KTM HINDLE ULTRA-SEAL SERIES 300 TWO PIECE CRYOGENIC
INSTALLATION AND MAINTENANCE INSTRUCTIONS

Before installation these instructions must be fully read and understood

1 STORAGE / PROTECTION / SELECTION

Storage
When valves are to be stored for some time before being fitted, storage should be in the original delivery crates with any waterproof lining and/or desiccant remaining in place. Storage should be off the ground in a clean, dry, indoor area. If storage is for a period exceeding six months the desiccant bags (if supplied) should be changed at this interval.

Protection
KTM Hindle valves are delivered with protection according to customer's specification, or in accordance with the Quality Assurance Manual, to protect the valve seats and closure member from damage. Wrapping and/or covers should be left in place until immediately before fitting to the pipe.

Selection
Ensure the valve's materials of construction and pressure/temperature limits shown on the identification plate are suitable for the process fluid and conditions. If in doubt contact KTM Hindle.

2 INSTALLATION

WARNING!
For Safety reasons, it is important to take the following precautions before you start work on the valve:

1. *Personnel making any adjustments to the valves should utilize equipment and clothing normally used to work with the process where the valve is installed.*
2. *The line must be depressurized, drained and vented before installing the valve.*
3. *Handling and installation of all valves, operators and actuators must be carried out by personnel trained in all aspects of installation and manual/mechanical handling techniques.*
4. *Ensure the valve pressure/temperature limitations marked on the identification label are above or equal to service conditions.*

1. KTM Hindle Series 300 low temperature valves for -50°C service and above are bi-directional as standard and may be fitted in either direction. Valves for service below -50°C are uni-directional and should be fitted with the body seat located downstream.
2. Installation of cryogenic valves should be carried out with the extension bonnet displaced within 45° of vertical.
3. Remove protective covers from valve faces.
4. Ensure that mating flanges and gaskets are clean and undamaged.
5. Possibility of abrasive particles (weld slag, sand etc.) within the piping system could damage valve seating/ball. The system will need to be flushed clean.
6. Ensure mating pipe flanges are aligned correctly. Bolting should be easily inserted through mating flange holes.
7. Fit the valve into pipework ensuring easy access of the lever/handwheel.
8. Tighten the flange bolts in a diagonal pattern.

3 OPERATION AND ROUTINE MAINTENANCE

!! Read all warning labels fitted to the valve before operation or maintenance !!

Scope
KTM Hindle Series 300 Cryogenic Valves both manual and actuated.

Operation
All standard manually operated valves are 'clockwise to close'. The closed position is indicated by either the handlever or indicator arrow being at 90° to the pipe/valve bore axis.

Routine maintenance
No routine maintenance is required other than periodic inspection to ensure satisfactory operation and sealing.
Any sign of leakage from the gland packing should be addressed immediately by depressurizing the valve and tightening the gland nut. If no further adjustment is possible, or if seat or joint leakage is suspected, the valve will require a complete overhaul.
This should be carried out after depressurisation and in accordance with KTM Hindle Maintenance Instructions. Only KTM Hindle spares should be used.

Spare parts
KTM Hindle valves are identified by a figure number, stamped on the identification plate, located on the valve body flange. This reference should be quoted in respect of any after sales queries, spare parts or repair enquiries/orders.

4 MAINTENANCE

CAUTION
Before attempting any maintenance, ensure the system has been fully depressurized and if necessary drained of any dangerous fluids. The valve being removed should be operated at least once and left in half open position before removal. Before disassembling the valve, ensure the valve has been decontaminated correctly from any harmful gasses or fluids and that it is within a safe temperature range for handling.
Personnel making any adjustments to the valves should utilize equipment and clothing normally used to work with the process where the valve is installed.
Handling of all valves, operators and actuators must be carried out by personnel trained in all aspects of manual and mechanical handling techniques.

Parts identification
The illustrations in Section 5 show the parts comprising the Series 300 Series valves. Item numbers for spare parts should be identified from GA Drawings supplied, or exploded views shown in the illustrations.

4A: Replacement of valve components
If no further adjustment of the gland is possible and shaft leakage is still evident or seat leakage is suspected, the valve will need to be removed from the line in order for new seats/seals to be fitted.
After removal of the valve, place the valve on a workbench and adopt the following procedure to remove/replace the seats/seals.

1. Remove connector bolting, and connector.
2. Remove connector seat ring and ball.
3. Remove body seat ring, shaft and thrust bearing.
4. Remove the operator (lever, gearbox, actuator) in accordance with instructions in Section 4B.
5. Remove bonnet screws and bonnet.
6. Remove gland nut, tab washer, Belleville washers and gland ring.
7. Remove extension shaft, primary shaft seal and bonnet fire-seals
8. Remove shaft spacer and bonnet primary seal.

Refitting is the reversal of removal.

Before refitting, ensure all sealing and metallic surfaces in seat pockets and shaft seal bores are free from damage/corrosion. Minor defects can be polished using abrasive cloth. If major defects are found, contact KTM Hindle for possible repair or component exchange.

4B: Removal and refitting of operator
Removal of handlever/T-bar
1. Remove the shaft nut and tab washer/T-bar screw and washer.
2. Remove the handlever/T-bar.

Removal of gearbox/actuator
1. Remove bracket screws.
2. Remove mounting bracket and gearbox/actuator.
3. Remove drive adaptor.

Refitting is the reversal of removal.

4C: Setting of travel stops on gearbox and actuated operators
See Figure 4 Section 5 for diagram of travel stop positions

(a) With valve out of pipeline:
1. Close valve fully.
2. Remove plastic indicator cover from top of gearbox.
3. Release closed stop screw.
4. Align diamond shaped drive points parallel to valve bore as shown in Figure 4 (Section 5).
5. Tighten closed stop screw, allowing for backlash between adaptor and shaft.
6. Hold stop screw in position with Allen key and tighten locking nut.
7. Open valve fully.
8. Visibly check that ball port is aligned with valve bore. If incorrect follow rest of procedure.
9. Release open stop screw.
10. Adjust ball position using handwheel until valve is porting correctly.
11. Tighten open stop screw and lock off with locknut.

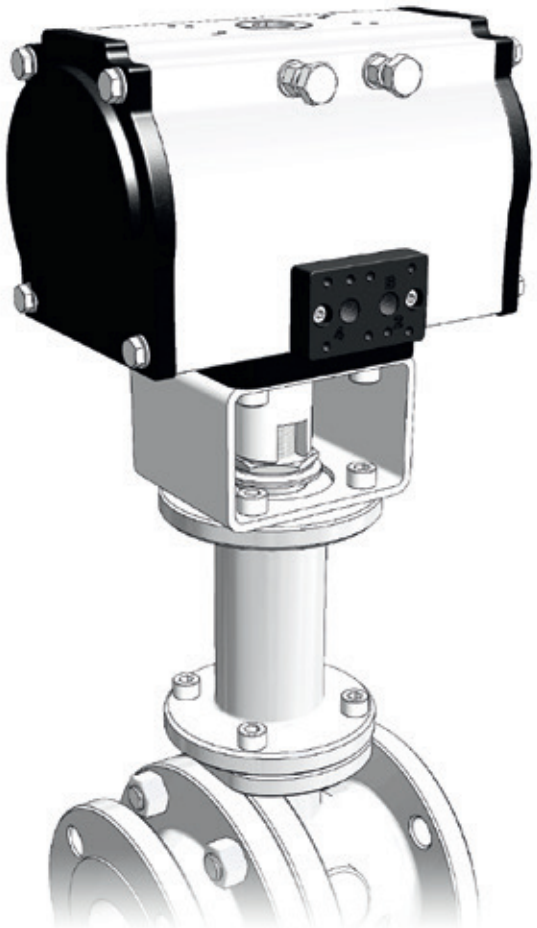
(b) With valve in pipeline:
Adopt steps 1-6 as above for open and closed positions.
Note: for the setting of stops on actuators, see separate instructions.

Orientation of gearbox
1. As standard, gearbox input shaft is across line with the offset opposite the valve body connector end.
2. Orientation of input shaft can be rotated through 180º if required. This requires removal of gearbox screws, rotation of gearbox through 180º, and refitting of gearbox screws.

4D: Actuator assembly
Prior to assembly, check the following details:
1. Actuator type and style, i.e. double acting or spring return.
2. Position of actuator in relation to valve and pipeline.
3. Fail-safe position of valve, i.e. open or closed.

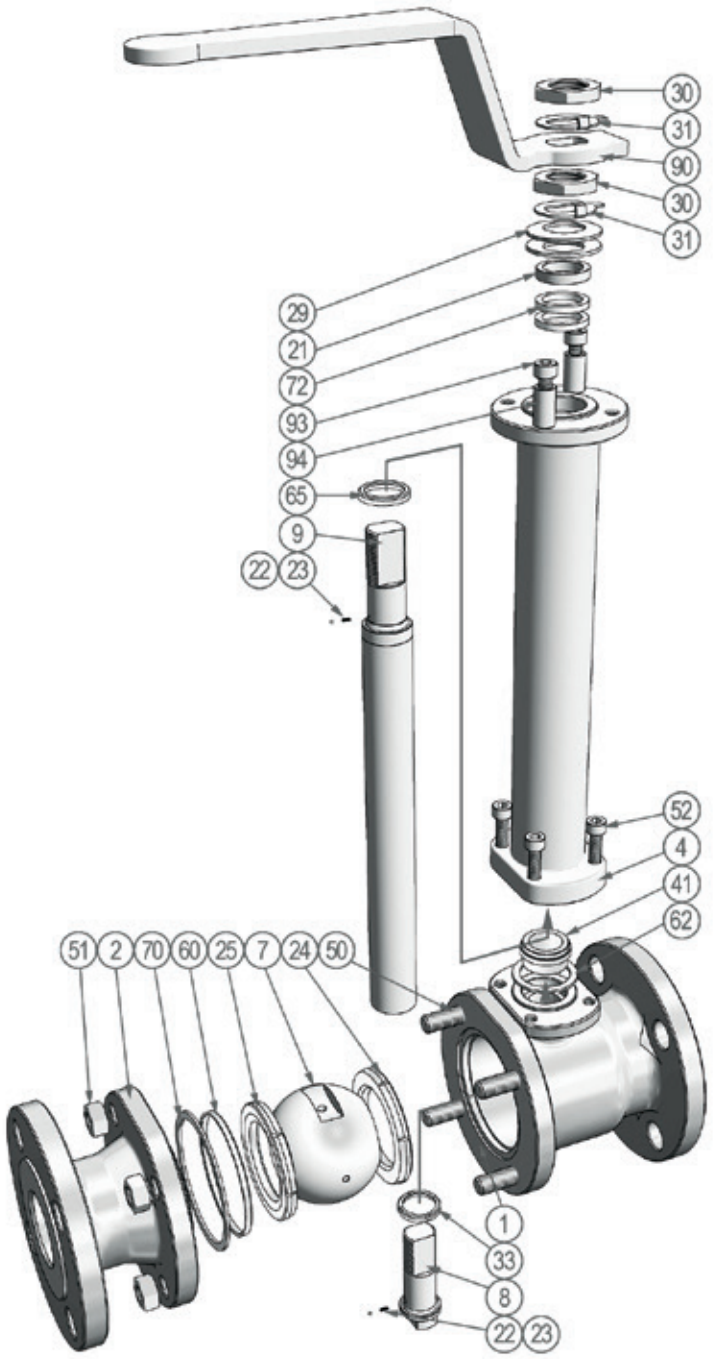
Assembly
1. Close valve fully.
2. Remove handlever/T-bar/gearbox as per Section 4B.
3. Remove stop screws and stop collars.
4. Ensure that adaptor coupling is a good fit with actuator drive and extension shaft.
5. Position mounting bracket on to valve and fit bracket screws. Do not tighten.
6. Position adaptor coupling on to valve.
7. Assemble actuator over adaptor coupling and on to mounting bracket.
8. Fit actuator screws. Do not tighten.
9. With actuator secure, check for free alignment of adaptor coupling between actuator drive and extension shaft. Tighten mounting bracket screws and re-check alignment.
10. With actuator in correct position, tighten actuator screws.
11. If the actuator is fitted with travel stops, adjust to the closed position. Operate to the open position and adjust so that the ball port is aligned with the valve bore.

FIGURE 1
Bonnet top and actuator diagram
(Model shown is NPS 3)



5 COMPONENT AND ASSEMBLY DRAWINGS

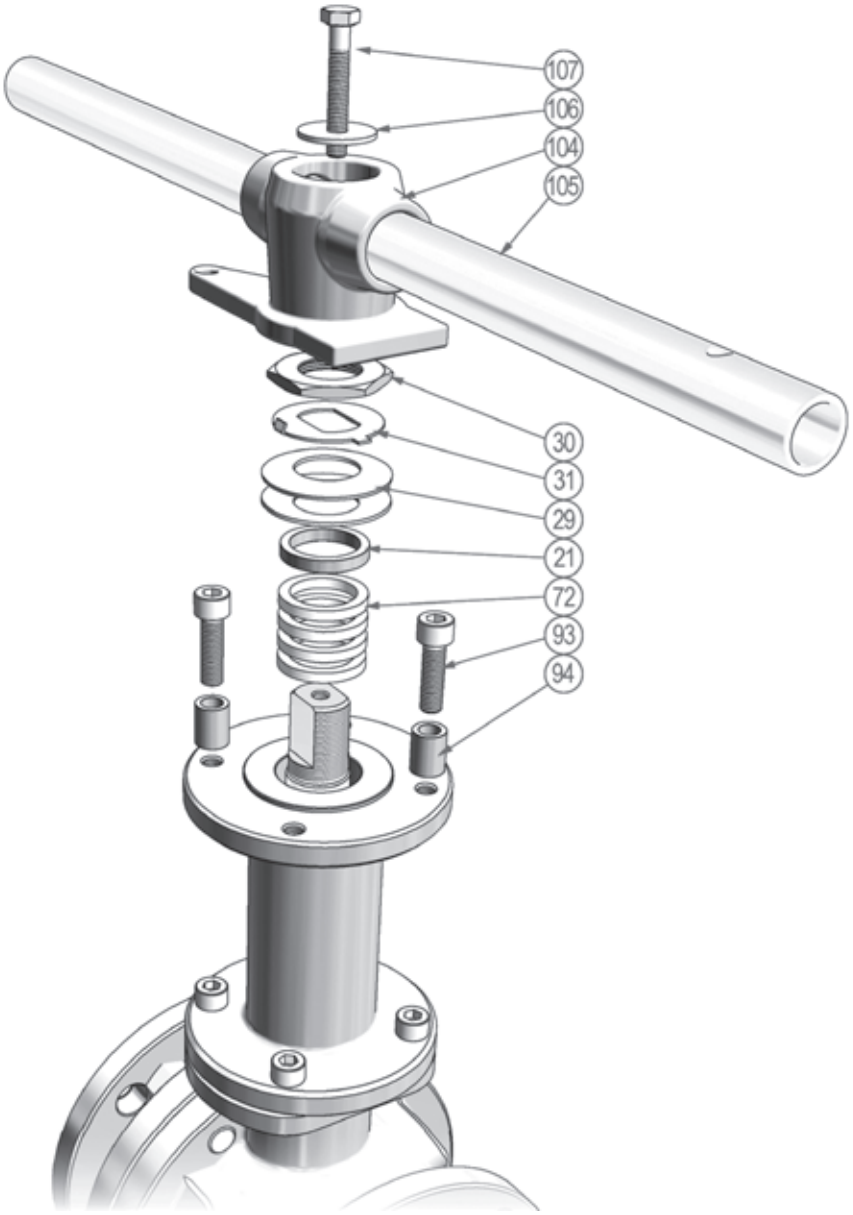
FIGURE 2
Typical component assembly drawing
(Model shown is NPS 1½)



PARTS LIST

Item	Part name
1	Body
2	Connector
4	Bonnet
7	Ball
8	Shaft
9	Extension shaft
21	Gland collar
22	Antistatic ball (shaft/ext. shaft)
23	Antistatic spring (shaft/ext. shaft)
24	Body seat
25	Connector seat
29	Gland spring
30	Shaft nut
31	Tab washer
33	Shaft thrust bearing
41	Shaft spacer
50	Body stud
51	Body nut
52	Bonnet screw
60	Body primary seal
62	Bonnet primary seal
65	Shaft primary seal
70	Body fireseal
72	Bonnet fireseal
90	Handlever
93	Stop screw
94	Stop collar

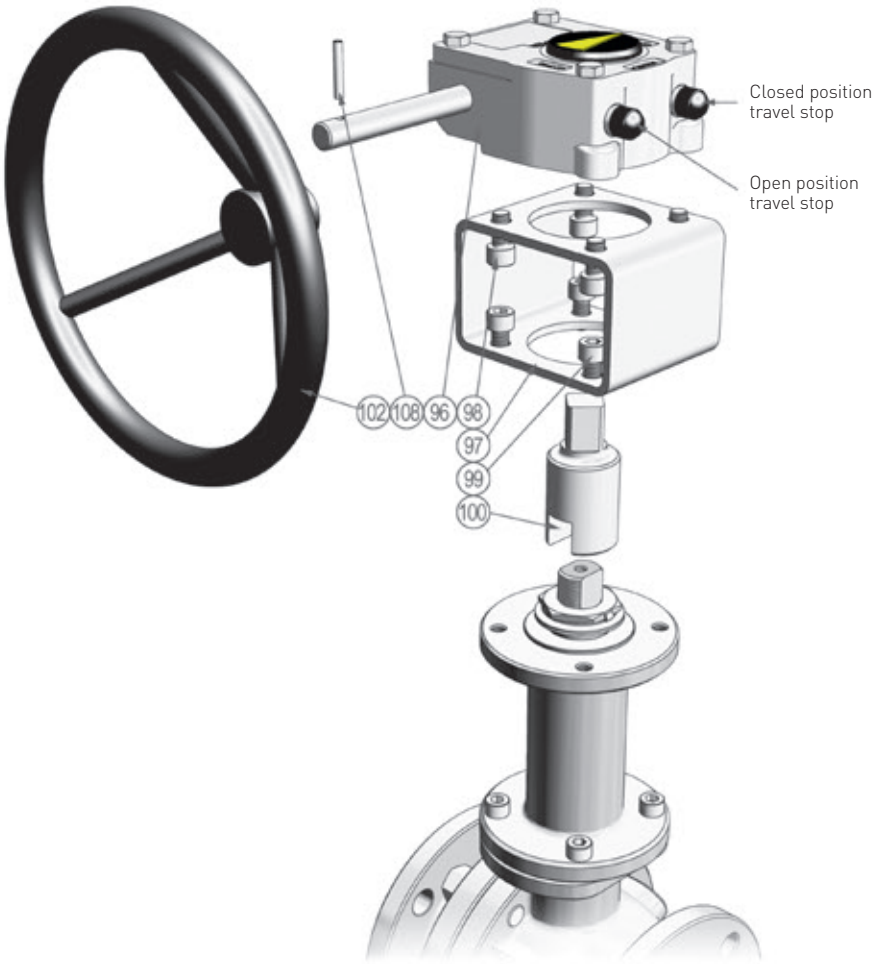
FIGURE 3
Typical component assembly drawing T-bar assembly
(Model shown is NPS 3)



PARTS LIST

Item	Part name
21	Gland collar
29	Gland spring
30	Shaft nut
31	Tab washer
72	Bonnet fireseal
93	Stop screw
94	Stop collar
104	T-bar adapter
105	T-bar tube
106	T-bar washer
107	T-bar screw

FIGURE 4
Typical component assembly drawing gearbox assembly
(Model shown is NPS 3)



PARTS LIST

Item	Part name
96	Gearbox
97	Mounting bracket
98	Gearbox screw
99	Bracket screw
100	Coupling
102	Handwheel
108	Handwheel pin