



# ELECTRO-PNEUMATIC CONTROL VALVE

## MODEL CV-COS-20

### POSITIONER/ACTUATOR CONTROL VALVE WITH SEPARATOR AND STEAM TRAP

#### Features

**Steam control valve featuring a digital I/P positioner combined with a compact pneumatic actuator. Built-in cyclone separator and steam trap to provide high-quality steam for process applications.**

1. Built-in cyclone separator and self-modulating free float steam trap provide dry, high-quality steam supply improving productivity and product quality for process applications.
2. Removal of condensate while valve is closed reduces scale adhesion and water hammer.
3. Pneumatic actuator with digital I/P positioner in a compact configuration.
4. Rolling actuator diaphragm ensures linearity over the operating stroke and maximizes life.
5. Self-adjusting positioner features zero calibration by auto-tuning, which ensures tight shut-off and improves control during low flow.
6. Positioner LCD allows simple operation with capacitive keys and displays valve travel and error codes.
7. Self-adjusting chevron packing minimizes seal leaks, stem wear and stiction/hysteresis problems.



#### Specifications

##### VALVE

|                                                     |                                                                |     |
|-----------------------------------------------------|----------------------------------------------------------------|-----|
| Model                                               | CV-COS-20                                                      |     |
| Body Material                                       | Cast Steel (A216 Gr.WCB)<br>Cast Stainless Steel (A351 Gr.CF8) |     |
| Connection                                          | Flanged ASME                                                   |     |
| Size (mm)                                           | 15, 20, 25, 40, 50, 65, 80, 100                                |     |
| Max. Operating Pressure (MPaG)                      | 150RF                                                          | 1.0 |
|                                                     | 300RF                                                          | 2.0 |
| Max. Operating Temperature (°C)                     | TMO                                                            | 220 |
| Leak Rate Class (IEC 60534-4)/<br>Seat Plug Sealing | Class IV/Metal sealing (Option: Class VI/Soft sealing)         |     |
| Characteristic                                      | Equal percentage or linear                                     |     |
| Rangeability                                        | 50 : 1                                                         |     |
| Applicable Fluid*                                   | Steam                                                          |     |

\* Do not use with toxic, flammable or otherwise hazardous fluids.

1 MPa = 10.197 kg/cm<sup>2</sup>

PRESSURE SHELL DESIGN CONDITIONS (**NOT** OPERATING CONDITIONS): Maximum Allowable Pressure (MPaG) PMA: 3.1  
Maximum Allowable Temperature (°C) TMA: 220

##### ACTUATOR / POSITIONER

|                                                 |                                |
|-------------------------------------------------|--------------------------------|
| Fail-safe Position                              | Valve CLOSED (Air to Open)     |
| Motive Medium                                   | Oil-free air, filtered to 5 µm |
| Electrical Input Signal (mA)                    | 4 to 20                        |
| Load Impedance (V)                              | Max. 6.3                       |
| Air Supply Pressure Range for Positioner (MPaG) | 0.37 to 0.6                    |
| Ambient Temperature Range (°C)                  | -20 to +80                     |
| Protection Class                                | IP 66                          |
| Intrinsically Safe Rating (optional)            | ATEX II 2G Ex ia IIC T4        |



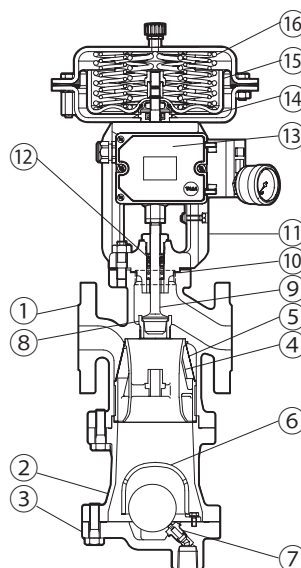
To avoid abnormal operation, accidents or serious injury, DO NOT use this product outside of the specification range. Local regulations may restrict the use of this product to below the conditions quoted.

## Configuration

| No. | Description                    | Material                                              | JIS                   | ASTM/AISI*              |
|-----|--------------------------------|-------------------------------------------------------|-----------------------|-------------------------|
| ①   | Main Body                      | See Valve Specification Table for available materials |                       |                         |
| ②   | Separator Body                 | See Valve Specification Table for available materials |                       |                         |
| ③   | Trap Cover                     | See Valve Specification Table for available materials |                       |                         |
| ④   | Separator                      | Cast Stainless Steel                                  | —                     | A351 Gr.CF8             |
| ⑤   | Separator Screen               | Stainless Steel                                       | SUS304                | AISI304                 |
| ⑥   | Float                          | Stainless Steel                                       | SUS316L               | AISI316L                |
| ⑦   | Trap Valve Seat                | —                                                     | —                     | —                       |
| ⑧   | Valve Seat                     | Stainless Steel                                       | SUS410/<br>SUS316L**  | AISI410/<br>AISI316L**  |
| ⑨   | Plug and Stem                  | Stainless Steel                                       | SUS316L/<br>SUS410*** | AISI316L/<br>AISI410*** |
| ⑩   | Valve Bonnet Gasket            | Graphite                                              | —                     | —                       |
| ⑪   | Valve Bonnet                   | Carbon Steel/<br>Stainless Steel                      | —/<br>SUSF316L**      | A105/<br>A182 F316L**   |
| ⑫   | Stuffing Box V-ring<br>Packing | Fluorine Resin with Carbon                            | PTFE                  | PTFE                    |
| ⑬   | Positioner Cover               | Polycarbonate                                         | PC                    | PC                      |
| ⑭   | Positioner Housing             | Polyphthalamide                                       | PPA                   | PPA                     |
| ⑮   | Rolling Diaphragm              | Nitrile Rubber with Fabric Insert                     | NBR                   | NBR                     |
| ⑯   | Actuator Springs               | Spring Carbon Steel                                   | —                     | —                       |

\* Equivalent \*\* For cast stainless steel model

\*\*\* For cast steel models, Cv(US) values 30 and higher  
Contact TLV for available replacement parts.



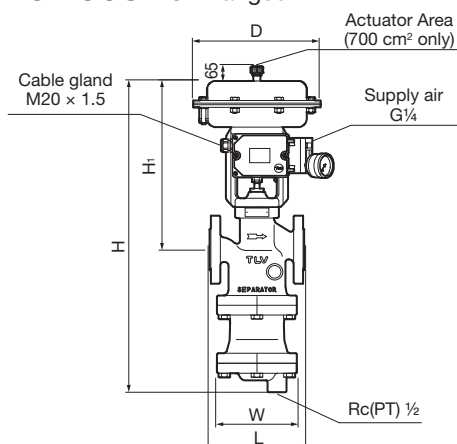
## Cv & Kvs Values

| Stroke<br>(mm) | Cv (US)                   | 0.5  | 1.2  | 3   | 5   | 7.5 | 12  | 20   | 30   | 47   | 70   | 95   | 75   | 120 | 190 |
|----------------|---------------------------|------|------|-----|-----|-----|-----|------|------|------|------|------|------|-----|-----|
|                | Cv (UK)                   | 0.39 | 0.97 | 2.4 | 3.9 | 6.1 | 9.7 | 15.5 | 24.3 | 38.8 | 58.2 | 77.6 | 61.1 | 97  | 155 |
|                | Kvs (DIN)                 | 0.4  | 1    | 2.5 | 4   | 6.3 | 10  | 16   | 25   | 40   | 60   | 80   | 63   | 100 | 160 |
|                | Seat Dia.<br>(mm)<br>Size | 6    |      | 12  |     | 24  |     | 31   | 38   | 48   | 63   | 80   | 63   | 80  | 100 |
| 15             | 15                        | ○    | ○    | ○   | ◎   |     |     |      |      |      |      |      |      |     |     |
|                | 20                        | ○    | ○    | ○   | ○   | ◎   |     |      |      |      |      |      |      |     |     |
|                | 25                        | ○    | ○    | ○   | ○   | ○   | ◎   |      |      |      |      |      |      |     |     |
|                | 40                        | ○    | ○    | ○   | ○   | ○   | ○   | ○    | ◎    |      |      |      |      |     |     |
|                | 50                        | ○    | ○    | ○   | ○   | ○   | ○   | ○    | ○    | ◎    |      |      |      |     |     |
|                | 65                        |      |      |     |     |     |     |      | ○    | ○    | ◎    |      |      |     |     |
| 30             | 80                        |      |      |     |     |     |     |      | ○    | ○    | ○    | ◎    |      |     |     |
|                | 100                       |      |      |     |     |     |     |      |      |      |      |      | ○    | ○   | ◎   |

◎: Standard, ○: Option. Price and delivery time may vary for options.

## Dimensions

### ● CV-COS-20 Flanged



### CV-COS-20 Flanged (mm)

| Size | L          |       | Actuator Area<br>(cm <sup>2</sup> ) | H            | H <sub>i</sub> | W   | ϕ D          | Weight*<br>(kg) |
|------|------------|-------|-------------------------------------|--------------|----------------|-----|--------------|-----------------|
|      | ASME Class |       |                                     |              |                |     |              |                 |
|      | 150RF      | 300RF |                                     |              |                |     |              |                 |
| 15   | 184        | 190   | 175                                 | 505          | 300            | 105 | 215          | 22              |
| 20   |            | 194   |                                     |              |                |     |              |                 |
| 25   |            | 197   |                                     | 545          | 150            | 23  |              |                 |
| 40   | 222        | 235   | 580                                 | 301          | 165            |     | 37           |                 |
| 50   | 254        | 267   | 175<br>[355]                        | 635<br>[690] | 301<br>[354]   | 195 | 215<br>[280] | 51              |
| 65   | 276        | 292   | 355                                 | 725          | 393            |     | 280          | 90              |
| 80   | 298        | 317   | 355<br>[750]                        | 860<br>[870] | 393<br>[401]   |     | 280<br>[394] | 114<br>[135]    |
| 100  | 352        | 368   | 750                                 | 1065         | 493            | 245 | 394          | 177             |

Other standards available, but length and weight may vary

\* Weight is for Class 300 RF

[ ] for Class 300RF

## Maximum Operating Differential Pressure\* PMX (Air to open)

| Size | Flange | Actuator Area (cm²) | Spring Bench Range (MPa) | Min. Air Supply Pressure (MPaG) | Max. Differential Pressure* (MPa) |
|------|--------|---------------------|--------------------------|---------------------------------|-----------------------------------|
| 15   | 150RF  | 175                 | 0.17 to 0.33             | 0.35                            | 1.0                               |
|      | 300RF  |                     |                          |                                 | 2.0                               |
| 20   | 150RF  |                     |                          |                                 | 1.0                               |
|      | 300RF  |                     |                          |                                 | 2.0                               |
| 25   | 150RF  |                     |                          |                                 | 1.0                               |
|      | 300RF  |                     |                          |                                 | 2.0                               |
| 40   | 150RF  |                     |                          |                                 | 1.0                               |
|      | 300RF  |                     |                          |                                 | 2.0                               |
| 50   | 150RF  | 355                 | 0.235 to 0.295           | 0.32                            | 1.0                               |
|      | 300RF  |                     |                          |                                 | 2.0                               |
| 65   | 150RF  |                     |                          |                                 | 1.0                               |
|      | 300RF  |                     |                          |                                 | 2.0                               |
| 80   | 150RF  | 750                 | 0.16 to 0.24             | 0.26                            | 1.0                               |
|      | 300RF  |                     |                          |                                 | 2.0                               |
| 100  | 150RF  |                     | 0.22 to 0.34**           | 0.36                            | 1.0                               |
|      | 300RF  |                     |                          |                                 | 2.0                               |
|      | 300RF  |                     | 0.25 to 0.42             | 0.44                            | 2.0                               |

\* Subject to limitation of maximum operating pressure rating of valve (PMO), see 'Specifications' for details.

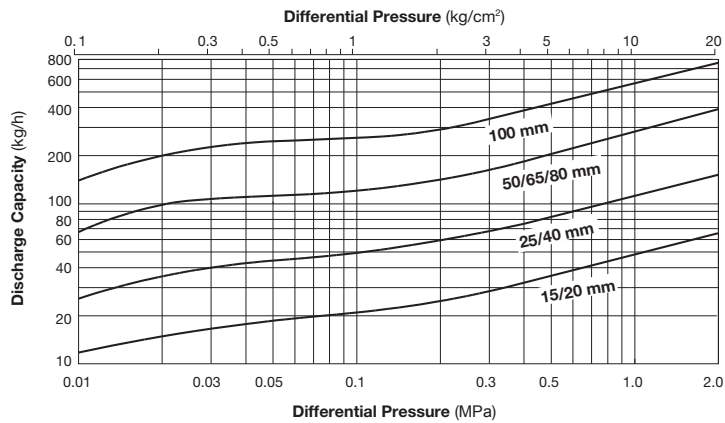
\*\* Pre-tensioned springs

## Options\*

- Air Filter Regulator
- Manual Handwheel
- Limit Switches
- Electric Actuator
- Pneumatic Positioners
- Intrinsically Safe Positioner

\* Details available on request

## Trap Discharge Capacity



1. The discharge capacity is the maximum continuous condensate discharge 6 °C below saturated steam temperature.
2. The differential pressure is the difference between the CV-COS inlet and its trap outlet pressure.



**CAUTION** DO NOT use this product under conditions that exceed maximum differential pressure, as condensate backup will occur!

Manufacturer

**TLV® CO., LTD.**  
Kakogawa, Japan

is approved by LRQA Ltd. to ISO 9001/14001

ISO 9001  
ISO 14001

