Robertshaw
CONTROLS COMPANY

DATA SHEET

MODEL V66

DIAPHRAGM CONTROL VALVE

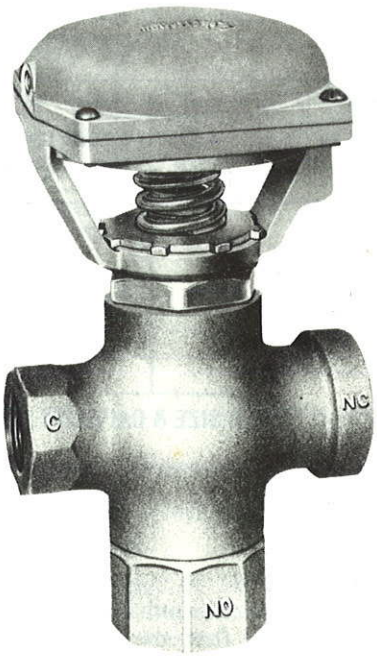
3-WAY MIXING

GENERAL DESCRIPTION

This valve is especially designed for the control of either hot water or chilled water, and is available in sizes ½" through 2" with linear flow characteristics.

Two spring-loaded U-cups and two expanders provide a positive self-adjusting seal around the valve stem. Service life of the seal is greatly extended by the use of a stainless steel stem.

The valve is operated by a pneumatic actuator, which includes a die-cast aluminum yoke and case and a molded rubber diaphragm.



SPECIFICATIONS

VALVE ASSEMBLY

ACTION: Top port normally closed. Bottom port normally open.

FLOW CHARACTERISTICS: Linear (Constant total flow).

RATING: ½ & ¾" sizes, 250 psi (17.2 bar), 35° to 250° F (1.6° to 121° C) water. 1" through 2" sizes, 300 psi (20.7 bar), 35° to 250° F (1.6° to 121° C) water.

BODY:

Pattern: 3-Way (integral bonnet on ½" and ¾" sizes).
Sizes: ½" through 2" (23.7 through 50.8 mm) NPT.
Connections: Female NPT.
Material: Brass.
Seat: Brass, integral with body.

PACKING: Two spring-loaded rubber U-cups.

VALVE TRIM:

Plug: Brass.
Stem: Stainless steel.

ACTUATOR ASSEMBLY

SIZE: 10 sq. in. (64.5 cm^2) effective area.

SPRING RANGES:
4-8 psi (.28-.55 bar)
8-13 psi (.55-.90 bar)

MAXIMUM AIR PRESSURE: 30 psi (2.1 bar)

AMBIENT TEMPERATURE RATING: 225°F (107°C) max.

DIAPHRAGM: Molded rubber.

CASE AND YOKE: Die-cast aluminum.

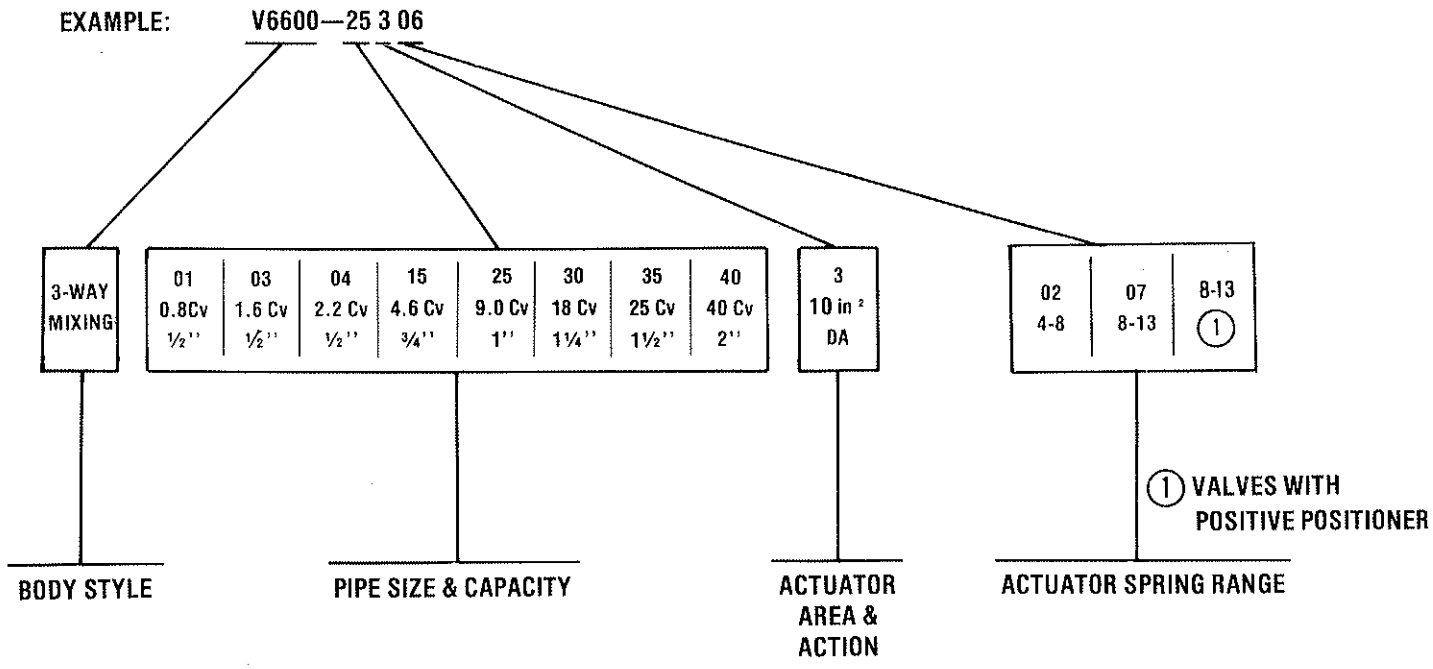
SPRING: Alloy steel, cadmium plated.

ORDERING INFORMATION: SPECIFY: Model No. V6600, size and spring range or positioner.

ORDER FROM:
Local Office of
CONTROL SYSTEMS DIVISION
ROBERTSHAW CONTROLS COMPANY
or office noted below.

ROBERTSHAW CONTROLS COMPANY • CONTROL SYSTEMS DIVISION 1800 GLENSIDE DRIVE
P. O. BOX 27606 • RICHMOND, VIRGINIA 23261

MODEL NO. CODES



CLOSE OFF RATINGS

Pressure drop acting against the unbalanced area of the valve produces a thrust. When the pressure in the normally-open port is greater than the pressure in the normally-closed port, the additional thrust must be compensated for by additional signal pressure applied at the top limit of the actuator range.

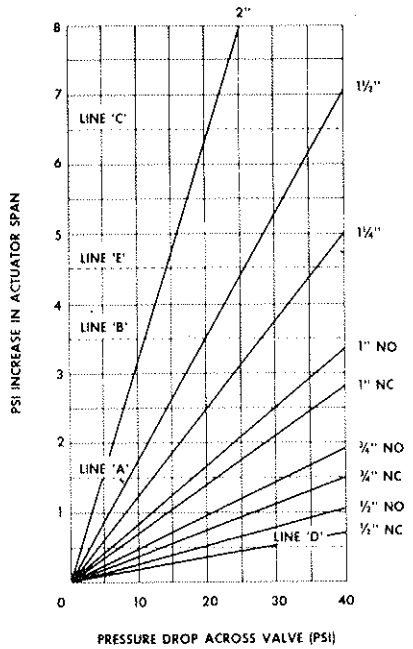


Figure 1—CLOSE OFF RATING, V66 VALVE

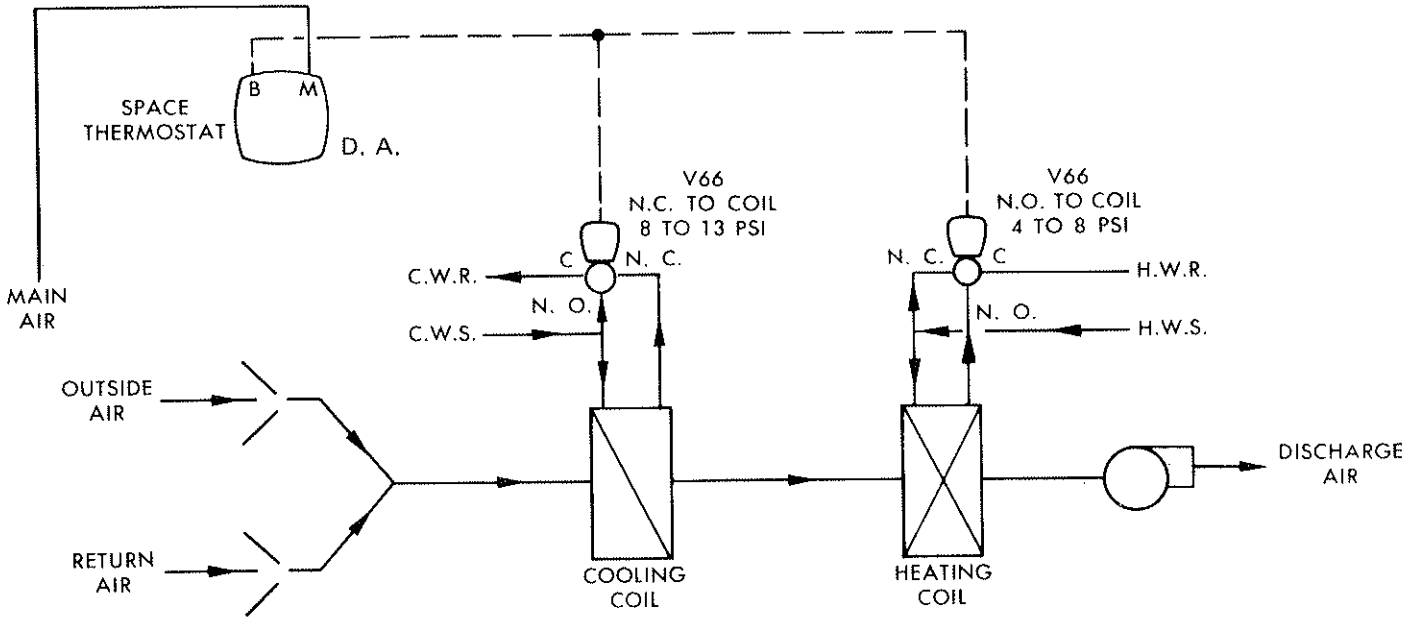
Conversely, when the pressure in the normally-closed port is greater than the pressure in the normally-open port, the additional thrust must be compensated for by a decrease in signal pressure at the low limit of the actuator range. (See Fig. 1)

For tight close off the valve must not be operated at pressure drops greater than those designated by the intersections of the valve size curves with the appropriate line selected from Table III (See Fig. 1). Maximum allowable pressure drop for any valve (including other actuator ranges) is 40 psi.

Table III— CLOSE OFF LINES

ACTUATOR RANGE (psi)	NORMALLY-OPEN PORT	NORMALLY-CLOSED PORT
4 - 8	Line C	Line B
8 - 13	Line A	Line C

TYPICAL APPLICATION



A. H. UNIT HEATING AND COOLING COIL CONTROL

INSTALLATION

Control valves are sized to the demand of the system to be controlled and are frequently smaller than supply lines. They should be installed as close as possible to the coil being controlled. Preferably, a control valve should be installed in the vertical position so the actuator will be over the valve, but can be installed in any position if necessary.

When installing a valve, these simple precautions should be taken:

1. Install a pipeline strainer just ahead of the valve.
2. Allow sufficient clearance that the valve may be easily serviced if necessary.
3. A minimum clearance of 3½" must be allowed between the extreme top of the actuator and the nearest obstruction. This permits removal of actuator yoke and parts required to replace packing.

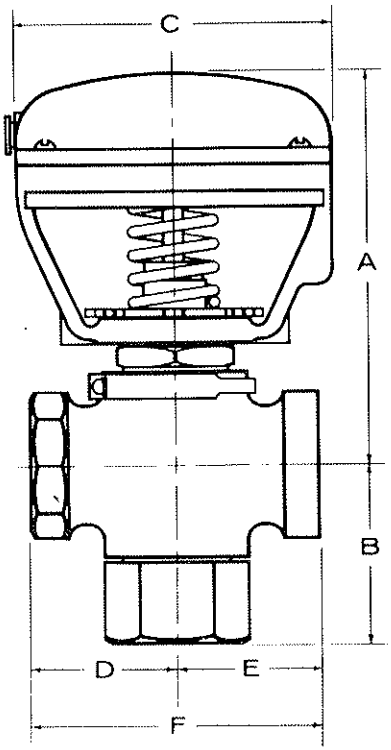


TABLE IV

SIZE in. (mm)	DIMENSIONS — in. (mm)						WEIGHT LBS. (KG)
	A	B	C	D	E	F	
½(12.7)	4 9/16(116)	1 15/16(49.2)	4 5/16(110)	1 3/8(34.9)	1 3/8(34.9)	2 3/4(69.9)	3.1 (1.41)
¾(19.05)	4 23/32(120)	2 7/32(56.3)	4 5/16(110)	1 19/32(40.5)	1 19/32(40.5)	3 5/16(55.6)	3.4 (1.55)
1 (25.4)	5 29/32(150)	3 3/8(85.7)	4 5/16(110)	2 1/2(63.5)	2 1/2(63.5)	5 (127)	6.9 (3.14)
1¼(31.8)	5 29/32(150)	3 3/8(85.7)	4 5/16(110)	2 9/16(65.1)	2 9/16(65.1)	5 1/8(130)	8.0 (3.64)
1½(38.1)	5 29/32(150)	3 3/8(85.7)	4 5/16(110)	2 9/16(65.1)	2 9/16(65.1)	5 1/8(130)	8.0 (3.64)
2 (50.8)	6 5/16(160)	3 25/32(96.1)	4 5/16(110)	3 3/8(85.7)	3 3/8(85.7)	6 3/4(171)	16.3 (7.41)

MAINTENANCE AND REPAIR

The V66 requires very little maintenance after proper installation. It is recommended that field repairs be limited to the following: (No Special Tools Required)

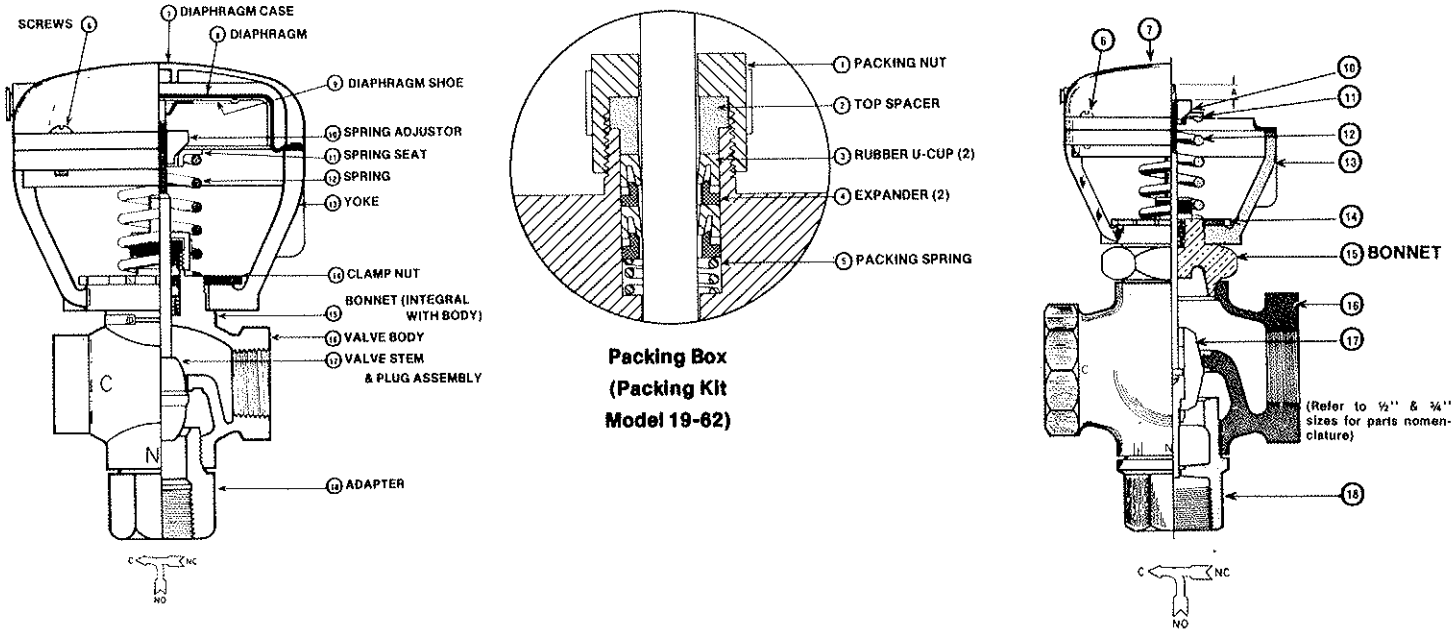


FIGURE 2-V66 VALVE ASSEMBLY

PACKING REPLACEMENT

If valve stem leakage is encountered, replace the U-cup packing as follows:

1. Remove clamp nut (14) and lift yoke (13) and assembled parts (7, 8, 9) off valve.
2. Measure dimension "A" from end of stem and plug assembly (17) to top of spring adjustor (10) and record. During reassembly of the valve, this dimension must be reset ± 1/64" so as not to change the actuator range.
3. Remove spring adjustor (10), spring seat (11), and spring (12).
4. Remove packing nut (1), spacer (2), U-cup packing (3), expanders (4), and packing spring (5). Be sure that the packing cavity in the bonnet and the valve stem are clean.
5. Drop packing spring (5) and expander (4) over stem into bottom of packing box. Apply a bead of valve seal lubricant (accessory number N6-3) around the valve stem and push one U-cup (3) over stem into packing box, thereby lubricating inside diameter of the packing and filling the annular groove in the packing with lubricant. Repeat this procedure with another expander (4) and U-cup (3) packing, taking care with U-cup *not to damage the sealing lip.* Drop top spacer (2) over stem and screw on packing nut (1) to a positive stop.
6. Reassemble spring (12), spring seat (11), and spring adjustor (10). Reset dimension "A" as recorded in step 2 above.
7. Replace yoke and assembled parts (7, 8, 9) on valve body (16) and lock in place with clamp nut (14). Make sure that end of stem is engaged in shaped hole in center of diaphragm shoe (9) during this operation.

VALVE PLUG REPLACEMENT

If indications of excessive valve seat leakage are encountered, the Stem and Plug Assembly (17) may be replaced. The packing should be replaced any time the stem and plug assembly is replaced. Replacement of parts is accomplished as follows:

1. Perform steps 1 through 4 under "Packing Replacement" above.
2. Remove adapter (18) from valve body (16). Remove old stem and plug assembly (17).
3. Insert new stem and plug assembly into valve body (16) and replace adapter (18).
4. Perform steps 5, 6, and 7 as listed under "Packing Replacement."