphide embrittlement is required. Also suitable for other chemicals, products or hydrocarbons where H2S is present. May be used when CO2 is present in smaller amounts than H2S. The temperature liitations are -50°C to 180° F (-45°C to 82°C).

SPECIAL TRIMS AND TEMPERATURE RANGES AVAILABLE UPON REQUEST.

VALVE TRIM CHART FOR API6A GATE & CHOKE VALVES

API6A TEMPERATURE CLASS P: SERVICE -20°F TO 180°F (-29°C TO 82°C)

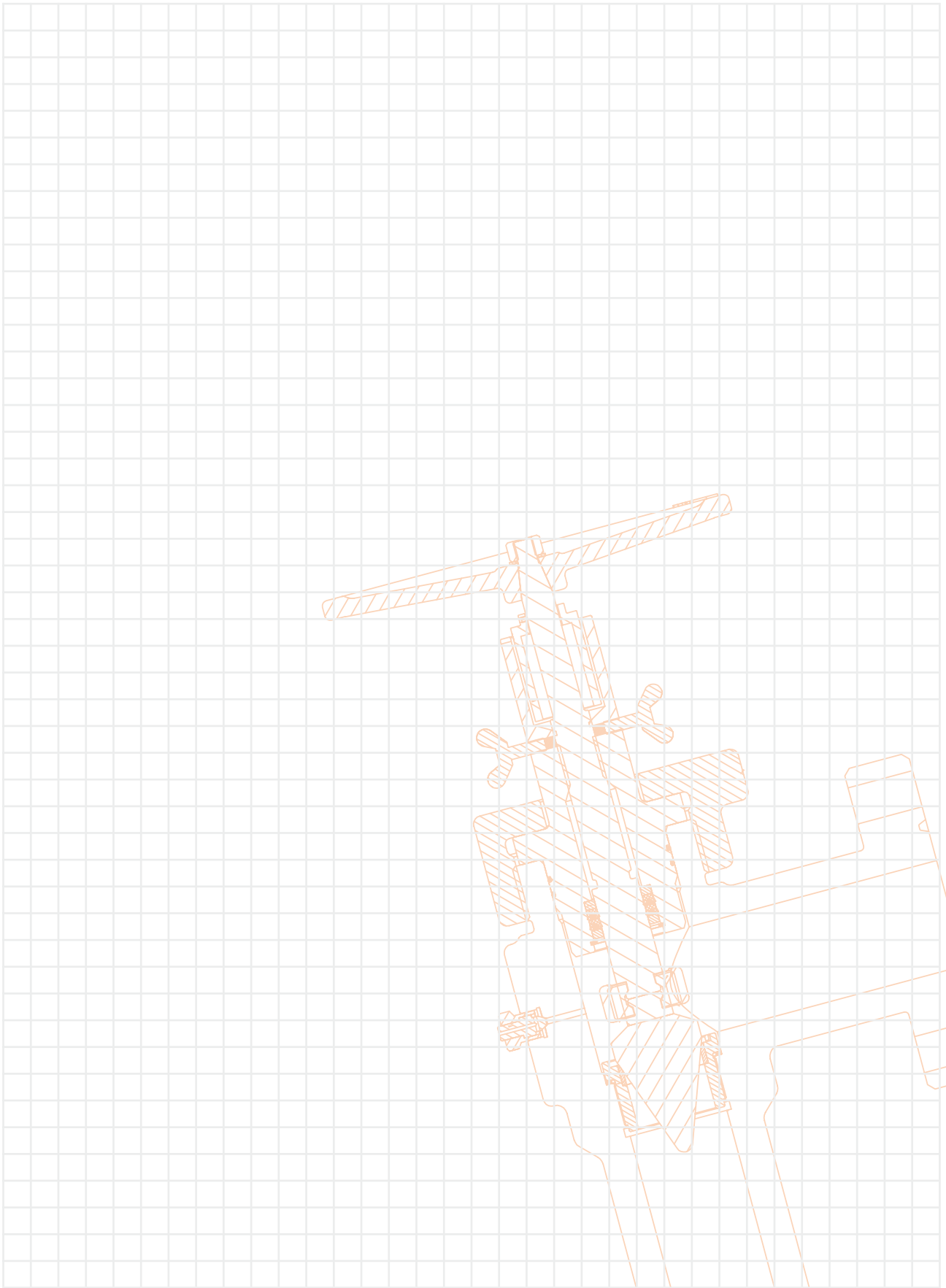
SERVICE	TRIM	API MATERIAL CLASS	PRESSURE RATING PSI	MATERIALS				
				BODY & BONNET	BONNET SEAL	NEEDLE/DISC/BEAN	SEAT	STEM
General Oilfield Gas, Oil	T21	AA	2,000 3,000 5,000	Carbon or Low Allow Steel	CS	4130 w/QPQ	4130 w/TFE ²	4130 w/MDC ⁵
General Moderately Corrosive CO ²	T22	BB	2,000 3,000 5,000	Carbon or Low Allow Steel	SS	410	410	17-4PH w/MDC ⁵
General Moderately Corrosive CO ²	T23	CC	2,000 3,000 5,000	API 60K CA6NM Stainless Steel	SS	410	410 w/TFE ²	17-4PH w/MDC ⁵
Sour (H ₂ S) Service NACE ⁴ MR01-75	T24	DD	2,000 3,000 5,000	API 60K Alloy Steel	SS	4130 or 17-4PH Nitrided	4130 w/TFE ²	17-4PH w/MDC ⁵
Sour (H ₂ S) Service NACE ⁴ MR01-75	S24	EE	2,000 3,000 5,000	API 60K Alloy Steel	SS	4130 or 17-4PH Nitrided	410 w/TFE ²	17-4PH w/MDC ⁵
Corrosive (CO ²) & Sour (H ₂ S) NACE ⁴ MR01-75	T26	FF	2,000 3,000 5,000	API 60K CA6NM Stainless Steel	SS	17-4PH	17-4PH w/TFE ²	17-4PH w/MDC ⁵
Waterflood	T27	EE	2,000 3,000 5,000	API 60K Alloy Steel w/Plastic Coat	SS	17-4PH	17-4PH w/TFE ²	17-4PH w/MDC ⁵
API 6A TEMPERATURE CLASS L: SERVICE -50°F TO 180°F (-46°C TO 82°C)								
General Oilfield Gas, Oil	T36	AA	2,000 3,000 5,000	API 60K Alloy Steel	CS	4130	4130 w/TFE ²	17-4PH w/MDC ⁵
Sour (H ₂ S) Service NACE ⁴ MR01-75	T37	DD	2,000 3,000 5,000	API 60K Alloy Steel	SS	4130	4130 w/TFE ²	17-4PH w/MDC ⁵
Sour (H ₂ S) Service NACE ⁴ MR01-75	S37	EE	2,000 3,000 5,000	API 60K Alloy Steel	SS	17-4PH	4130 w/TFE ²	17-4PH w/MDC ⁵

- 1 QPQ NITRIDE
- 2 TFE TEFLON
- 3 HF6 STELLITE #6
- 4 CHARPY V NOTCH IMPACT TEST
- 5 MDC MOLYBDENUM DISULFIDE COATING

This list is provided as a guide only. Australian Pipeline Valve reserves the right to provide alternate materials without prior notice.

NOTES

A large grid of graph paper for taking notes, consisting of 20 columns and 40 rows of small squares.





AUSTRALIAN PIPELINE VALVE®

ADELAIDE • BRISBANE • PERTH



AUSTRALIAN PIPELINE VALVE® HEAD OFFICE
70-78 Stanbel Road Salisbury Plain South Australia 5109 Telephone +61 (0)8 8285 0033 Fax +61 (0)8 8285 0044
email: admin@australianpipelinevalve.com.au

www.australianpipelinevalve.com.au

LOCAL DISTRIBUTOR/AGENT

If you have any requirements in the field of valves, please contact us for a prompt response. Continuous development of Australian Pipeline Valve products may necessitate changes in the design or manufacture process. Australian Pipeline Valve reserves the right to effect any such changes without prior notice.

