



## **WACO Environmental Products**

# **WACO Series 2000 Telescopic Valves - Sample Specification**

### **General**

The fabricated 304L or 316L stainless steel telescopic valves shall be Series 2000 type as manufactured by WAGO Products, Inc., Baltimore, Maryland or equal. Valves and appurtenances shall be furnished with all necessary accessories and parts for a complete installation and shall be the latest standard product of a manufacturer regularly engaged in the production of equipment of this type. All telescopic valves and their operators shall be furnished by the same manufacturer.

### **Design**

Except as otherwise indicated by this specification, all telescopic valves will be designed and manufactured to meet or exceed all specified criteria defining loading calculations, structural strength, deflection requirements, and material specifications including minimum dimensions.

Structural components shall have a minimum design safety factor of 4 with regard to ultimate tensile, compressive, and shear strength and a minimum safety factor of 2 with regard to tensile, compressive, and shear yield strength.

### **Telescopic Tubes**

The telescopic tubes are to be fabricated from minimum 16 gage thickness tube, plate and shapes, reinforced as required to meet the operating loads. The tube shall be accurately formed and finished to assure a smooth leak resistant fit with the valve gasket. The tube shall have a flush upper edge or two opposing v notch weir cut-outs as specified. The tube shall be attached to the operator stem by means of a stainless steel yoke of the same alloy as the tube, minimum ¼" thickness, bolted to the outer tube wall such that the operator stem may be

removed without disengaging the tube from the seal and drain pipe assembly.

The outer tube wall shall have a guide bar along the entire telescoping length to prevent rotation of the tube within the seal assembly during operation.

### **Seal and Drain Pipe**

The seal gasket shall be minimum ½" thick neoprene or EPDM rubber, with accurately cut tube center hole and bolt holes to match drain pipe and telescopic valve flanges. The telescopic valve shall include a lower seal flange of the same alloy as the tube, machined to match the drain pipe bolt hole pattern and tube/gasket center holes. The valve seal gasket and valve flange shall have guide grooves to match the tube anti-rotation guide bar.

The tube center hole on the seal flange shall be sized to assure that compression of the seal against the outer tube wall shall occur when the seal and pipe assembly is properly secured to the drain pipe flange. Stainless steel flange mounting bolts of the same alloy as the tube shall be supplied by the telescopic valve manufacturer. The drain pipe and integral mounting flange shall be supplied by others.

### **Manual Operator**

The standard telescopic valve operator will be a BS-1015 horizontal handwheel type mounted on a pedestal unless otherwise specified. The bronze operating nut of the operator will be accurately machined to match the thread of the rising stem. Non-rising stems shall not be acceptable. The operating nut shall be supported by regreasable ball or roller thrust bearings top and bottom, secured in an

accurately machined cast aluminum or iron housing bolted to operator support pedestal.

Where torque, operation or space requirements dictate, bevel gear boxes with either a handcrank or handwheel shall be supplied in lieu of the standard operator. Bevel gear boxes shall have stainless steel input and/or output shafts, accurately machined gears supported by ball or roller bearings secured in an accurately machined cast aluminum or iron housing bolted to the operator support pedestal.

Regardless of the manual operator used to meet the specification, the required effort on the handwheel or crank is to be limited to a maximum 40 lb. pull. The lift mechanism will be capable of withstanding an effort of up to 200 lbs. without damage to the operator, stem or telescopic valve. Manually operated telescopic valves are to be supplied with adjustable stop collars as required to set the valve opening range. Where the size of the telescopic valve requires lift assist, but the frequency of operation does not indicate use of a permanent electric operator, a portable electric or hydraulic motor operator will be supplied as specified.

### **Electric Operator Option**

The telescopic valve will be provided with an electric multi-turn operator incorporating integral limit switches to stop the telescopic tube in the desired full open and closed positions. The operator will also have a torque limit switch to prevent damage to an obstructed telescopic valve. Operators can be specified for modulating function where required to maximize level or flow control. Electric operators shall be in accordance with ANSI/AWWA C540 "Standard for Power-Actuating Devices for Valves and Slide Gates".

### **Operator Support**

A fabricated pedestal of the same alloy as the tube shall be mounted on the operating floor or over-hung off of a wall at the operating level by means of an offset wall bracket. The pedestal shall be capable of supporting all loads imparted by the operator.

### **Operator Stems**

Stem shall be of 1½" diameter stainless steel rod with accurately machined Acme stub threads. Stem shall be designed for a safety factor of 2 based on a critical buckling compressive load calculated by the Euler Column formula where C=2 and assuming a 50 lb torque on the AWWA nut. The stem shall be welded to the tube lifting yoke.

Stem guides will be supplied to support the stem as required to meet the stem design criteria and shall be fabricated of the same alloy material as the tube. Stem guides shall have bronze or UHMW bushings to reduce stem friction and wear if specified. Stem guides shall be adjustable in multiple dimensions to allow for alignment with operator and gate stem nut. Guides will be mounted on the installation wall as required to support and align the stem(s) properly. All stems shall be supplied with protective clear UV resistant stem covers with vent holes and mylar indicator tapes for quick visual valve position reference.

### **Specifying Style:**

To specify 2000 series models, designate the stainless steel alloy, drain pipe inside diameter (including any reductions for pipe linings or coatings), the total length of tube travel (not the overall tube height), and the drain pipe flange and operating floor elevations.

### ***WACO Products, Inc.***

1330 Knecht Avenue  
Baltimore, Maryland 21229-5511  
410-242-1000 Fax 410-247-4890  
Sales@WACOProducts.com