

# Cartridge Valve

Solenoid Operated  
Pressure Control  
Flow Control  
Directional  
Load Holding  
Logic Element  
Circuit Saver  
Electronic Amplifier P-C Board  
Filter  
Cavity Plug





# Contents

Cartridge Valve

|                                |   |
|--------------------------------|---|
| Operating Recommendation ..... | 7 |
|--------------------------------|---|

|             |   |
|-------------|---|
| Index ..... | 8 |
|-------------|---|

## Solenoid Operated

|                                                                                |           |    |
|--------------------------------------------------------------------------------|-----------|----|
| Solenoid-Operated, 2-posion 2-way, Poppet Valve .....                          | DTA ..... | 22 |
| Solenoid-Operated, 2-posion 3-way, 1 to 2, Shift to 2 to 3, Poppet Valve ..... |           |    |
| .....                                                                          | DWA ..... | 24 |

## Pressure Control

|                                                                                   |             |    |
|-----------------------------------------------------------------------------------|-------------|----|
| Pilot Stage, Proportional, Relief .....                                           | RBP .....   | 26 |
| Pilot Stage, Proportional, Inverse Relief .....                                   | RBN .....   | 28 |
| Pilot Stage, Direct-acting Relief Valve - Pilot Capacity .....                    | RBC, RBA .. | 30 |
| Main Stage, Pilot Operated Relief with Integral T8A Cavity .....                  | RPC8 .....  | 32 |
| Pilot Operated Relief Valve .....                                                 | RPC .....   | 34 |
| Fast-acting, Pilot Operated Relief .....                                          | RPE .....   | 36 |
| Direct-acting Relief Valve .....                                                  | RD .....    | 38 |
| Kick-down, Pilot-operated, Balanced Piston Relief Valve .....                     | RQ .....    | 40 |
| Pilot Operated Relief Valve with Vent .....                                       | RVA .....   | 42 |
| Ventable, Pilot-operated, Balanced Piston Relief Valve with Drain to Port 4 ..... |             |    |
| .....                                                                             | RVD .....   | 44 |
| Pilot Operated Sequence Valve .....                                               | RS .....    | 46 |
| Kick-down, Pilot-operated, Balanced Piston Sequence Valve .....                   | SQ .....    | 48 |
| Direct-acting Sequence Valve with Reverse Flow Check .....                        | SC .....    | 50 |
| Direct-acting Sequence Valve without Reverse Flow Check .....                     | SX .....    | 52 |
| Pilot Operated Reducing Valve .....                                               | PB .....    | 54 |
| Pilot Operated Reducing / Relieving Valve .....                                   | PP .....    | 56 |
| Direct-acting Pressure Reducing / Relieving Valve .....                           | PRB .....   | 58 |

## Flow Control

|                                                                                             |           |    |
|---------------------------------------------------------------------------------------------|-----------|----|
| Proportional, Normally Closed, Flow Control Valve .....                                     | FPC ..... | 60 |
| Proportional, Normally Open, Flow Control Valve .....                                       | FPH ..... | 62 |
| Fully Adjustable Needle Valve .....                                                         | NFC ..... | 64 |
| Fully Adjustable and High Capacity Needle Valve .....                                       | NFD ..... | 66 |
| Fully Adjustable Needle Valve (with Free Flow Check Valve) .....                            | NCB ..... | 68 |
| Pressure Compensated Fully Adjustable Flow Control Valve (with Free Flow Check Valve) ..... | FD .....  | 70 |
| Normally Closed, Modulating Element with Pilot Source from Port 1 ..                        | LRA ..... | 72 |
| Normally Closed, Modulating Element .....                                                   | LRC ..... | 74 |

(continue)

# Contents

Cartridge Valve

## Directional

|                                                                  |          |    |
|------------------------------------------------------------------|----------|----|
| Pilot-to-Open Check Valve with Standard Pilot & POM Seat.....    | CKA      | 76 |
| Pilot-to-Open Check Valve with Standard Pilot .....              | CKB      | 78 |
| Pilot-to-Open Check Valve with Sealed Pilot & POM Seat .....     | CKC      | 80 |
| Pilot-to-Open Check Valve with Sealed Pilot .....                | CKD      | 82 |
| Vented, Pilot-to-Open Check Valve with External Pilot Port ..... | CKF      | 84 |
| Vented, Pilot-to-Open Check Valve .....                          | CVV      | 86 |
| Shuttle Valve .....                                              | CSD, CSB | 88 |
| Shuttle Valve, with External Port .....                          | CSA, CSC | 90 |
| Check Valve, Free Flow Port1 to Port2 .....                      | CXA      | 92 |
| Check Valve, Free Flow Port2 to Port1 with POM Seat .....        | CXB      | 94 |
| Check Valve, Free Flow Port2 to Port1 .....                      | CXD      | 96 |

## Load Holding

|                                                                                 |     |     |
|---------------------------------------------------------------------------------|-----|-----|
| 3:1 Pilot Ratio, Vented Counterbalance Valve - Atmospherically Referenced ..... | CAA | 98  |
| 5:1 Pilot Ratio, Vented Counterbalance Valve - Atmospherically Referenced ..... | CAG | 100 |
| Counterbalance 3:1 Pilot Ratio External Pilot Non-Vented Valve .....            | CBA | 102 |
| Counterbalance 4.5:1 Pilot Ratio External Pilot Non-Vented Valve ....           | CBG | 104 |
| Counterbalance 10:1 Pilot Ratio External Pilot Non-Vented Valve ....            | CBH | 106 |
| 3:1 Pilot Ratio, Semi-restrictive Counterbalance Valve .....                    | CBC | 108 |
| 4.5:1 Pilot Ratio, Semi-restrictive Counterbalance Valve .....                  | CBD | 110 |
| 3:1 Pilot Ratio, Restrictive Counterbalance Valve .....                         | CBE | 112 |
| 4.5:1 Pilot Ratio, Restrictive Counterbalance Valve .....                       | CBF | 114 |
| 3:1 Pilot Ratio, Vented, Counterbalance Valve.....                              | CWA | 116 |
| 5:1 Pilot Ratio, Vented, Counterbalance Valve.....                              | CWG | 118 |

## Logic Element

|                                       |    |     |
|---------------------------------------|----|-----|
| Logic Elements.....                   | LO | 120 |
| Normally Open, Logic Modulating ..... | LP | 122 |

## Circuit Saver

|                                                                                |     |     |
|--------------------------------------------------------------------------------|-----|-----|
| Fixed Orifice, Flow Fuse Valve .....                                           | FQ  | 124 |
| 1.8:1 Pilot Ratio, Pilot to Close Check Valve .....                            | COA | 126 |
| 120:1 Pilot Ratio, Pilot to Close Check Valve .....                            | COO | 128 |
| 30%, Accumulator Sense, Pump Unload Valve with<br>Check - Pilot Capacity ..... | QC  | 130 |

(continue)

# Contents

## Cartridge Valve

### Cavity Plug

|                                                    |           |     |
|----------------------------------------------------|-----------|-----|
| 2 Holes External Port Blocked Cavity Plug .....    | OA2 ..... | 132 |
| 2 Holes All Ports Blocked Cavity Plug .....        | CA2 ..... | 133 |
| Port 1 to 2 Open, Port 3 Blocked Cavity Plug ..... | OA3 ..... | 134 |
| 3 Holes All Ports Blocked Cavity Plug .....        | CA3 ..... | 135 |

### Electronic Amplifier P-C Board

|                                                  |                      |     |
|--------------------------------------------------|----------------------|-----|
| Digital Proportional Controller - Case .....     | SY-DPCA-C-1 .....    | 136 |
| Digital Proportional Controller - PCB Only ..... | SY-DPCA-P-1 .....    | 138 |
| Digital Proportional Controller - DIN Plug ..... | SY-DPCA-D-P9-1 ..... | 140 |

### Filter

|       |           |     |
|-------|-----------|-----|
| ..... | FLA ..... | 142 |
|-------|-----------|-----|

### SAE Cavity Cartridge Valve > Pressure Control

|                                                          |          |     |
|----------------------------------------------------------|----------|-----|
| Noiseless Direct Acting Diagonal Area Relief Valve ..... | MH ..... | 146 |
|----------------------------------------------------------|----------|-----|

### SAE Cavity Cartridge Valve > Flow Control

|                                                    |          |     |
|----------------------------------------------------|----------|-----|
| Check with Manual Flow Adjustment .....            | CN ..... | 147 |
| Fully Adjustable Needle .....                      | NV ..... | 150 |
| Fully Adjustable Needle with Free Flow Check ..... | NC ..... | 152 |
| Flow Divider (Flow Ratio: 1:1) .....               | CP ..... | 154 |

### SAE Cavity Cartridge Valve > Directional

|                                        |          |     |
|----------------------------------------|----------|-----|
| Check Free Flow 1-2, Poppet Type ..... | CV ..... | 156 |
| Shuttle Valve .....                    | LS ..... | 158 |

### SAE Cavity Cartridge Valve > Directional > On/Off Valves 2 Way Valve

|                                                 |                         |     |
|-------------------------------------------------|-------------------------|-----|
| Normally Closed Single Check .....              | HS, JS, LS, PS-2A ..... | 160 |
| Normally Closed Single Check Reverse Flow ..... | HS, JS, LS, PS-2B ..... | 162 |
| Normally Open Single Check .....                | HS, JS, LS, PS-2C ..... | 164 |
| Normally Open Single Check Reverse Flow .....   | HS, JS, LS, PS-2D ..... | 166 |
| Normally Closed Double Check .....              | HS, JS, LS, PS-2I ..... | 168 |
| Normally Open Double Check .....                | HS, JS, LS, PS-2J ..... | 170 |

### SAE Cavity Cartridge Valve > Directional > On/Off Valves 3 Way Valve

|                         |                    |     |
|-------------------------|--------------------|-----|
| 3 Way, 2 Position ..... | HS-3A, JS-3A ..... | 172 |
| 3 Way, 2 Position ..... | HS-3X, JS-3X ..... | 174 |

|                        |     |
|------------------------|-----|
| Cavities Tooling ..... | 176 |
|------------------------|-----|

|                                       |     |
|---------------------------------------|-----|
| Cavities Tooling ( SAE Cavity ) ..... | 180 |
|---------------------------------------|-----|



# Operating Recommendation

## · Fluid Viscosity Recommendations

15 to 380 cSt

## · Fluid Cleanliness Recommendations

Specified in accordance with ISO 4406:1999; 4µm / 6µm / 14µm

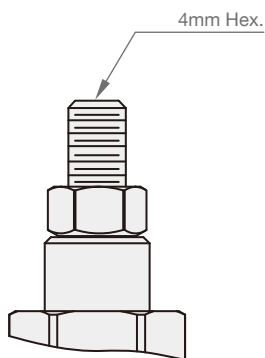
## · Fluid Temperature Recommendations

Buna N (Nitrile) : -35°C to 90°C

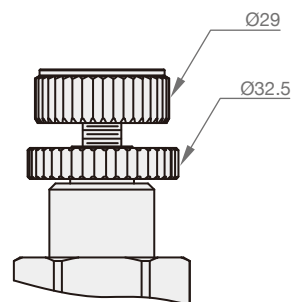
Viton : -20°C to 120°C

## CONTROL MANNER

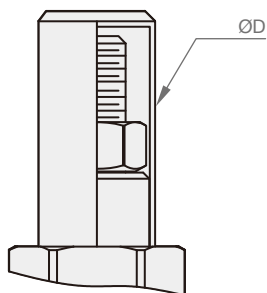
### ► L : Standard Screw Adjustment



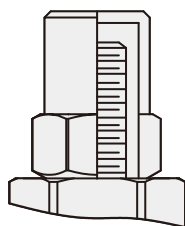
### ► K : Hand Knob with Lock Knob



### ► C : Tamper Resistant Cover



For Line Mount Type

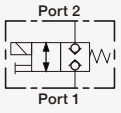
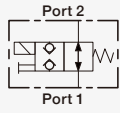
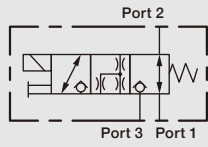


For SAE Cavity Type

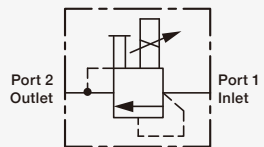
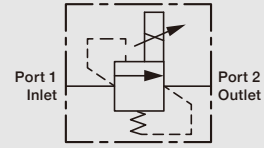
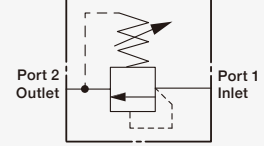
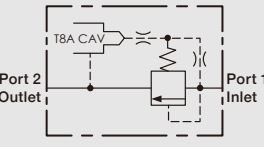
| ØD  | Size | Cavity        |
|-----|------|---------------|
| Ø19 | 02   | T10, T11, T13 |
| Ø25 | 03   | T2, T3, T5    |
| Ø30 | 06   | T16, T17      |
| Ø40 | 08   | T18, T19      |

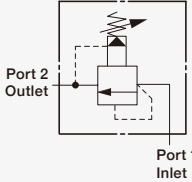
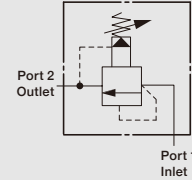
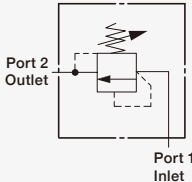
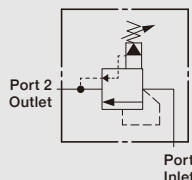
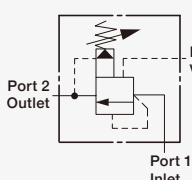
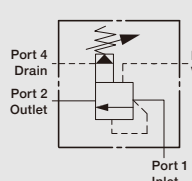
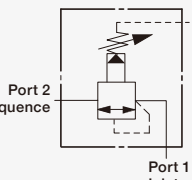
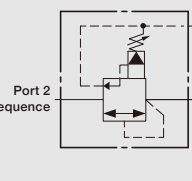
# Index

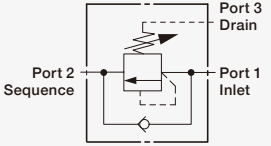
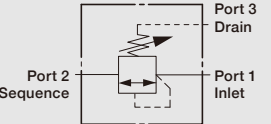
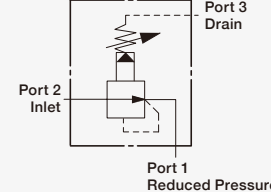
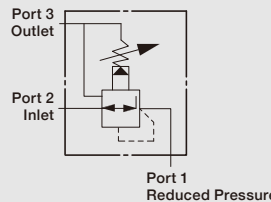
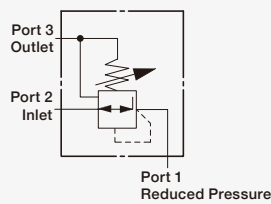
## Solenoid Operated

| Page No. | Function                                                                 | Symbols                                                                                                                                                             | Model No. | Cavity | Capacity (l/min) | Control Manner |   |   |   |
|----------|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------|------------------|----------------|---|---|---|
|          |                                                                          |                                                                                                                                                                     |           |        |                  | L              | K | X | M |
| 22       | Solenoid-Operated, 2-posion 2-way, Poppet Valve                          |   | DT2A      | T13A   | 40               |                |   |   | ✓ |
| 24       | Solenoid-Operated, 2-posion 3-way, 1 to 2, Shift to 2 to 3, Poppet Valve |                                                                                    | DW2A      | T11A   | 30               |                |   |   | ✓ |

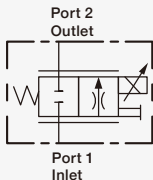
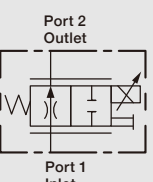
## Pressure Control

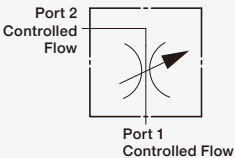
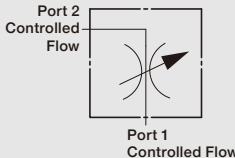
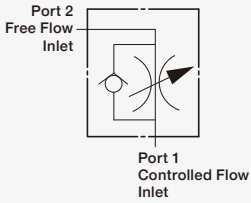
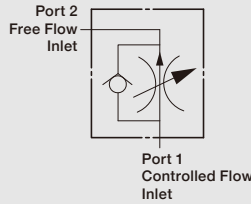
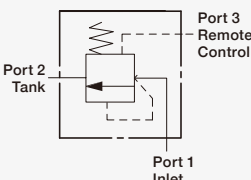
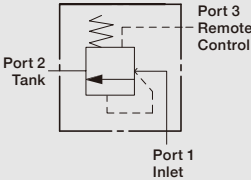
| Page No. | Function                                                   | Symbols                                                                             | Model No. | Cavity | Capacity (l/min) | Control Manner |   |   |   |
|----------|------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------|--------|------------------|----------------|---|---|---|
|          |                                                            |                                                                                     |           |        |                  | L              | K | X | M |
| 26       | Pilot Stage, Proportional, Relief                          |  | RB1P      | T8A    | 1                |                |   |   | ✓ |
| 28       | Pilot Stage, Proportional, Inverse Relief                  |  | RB1N      | T8A    | 1                |                |   |   | ✓ |
| 30       | Pilot Stage, Direct-acting Relief Valve - Pilot Capacity   |  | RB2C      | T10A   | 1                | ✓              | ✓ |   |   |
|          |                                                            |                                                                                     | RB3A      | T3A    | 2                | ✓              | ✓ |   |   |
| 32       | Main Stage, Pilot Operated Relief with Integral T8A Cavity |  | RP2C8     | T10A   | 95               |                |   |   |   |
|          |                                                            |                                                                                     | RP3C8     | T3A    | 200              |                |   |   |   |
|          |                                                            |                                                                                     | RP6C8     | T16A   | 380              |                |   |   |   |
|          |                                                            |                                                                                     | RP8C8     | T18A   | 760              |                |   |   |   |

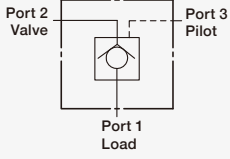
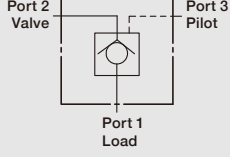
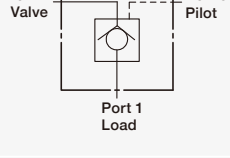
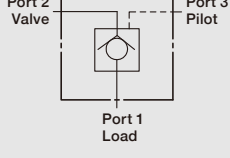
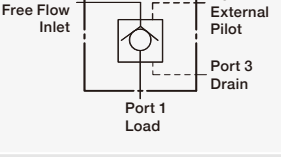
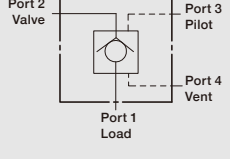
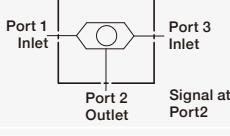
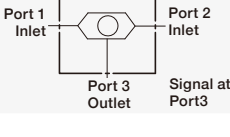
| Page No. | Function                                                                    | Symbols                                                                             | Model No. | Cavity | Capacity (l/min) | Control Manner |   |   |
|----------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------|--------|------------------|----------------|---|---|
|          |                                                                             |                                                                                     |           |        |                  | L              | K | X |
| 34       | Pilot Operated Relief Valve                                                 |    | RP2C      | T10A   | 95               | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RP3C      | T3A    | 200              | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RP6C      | T16A   | 380              | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RP8C      | T18A   | 760              | ✓              | ✓ |   |
| 36       | Fast-acting, Pilot Operated Relief                                          |    | RP2E      | T10A   | 95               | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RP3E      | T3A    | 200              | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RP6E      | T16A   | 380              | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RP8E      | T18A   | 760              | ✓              | ✓ |   |
| 38       | Direct-acting Relief Valve                                                  |    | RD1A      | T162A  | 28.4             | ✓              |   |   |
|          |                                                                             |                                                                                     | RD2A      | T10A   | 95               | ✓              |   |   |
|          |                                                                             |                                                                                     | RD3A      | T3A    | 200              | ✓              |   |   |
|          |                                                                             |                                                                                     | RD6A      | T16A   | 380              | ✓              |   |   |
|          |                                                                             |                                                                                     | RD8A      | T18A   | 760              | ✓              |   |   |
| 40       | Kick-down, Pilot-operated, Balanced Piston Relief Valve                     |   | RQ2B      | T10A   | 95               | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RQ3B      | T3A    | 200              | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RQ6B      | T16A   | 380              | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RQ8B      | T18A   | 760              | ✓              | ✓ |   |
| 42       | Pilot Operated Relief Valve with Vent                                       |  | RV1A      | T163A  | 28.4             | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RV2A      | T11A   | 60               | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RV3A      | T2A    | 120              | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RV6A      | T17A   | 240              | ✓              | ✓ |   |
| 44       | Ventable, Pilot-operated, Balanced Piston Relief Valve with Drain to Port 4 |  | RV2D      | T21A   | 60               | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RV3D      | T22A   | 120              | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RV6D      | T23A   | 240              | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RV8D      | T24A   | 480              | ✓              | ✓ |   |
| 46       | Pilot Operated Sequence Valve                                               |  | RS2C      | T11A   | 60               | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RS3C      | T2A    | 120              | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RS6C      | T17A   | 240              | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | RS8C      | T19A   | 480              | ✓              | ✓ |   |
| 48       | Kick-down, Pilot-operated, Balanced Piston Sequence Valve                   |  | SQ2B      | T11A   | 60               | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | SQ3B      | T2A    | 120              | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | SQ6B      | T17A   | 240              | ✓              | ✓ |   |
|          |                                                                             |                                                                                     | SQ8B      | T19A   | 480              | ✓              | ✓ |   |

| Page No. | Function                                                | Symbols                                                                             | Model No. | Cavity | Capacity (l/min) | Control Manner |   |   |
|----------|---------------------------------------------------------|-------------------------------------------------------------------------------------|-----------|--------|------------------|----------------|---|---|
|          |                                                         |                                                                                     |           |        |                  | L              | K | X |
| 50       | Direct-acting Sequence Valve with Reverse Flow Check    |    | SC2A      | T11A   | 60               | ✓              | ✓ |   |
|          |                                                         |                                                                                     | SC3A      | T2A    | 120              | ✓              | ✓ |   |
|          |                                                         |                                                                                     | SC6A      | T17A   | 240              | ✓              | ✓ |   |
|          |                                                         |                                                                                     | SC8A      | T19A   | 480              | ✓              | ✓ |   |
| 52       | Direct-acting Sequence Valve without Reverse Flow Check |    | SX2A      | T11A   | 60               | ✓              | ✓ |   |
|          |                                                         |                                                                                     | SX3A      | T2A    | 120              | ✓              | ✓ |   |
| 54       | Pilot Operated Reducing Valve                           |    | PB2B      | T11A   | 40               | ✓              | ✓ |   |
|          |                                                         |                                                                                     | PB3B      | T2A    | 80               | ✓              | ✓ |   |
|          |                                                         |                                                                                     | PB6B      | T17A   | 160              | ✓              | ✓ |   |
|          |                                                         |                                                                                     | PB8B      | T19A   | 320              | ✓              | ✓ |   |
| 56       | Pilot Operated Reducing / Relieving Valve               |   | PP2B      | T11A   | 40               | ✓              | ✓ |   |
|          |                                                         |                                                                                     | PP3B      | T2A    | 80               | ✓              | ✓ |   |
|          |                                                         |                                                                                     | PP6B      | T17A   | 160              | ✓              | ✓ |   |
|          |                                                         |                                                                                     | PP8B      | T19A   | 320              | ✓              | ✓ |   |
| 58       | Direct-acting Pressure Reducing / Relieving Valve       |  | PR2B      | T11A   | 40               | ✓              | ✓ |   |
|          |                                                         |                                                                                     | PR3B      | T2A    | 80               | ✓              | ✓ |   |
|          |                                                         |                                                                                     | PR6B      | T17A   | 160              | ✓              | ✓ |   |
|          |                                                         |                                                                                     | PR8B      | T19A   | 320              | ✓              | ✓ |   |

## Flow Control

| Page No. | Function                                          | Symbols                                                                             | Model No. | Cavity | Capacity (l/min) | Control Manner |   |   |   |
|----------|---------------------------------------------------|-------------------------------------------------------------------------------------|-----------|--------|------------------|----------------|---|---|---|
|          |                                                   |                                                                                     |           |        |                  | L              | K | X | M |
| 60       | Proportional, Normally Closed, Flow Control Valve |  | FP2C      | T13A   | 40               |                |   |   | ✓ |
| 62       | Proportional, Normally Open, Flow Control Valve   |  | FP2H      | T13A   | 28               |                |   |   | ✓ |

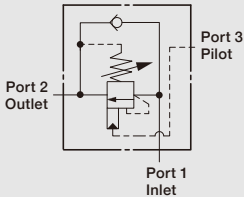
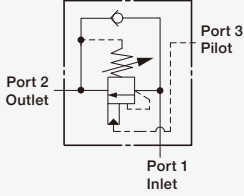
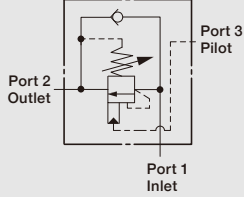
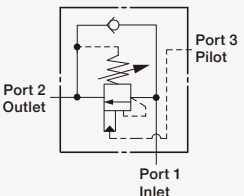
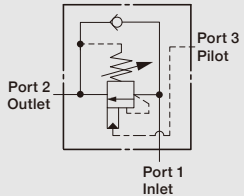
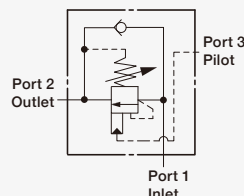
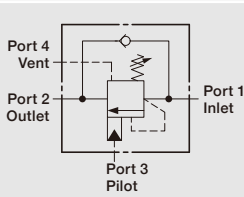
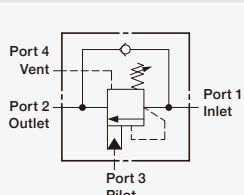
| Page No. | Function                                                                              | Symbols                                                                             | Model No. | Cavity | Capacity (l/min) | Control Manner |   |   |   |
|----------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------|--------|------------------|----------------|---|---|---|
|          |                                                                                       |                                                                                     |           |        |                  | L              | K | X | M |
| 64       | Fully Adjustable Needle Valve                                                         |    | NF1C      | T162A  | 18.9             | ✓              | ✓ |   |   |
|          |                                                                                       |                                                                                     | NF2C      | T13A   | 25               | ✓              | ✓ |   |   |
|          |                                                                                       |                                                                                     | NF3C      | T5A    | 50               | ✓              | ✓ |   |   |
|          |                                                                                       |                                                                                     | NF6C      | T16A   | 100              | ✓              | ✓ |   |   |
|          |                                                                                       |                                                                                     | NF8C      | T18A   | 200              | ✓              | ✓ |   |   |
| 66       | Fully Adjustable and High Capacity Needle Valve                                       |    | NF2D      | T13A   | 80               | ✓              | ✓ |   |   |
|          |                                                                                       |                                                                                     | NF3D      | T5A    | 160              | ✓              | ✓ |   |   |
|          |                                                                                       |                                                                                     | NF6D      | T16A   | 320              | ✓              | ✓ |   |   |
|          |                                                                                       |                                                                                     | NF8D      | T18A   | 500              | ✓              | ✓ |   |   |
| 68       | Fully Adjustable Needle Valve (with Free Flow Check Valve)                            |    | NC2B      | T13A   | 25               | ✓              | ✓ |   |   |
|          |                                                                                       |                                                                                     | NC3B      | T5A    | 50               | ✓              | ✓ |   |   |
|          |                                                                                       |                                                                                     | NC6B      | T16A   | 100              | ✓              | ✓ |   |   |
|          |                                                                                       |                                                                                     | NC8B      | T18A   | 200              | ✓              | ✓ |   |   |
| 70       | Pressure Compensated Fully Adjustable Flow Control Valve (with Free Flow Check Valve) |  | FD2A      | T13A   | 23               | ✓              | ✓ |   |   |
|          |                                                                                       |                                                                                     | FD3B      | T5A    | 45               | ✓              | ✓ |   |   |
|          |                                                                                       |                                                                                     | FD6A      | T16A   | 95               | ✓              | ✓ |   |   |
|          |                                                                                       |                                                                                     | FD8A      | T18A   | 200              | ✓              | ✓ |   |   |
| 72       | Normally Closed, Modulating Element with Pilot Source from Port 1                     |  | LR2A      | T11A   | 60               | ✓              |   | ✓ |   |
|          |                                                                                       |                                                                                     | LR3A      | T2A    | 120              | ✓              |   | ✓ |   |
|          |                                                                                       |                                                                                     | LR6A      | T17A   | 240              | ✓              |   | ✓ |   |
|          |                                                                                       |                                                                                     | LR8A      | T19A   | 480              | ✓              |   | ✓ |   |
| 74       | Normally Closed, Modulating Element                                                   |  | LR2C      | T11A   | 60               | ✓              |   | ✓ |   |
|          |                                                                                       |                                                                                     | LR3C      | T2A    | 120              | ✓              |   | ✓ |   |
|          |                                                                                       |                                                                                     | LR6C      | T17A   | 240              | ✓              |   | ✓ |   |
|          |                                                                                       |                                                                                     | LR8C      | T19A   | 480              | ✓              |   | ✓ |   |

| Page No. | Function                                                   | Symbols                                                                             | Model No. | Cavity | Capacity (l/min) | Control Manner |   |   |   |   |
|----------|------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------|--------|------------------|----------------|---|---|---|---|
|          |                                                            |                                                                                     |           |        |                  | L              | K | X | V | E |
| 76       | Pilot-to-Open Check Valve with Standard Pilot & POM Seat   |    | CK2A      | T11A   | 60               | ✓              |   | ✓ |   |   |
|          |                                                            |                                                                                     | CK3A      | T2A    | 120              | ✓              |   | ✓ |   |   |
|          |                                                            |                                                                                     | CK6A      | T17A   | 240              | ✓              |   | ✓ |   |   |
|          |                                                            |                                                                                     | CK8A      | T19A   | 480              | ✓              |   | ✓ |   |   |
| 78       | Pilot-to-Open Check Valve with Standard Pilot              |    | CK1B      | T163A  | 28.4             | ✓              |   | ✓ |   |   |
|          |                                                            |                                                                                     | CK2B      | T11A   | 60               | ✓              |   | ✓ |   |   |
|          |                                                            |                                                                                     | CK3B      | T2A    | 120              | ✓              |   | ✓ |   |   |
|          |                                                            |                                                                                     | CK6B      | T17A   | 240              | ✓              |   | ✓ |   |   |
| 80       | Pilot-to-Open Check Valve with Sealed Pilot & POM Seat     |    | CK2C      | T11A   | 60               | ✓              |   | ✓ |   |   |
|          |                                                            |                                                                                     | CK3C      | T2A    | 120              | ✓              |   | ✓ |   |   |
|          |                                                            |                                                                                     | CK6C      | T17A   | 240              | ✓              |   | ✓ |   |   |
|          |                                                            |                                                                                     | CK8C      | T19A   | 480              | ✓              |   | ✓ |   |   |
| 82       | Pilot-to-Open Check Valve with Sealed Pilot                |   | CK2D      | T11A   | 60               | ✓              |   | ✓ |   |   |
|          |                                                            |                                                                                     | CK3D      | T2A    | 120              | ✓              |   | ✓ |   |   |
|          |                                                            |                                                                                     | CK6D      | T17A   | 240              | ✓              |   | ✓ |   |   |
|          |                                                            |                                                                                     | CK8D      | T19A   | 480              | ✓              |   | ✓ |   |   |
| 84       | Vented, Pilot-to-Open Check Valve with External Pilot Port |  | CK2F      | T11A   | 60               |                |   |   | ✓ |   |
|          |                                                            |                                                                                     | CK3F      | T2A    | 120              |                |   |   | ✓ |   |
|          |                                                            |                                                                                     | CK6F      | T17A   | 240              |                |   |   | ✓ |   |
|          |                                                            |                                                                                     | CK8F      | T19A   | 480              |                |   |   | ✓ |   |
| 86       | Vented, Pilot-to-Open Check Valve                          |  | CV2V      | T21A   | 60               | ✓              |   | ✓ |   |   |
|          |                                                            |                                                                                     | CV3V      | T22A   | 120              | ✓              |   | ✓ |   |   |
|          |                                                            |                                                                                     | CV6V      | T23A   | 240              | ✓              |   | ✓ |   |   |
|          |                                                            |                                                                                     | CV8V      | T24A   | 480              | ✓              |   | ✓ |   |   |
| 88       | Shuttle Valve                                              |  | CS2D      | T11A   | 10               |                |   | ✓ |   |   |
|          |                                                            |  | CS2B      | T11A   | 10               |                |   | ✓ |   |   |

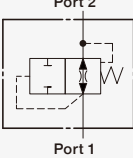
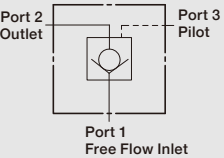
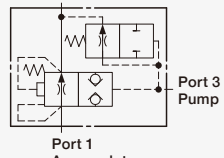
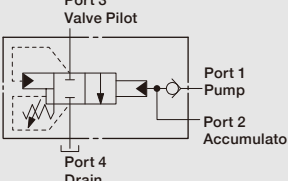
| Page No. | Function                                            | Symbols | Model No. | Cavity | Capacity (l/min) | Control Manner |   |   |   |   |
|----------|-----------------------------------------------------|---------|-----------|--------|------------------|----------------|---|---|---|---|
|          |                                                     |         |           |        |                  | L              | K | X | V | E |
| 90       | Shuttle Valve, with External Port                   |         | CS2A      | T13A   | 10               |                |   |   |   | ✓ |
|          |                                                     |         | CS2C      | T13A   | 10               |                |   |   |   | ✓ |
| 92       | Check Valve, Free Flow Port1 to Port2               |         | CX2A      | T13A   | 80               |                |   | ✓ |   |   |
|          |                                                     |         | CX3A      | T5A    | 160              |                |   | ✓ |   |   |
|          |                                                     |         | CX7A      | T16A   | 320              |                |   | ✓ |   |   |
|          |                                                     |         | CX8A      | T18A   | 640              |                |   | ✓ |   |   |
| 94       | Check Valve, Free Flow Port2 to Port1 with POM Seat |         | CX2B      | T13A   | 60               |                |   | ✓ |   |   |
|          |                                                     |         | CX3B      | T5A    | 120              |                |   | ✓ |   |   |
|          |                                                     |         | CX6B      | T16A   | 240              |                |   | ✓ |   |   |
|          |                                                     |         | CX8B      | T18A   | 480              |                |   | ✓ |   |   |
| 96       | Check Valve, Free Flow Port2 to Port1               |         | CX2D      | T13A   | 60               |                |   | ✓ |   |   |
|          |                                                     |         | CX3D      | T5A    | 120              |                |   | ✓ |   |   |
|          |                                                     |         | CX7D      | T16A   | 240              |                |   | ✓ |   |   |
|          |                                                     |         | CX8D      | T18A   | 480              |                |   | ✓ |   |   |

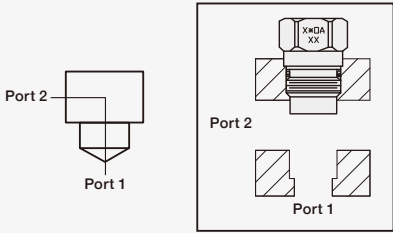
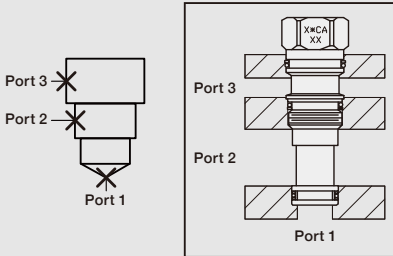
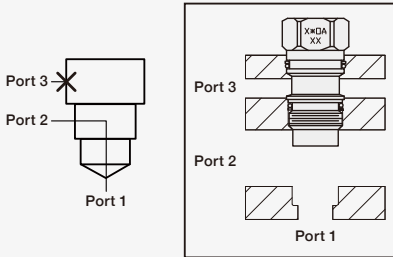
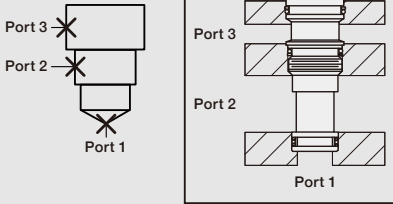
## Load Holding

| Page No. | Function                                                                  | Symbols | Model No. | Cavity | Capacity (l/min) | Control Manner |   |   |
|----------|---------------------------------------------------------------------------|---------|-----------|--------|------------------|----------------|---|---|
|          |                                                                           |         |           |        |                  | L              | K | X |
| 98       | 3:1 Pilot Ratio, Vented Counterbalance Valve - Atmospherically Referenced |         | CA2A      | T11A   | 60               | ✓              |   |   |
|          |                                                                           |         | CA3A      | T2A    | 120              | ✓              |   |   |
|          |                                                                           |         | CA6A      | T17A   | 240              | ✓              |   |   |
|          |                                                                           |         | CA8A      | T19A   | 480              | ✓              |   |   |
| 100      | 5:1 Pilot Ratio, Vented Counterbalance Valve - Atmospherically Referenced |         | CA2G      | T11A   | 60               | ✓              |   |   |
|          |                                                                           |         | CA3G      | T2A    | 120              | ✓              |   |   |
|          |                                                                           |         | CA6G      | T17A   | 240              | ✓              |   |   |
|          |                                                                           |         | CA8G      | T19A   | 480              | ✓              |   |   |
| 102      | Counterbalance 3:1 Pilot Ratio External Pilot Non-Vented Valve            |         | CB2A      | T11A   | 60               | ✓              |   |   |
|          |                                                                           |         | CB3A      | T2A    | 120              | ✓              |   |   |
|          |                                                                           |         | CB6A      | T17A   | 240              | ✓              |   |   |
|          |                                                                           |         | CB8A      | T19A   | 480              | ✓              |   |   |

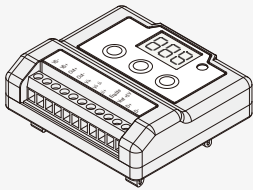
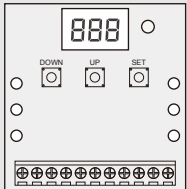
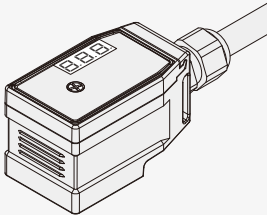
| Page No. | Function                                                                  | Symbols                                                                             | Model No. | Cavity | Capacity (l/min) | Control Manner |   |   |
|----------|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------|--------|------------------|----------------|---|---|
|          |                                                                           |                                                                                     |           |        |                  | L              | K | X |
| 104      | Counterbalance<br>4.5:1 Pilot Ratio<br>External Pilot<br>Non-Vented Valve |    | CB2G      | T11A   | 60               | ✓              |   |   |
|          |                                                                           |                                                                                     | CB3G      | T2A    | 120              | ✓              |   |   |
|          |                                                                           |                                                                                     | CB6G      | T17A   | 240              | ✓              |   |   |
|          |                                                                           |                                                                                     | CB8G      | T19A   | 480              | ✓              |   |   |
| 106      | Counterbalance<br>10:1 Pilot Ratio<br>External Pilot<br>Non-Vented Valve  |    | CB2H      | T11A   | 60               | ✓              |   |   |
|          |                                                                           |                                                                                     | CB3H      | T2A    | 120              | ✓              |   |   |
|          |                                                                           |                                                                                     | CB6H      | T17A   | 240              | ✓              |   |   |
|          |                                                                           |                                                                                     | CB8H      | T19A   | 480              | ✓              |   |   |
| 108      | 3:1 Pilot Ratio,<br>Semi-restrictive<br>Counterbalance<br>Valve           |    | CB2C      | T11A   | 40               | ✓              |   |   |
|          |                                                                           |                                                                                     | CB3C      | T2A    | 80               | ✓              |   |   |
|          |                                                                           |                                                                                     | CB6C      | T17A   | 160              | ✓              |   |   |
|          |                                                                           |                                                                                     |           |        |                  |                |   |   |
| 110      | 4.5:1 Pilot Ratio,<br>Semi-restrictive<br>Counterbalance<br>Valve         |   | CB2D      | T11A   | 40               | ✓              |   |   |
|          |                                                                           |                                                                                     | CB3D      | T2A    | 80               | ✓              |   |   |
|          |                                                                           |                                                                                     | CB6D      | T17A   | 160              | ✓              |   |   |
|          |                                                                           |                                                                                     |           |        |                  |                |   |   |
| 112      | 3:1 Pilot Ratio,<br>Restrictive<br>Counterbalance<br>Valve                |  | CB2E      | T11A   | 15               | ✓              |   |   |
|          |                                                                           |                                                                                     | CB3E      | T2A    | 30               | ✓              |   |   |
|          |                                                                           |                                                                                     | CB6E      | T17A   | 60               | ✓              |   |   |
|          |                                                                           |                                                                                     | CB8E      | T19A   | 80               | ✓              |   |   |
| 114      | 4.5:1 Pilot Ratio,<br>Restrictive<br>Counterbalance<br>Valve              |  | CB2F      | T11A   | 15               | ✓              |   |   |
|          |                                                                           |                                                                                     | CB3F      | T2A    | 30               | ✓              |   |   |
|          |                                                                           |                                                                                     | CB6F      | T17A   | 60               | ✓              |   |   |
|          |                                                                           |                                                                                     | CB8F      | T19A   | 80               | ✓              |   |   |
| 116      | 3:1 Pilot<br>Ratio, Vented,<br>Counterbalance<br>Valve                    |  | CW2A      | T21A   | 60               | ✓              |   |   |
|          |                                                                           |                                                                                     | CW3A      | T22A   | 120              | ✓              |   |   |
|          |                                                                           |                                                                                     | CW6A      | T23A   | 240              | ✓              |   |   |
|          |                                                                           |                                                                                     | CW8A      | T24A   | 480              | ✓              |   |   |
| 118      | 5:1 Pilot<br>Ratio, Vented,<br>Counterbalance<br>Valve                    |  | CW2G      | T21A   | 60               | ✓              |   |   |
|          |                                                                           |                                                                                     | CW3G      | T22A   | 120              | ✓              |   |   |
|          |                                                                           |                                                                                     | CW6G      | T23A   | 240              | ✓              |   |   |
|          |                                                                           |                                                                                     | CW8G      | T24A   | 480              | ✓              |   |   |

| Page No. | Function                                                                             | Symbols | Model No. | Cavity | Capacity<br>(l/min) | Control Manner |   |   |
|----------|--------------------------------------------------------------------------------------|---------|-----------|--------|---------------------|----------------|---|---|
|          |                                                                                      |         |           |        |                     | L              | K | X |
| 120      | Logic Elements<br>( Spring biased closed,<br>pilot source from port 1 )              |         | LO2A      | T11A   | 80                  | ✓              |   | ✓ |
|          |                                                                                      |         | LO3A      | T2A    | 160                 | ✓              |   | ✓ |
|          |                                                                                      |         | LO6A      | T17A   | 320                 | ✓              |   | ✓ |
|          |                                                                                      |         | LO8A      | T19A   | 640                 | ✓              |   | ✓ |
| 120      | Logic Elements<br>( Spring biased closed,<br>pilot source from port 2 )              |         | LO2B      | T11A   | 80                  | ✓              |   | ✓ |
|          |                                                                                      |         | LO3B      | T2A    | 160                 | ✓              |   | ✓ |
|          |                                                                                      |         | LO6B      | T17A   | 320                 | ✓              |   | ✓ |
|          |                                                                                      |         | LO8B      | T19A   | 640                 | ✓              |   | ✓ |
| 120      | Logic Elements<br>( Spring biased closed,<br>pilot source from port 3 )              |         | LO2C      | T11A   | 80                  | ✓              |   | ✓ |
|          |                                                                                      |         | LO3C      | T2A    | 160                 | ✓              |   | ✓ |
|          |                                                                                      |         | LO6C      | T17A   | 320                 | ✓              |   | ✓ |
|          |                                                                                      |         | LO8C      | T19A   | 640                 | ✓              |   | ✓ |
| 120      | Logic Elements<br>( Spring biased closed,<br>higher of port 1 or<br>2 pilot source ) |         | LO2D      | T11A   | 80                  | ✓              |   | ✓ |
|          |                                                                                      |         | LO3D      | T2A    | 160                 | ✓              |   | ✓ |
|          |                                                                                      |         | LO6D      | T17A   | 320                 | ✓              |   | ✓ |
|          |                                                                                      |         | LO8D      | T19A   | 640                 | ✓              |   | ✓ |
| 120      | Logic Elements<br>( Spring biased open,<br>pilot source from port 3 )                |         | LO2O      | T11A   | 80                  | ✓              |   | ✓ |
|          |                                                                                      |         | LO3O      | T2A    | 160                 | ✓              |   | ✓ |
|          |                                                                                      |         | LO6O      | T17A   | 320                 | ✓              |   | ✓ |
|          |                                                                                      |         | LO8O      | T19A   | 640                 | ✓              |   | ✓ |
| 122      | Normally Open,<br>Logic Modulating,<br>Internal Pilot                                |         | LP2A      | T11A   | 60                  | ✓              |   | ✓ |
|          |                                                                                      |         | LP3A      | T2A    | 120                 | ✓              |   | ✓ |
|          |                                                                                      |         | LP6A      | T17A   | 240                 | ✓              |   | ✓ |
|          |                                                                                      |         | LP8A      | T19A   | 480                 | ✓              |   | ✓ |
| 122      | Normally Open,<br>Logic Modulating,<br>External Pilot                                |         | LP2C      | T11A   | 60                  | ✓              |   | ✓ |
|          |                                                                                      |         | LP3C      | T2A    | 120                 | ✓              |   | ✓ |
|          |                                                                                      |         | LP6C      | T17A   | 240                 | ✓              |   | ✓ |
|          |                                                                                      |         | LP8C      | T19A   | 480                 | ✓              |   | ✓ |

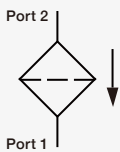
| Page No. | Function                                                              | Symbols                                                                            | Model No. | Cavity | Capacity (l/min) | Control Manner |   |   |
|----------|-----------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------|--------|------------------|----------------|---|---|
|          |                                                                       |                                                                                    |           |        |                  | L              | K | X |
| 124      | Fixed Orifice, Flow Fuse Valve                                        |   | FQ2A      | T13A   | 23               |                |   | ✓ |
|          |                                                                       |                                                                                    | FQ3A      | T5A    | 60               |                |   | ✓ |
|          |                                                                       |                                                                                    | FQ6A      | T16A   | 95               |                |   | ✓ |
|          |                                                                       |                                                                                    | FQ8A      | T18A   | 200              |                |   | ✓ |
| 126      | 1.8:1 Pilot Ratio, Pilot to Close Check Valve                         |   | CO1A      | T163A  | 40               |                |   | ✓ |
|          |                                                                       |                                                                                    | CO2A      | T11A   | 80               |                |   | ✓ |
|          |                                                                       |                                                                                    | CO3A      | T2A    | 160              |                |   | ✓ |
|          |                                                                       |                                                                                    | CO6A      | T17A   | 320              |                |   | ✓ |
|          |                                                                       |                                                                                    | CO8A      | T19A   | 640              |                |   | ✓ |
| 128      | 120:1 Pilot Ratio, Pilot to Close Check Valve                         |   | CO3O      | T2A    | 4                |                |   | ✓ |
|          |                                                                       |                                                                                    |           |        |                  |                |   |   |
|          |                                                                       |                                                                                    |           |        |                  |                |   |   |
| 130      | 30%, Accumulator Sense, Pump Unload Valve with Check - Pilot Capacity |  | QC2A      | T21A   | 60               | ✓              | ✓ |   |
|          |                                                                       |                                                                                    | QC2B      | T21A   | 60               | ✓              | ✓ |   |
|          |                                                                       |                                                                                    | QC2C      | T21A   | 60               | ✓              | ✓ |   |

| Page No. | Function                                     | Symbols                                                                             | Model No. | Cavity | Thread      |
|----------|----------------------------------------------|-------------------------------------------------------------------------------------|-----------|--------|-------------|
| 132      | 2 Holes External Port Blocked Cavity Plug    |    | X10A2     | T162A  | M16 P15     |
|          |                                              |                                                                                     | X20A2     | T10A   | M20 P1.5    |
|          |                                              |                                                                                     | X20A2     | T13A   | M20 P1.5    |
|          |                                              |                                                                                     | X30A2     | T3A    | 1"-14UNS-2B |
|          |                                              |                                                                                     | X30A2     | T5A    | 1"-14UNS-2B |
|          |                                              |                                                                                     | X60A2     | T16A   | M36 P2      |
|          |                                              |                                                                                     | X80A2     | T18A   | M48 P2      |
| 133      | 2 Holes All Ports Blocked Cavity Plug        |   | X1CA2     | T162A  | M16 P15     |
|          |                                              |                                                                                     | X2CA2     | T10A   | M20 P1.5    |
|          |                                              |                                                                                     | X2CA2     | T13A   | M20 P1.5    |
|          |                                              |                                                                                     | X3CA2     | T3A    | 1"-14UNS-2B |
|          |                                              |                                                                                     | X3CA2     | T5A    | 1"-14UNS-2B |
|          |                                              |                                                                                     | X6CA2     | T16A   | M36 P2      |
|          |                                              |                                                                                     | X8CA2     | T18A   | M48 P2      |
| 134      | Port 1 to 2 Open, Port 3 Blocked Cavity Plug |  | X10A3     | T163A  | M16 P1.5    |
|          |                                              |                                                                                     | X20A3     | T11A   | M20 P1.5    |
|          |                                              |                                                                                     | X30A3     | T2A    | 1"-14UNS-2B |
|          |                                              |                                                                                     | X60A3     | T17A   | M36 P2      |
|          |                                              |                                                                                     | X80A3     | T19A   | M48 P2      |
| 135      | 3 Holes All Ports Blocked Cavity Plug        |  | X1CA3     | T163A  | M16 P1.5    |
|          |                                              |                                                                                     | X2CA3     | T13A   | M20 P1.5    |
|          |                                              |                                                                                     | X3CA3     | T2A    | 1"-14UNS-2B |
|          |                                              |                                                                                     | X6CA3     | T17A   | M36 P2      |
|          |                                              |                                                                                     | X8CA3     | T19A   | M48 P2      |

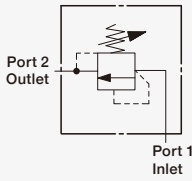
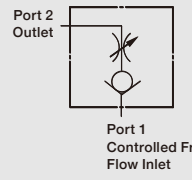
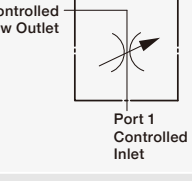
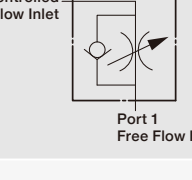
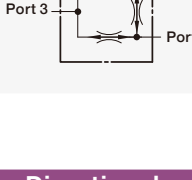
## Electronic Amplifier P-C Board

| Page No. | Function                                   | Appearance                                                                        | Model No.      | Type                         |
|----------|--------------------------------------------|-----------------------------------------------------------------------------------|----------------|------------------------------|
| 136      | Digital Proportional Controller - Case     |  | SY-DPCA-C-1    | Case with DIN-35 rail clamps |
| 138      | Digital Proportional Controller - PCB Only |  | SY-DPCA-P-1    | PCB only                     |
| 140      | Digital Proportional Controller - DIN Plug |  | SY-DPCA-D-P9-1 | DIN43650A plug               |

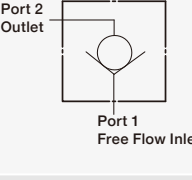
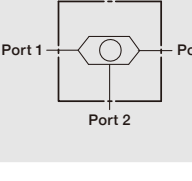
## Filter

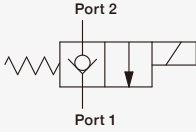
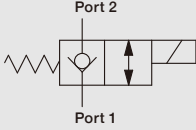
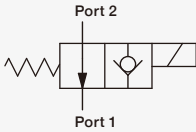
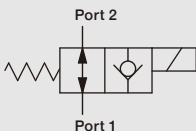
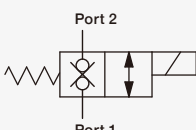
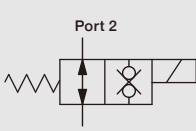
| Page No. | Function | Symbols                                                                             | Model No. | Cavity | Capacity<br>(l/min) | Control Manner |   |   |
|----------|----------|-------------------------------------------------------------------------------------|-----------|--------|---------------------|----------------|---|---|
|          |          |                                                                                     |           |        |                     | L              | K | X |
| 142      | Filter   |  | FL2A      | T13A   | 37.9                |                |   | ✓ |
|          |          |                                                                                     | FL3A      | T5A    | 75.7                |                |   | ✓ |
|          |          |                                                                                     | FL6A      | T16A   | 151.4               |                |   | ✓ |
|          |          |                                                                                     | FL8A      | T18A   | 302.8               |                |   | ✓ |

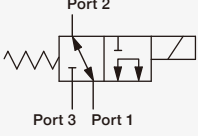
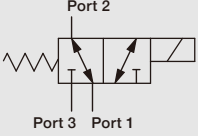
## SAE Cavity Cartridge Valve > Flow Control

| Page No. | Function                                           | Symbols                                                                             | Model No. | Cavity | Capacity (l/min) | Control Manner |   |   |   |
|----------|----------------------------------------------------|-------------------------------------------------------------------------------------|-----------|--------|------------------|----------------|---|---|---|
|          |                                                    |                                                                                     |           |        |                  | L              | K | X | C |
| 146      | Noiseless Direct Acting Diagonal Area Relief Valve |    | MH-082    | T082   | 25               | ✓              | ✓ |   | ✓ |
|          |                                                    |                                                                                     | MH-092    | T092   | 45               | ✓              | ✓ |   | ✓ |
|          |                                                    |                                                                                     | MH-102    | T102   | 45               | ✓              | ✓ |   | ✓ |
|          |                                                    |                                                                                     | MH-122    | T122   | 85               | ✓              | ✓ |   | ✓ |
| 148      | Check with Manual Flow Adjustment                  |    | CN-082    | T082   | 30               | ✓              | ✓ |   |   |
|          |                                                    |                                                                                     | CN-102    | T102   | 50               | ✓              | ✓ |   |   |
|          |                                                    |                                                                                     | CN-122    | T122   | 80               | ✓              | ✓ |   |   |
|          |                                                    |                                                                                     | CN-162    | T162   | 150              | ✓              | ✓ |   |   |
| 150      | Fully Adjustable Needle                            |    | NV-082    | T082   | 30               | ✓              | ✓ |   |   |
|          |                                                    |                                                                                     | NV-102    | T102   | 50               | ✓              | ✓ |   |   |
|          |                                                    |                                                                                     | NV-122    | T122   | 80               | ✓              | ✓ |   |   |
|          |                                                    |                                                                                     | NV-162    | T162   | 150              | ✓              | ✓ |   |   |
| 152      | Fully Adjustable Needle with Free Flow Check       |   | NC-082    | T082   | 30               | ✓              | ✓ |   |   |
|          |                                                    |                                                                                     | NC-102    | T102   | 50               | ✓              | ✓ |   |   |
|          |                                                    |                                                                                     | NC-122    | T122   | 80               | ✓              | ✓ |   |   |
|          |                                                    |                                                                                     | NC-162    | T162   | 150              | ✓              | ✓ |   |   |
| 154      | Flow Divider (Flow Ratio: 1:1)                     |  | CP-104    | T104   | 45               |                |   | ✓ |   |
|          |                                                    |                                                                                     | CP-124    | T124   | 75               |                |   | ✓ |   |
|          |                                                    |                                                                                     | CP-164    | T164   | 150              |                |   | ✓ |   |

## SAE Cavity Cartridge Valve > Directional

| Page No. | Function                           | Symbols                                                                             | Model No. | Cavity | Capacity (l/min) | Control Manner |   |   |
|----------|------------------------------------|-------------------------------------------------------------------------------------|-----------|--------|------------------|----------------|---|---|
|          |                                    |                                                                                     |           |        |                  | L              | K | X |
| 156      | Check Free Flow 1-2, , Poppet Type |  | CV-082    | T082   | 30               |                |   | ✓ |
|          |                                    |                                                                                     | CV-102    | T102   | 50               |                |   | ✓ |
|          |                                    |                                                                                     | CV-122    | T122   | 80               |                |   | ✓ |
|          |                                    |                                                                                     | CV-162    | T162   | 150              |                |   | ✓ |
| 158      | Shuttle Valve                      |  | LS-083    | T083   | 15               |                |   | ✓ |
|          |                                    |                                                                                     | LS-103    | T103   | 30               |                |   | ✓ |

| Page No. | Function                                  | Symbols                                                                             | Model No. | Cavity | Capacity (l/min) | Control Manner |   |   |
|----------|-------------------------------------------|-------------------------------------------------------------------------------------|-----------|--------|------------------|----------------|---|---|
|          |                                           |                                                                                     |           |        |                  | L              | K | X |
| 160      | Normally Closed Single Check              |    | HS-2A     | T082   | 28               |                |   | ✓ |
|          |                                           |                                                                                     | JS-2A     | T102   | 50               |                |   | ✓ |
|          |                                           |                                                                                     | LS-2A     | T122   | 100              |                |   | ✓ |
|          |                                           |                                                                                     | PS-2A     | T162   | 150              |                |   | ✓ |
| 162      | Normally Closed Single Check Reverse Flow |    | HS-2B     | T082   | 28               |                |   | ✓ |
|          |                                           |                                                                                     | JS-2B     | T102   | 50               |                |   | ✓ |
|          |                                           |                                                                                     | LS-2B     | T122   | 100              |                |   | ✓ |
|          |                                           |                                                                                     | PS-2B     | T162   | 150              |                |   | ✓ |
| 164      | Normally Open Single Check                |    | HS-2C     | T082   | 28               |                |   | ✓ |
|          |                                           |                                                                                     | JS-2C     | T102   | 50               |                |   | ✓ |
|          |                                           |                                                                                     | LS-2C     | T122   | 100              |                |   | ✓ |
|          |                                           |                                                                                     | PS-2C     | T162   | 150              |                |   | ✓ |
| 166      | Normally Open Single Check Reverse Flow   |   | HS-2D     | T082   | 28               |                |   | ✓ |
|          |                                           |                                                                                     | JS-2D     | T102   | 50               |                |   | ✓ |
|          |                                           |                                                                                     | LS-2D     | T122   | 100              |                |   | ✓ |
|          |                                           |                                                                                     | PS-2D     | T162   | 150              |                |   | ✓ |
| 168      | Normally Closed Double Check              |  | HS-2I     | T082   | 28               |                |   | ✓ |
|          |                                           |                                                                                     | JS-2I     | T102   | 50               |                |   | ✓ |
|          |                                           |                                                                                     | LS-2I     | T122   | 100              |                |   | ✓ |
|          |                                           |                                                                                     | PS-2I     | T162   | 150              |                |   | ✓ |
| 170      | Normally Open Double Check                |  | HS-2J     | T082   | 28               |                |   | ✓ |
|          |                                           |                                                                                     | JS-2J     | T102   | 50               |                |   | ✓ |
|          |                                           |                                                                                     | LS-2J     | T122   | 100              |                |   | ✓ |
|          |                                           |                                                                                     | PS-2J     | T162   | 150              |                |   | ✓ |

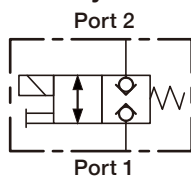
| Page No. | Function          | Symbols                                                                           | Model No. | Cavity | Capacity (l/min) | Control Manner |   |   |
|----------|-------------------|-----------------------------------------------------------------------------------|-----------|--------|------------------|----------------|---|---|
|          |                   |                                                                                   |           |        |                  | L              | K | X |
| 172      | 3 Way, 2 Position |  | HS-3A     | T082   | 15               |                |   | ✓ |
|          |                   |                                                                                   | JS-3A     | T102   |                  |                |   | ✓ |
| 174      | 3 Way, 2 Position |  | HS-3X     | T082   | 13               |                |   | ✓ |
|          |                   |                                                                                   | JS-3X     | T102   | 38               |                |   | ✓ |

# DTA

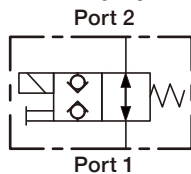


## SYMBOLS

normally closed



normally open



## ORDER CODES

**DT 2 A - T13A - M C N - DG 24**

1 2 3 4 5 6 7 8

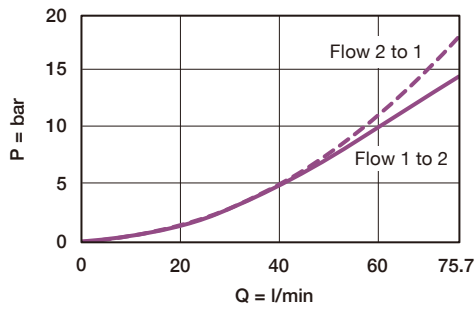
|   |                  |      |                 |
|---|------------------|------|-----------------|
| 1 | Model Name       | DT   |                 |
| 2 | Capacity (l/min) | 2    | 40              |
| 3 | Cavity           | T13A |                 |
| 4 | Control Manner   | M    | manual override |
| 5 | Type             | C    | normally closed |
|   |                  | H    | normally open   |
| 6 | Material of Seal | N    | buna-N          |
|   |                  | V    | viton           |
| 7 | Connector (coil) | DG   | ISO/DIN43650    |
|   |                  | DR   | Deutsch DT04-2P |
| 8 | Voltage (coil)   | 12   | 12 VDC          |
|   |                  | 24   | 24 VDC          |

## MODEL SPEC.

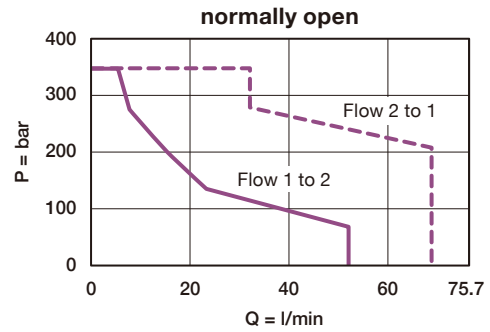
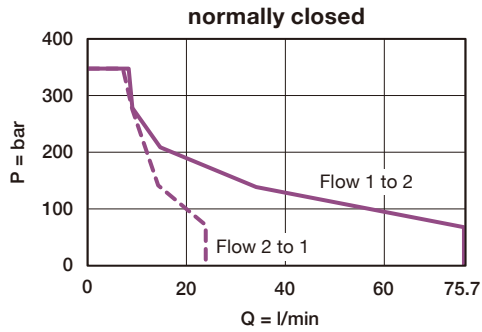
| Model | Cavity                      | Capacity (l/min)          | Max. Pressure (bar) | Leakage              | Installation Torque (Nm) |
|-------|-----------------------------|---------------------------|---------------------|----------------------|--------------------------|
| DT2A  | T13A                        | 40                        | 350                 | less than 0.7 cc/min | 45/50                    |
| Model | Max. Current                | Power Consumption (watts) | Body's Weight (kg)  | Coil's Weight (kg)   |                          |
| DT2A  | 1820mA@12VDC<br>910mA@24VDC | 22                        | 0.24                | 0.23                 |                          |

## PERFORMANCE CURVES

### ► Pressure Differential vs. Flow

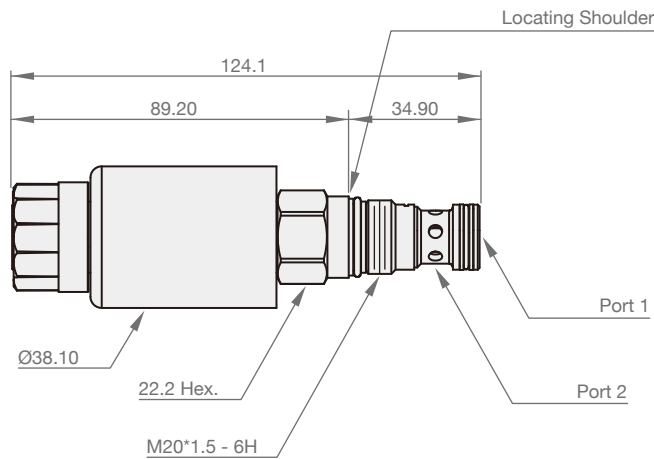


### ► Valve Performance Limits @ 10% Undervoltage & Stabilized Coil Temperature



## DIMENSION

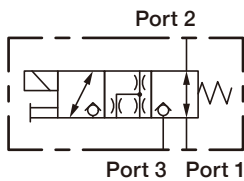
( UNIT : mm )



# DWA



## SYMBOLS



## ORDER CODES

**DW** **2** **A** - **T11A** - **M** **A** **N** - **DR** **24**

1 2 3 4 5 6 7 8

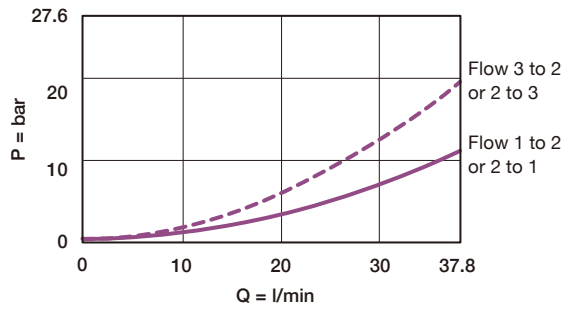
|   |                  |      |                               |
|---|------------------|------|-------------------------------|
| 1 | Model Name       | DW   |                               |
| 2 | Capacity (l/min) | 2    | 30                            |
| 3 | Cavity           | T11A |                               |
| 4 | Control Manner   | M    | manual override               |
| 5 | Type             | A    | 1-2 normally open, 2-3 closed |
| 6 | Material of Seal | N    | buna-N                        |
|   |                  | V    | viton                         |
| 7 | Connector (coil) | DG   | ISO/DIN43650                  |
|   |                  | DR   | Deutsch DT04-2P               |
| 8 | Voltage (coil)   | 12   | 12 VDC                        |
|   |                  | 24   | 24 VDC                        |

## MODEL SPEC.

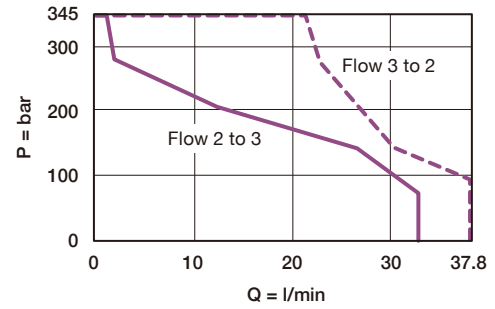
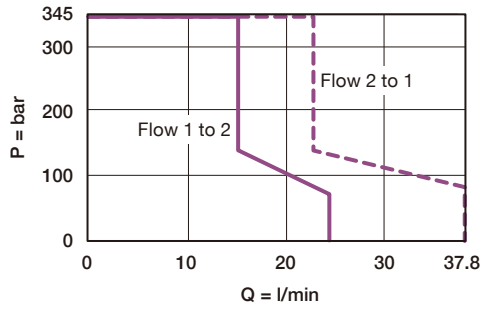
| Model | Cavity                      | Capacity (l/min)          | Max. Pressure (bar) | Leakage              | Installation Torque (Nm) |
|-------|-----------------------------|---------------------------|---------------------|----------------------|--------------------------|
| DW2A  | T11A                        | 30                        | 350                 | less than 0.7 cc/min | 45/50                    |
| Model | Max. Current                | Power Consumption (watts) | Body's Weight (kg)  | Coil's Weight (kg)   |                          |
| DW2A  | 1820mA@12VDC<br>910mA@24VDC | 22                        | 0.28                | 0.23                 |                          |

## PERFORMANCE CURVES

### ► Pressure Differential vs. Flow

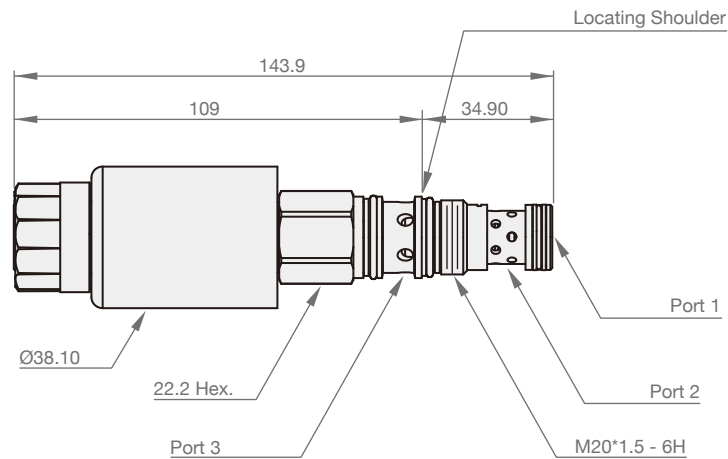


### ► Valve Performance Limits @ 10% Undervoltage & Stabilized Coil Temperature



## DIMENSION

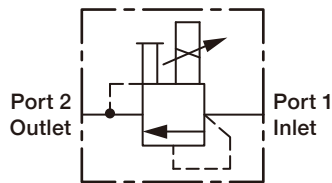
( UNIT : mm )



# RBP



## SYMBOLS



## ORDER CODES

**RB 1 P - T8A - M A N - DG 24**

1 2 1 3 4 5 6 7 8

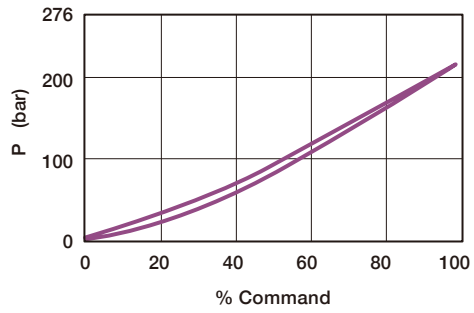
|   |                        |     |                 |
|---|------------------------|-----|-----------------|
| 1 | Model Name             | RBP |                 |
| 2 | Capacity (l/min)       | 1   | 1               |
| 3 | Cavity                 | T8A |                 |
| 4 | Control Manner         | M   | manual override |
| 5 | Adjustment Range (bar) | A   | 20 ~ 210        |
|   |                        | B   | 10.5 ~ 105      |
|   |                        | D   | 3.5 ~ 50        |
|   |                        | W   | 35 ~ 350        |
| 6 | Material of Seal       | N   | buna-N          |
|   |                        | V   | viton           |
| 7 | Connector (coil)       | DG  | ISO/DIN43650    |
|   |                        | DR  | Deutsch DT04-2P |
| 8 | Voltage (coil)         | 12  | 12 VDC          |
|   |                        | 24  | 24 VDC          |

## MODEL SPEC.

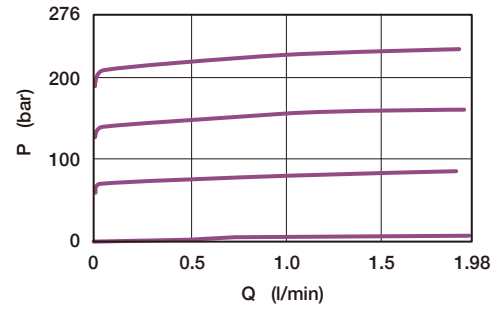
| Model | Cavity     | Capacity (l/min)            | Max. Pressure (bar)       | Leakage             | Installation Torque (Nm) |
|-------|------------|-----------------------------|---------------------------|---------------------|--------------------------|
| RB1P  | T8A        | 1                           | 350                       | less than 25 cc/min | 9/10                     |
| Model | Hysteresis | Max. Current                | Power Consumption (watts) | Body's Weight (kg)  | Coil's Weight (kg)       |
| RB1P  | 5%         | 1820mA@12VDC<br>910mA@24VDC | 22                        | 0.26                | 0.23                     |

## PERFORMANCE CURVES

### ► Pressure vs. Command (Range A)

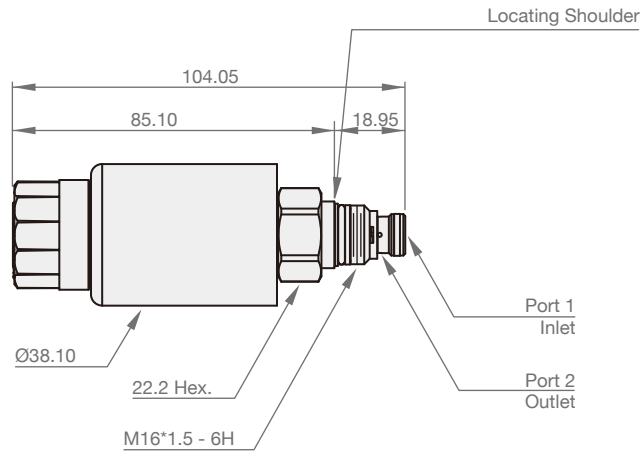


### ► Typical Pressure Rise



## DIMENSION

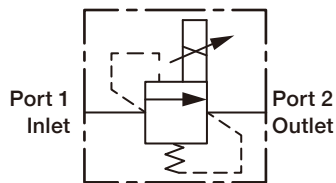
( UNIT : mm )



# RBN



## SYMBOLS



## ORDER CODES

|           |          |          |   |            |   |          |          |          |   |           |           |
|-----------|----------|----------|---|------------|---|----------|----------|----------|---|-----------|-----------|
| <b>RB</b> | <b>1</b> | <b>N</b> | - | <b>T8A</b> | - | <b>M</b> | <b>A</b> | <b>N</b> | - | <b>DR</b> | <b>24</b> |
| 1         | 2        | 1        |   | 3          |   | 4        | 5        | 6        |   | 7         | 8         |

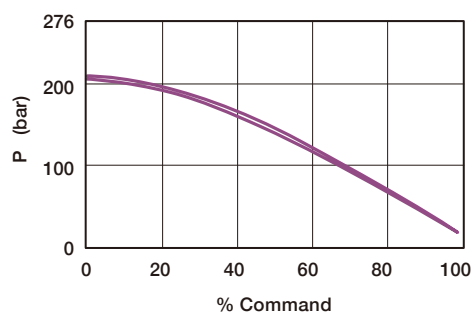
|   |                        |     |                 |
|---|------------------------|-----|-----------------|
| 1 | Model Name             | RBN |                 |
| 2 | Capacity (l/min)       | 1   | 1               |
| 3 | Cavity                 | T8A |                 |
| 4 | Control Manner         | M   | manual override |
| 5 | Adjustment Range (bar) | A   | 105 ~ 210       |
|   |                        | B   | 55 ~ 105        |
|   |                        | D   | 20 ~ 55         |
|   |                        | W   | 210 ~ 350       |
| 6 | Material of Seal       | N   | buna-N          |
|   |                        | V   | viton           |
| 7 | Connector (coil)       | DG  | ISO/DIN43650    |
|   |                        | DR  | Deutsch DT04-2P |
| 8 | Voltage (coil)         | 12  | 12 VDC          |
|   |                        | 24  | 24 VDC          |

## MODEL SPEC.

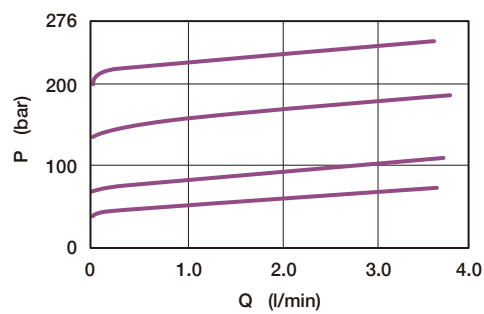
| Model | Cavity     | Capacity (l/min)            | Max. Pressure (bar)       | Leakage             | Installation Torque (Nm) |
|-------|------------|-----------------------------|---------------------------|---------------------|--------------------------|
| RB1N  | T8A        | 1                           | 350                       | less than 25 cc/min | 9/10                     |
| Model | Hysteresis | Max. Current                | Power Consumption (watts) | Body's Weight (kg)  | Coil's Weight (kg)       |
| RB1N  | 5%         | 1820mA@12VDC<br>910mA@24VDC | 22                        | 0.45                | 0.23                     |

## PERFORMANCE CURVES

### ► Pressure vs. Command (Range A)

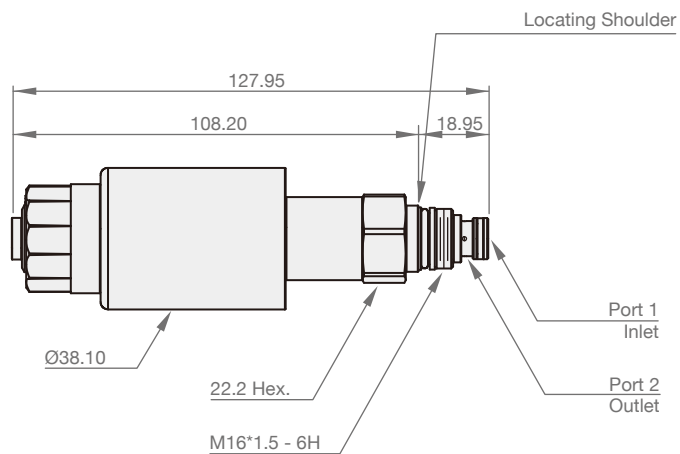


### ► Pressure Differential vs. Flow (Range A)



## DIMENSION

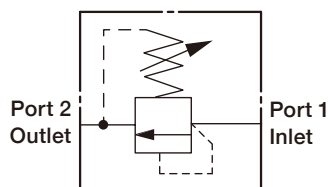
( UNIT : mm )



# RBC, RBA



## SYMBOLS



## ORDER CODES

|           |           |   |             |   |          |          |          |
|-----------|-----------|---|-------------|---|----------|----------|----------|
| <b>RB</b> | <b>2C</b> | - | <b>T10A</b> | - | <b>L</b> | <b>A</b> | <b>N</b> |
| 1         | 2         |   | 3           |   | 4        | 5        | 6        |

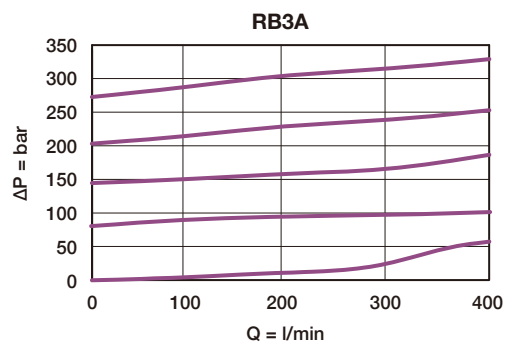
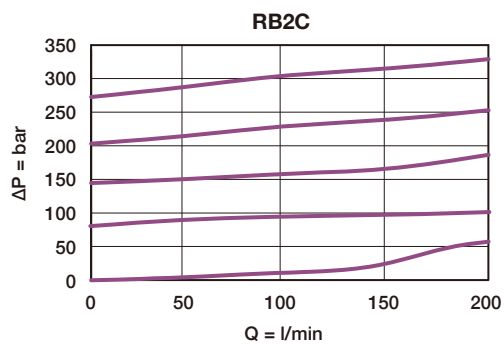
|   |                  |                             |
|---|------------------|-----------------------------|
| 1 | Model Name       | RB                          |
| 2 | Capacity         | 2C 1 l/min                  |
|   |                  | 3A 2 l/min                  |
| 3 | Cavity           | T10A, T3A                   |
| 4 | Control Manner   | L standard screw adjustment |
|   |                  | K hand knob with lock knob  |
| 5 | Adjustable Range | A 7 ~ 210 bar               |
|   |                  | B 3.5 ~ 105 bar             |
|   |                  | C 10.5 ~ 400 bar            |
|   |                  | N 5 ~ 55 bar                |
| 6 | Material of Seal | N buna-N                    |
|   |                  | V viton                     |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating<br>Temperature     | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| RB2C  | T10A   | 1                   | 350                    | 45/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.15           |
| RB3A  | T3A    | 2                   | 350                    | 60/70                       |                              | 0.25           |

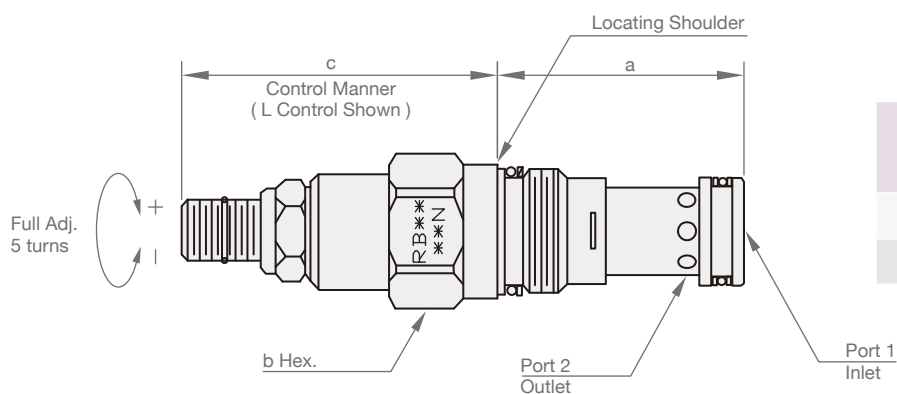
## PERFORMANCE CURVES

### ► Typical Pressure Rise



## DIMENSION

( UNIT : mm )

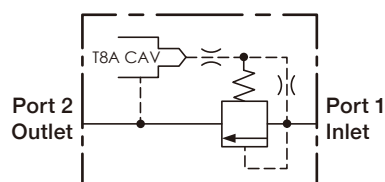


| Model | a    | b    | c  |    |
|-------|------|------|----|----|
|       |      |      | L  | K  |
| RB2C  | 39.7 | 22.2 | 51 | 58 |
| RB3A  | 47.8 | 28.6 | 54 | 61 |

# RPC8



## SYMBOLS



## ORDER CODES

**RP 3 C - T3A - 8 W N**

1 2 1 3 4 5 6

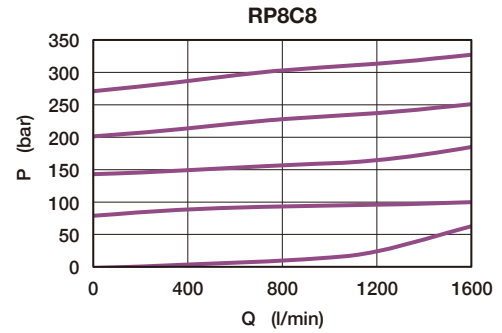
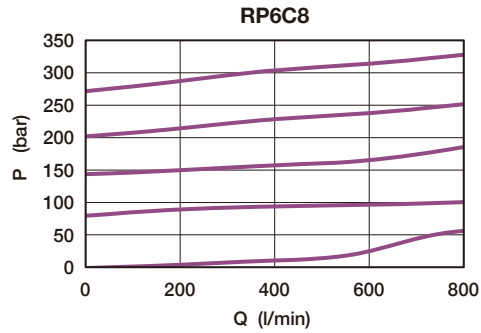
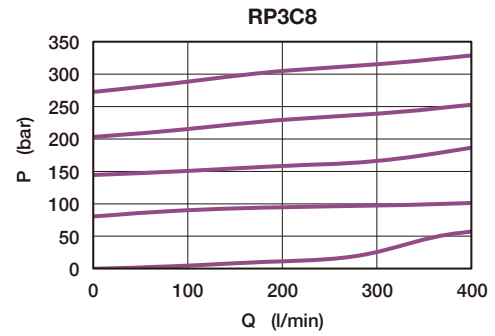
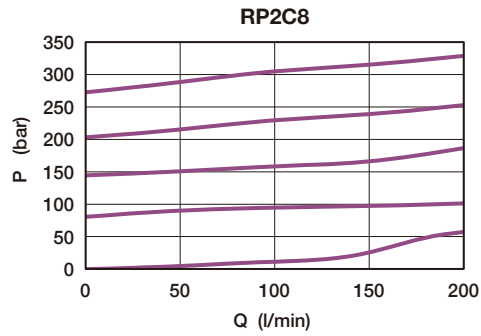
|   |                         |                       |                     |
|---|-------------------------|-----------------------|---------------------|
| 1 | Model Name              | RPC                   |                     |
| 2 | Valve Size              | 2, 3, 6, 8            |                     |
| 3 | Cavity                  | T10A, T3A, T16A, T18A |                     |
| 4 | Control Manner          | 8                     | integral cavity T8A |
| 5 | Cracking Pressure (bar) | W                     | 7                   |
|   |                         | D                     | 1.7                 |
| 6 | Material of Seal        | N                     | buna-N              |
|   |                         | V                     | viton               |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| RP2C8 | T10A   | 95                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.09           |
| RP3C8 | T3A    | 200                 | 350                    | 60/70                       |                              | 0.17           |
| RP6C8 | T16A   | 380                 | 350                    | 200/215                     |                              | 0.43           |
| RP8C8 | T18A   | 760                 | 350                    | 465/500                     |                              | 0.59           |

## PERFORMANCE CURVES

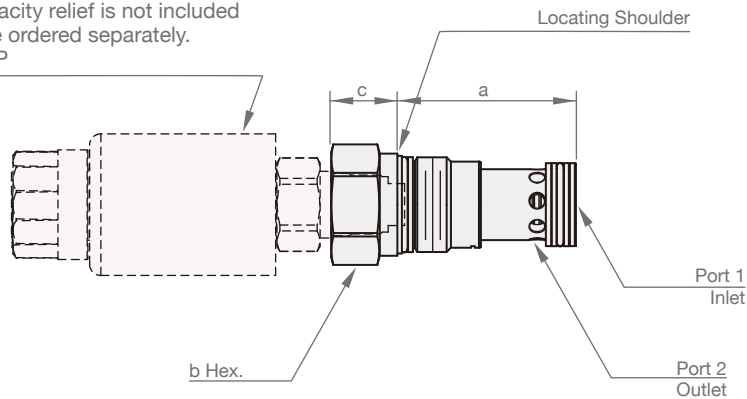
### ► Typical Pressure Rise



## DIMENSION

( UNIT : mm )

T8A pilot capacity relief is not included and has to be ordered separately.  
Refer to RB1P

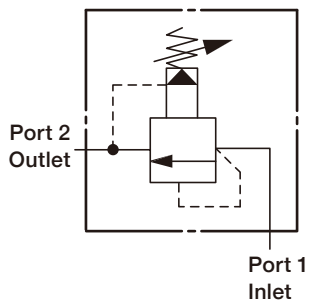


| Model | a    | b    | c    |
|-------|------|------|------|
| RP2C8 | 39.7 | 22.2 | 19   |
| RP3C8 | 47.8 | 28.6 | 17.5 |
| RP6C8 | 61.9 | 31.8 | 24.6 |
| RP8C8 | 79.4 | 41.3 | 30.2 |

# RPC



## SYMBOLS



## ORDER CODES

**RP 2 C - T10A - L A N**

1 2 1 3 4 5 6

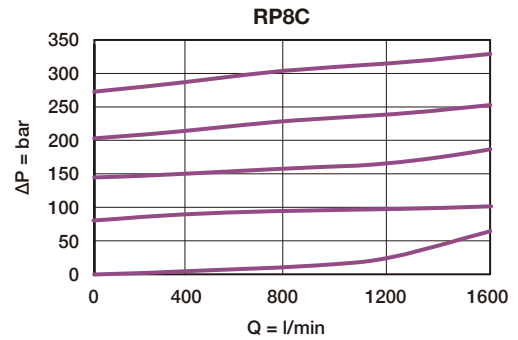
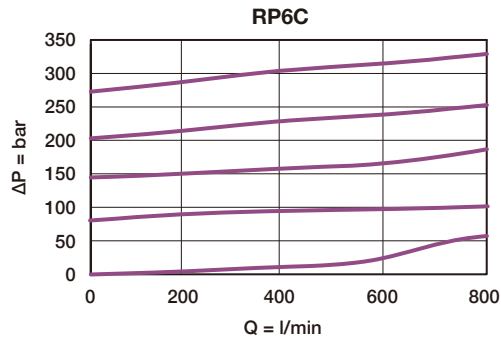
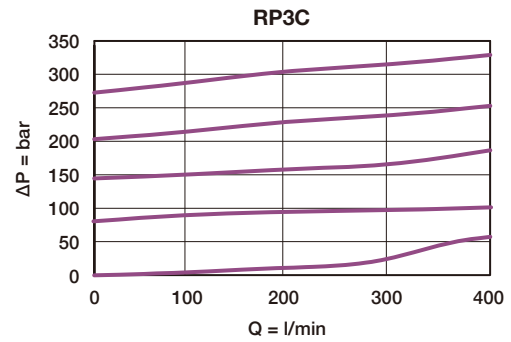
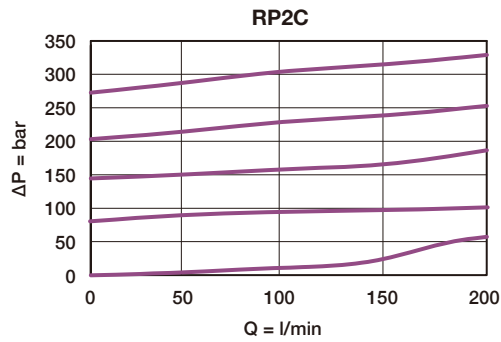
|   |                  |                       |                           |
|---|------------------|-----------------------|---------------------------|
| 1 | Model Name       | RPC                   |                           |
| 2 | Valve Size       | 2, 3, 6, 8            |                           |
| 3 | Cavity           | T10A, T3A, T16A, T18A |                           |
| 4 | Control Manner   | L                     | standard screw adjustment |
|   |                  | K                     | hand knob with lock knob  |
|   |                  |                       |                           |
|   |                  |                       |                           |
|   |                  |                       |                           |
| 5 | Adjustable Range | A                     | 7 ~ 210 bar               |
|   |                  | B                     | 3.5 ~ 105 bar             |
|   |                  | C                     | 10.5 ~ 400 bar            |
|   |                  | N                     | 5 ~ 55 bar                |
|   |                  | W                     | 10.5~315 bar              |
|   |                  |                       |                           |
| 6 | Material of Seal | N                     | buna-N                    |
|   |                  | V                     | viton                     |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| RP2C  | T10A   | 95                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.15           |
| RP3C  | T3A    | 200                 | 350                    | 60/70                       |                              | 0.25           |
| RP6C  | T16A   | 380                 | 350                    | 200/215                     |                              | 0.55           |
| RP8C  | T18A   | 760                 | 350                    | 465/500                     |                              | 1.17           |

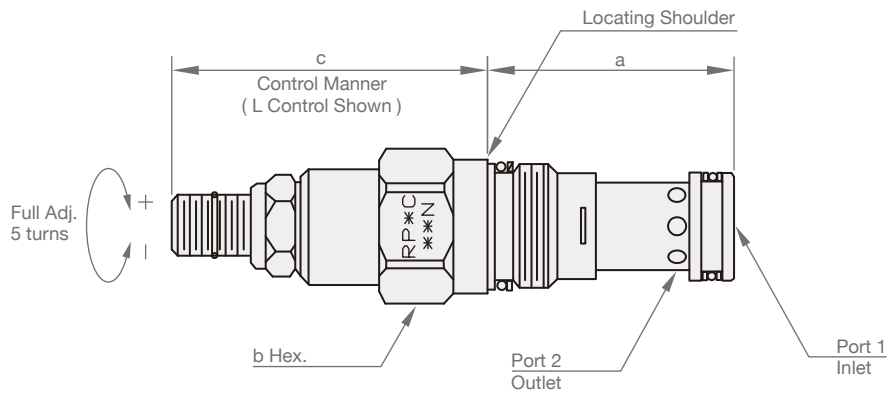
## PERFORMANCE CURVES

### ► Typical Pressure Rise



## DIMENSION

( UNIT : mm )

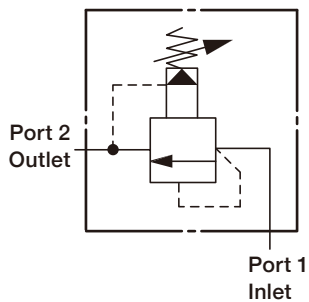


| Model | a    | b    | c  |    |
|-------|------|------|----|----|
|       |      |      | L  | K  |
| RP2C  | 39.7 | 22.2 | 51 | 58 |
| RP3C  | 47.8 | 28.6 | 54 | 61 |
| RP6C  | 61.9 | 31.8 | 62 | 69 |
| RP8C  | 79.4 | 41.3 | 71 | 78 |

# RPE



## SYMBOLS



## ORDER CODES

**RP 2 E - T10A - L A N**

1 2 1 3 4 5 6

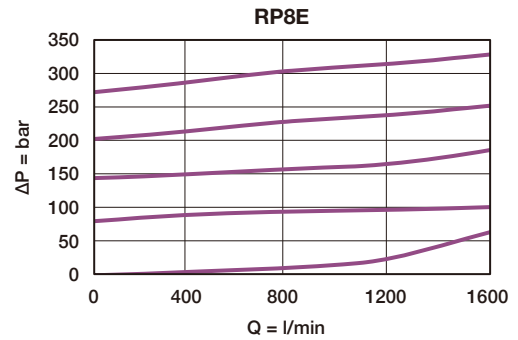
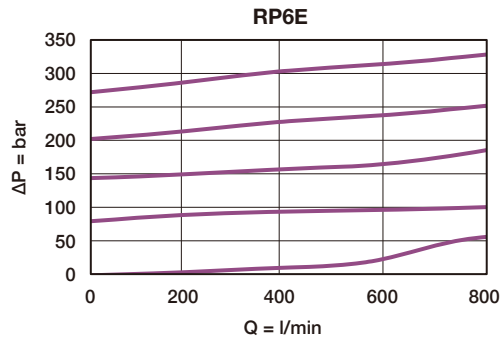
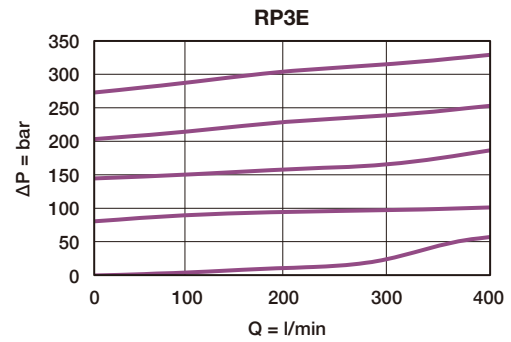
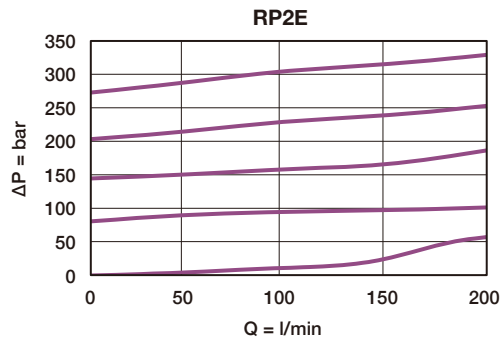
|   |                  |                       |                           |
|---|------------------|-----------------------|---------------------------|
| 1 | Model Name       | RPE                   |                           |
| 2 | Valve Size       | 2, 3, 6, 8            |                           |
| 3 | Cavity           | T10A, T3A, T16A, T18A |                           |
| 4 | Control Manner   | L                     | standard screw adjustment |
|   |                  | K                     | hand knob with lock knob  |
|   |                  | A                     | 7 ~ 210 bar               |
|   |                  | B                     | 3.5 ~ 105 bar             |
| 5 | Adjustable Range | C                     | 10.5 ~ 400 bar            |
|   |                  | N                     | 5 ~ 55 bar                |
|   |                  | N                     | buna-N                    |
|   |                  | V                     | viton                     |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| RP2E  | T10A   | 95                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.15           |
| RP3E  | T3A    | 200                 | 350                    | 60/70                       |                              | 0.25           |
| RP6E  | T16A   | 380                 | 350                    | 200/215                     |                              | 0.55           |
| RP8E  | T18A   | 760                 | 350                    | 465/500                     |                              | 1.17           |

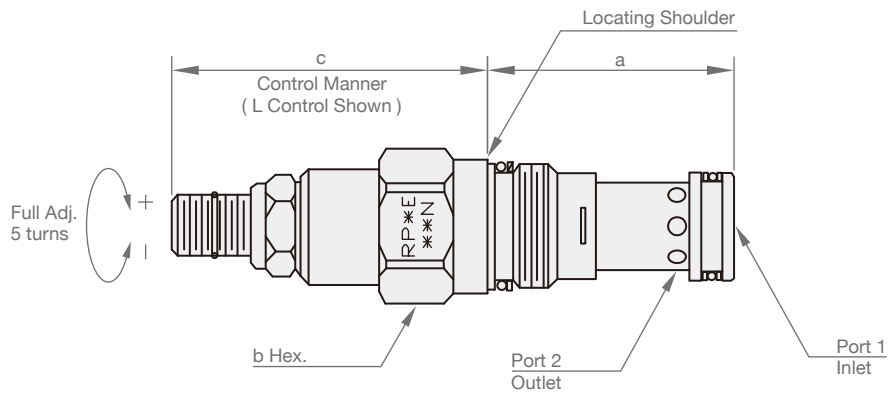
## PERFORMANCE CURVES

### ► Typical Pressure Rise



## DIMENSION

( UNIT : mm )

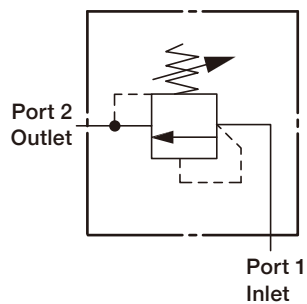


| Model | a    | b    | c  |    |
|-------|------|------|----|----|
|       |      |      | L  | K  |
| RP2E  | 39.7 | 22.2 | 51 | 58 |
| RP3E  | 47.8 | 28.6 | 54 | 61 |
| RP6E  | 61.9 | 31.8 | 62 | 69 |
| RP8E  | 79.4 | 41.3 | 71 | 78 |

# RD



## SYMBOLS



## ORDER CODES

|           |           |   |             |   |          |          |          |
|-----------|-----------|---|-------------|---|----------|----------|----------|
| <b>RD</b> | <b>2A</b> | - | <b>T10A</b> | - | <b>L</b> | <b>A</b> | <b>N</b> |
| 1         | 2         |   | 3           |   | 4        | 5        | 6        |

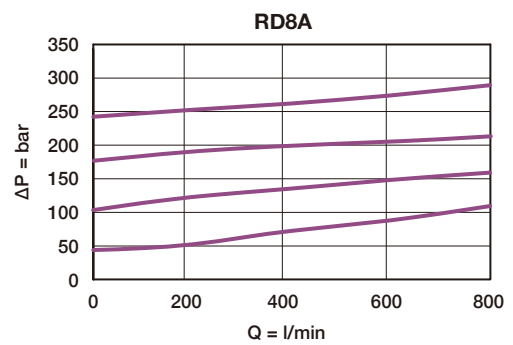
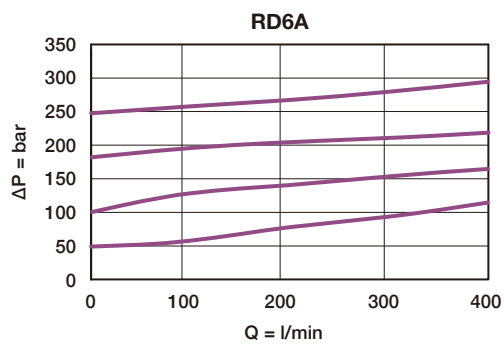
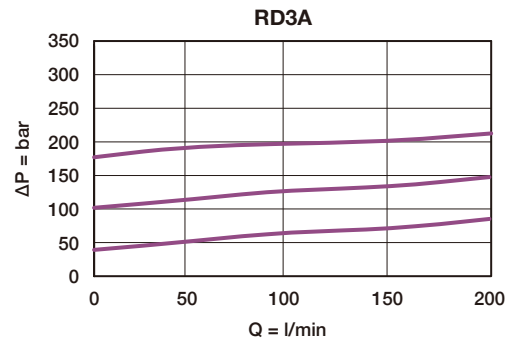
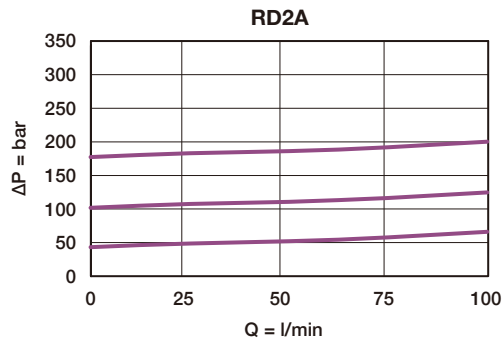
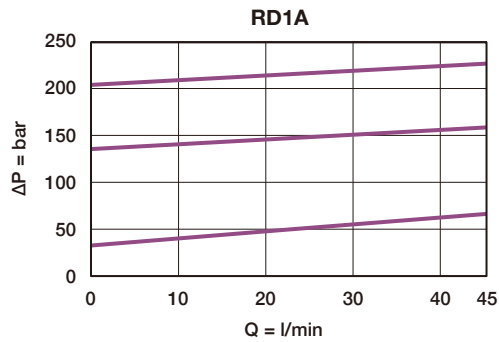
|   |                  |                              |                           |
|---|------------------|------------------------------|---------------------------|
| 1 | Model Name       | RD                           |                           |
| 2 | Valve Size       | 1A, 2A, 3A, 6A, 8A           |                           |
| 3 | Cavity           | T162A, T10A, T3A, T16A, T18A |                           |
| 4 | Control Manner   | L                            | standard screw adjustment |
| 5 | Adjustable Range | A                            | 35 ~ 210 bar              |
|   |                  | B                            | 20 ~ 105 bar              |
|   |                  | C                            | 70 ~ 420 bar              |
|   |                  | D                            | 14 ~ 55 bar               |
| 6 | Material of Seal | N                            | buna-N                    |
|   |                  | V                            | viton                     |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| RD1A  | T162A  | 28.4                | 350                    | 27/33                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.1            |
| RD2A  | T10A   | 95                  | 350                    | 40/50                       |                              | 0.155          |
| RD3A  | T3A    | 200                 | 350                    | 60/70                       |                              | 0.295          |
| RD6A  | T16A   | 380                 | 350                    | 200/215                     |                              | 0.670          |
| RD8A  | T18A   | 760                 | 350                    | 465/500                     |                              | 1.450          |

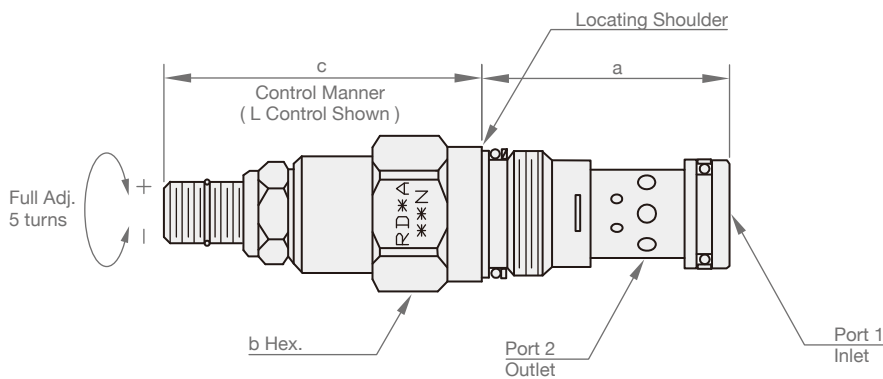
## PERFORMANCE CURVES

### ► Typical Pressure Rise



## DIMENSION

( UNIT : mm )

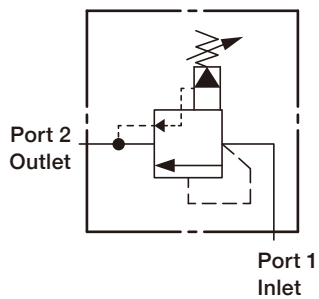


| Model | a    | b     | c    |
|-------|------|-------|------|
|       |      |       | L    |
| RD1A  | 30.2 | 18.62 | 54.1 |
| RD2A  | 39.7 | 22.2  | 61   |
| RD3A  | 47.8 | 28.6  | 64   |
| RD6A  | 61.9 | 31.8  | 83   |
| RD8A  | 79.4 | 41.3  | 100  |

# RQ



## SYMBOLS



## ORDER CODES

|           |           |   |             |   |          |          |          |
|-----------|-----------|---|-------------|---|----------|----------|----------|
| <b>RQ</b> | <b>2B</b> | - | <b>T10A</b> | - | <b>L</b> | <b>A</b> | <b>N</b> |
| 1         | 2         |   | 3           |   | 4        | 5        | 6        |

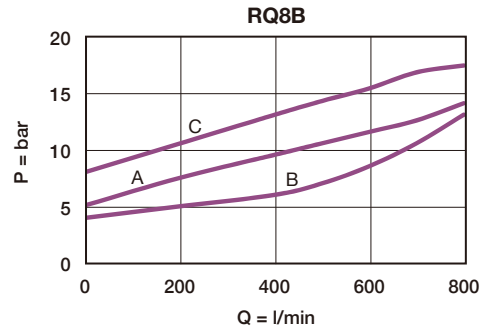
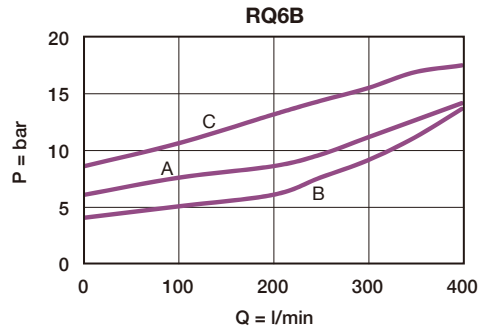
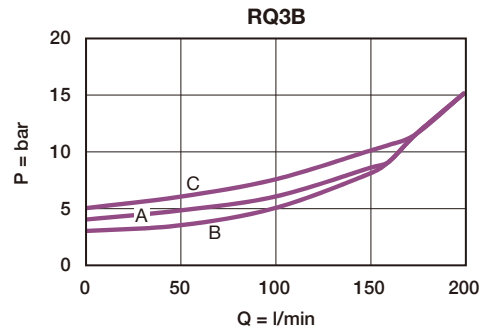
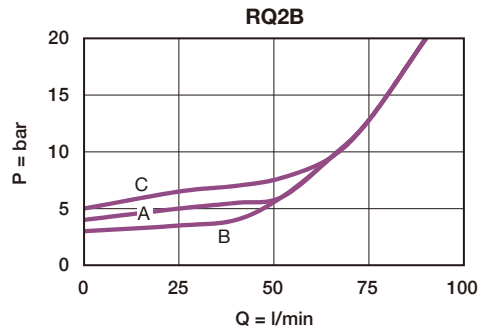
|   |                  |                       |                           |
|---|------------------|-----------------------|---------------------------|
| 1 | Model Name       | RQ                    |                           |
| 2 | Valve Size       | 2B, 3B, 6B, 8B        |                           |
| 3 | Cavity           | T10A, T3A, T16A, T18A |                           |
| 4 | Control Manner   | L                     | standard screw adjustment |
|   |                  | K                     | hand knob with lock knob  |
| 5 | Adjustable Range | A                     | 7 ~ 210 bar               |
|   |                  | B                     | 3.5 ~ 105 bar             |
|   |                  | C                     | 10.5 ~ 420 bar            |
|   |                  | N                     | 5 ~ 55 bar                |
| 6 | Material of Seal | N                     | buna-N                    |
|   |                  | V                     | viton                     |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| RQ2B  | T10A   | 95                  | 350                    | 45/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.14           |
| RQ3B  | T3A    | 200                 | 350                    | 60/70                       |                              | 0.26           |
| RQ6B  | T16A   | 380                 | 350                    | 200/215                     |                              | 0.54           |
| RQ8B  | T18A   | 760                 | 350                    | 465/500                     |                              | 1.17           |

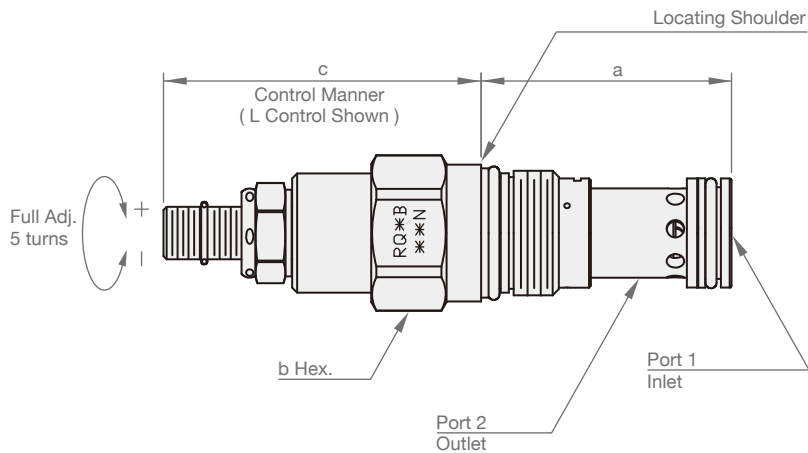
## PERFORMANCE CURVES

### ► Unloaded Pressure Drop



## DIMENSION

( UNIT : mm )

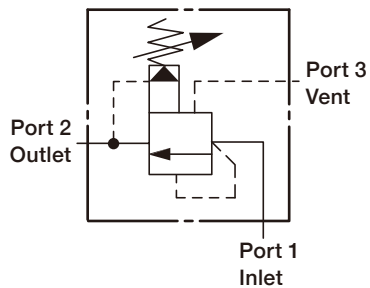


| Model | a    | b    | c    |      |
|-------|------|------|------|------|
|       |      |      | L    | K    |
| RQ2B  | 39.6 | 22.2 | 50.8 | 57.2 |
| RQ3B  | 47.8 | 28.6 | 53.8 | 60.5 |
| RQ6B  | 62.0 | 31.8 | 62.0 | 68.3 |
| RQ8B  | 79.5 | 41.3 | 71.4 | 77.7 |

# RVA



## SYMBOLS



## ORDER CODES

**RV 2A - T11A - L A N**

1 2 3 4 5 6

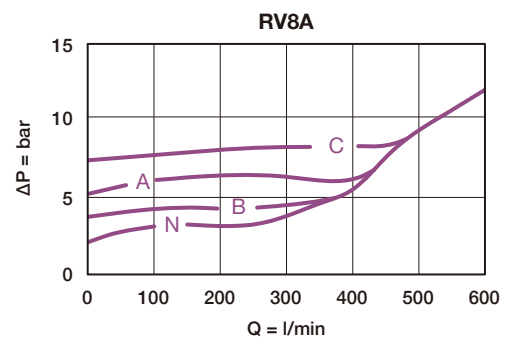
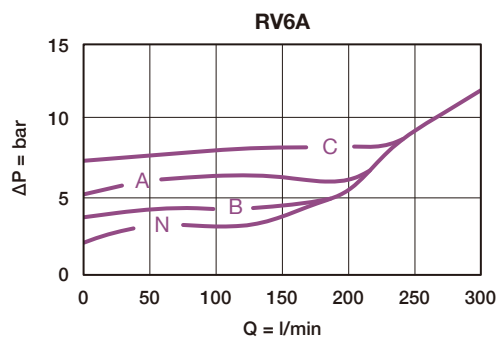
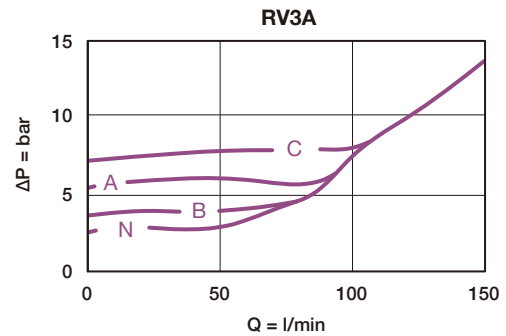
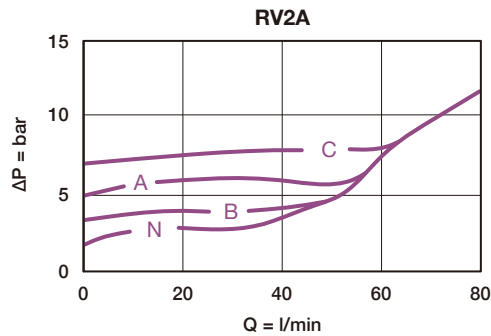
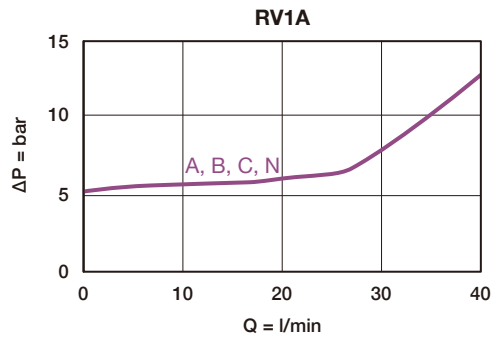
|   |                  |                              |
|---|------------------|------------------------------|
| 1 | Model Name       | RV                           |
| 2 | Valve Size       | 1A, 2A, 3A, 6A, 8A           |
| 3 | Cavity           | T163A, T11A, T2A, T17A, T19A |
| 4 | Control Manner   | L standard screw adjustment  |
|   |                  | K hand knob with lock knob   |
| 5 | Adjustable Range | A 7 ~ 210 bar                |
|   |                  | B 3.5 ~105 bar               |
|   |                  | C 10.5 ~ 420 bar             |
|   |                  | N 5 ~ 55 bar                 |
| 6 | Material of Seal | N buna-N                     |
|   |                  | V viton                      |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| RV1A  | T163A  | 28.4                | 350                    | 40/48                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.12           |
| RV2A  | T11A   | 60                  | 350                    | 40/50                       |                              | 0.17           |
| RV3A  | T2A    | 120                 | 350                    | 60/70                       |                              | 0.30           |
| RV6A  | T17A   | 240                 | 350                    | 200/215                     |                              | 0.64           |
| RV8A  | T19A   | 480                 | 350                    | 465/500                     |                              | 1.43           |

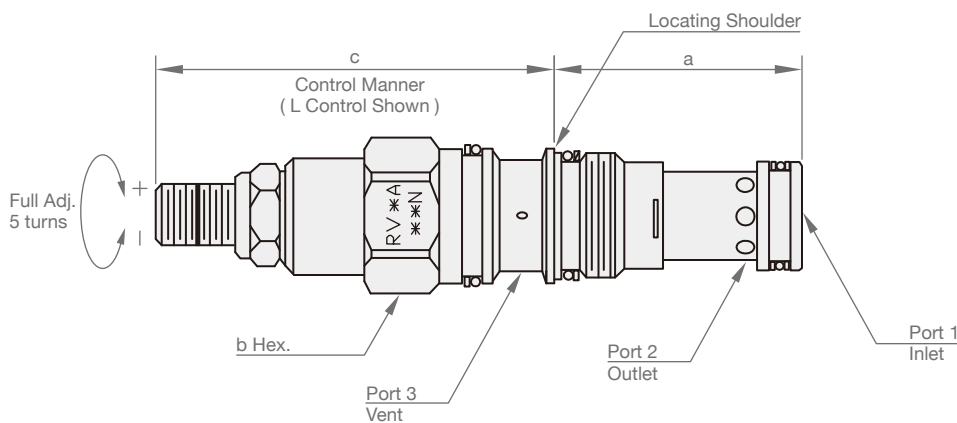
## PERFORMANCE CURVES

### ► Vented Pressure Drop



## DIMENSION

( UNIT : mm )

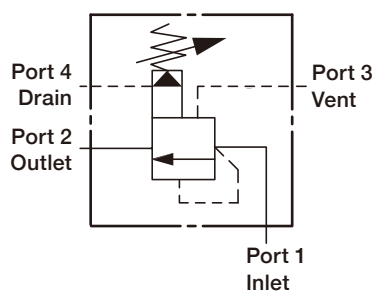


| Model | a    | b    | c   |     |
|-------|------|------|-----|-----|
|       |      |      | L   | K   |
| RV1A  | 29.9 | 19   | 66  | 72  |
| RV2A  | 34.9 | 22.2 | 64  | 70  |
| RV3A  | 34.9 | 28.6 | 72  | 78  |
| RV6A  | 46.0 | 31.8 | 84  | 90  |
| RV8A  | 63.5 | 41.3 | 100 | 107 |

# RVD



## SYMBOLS



## ORDER CODES

**RV** **2D** - **T21A** - **L** **A** **N**

1 2 3 4 5 6

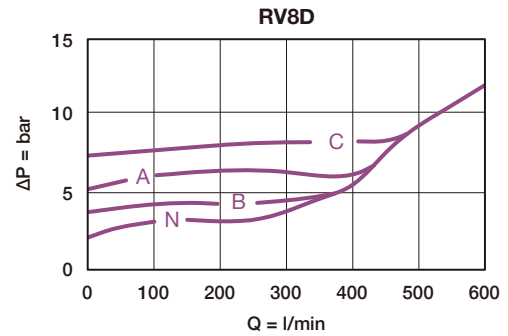
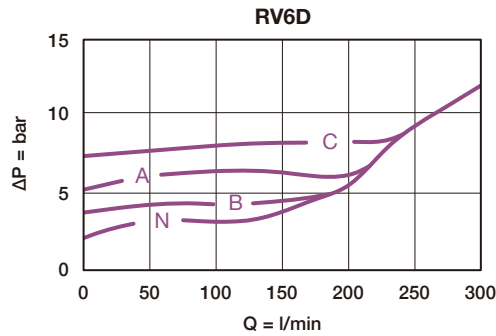
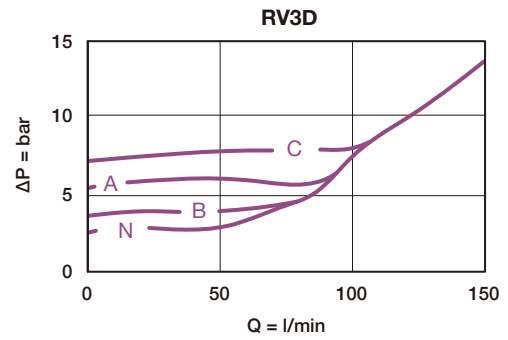
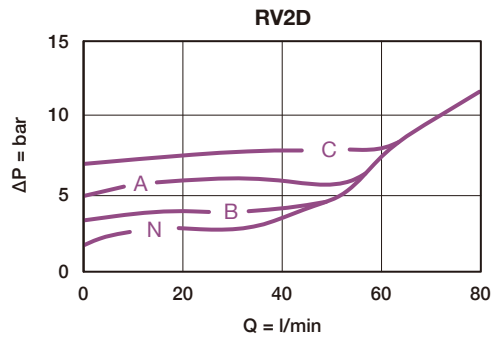
|   |                  |                                                                      |
|---|------------------|----------------------------------------------------------------------|
| 1 | Model Name       | RV                                                                   |
| 2 | Valve Size       | 2D, 3D, 6D, 8D                                                       |
| 3 | Cavity           | T21A, T22A, T23A, T24A                                               |
| 4 | Control Manner   | L standard screw adjustment<br>K hand knob with lock knob            |
| 5 | Adjustable Range | A 7 ~ 210 bar<br>B 3.5 ~ 105 bar<br>C 10.5 ~ 420 bar<br>N 5 ~ 55 bar |
| 6 | Material of Seal | N buna-N<br>V viton                                                  |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| RV2D  | T21A   | 60                  | 350                    | 45/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.20           |
| RV3D  | T22A   | 120                 | 350                    | 60/70                       |                              | 0.35           |
| RV6D  | T23A   | 240                 | 350                    | 200/215                     |                              | 0.75           |
| RV8D  | T24A   | 480                 | 350                    | 465/500                     |                              | 1.75           |

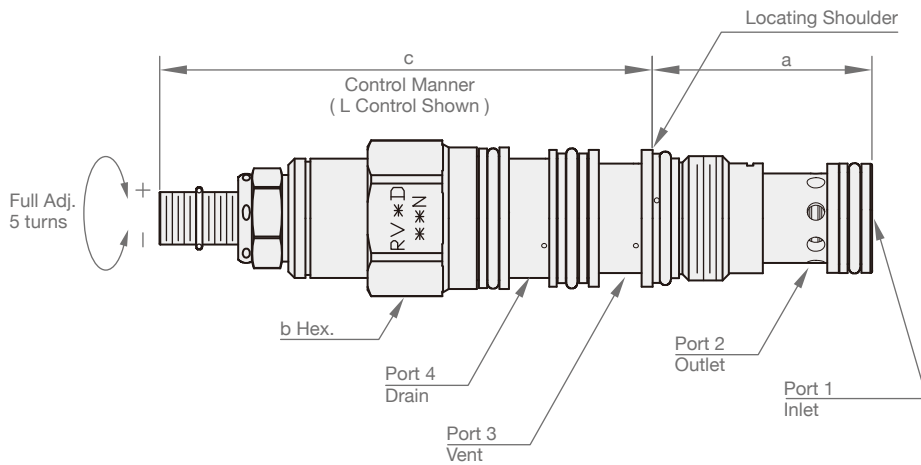
## PERFORMANCE CURVES

### ► Vented Pressure Drop



## DIMENSION

( UNIT : mm )

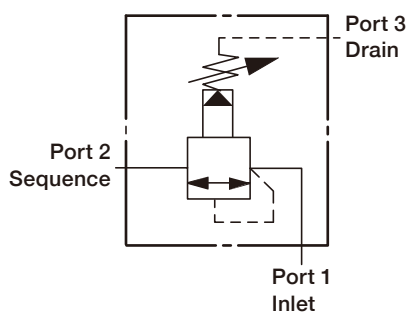


| Model | a    | b    | c     |       |
|-------|------|------|-------|-------|
|       |      |      | L     | K     |
| RV2D  | 35.1 | 22.2 | 78.5  | 84.8  |
| RV3D  | 35.1 | 28.6 | 87.4  | 93.7  |
| RV6D  | 46.0 | 31.8 | 99.8  | 106.4 |
| RV8D  | 63.5 | 41.3 | 121.4 | 127.8 |

# RS



## SYMBOLS



## ORDER CODES

**RS 2C - T11A - L A N**

1 2 3 4 5 6

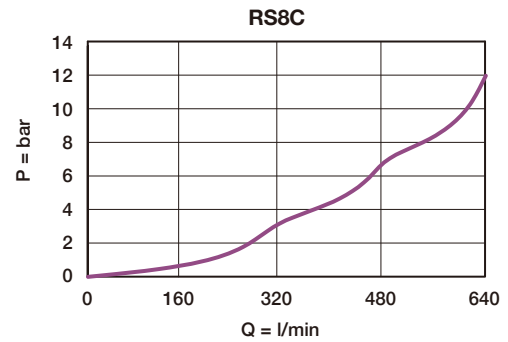
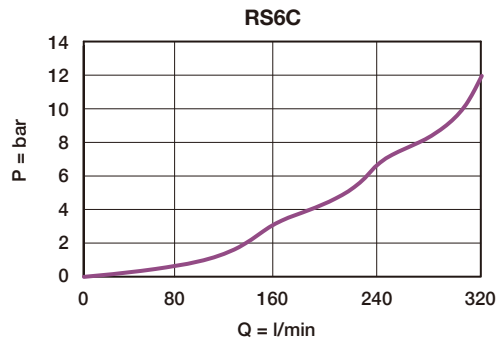
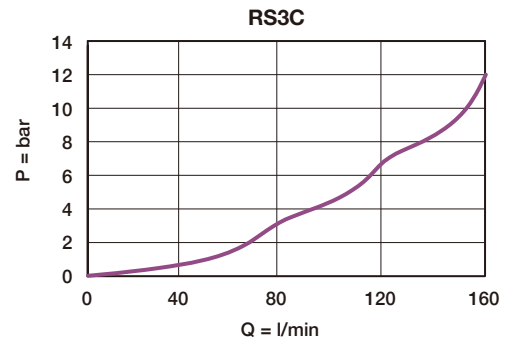
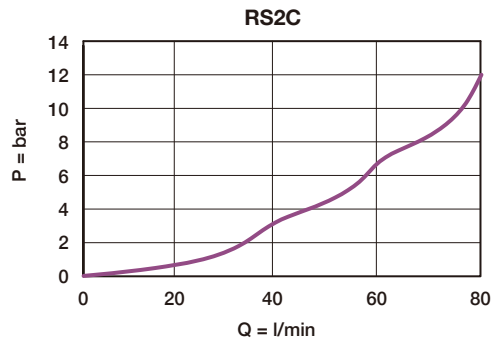
|   |                  |                       |                           |
|---|------------------|-----------------------|---------------------------|
| 1 | Model Name       | RS                    |                           |
| 2 | Valve Size       | 2C, 3C, 6C, 8C        |                           |
| 3 | Cavity           | T11A, T2A, T17A, T19A |                           |
| 4 | Control Manner   | L                     | standard screw adjustment |
|   |                  | K                     | hand knob with lock knob  |
|   |                  |                       |                           |
|   |                  |                       |                           |
|   |                  |                       |                           |
| 5 | Adjustable Range | A                     | 7 ~ 210 bar               |
|   |                  | B                     | 3.5 ~ 105 bar             |
|   |                  | C                     | 10.5 ~ 420 bar            |
|   |                  | E                     | 1.7 ~ 28 bar              |
|   |                  | N                     | 5 ~ 55 bar                |
|   |                  |                       |                           |
| 6 | Material of Seal | N                     | buna-N                    |
|   |                  | V                     | viton                     |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| RS2C  | T11A   | 60                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.17           |
| RS3C  | T2A    | 120                 | 350                    | 60/70                       |                              | 0.30           |
| RS6C  | T17A   | 240                 | 350                    | 200/215                     |                              | 0.64           |
| RS8C  | T19A   | 480                 | 350                    | 465/500                     |                              | 1.43           |

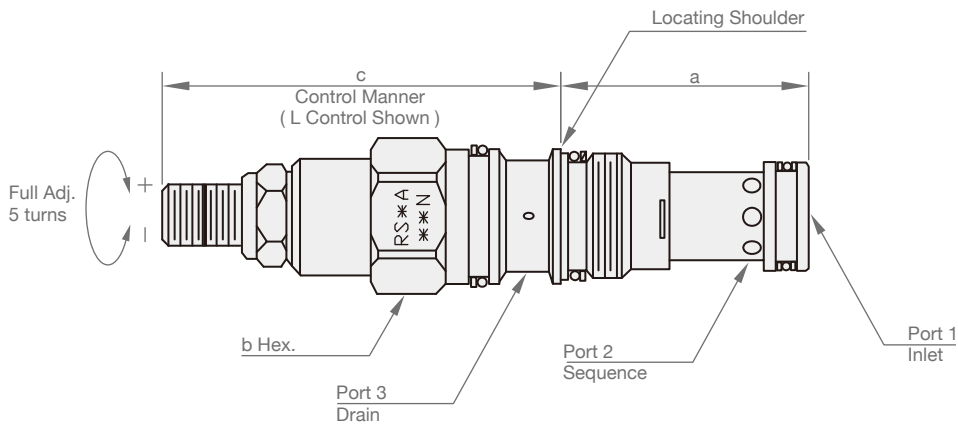
## PERFORMANCE CURVES

### ► Pressure Drop Fully Sequence



## DIMENSION

( UNIT : mm )

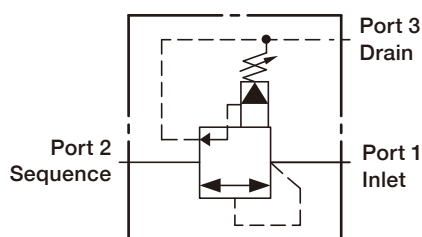


| Model | a    | b    | c   |     |
|-------|------|------|-----|-----|
|       |      |      | L   | K   |
| RS2C  | 34.9 | 22.2 | 64  | 70  |
| RS3C  | 34.9 | 28.6 | 72  | 78  |
| RS6C  | 46.0 | 31.8 | 84  | 90  |
| RS8C  | 63.5 | 41.3 | 100 | 107 |

# SQ



## SYMBOLS



## ORDER CODES

|           |           |   |             |   |          |          |          |
|-----------|-----------|---|-------------|---|----------|----------|----------|
| <b>SQ</b> | <b>2B</b> | - | <b>T11A</b> | - | <b>L</b> | <b>A</b> | <b>N</b> |
| 1         | 2         |   | 3           |   | 4        | 5        | 6        |

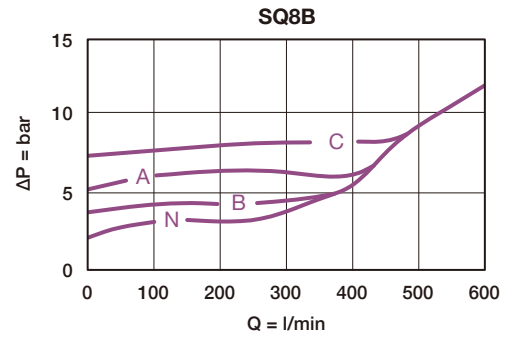
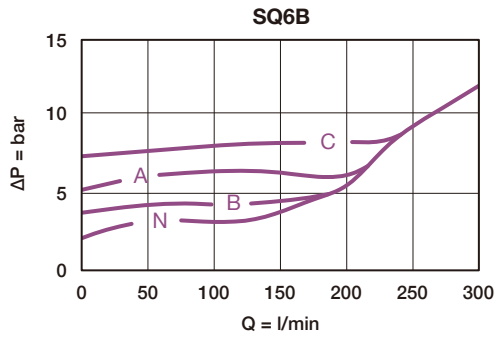
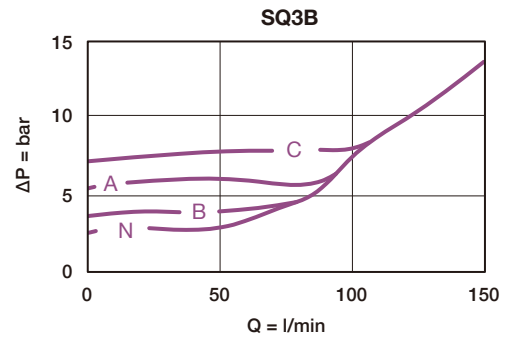
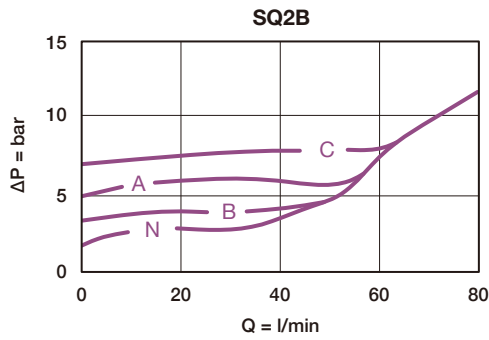
|   |                  |                                                                   |
|---|------------------|-------------------------------------------------------------------|
| 1 | Model Name       | SQ                                                                |
| 2 | Valve Size       | 2C, 3C, 6C, 8C                                                    |
| 3 | Cavity           | T11A, T2A, T17A, T19A                                             |
| 4 | Control Manner   | L standard screw adjustment<br>K hand knob with lock knob         |
| 5 | Adjustable Range | A 7 ~ 210 bar<br>B 3.5 ~105 bar<br>C 10 ~ 400 bar<br>N 5 ~ 55 bar |
| 6 | Material of Seal | N buna-N<br>V viton                                               |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating<br>Temperature     | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| SQ2B  | T11A   | 60                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.17           |
| SQ3B  | T2A    | 120                 | 350                    | 60/70                       |                              | 0.30           |
| SQ6B  | T17A   | 240                 | 350                    | 200/215                     |                              | 0.64           |
| SQ8B  | T19A   | 480                 | 350                    | 465/500                     |                              | 1.43           |

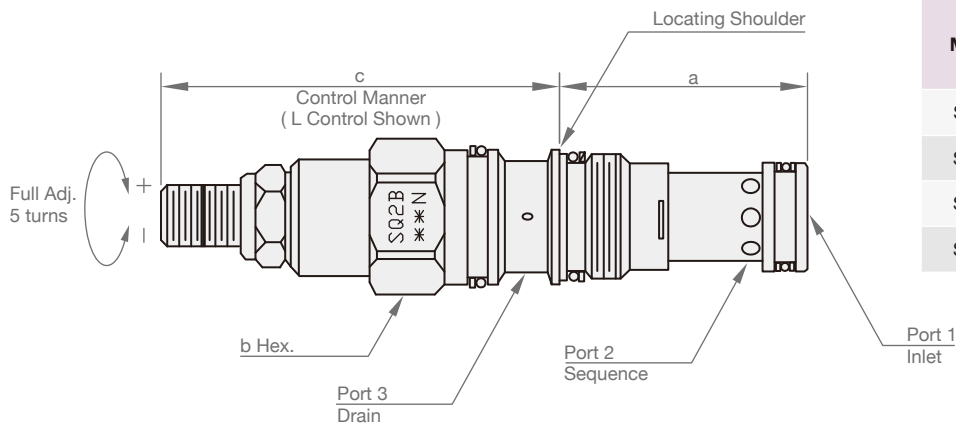
## PERFORMANCE CURVES

### ► Pressure Drop After Opening



## DIMENSION

( UNIT : mm )

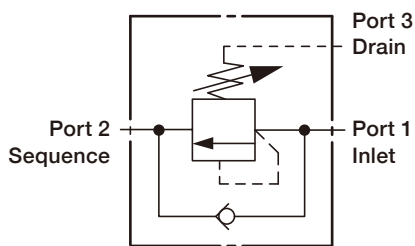


| Model | a    | b    | c   |     |
|-------|------|------|-----|-----|
|       |      |      | L   | K   |
| SQ2B  | 34.9 | 22.2 | 64  | 70  |
| SQ3B  | 34.9 | 28.6 | 72  | 78  |
| SQ6B  | 46.0 | 31.8 | 84  | 90  |
| SQ8B  | 63.5 | 41.3 | 100 | 107 |

# SC



## SYMBOLS



## ORDER CODES

|           |           |   |             |   |          |          |          |
|-----------|-----------|---|-------------|---|----------|----------|----------|
| <b>SC</b> | <b>2A</b> | - | <b>T11A</b> | - | <b>L</b> | <b>A</b> | <b>N</b> |
| 1         | 2         |   | 3           |   | 4        | 5        | 6        |

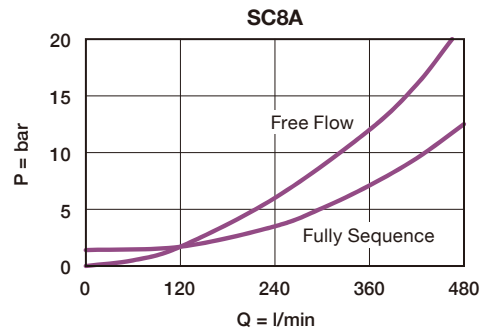
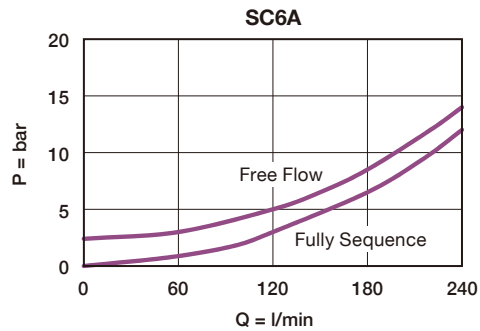
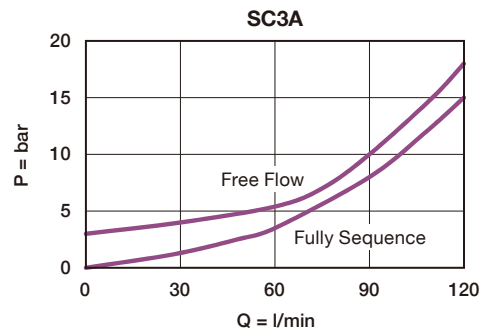
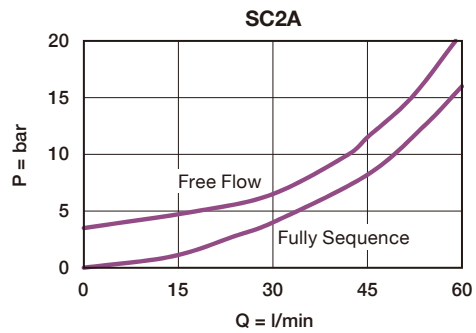
|   |                  |                       |                           |
|---|------------------|-----------------------|---------------------------|
| 1 | Model Name       | SC                    |                           |
| 2 | Valve Size       | 2A, 3A, 6A, 8A        |                           |
| 3 | Cavity           | T11A, T2A, T17A, T19A |                           |
| 4 | Control Manner   | L                     | standard screw adjustment |
|   |                  | K                     | hand knob with lock knob  |
| 5 | Adjustable Range | A                     | 35 ~ 210 bar              |
|   |                  | B                     | 20 ~105 bar               |
|   |                  | C                     | 140 ~ 420 bar             |
|   |                  | D                     | 14 ~ 55 bar               |
| 6 | Material of Seal | N                     | buna-N                    |
|   |                  | V                     | viton                     |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| SC2A  | T11A   | 60                  | 350                    | 45/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.20           |
| SC3A  | T2A    | 120                 | 350                    | 60/70                       |                              | 0.38           |
| SC6A  | T17A   | 240                 | 350                    | 200/215                     |                              | 0.74           |
| SC8A  | T19A   | 480                 | 350                    | 465/500                     |                              | 1.62           |

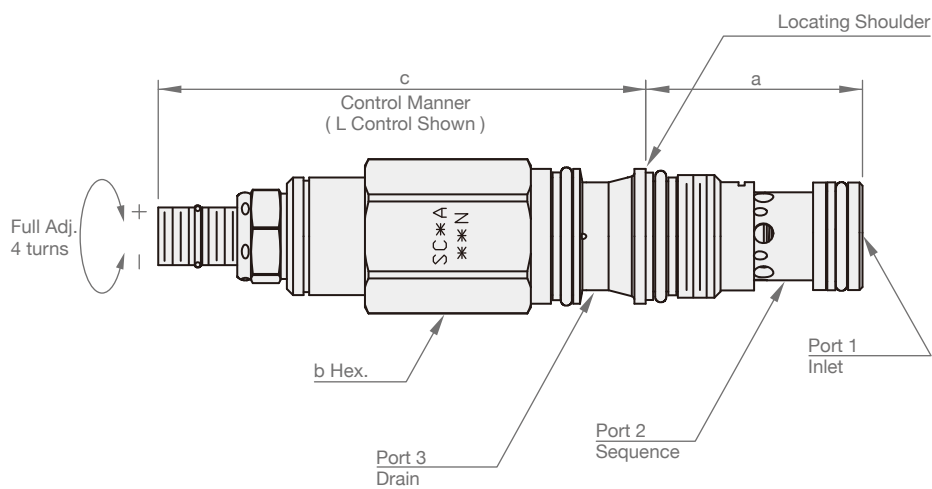
## PERFORMANCE CURVES

### ► Free Flow & Pressure Drop Fully Sequenced



## DIMENSION

( UNIT : mm )

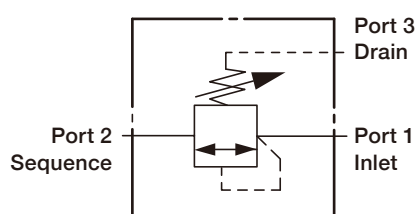


| Model | a    | b    | c     |      |
|-------|------|------|-------|------|
|       |      |      | L     | K    |
| SC2A  | 35.1 | 22.2 | 78.5  | 84.8 |
| SC3A  | 35.1 | 28.6 | 88.1  | 94.0 |
| SC6A  | 46.0 | 31.8 | 100.0 | -    |
| SC8A  | 63.5 | 41.3 | 122.9 | -    |

# SX



## SYMBOLS



## ORDER CODES

|           |           |   |             |   |          |          |          |
|-----------|-----------|---|-------------|---|----------|----------|----------|
| <b>SX</b> | <b>3A</b> | - | <b>T11A</b> | - | <b>L</b> | <b>A</b> | <b>N</b> |
| 1         | 2         |   | 3           |   | 4        | 5        | 6        |

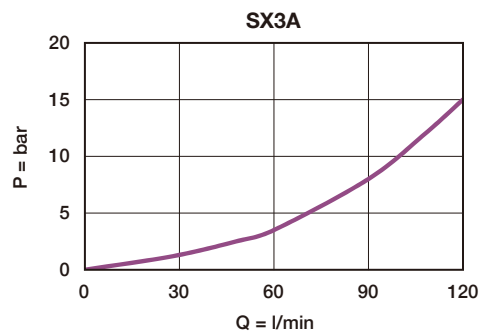
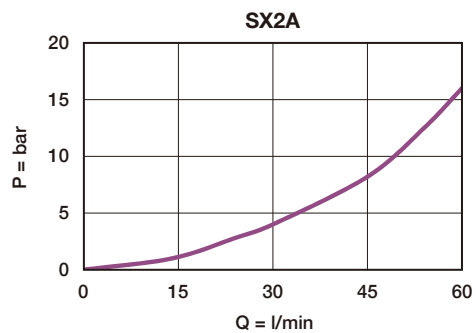
|   |                  |                                                                      |
|---|------------------|----------------------------------------------------------------------|
| 1 | Model Name       | SX                                                                   |
| 2 | Valve Size       | 2A, 3A                                                               |
| 3 | Cavity           | T11A, T2A                                                            |
| 4 | Control Manner   | L standard screw adjustment<br>K hand knob with lock knob            |
| 5 | Adjustable Range | A 35 ~ 210 bar<br>B 20 ~ 105 bar<br>C 140 ~ 420 bar<br>D 14 ~ 55 bar |
| 6 | Material of Seal | N buna-N<br>V viton                                                  |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| SX2A  | T11A   | 60                  | 350                    | 45/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.20           |
| SX3A  | T2A    | 120                 | 350                    | 60/70                       |                              | 0.36           |

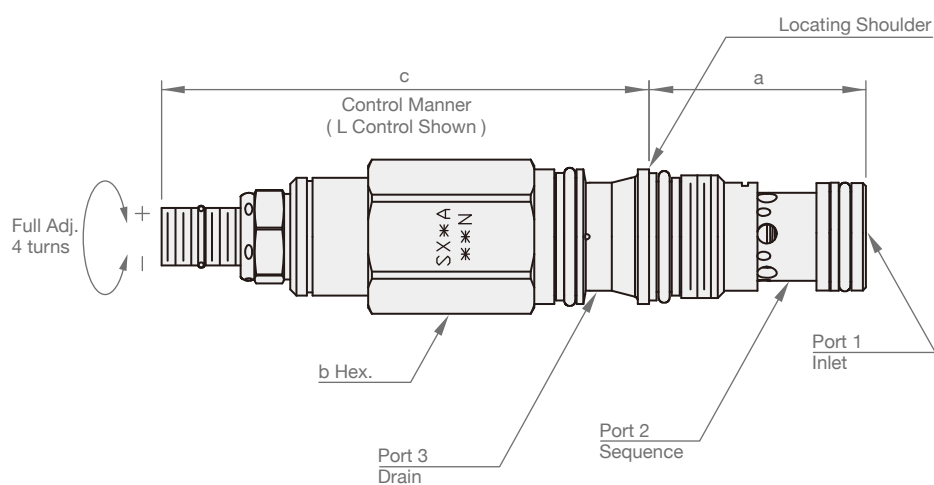
## PERFORMANCE CURVES

### ► Pressure Drop Fully Sequenced



## DIMENSION

( UNIT : mm )

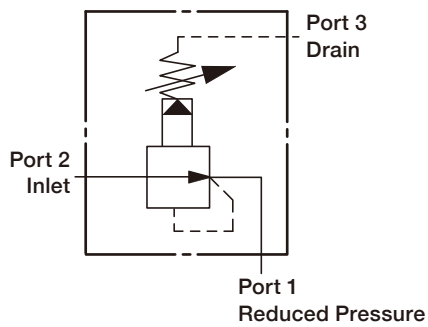


| Model | a    | b    | c    |      |
|-------|------|------|------|------|
|       |      |      | L    | K    |
| SX2A  | 35.1 | 22.2 | 78.5 | 84.8 |
| SX3A  | 35.1 | 28.6 | 88.1 | 94.0 |

# PB



## SYMBOLS



## ORDER CODES

|           |           |   |             |   |          |          |          |
|-----------|-----------|---|-------------|---|----------|----------|----------|
| <b>PB</b> | <b>2B</b> | - | <b>T11A</b> | - | <b>L</b> | <b>A</b> | <b>N</b> |
| 1         | 2         |   | 3           |   | 4        | 5        | 6        |

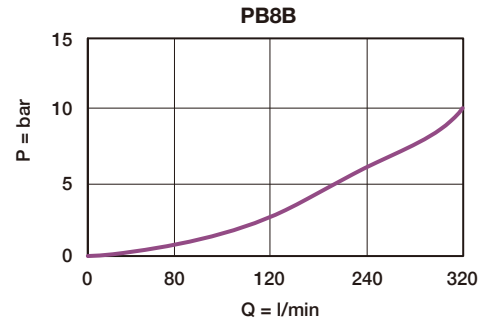
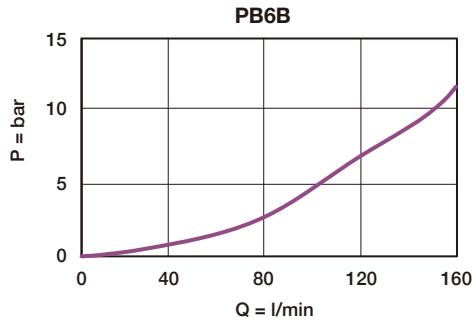
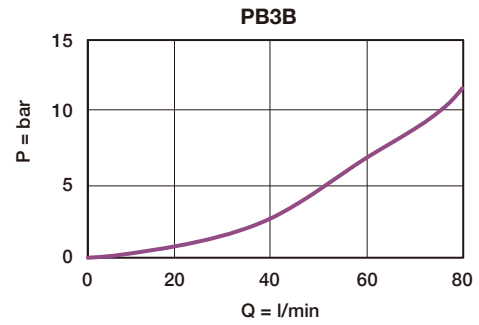
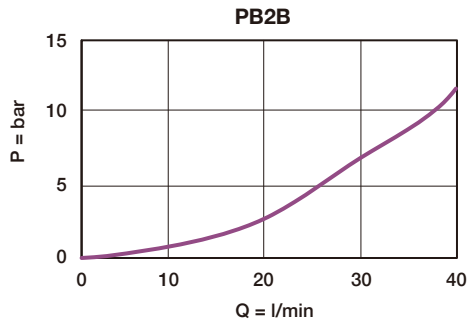
|   |                  |                       |                           |
|---|------------------|-----------------------|---------------------------|
| 1 | Model Name       | PB                    |                           |
| 2 | Valve Size       | 2B, 3B, 6B, 8B        |                           |
| 3 | Cavity           | T11A, T2A, T17A, T19A |                           |
| 4 | Control Manner   | L                     | standard screw adjustment |
|   |                  | K                     | hand knob with lock knob  |
|   |                  | A                     | 7 ~ 210 bar               |
|   |                  | B                     | 3.5 ~105 bar              |
| 5 | Adjustable Range | C                     | 10.5~420 bar              |
|   |                  | N                     | 4~55 bar                  |
|   |                  | N                     | buna-N                    |
|   |                  | V                     | viton                     |
| 6 | Material of Seal |                       |                           |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| PB2B  | T11A   | 40                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.17           |
| PB3B  | T2A    | 80                  | 350                    | 60/70                       |                              | 0.30           |
| PB6B  | T17A   | 160                 | 350                    | 200/215                     |                              | 0.64           |
| PB8B  | T19A   | 320                 | 350                    | 465/500                     |                              | 1.43           |

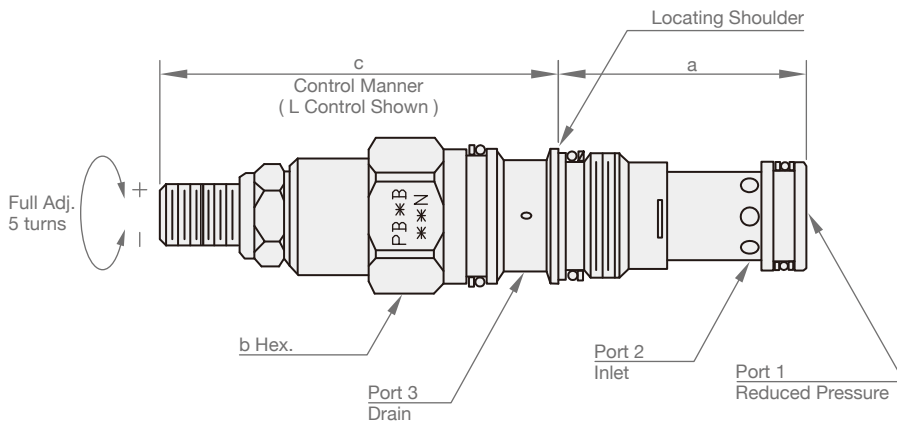
## PERFORMANCE CURVES

### ► No Load Pressure Drop



## DIMENSION

( UNIT : mm )

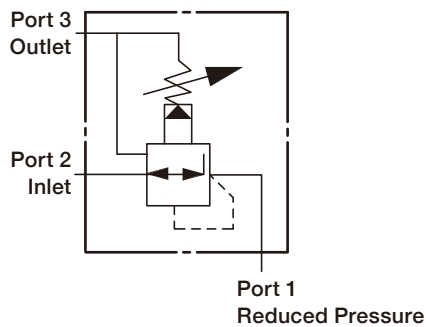


| Model | a    | b    | c   |     |
|-------|------|------|-----|-----|
|       |      |      | L   | K   |
| PB2B  | 34.9 | 22.2 | 64  | 70  |
| PB3B  | 34.9 | 28.6 | 72  | 78  |
| PB6B  | 46.0 | 31.8 | 84  | 90  |
| PB8B  | 63.5 | 41.3 | 100 | 107 |

# PP



## SYMBOLS



## ORDER CODES

**PP 2B - T11A - L A N**

1 2 3 4 5 6

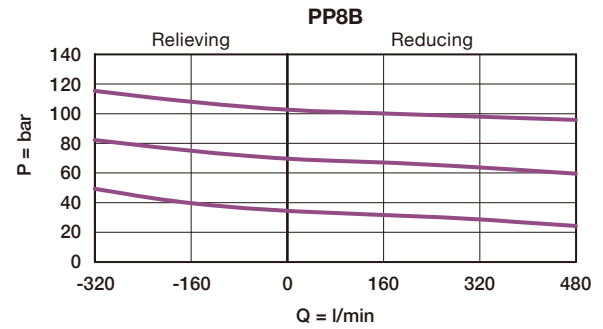
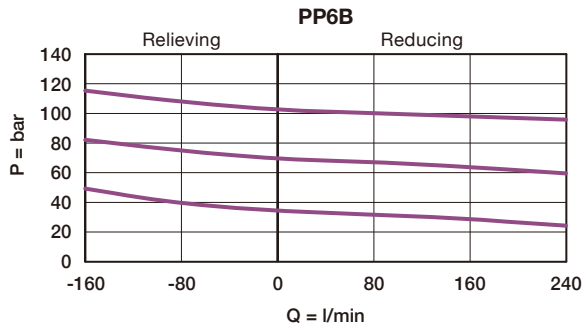
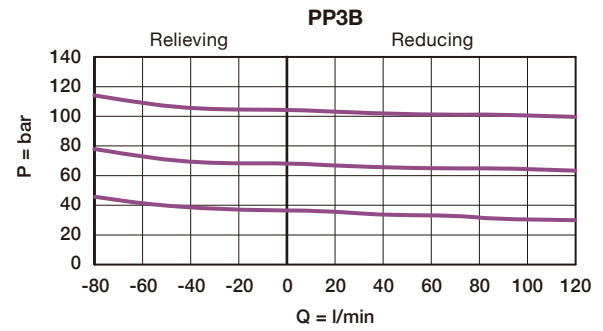
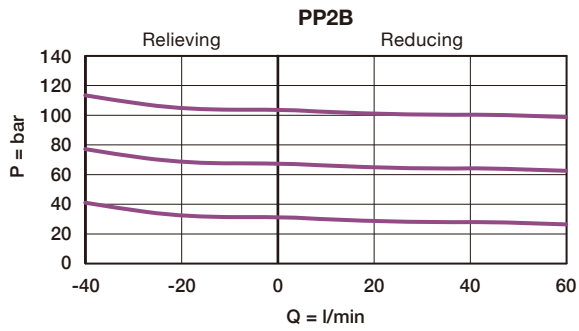
|   |                  |                       |                           |
|---|------------------|-----------------------|---------------------------|
| 1 | Model Name       | PP                    |                           |
| 2 | Valve Size       | 2B, 3B, 6B, 8B        |                           |
| 3 | Cavity           | T11A, T2A, T17A, T19A |                           |
| 4 | Control Manner   | L                     | standard screw adjustment |
|   |                  | K                     | hand knob with lock knob  |
|   |                  | A                     | 7 ~ 210 bar               |
|   |                  | B                     | 3.5 ~105 bar              |
| 5 | Adjustable Range | C                     | 10.5 ~ 420 bar            |
|   |                  | N                     | 4 ~ 55 bar                |
|   |                  | N                     | buna-N                    |
|   |                  | V                     | viton                     |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating<br>Temperature     | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| PP2B  | T11A   | 40                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.17           |
| PP3B  | T2A    | 80                  | 350                    | 60/70                       |                              | 0.30           |
| PP6B  | T17A   | 160                 | 350                    | 200/215                     |                              | 0.64           |
| PP8B  | T19A   | 320                 | 350                    | 465/500                     |                              | 1.43           |

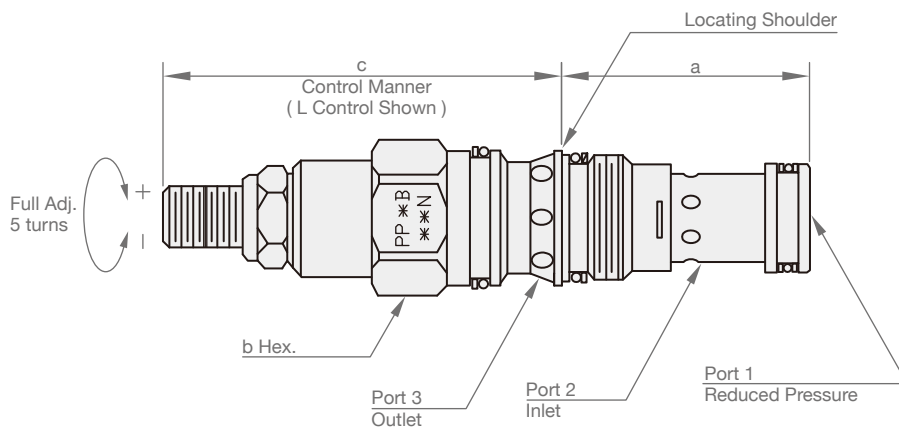
## PERFORMANCE CURVES

### ► Regulated Pressure



## DIMENSION

( UNIT : mm )

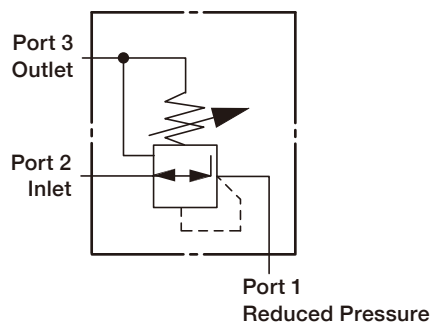


| Model | a    | b    | c   |     |
|-------|------|------|-----|-----|
|       |      |      | L   | K   |
| PP2B  | 34.9 | 22.2 | 64  | 70  |
| PP3B  | 34.9 | 28.6 | 72  | 78  |
| PP6B  | 46.0 | 31.8 | 84  | 90  |
| PP8B  | 63.5 | 41.3 | 100 | 107 |

# PRB



## SYMBOLS



## ORDER CODES

**PR 2 B - T11A - L A N**

1 2 1 3 4 5 6

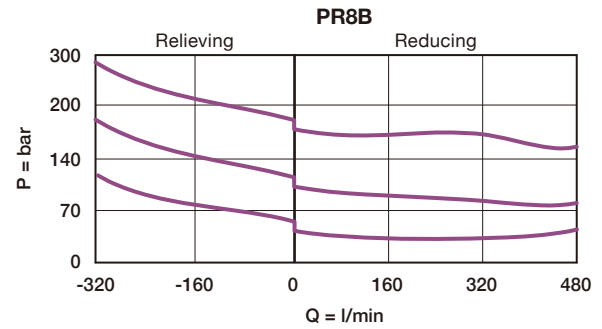
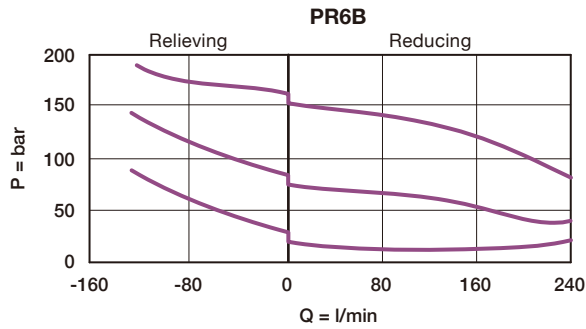
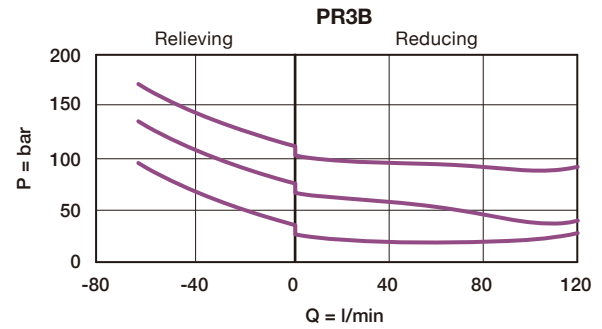
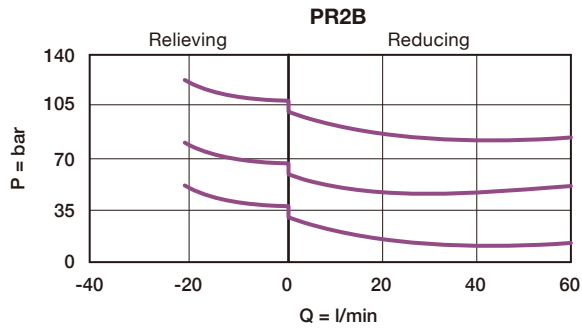
|   |                  |                       |                           |
|---|------------------|-----------------------|---------------------------|
| 1 | Model Name       | PRB                   |                           |
| 2 | Valve Size       | 2, 3, 6, 8            |                           |
| 3 | Cavity           | T11A, T2A, T17A, T19A |                           |
| 4 | Control Manner   | L                     | standard screw adjustment |
|   |                  | K                     | hand knob with lock knob  |
|   |                  | A                     | 35 ~ 210 bar              |
|   |                  | B                     | 3.5 ~ 105 bar             |
| 5 | Adjustable Range | D                     | 1.7 ~ 55 bar              |
|   |                  | W                     | 50 ~ 315 bar              |
|   |                  | N                     | buna-N                    |
|   |                  | V                     | viton                     |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| PR2B  | T11A   | 40                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.20           |
| PR3B  | T2A    | 80                  | 350                    | 60/70                       |                              | 0.36           |
| PR6B  | T17A   | 160                 | 350                    | 200/215                     |                              | 0.76           |
| PR8B  | T19A   | 320                 | 350                    | 465/500                     |                              | 1.58           |

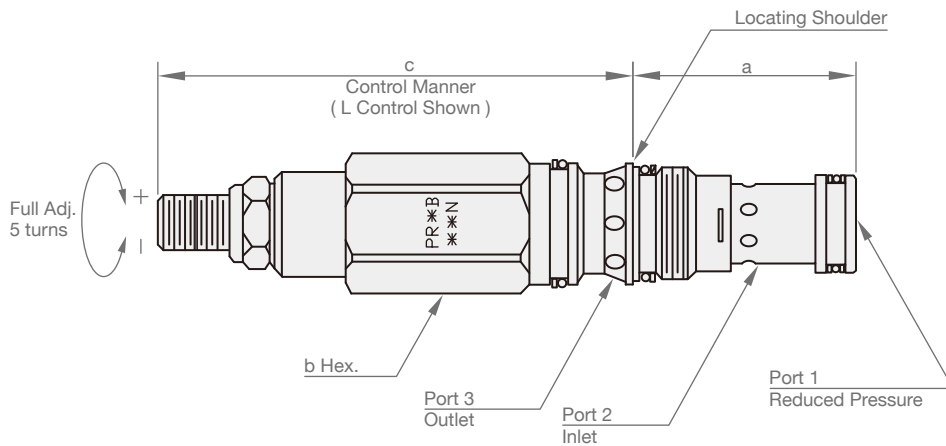
## PERFORMANCE CURVES

### ► Regulated Pressure



## DIMENSION

( UNIT : mm )

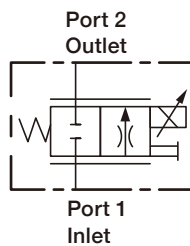


| Model | a    | b    | c   |     |
|-------|------|------|-----|-----|
|       |      |      | L   | K   |
| PR2B  | 34.9 | 22.2 | 79  | 85  |
| PR3B  | 34.9 | 28.6 | 89  | 96  |
| PR6B  | 46.0 | 31.8 | 100 | 107 |
| PR8B  | 63.5 | 41.3 | 124 | 130 |

# FPC



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |   |           |           |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|---|-----------|-----------|
| <b>FP</b> | <b>2</b> | <b>C</b> | - | <b>T13A</b> | - | <b>M</b> | <b>C</b> | <b>N</b> | - | <b>DR</b> | <b>24</b> |
| 1         | 2        | 1        |   | 3           |   | 4        | 5        | 6        |   | 7         | 8         |

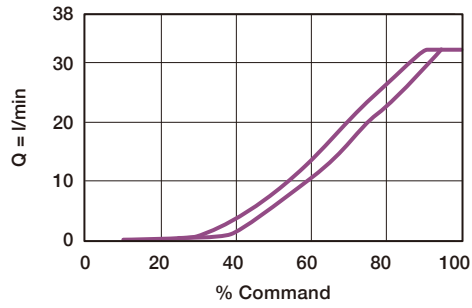
|   |                    |      |                 |
|---|--------------------|------|-----------------|
| 1 | Model Name         | FPC  | normally closed |
| 2 | Capacity (l/min)   | 2    | 40              |
| 3 | Cavity             | T13A |                 |
| 4 | Control Manner     | M    | manual override |
| 5 | Flow Range (l/min) | C    | 1 ~ 28          |
| 6 | Material of Seal   | N    | buna-N          |
|   |                    | V    | viton           |
| 7 | Connector (coil)   | DG   | ISO/DIN43650    |
|   |                    | DR   | Deutsch DT04-2P |
| 8 | Voltage (coil)     | 12   | 12 VDC          |
|   |                    | 24   | 24 VDC          |

## MODEL SPEC.

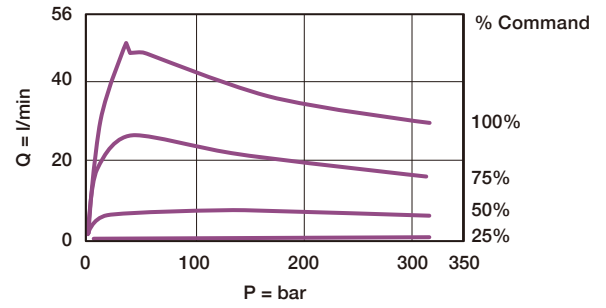
| Model | Cavity     | Capacity (l/min)            | Max. Pressure (bar)       | Leakage              | Installation Torque (Nm) |
|-------|------------|-----------------------------|---------------------------|----------------------|--------------------------|
| FP2C  | T13A       | 40                          | 350                       | less than 100 cc/min | 45/50                    |
| Model | Hysteresis | Max. Current                | Power Consumption (watts) | Body's Weight (kg)   | Coil's Weight (kg)       |
| FP2C  | 5%         | 1820mA@12VDC<br>910mA@24VDC | 22                        | 0.27                 | 0.23                     |

## PERFORMANCE CURVES

### ► Flow vs. Command @14bar

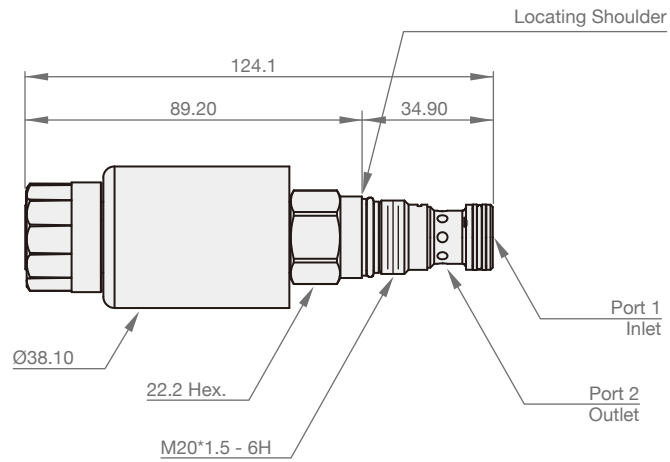


### ► Flow vs. Pressure Differential



## DIMENSION

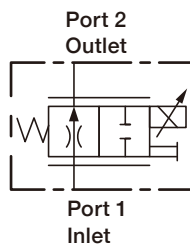
( UNIT : mm )



# FPH



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |   |           |           |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|---|-----------|-----------|
| <b>FP</b> | <b>2</b> | <b>H</b> | - | <b>T13A</b> | - | <b>M</b> | <b>C</b> | <b>N</b> | - | <b>DG</b> | <b>24</b> |
| 1         | 2        | 1        |   | 3           |   | 4        | 5        | 6        |   | 7         | 8         |

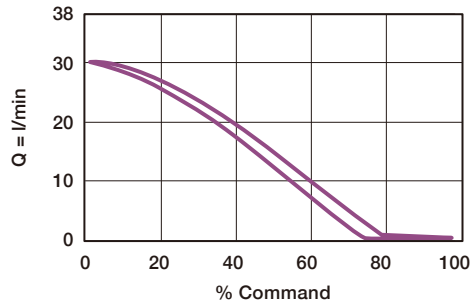
|   |                    |             |                 |
|---|--------------------|-------------|-----------------|
| 1 | Model Name         | <b>FPH</b>  | normally open   |
| 2 | Capacity (l/min)   | <b>2</b>    | 28              |
| 3 | Cavity             | <b>T13A</b> |                 |
| 4 | Control Manner     | <b>M</b>    | manual override |
| 5 | Flow Range (l/min) | <b>C</b>    | 1 ~ 28          |
| 6 | Material of Seal   | <b>N</b>    | buna-N          |
|   |                    | <b>V</b>    | viton           |
| 7 | Connector (coil)   | <b>DG</b>   | ISO/DIN43650    |
|   |                    | <b>DR</b>   | Deutsch DT04-2P |
| 8 | Voltage (coil)     | <b>12</b>   | 12 VDC          |
|   |                    | <b>24</b>   | 24 VDC          |

## MODEL SPEC.

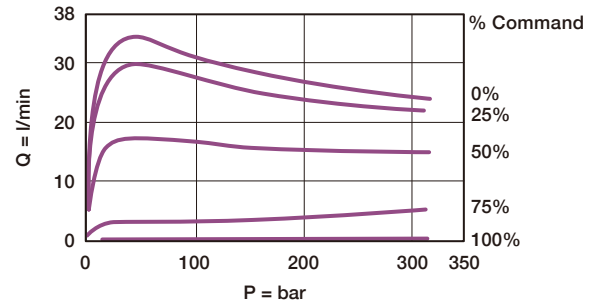
| Model | Cavity     | Capacity<br>(l/min)         | Max. Pressure<br>(bar)       | Leakage               | Installation Torque<br>(Nm) |
|-------|------------|-----------------------------|------------------------------|-----------------------|-----------------------------|
| FP2H  | T13A       | 28                          | 350                          | less than 100 cc/min  | 45/50                       |
| Model | Hysteresis | Max. Current                | Power Consumption<br>(watts) | Body's Weight<br>(kg) | Coil's Weight<br>(kg)       |
| FP2H  | 5%         | 1820mA@12VDC<br>910mA@24VDC | 22                           | 0.27                  | 0.23                        |

## PERFORMANCE CURVES

### ► Flow vs. Command @14bar

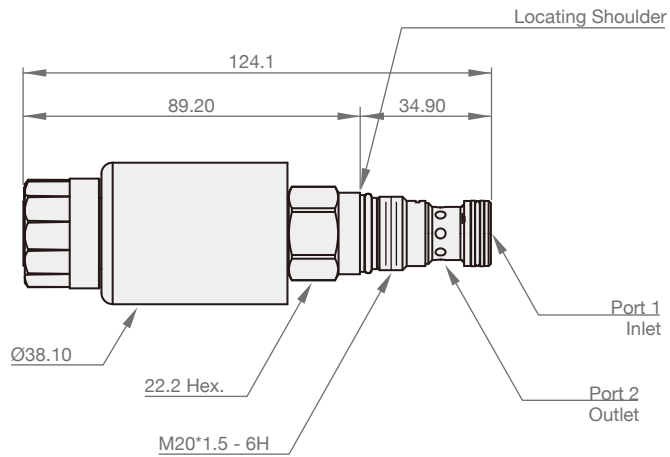


### ► Flow vs. Pressure Differential



## DIMENSION

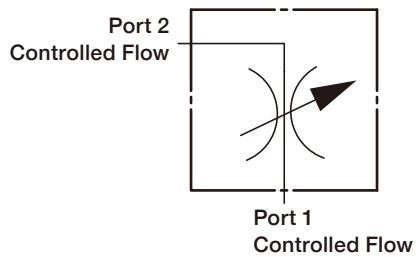
( UNIT : mm )



# NFC



## SYMBOLS



## ORDER CODES

**NF 2C - T13A - L C N**

1 2 3 4 5 6

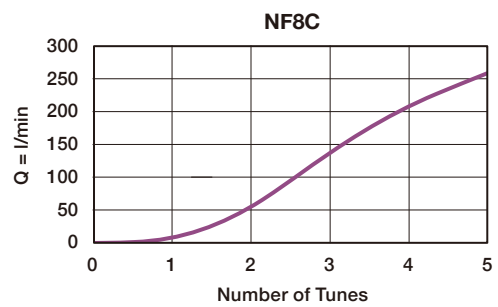
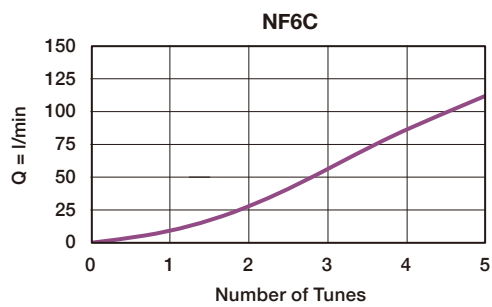
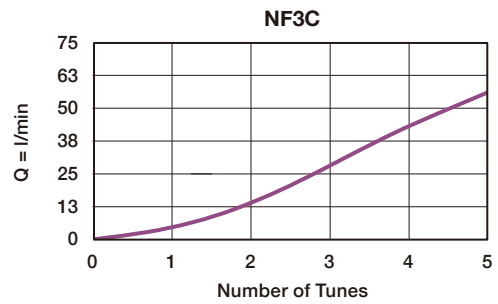
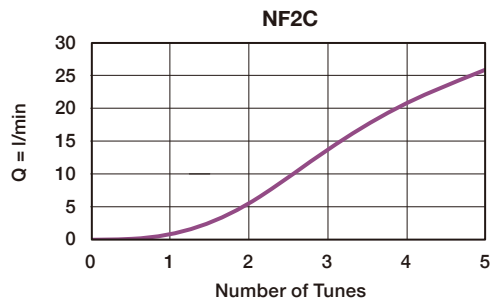
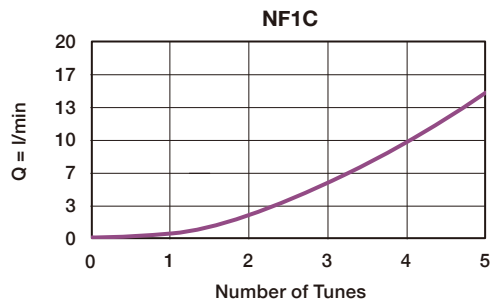
|   |                  |                              |                             |
|---|------------------|------------------------------|-----------------------------|
| 1 | Model Name       | NF                           |                             |
| 2 | Valve Size       | 1C, 2C, 3C, 6C, 8C           |                             |
| 3 | Cavity           | T162A, T13A, T5A, T16A, T18A |                             |
| 4 | Control Manner   | L                            | standard screw adjustment   |
|   |                  | K                            | hand knob with lock knob    |
| 5 | Max. Orifice     | C                            | T162A : 4mm<br>T13A : 4.8mm |
|   |                  | A                            | T5A : 6.3mm                 |
|   |                  | E                            | T16A : 9.6mm                |
|   |                  | G                            | T18A : 14.2mm               |
|   |                  |                              |                             |
| 6 | Material of Seal | N                            | buna-N                      |
|   |                  | V                            | viton                       |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| NF1C  | T162A  | 18.9                | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.07           |
| NF2C  | T13A   | 25                  | 350                    | 40/50                       |                              | 0.14           |
| NF3C  | T5A    | 50                  | 350                    | 60/70                       |                              | 0.26           |
| NF6C  | T16A   | 100                 | 350                    | 200/215                     |                              | 0.55           |
| NF8C  | T18A   | 200                 | 350                    | 465/500                     |                              | 1.21           |

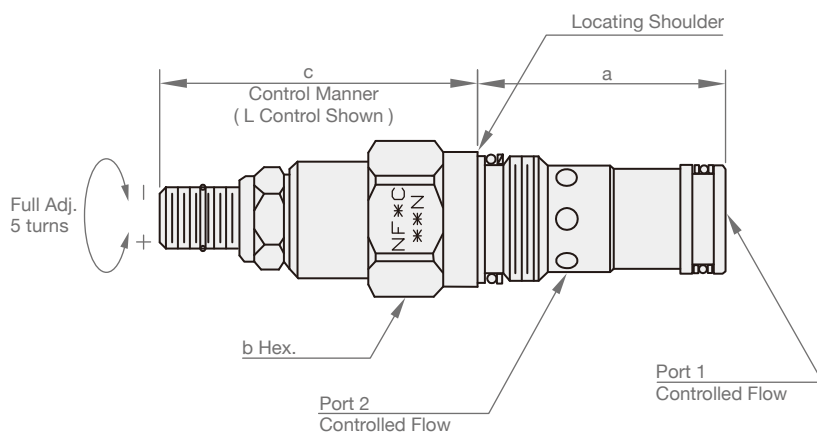
## PERFORMANCE CURVES

### ► Adjustment Sensitivity at 7 bar Differential



## DIMENSION

( UNIT : mm )

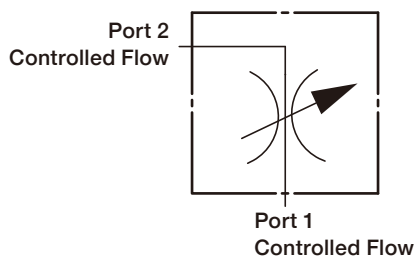


| Model | a    | b    | c    |      |
|-------|------|------|------|------|
|       |      |      | L    | K    |
| NF1C  | 30   | 19   | 24.8 | 30.8 |
| NF2C  | 34.9 | 22.2 | 58   | 64   |
| NF3C  | 41.1 | 28.6 | 67   | 73   |
| NF6C  | 61.9 | 31.8 | 73   | 79   |
| NF8C  | 79.4 | 41.3 | 84   | 90   |

# NFD



## SYMBOLS



## ORDER CODES

|    |   |   |   |      |   |   |   |   |
|----|---|---|---|------|---|---|---|---|
| NF | 2 | D | - | T13A | - | L | F | N |
| 1  | 2 | 3 |   | 4    |   | 5 | 6 | 7 |

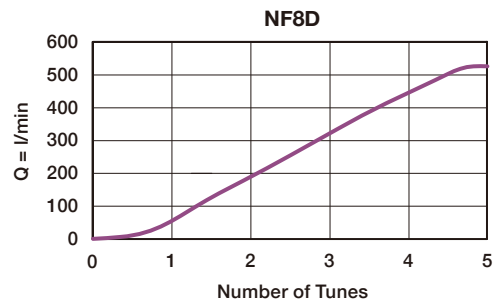
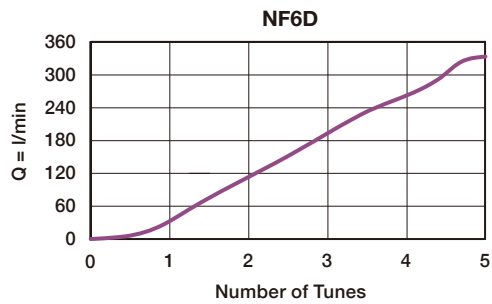
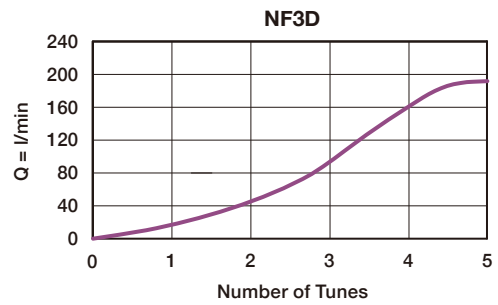
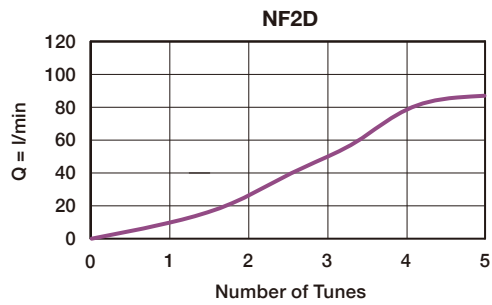
|   |                  |                                                                        |
|---|------------------|------------------------------------------------------------------------|
| 1 | Model Name       | NF                                                                     |
| 2 | Valve Size       | 2, 3, 6, 8                                                             |
| 3 | Operation        | D high capacity                                                        |
| 4 | Cavity           | T13A, T5A, T16A, T18A                                                  |
| 5 | Control Manner   | L standard screw adjustment<br>K hand knob with lock knob              |
| 6 | Max. Orifice     | F T13A : 8.4mm<br>G T5A : 12.7mm<br>H T16A : 17.5mm<br>I T18A : 21.6mm |
| 7 | Material of Seal | N buna-N<br>V viton                                                    |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| NF2D  | T13A   | 80                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.15           |
| NF3D  | T5A    | 160                 | 350                    | 60/70                       |                              | 0.28           |
| NF6D  | T16A   | 320                 | 350                    | 200/215                     |                              | 0.57           |
| NF8D  | T18A   | 500                 | 350                    | 465/500                     |                              | 1.24           |

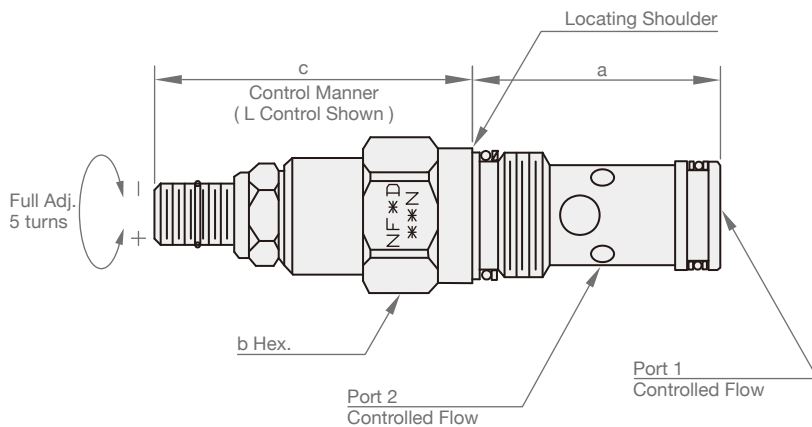
## PERFORMANCE CURVES

### ► Adjustment Sensitivity at 7 bar Differential



## DIMENSION

( UNIT : mm )

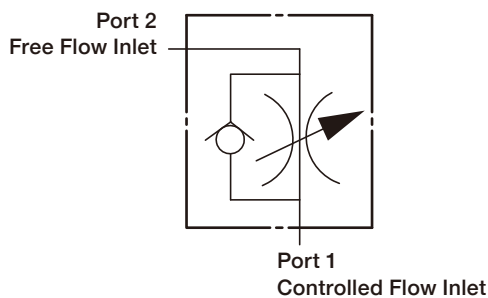


| Model | a    | b    | c  |    |
|-------|------|------|----|----|
|       |      |      | L  | K  |
| NF2D  | 34.9 | 22.2 | 58 | 64 |
| NF3D  | 41.1 | 28.6 | 67 | 73 |
| NF6D  | 61.9 | 31.8 | 73 | 79 |
| NF8D  | 79.4 | 41.3 | 84 | 90 |

# NCB



## SYMBOLS



## ORDER CODES

|    |    |   |      |   |   |   |   |
|----|----|---|------|---|---|---|---|
| NC | 2B | - | T13A | - | L | C | N |
| 1  | 2  |   | 3    |   | 4 | 5 | 6 |

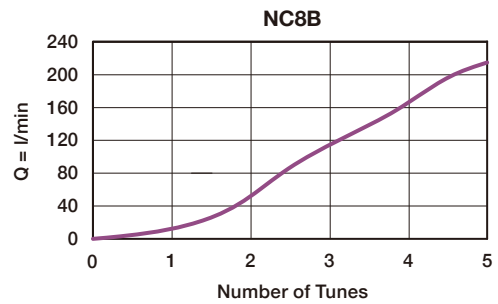
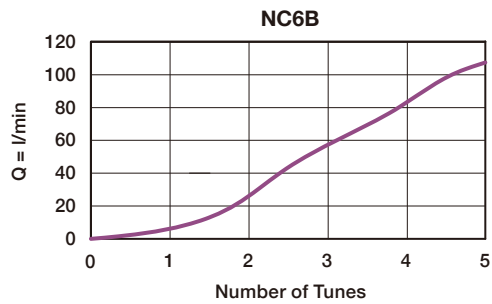
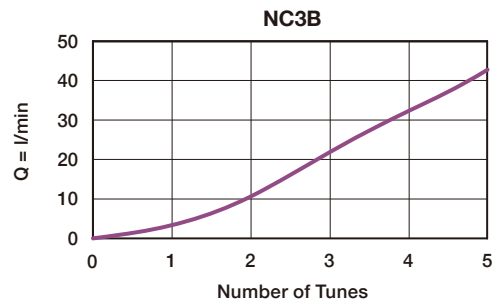
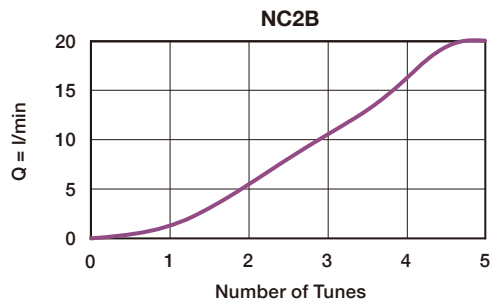
|   |                       |                             |
|---|-----------------------|-----------------------------|
| 1 | Model Name            | NC                          |
| 2 | Valve Size            | 2B, 3B, 6B, 8B              |
| 3 | Cavity & Max. Orifice | T13A 4.8mm                  |
|   |                       | T5A 6.3mm                   |
|   |                       | T16A 9.6mm                  |
|   |                       | T18A 14.2mm                 |
| 4 | Control Manner        | L standard screw adjustment |
|   |                       | K hand knob with lock knob  |
| 5 | Cracking Pressure     | A 0.3 bar                   |
|   |                       | C 2.0 bar                   |
|   |                       | E 5.0 bar                   |
| 6 | Material of Seal      | N buna-N                    |
|   |                       | V viton                     |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| NC2B  | T13A   | 25                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.14           |
| NC3B  | T5A    | 50                  | 350                    | 60/70                       |                              | 0.26           |
| NC6B  | T16A   | 100                 | 350                    | 200/215                     |                              | 0.58           |
| NC8B  | T18A   | 200                 | 350                    | 465/500                     |                              | 1.23           |

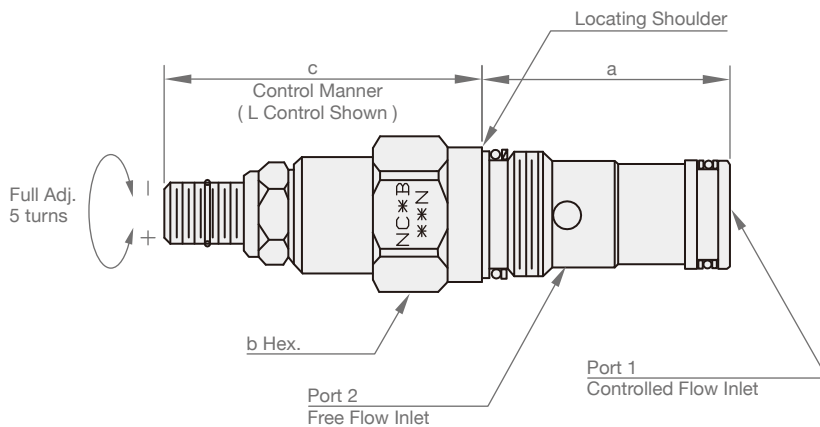
## PERFORMANCE CURVES

### ► Adjustment Sensitivity at 7 bar Differential



## DIMENSION

( UNIT : mm )

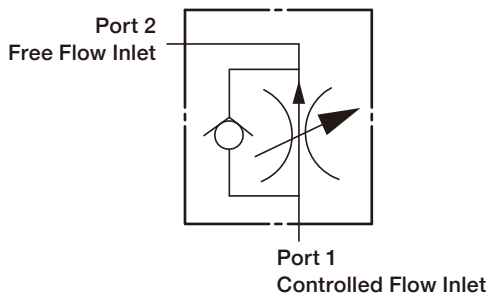


| Model | a    | b    | c  |    |
|-------|------|------|----|----|
|       |      |      | L  | K  |
| NC2B  | 34.9 | 22.2 | 58 | 64 |
| NC3B  | 41.1 | 28.6 | 67 | 73 |
| NC6B  | 61.9 | 31.8 | 73 | 79 |
| NC8B  | 79.4 | 41.3 | 84 | 90 |

# FD



## SYMBOLS



## ORDER CODES

|           |           |   |             |   |          |          |          |
|-----------|-----------|---|-------------|---|----------|----------|----------|
| <b>FD</b> | <b>2A</b> | - | <b>T13A</b> | - | <b>L</b> | <b>A</b> | <b>N</b> |
| 1         | 2         |   | 3           |   | 4        | 5        | 6        |

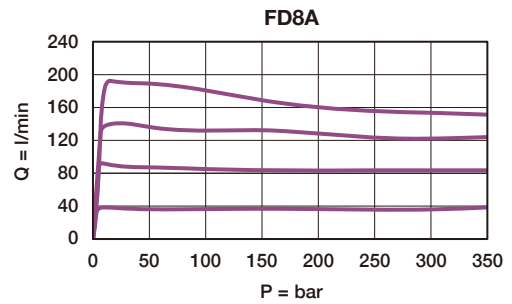
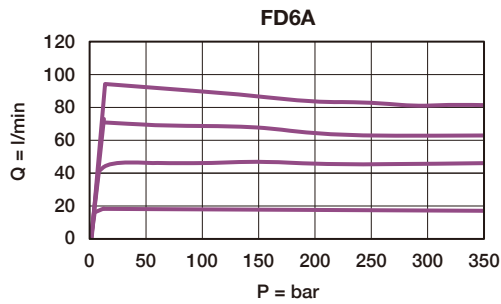
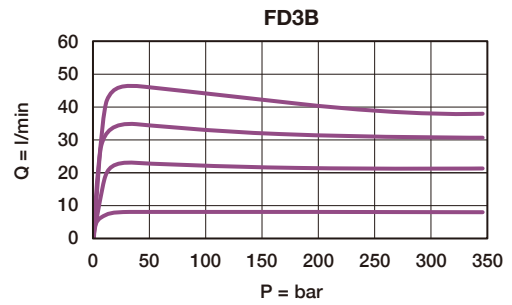
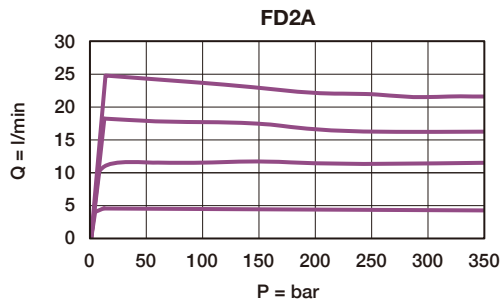
|   |                  |                                                                                                |
|---|------------------|------------------------------------------------------------------------------------------------|
| 1 | Model Name       | FD                                                                                             |
| 2 | Valve Size       | 2A, 3B, 6A, 8A                                                                                 |
| 3 | Cavity           | T13A, T5A, T16A, T18A                                                                          |
| 4 | Control Manner   | L standard screw adjustment<br>K hand knob with lock knob                                      |
| 5 | Adjustable Range | A<br>2A : 0.4 ~ 23 l/min<br>3B : 0.4 ~ 45 l/min<br>6A : 1.0 ~ 95 l/min<br>8A : 1.0 ~ 200 l/min |
| 6 | Material of Seal | N buna-N<br>V viton                                                                            |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| FD2A  | T13A   | 23                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.14           |
| FD3B  | T5A    | 45                  | 350                    | 60/70                       |                              | 0.28           |
| FD6A  | T16A   | 95                  | 350                    | 200/215                     |                              | 0.55           |
| FD8A  | T18A   | 200                 | 350                    | 465/500                     |                              | 1.23           |

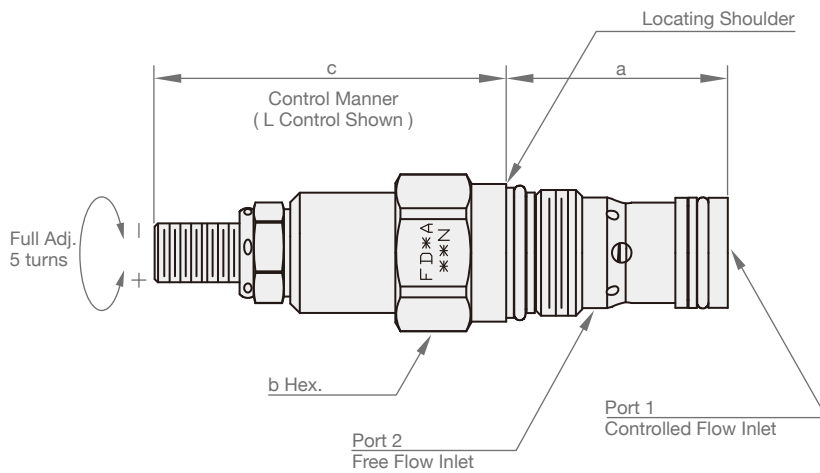
## PERFORMANCE CURVES

### ► Typical Performance



## DIMENSION

( UNIT : mm )

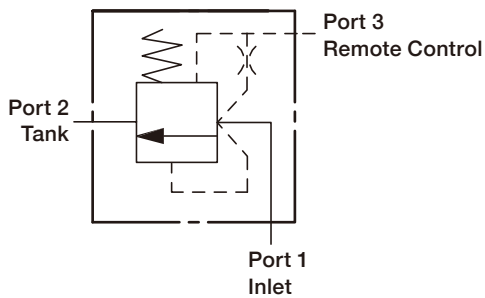


| Model | a    | b    | c  |    |
|-------|------|------|----|----|
|       |      |      | L  | K  |
| FD2A  | 34.9 | 22.2 | 58 | 64 |
| FD3B  | 41.1 | 28.6 | 67 | 73 |
| FD6A  | 61.9 | 31.8 | 73 | 79 |
| FD8A  | 79.4 | 41.3 | 84 | 90 |

# LRA



## SYMBOLS



## ORDER CODES

**LR 2 A - T11A - X D N**

1 2 3 4 5 6 7

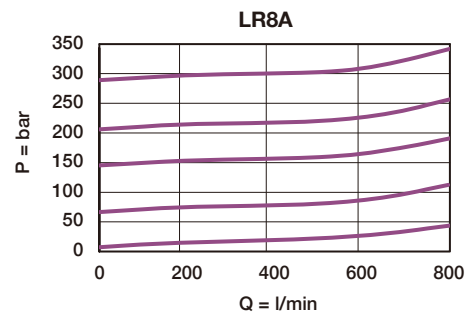
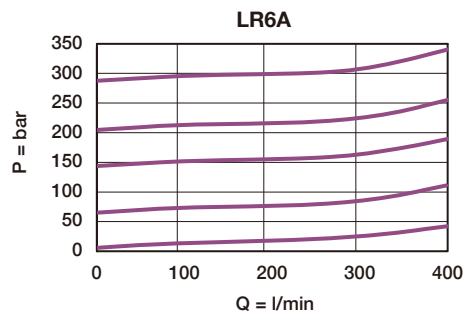
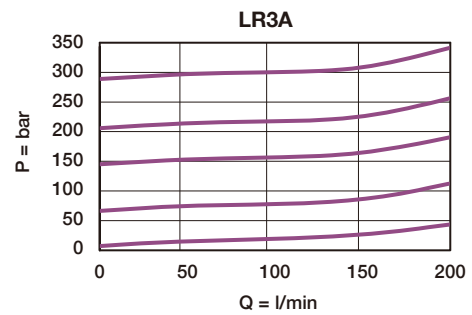
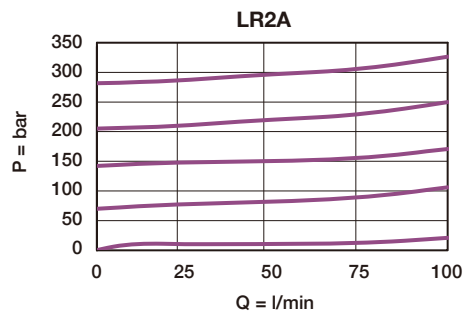
|   |                   |                                               |
|---|-------------------|-----------------------------------------------|
| 1 | Model Name        | LR                                            |
| 2 | Valve Size        | 2, 3, 6, 8                                    |
| 3 | Type              | A internal pilot                              |
| 4 | Cavity            | T11A, T2A, T17A, T19A                         |
| 5 | Control Manner    | X unadjustable<br>L standard screw adjustment |
| 6 | Cracking Pressure | D 3.5 bar<br>F 7.0 bar<br>G 10.0 bar          |
| 7 | Material of Seal  | N buna-N<br>V viton                           |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| LR2A  | T11A   | 60                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.12           |
| LR3A  | T2A    | 120                 | 350                    | 60/70                       |                              | 0.22           |
| LR6A  | T17A   | 240                 | 350                    | 200/215                     |                              | 0.50           |
| LR8A  | T19A   | 480                 | 350                    | 465/500                     |                              | 1.15           |

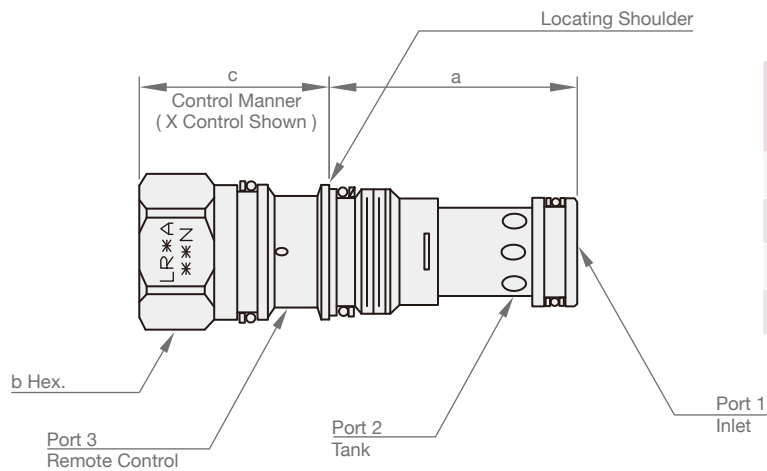
## PERFORMANCE CURVES

### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

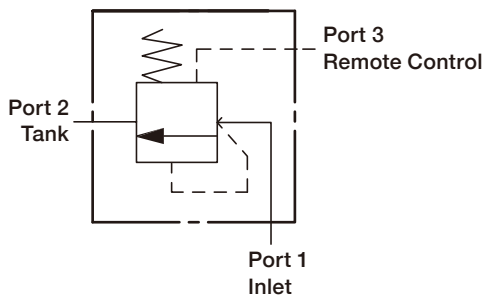


| Model | a    | b    | c  |     |
|-------|------|------|----|-----|
|       |      |      | X  | L   |
| LR2A  | 34.9 | 22.2 | 31 | 64  |
| LR3A  | 34.9 | 28.6 | 35 | 72  |
| LR6A  | 46.0 | 31.8 | 46 | 84  |
| LR8A  | 63.5 | 41.3 | 59 | 100 |

# LRC



## SYMBOLS



## ORDER CODES

**LR 2 C - T11A - X D N**

1 2 3 4 5 6 7

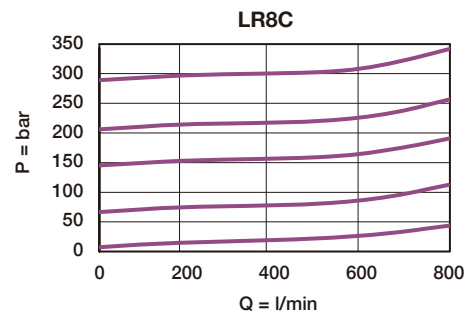
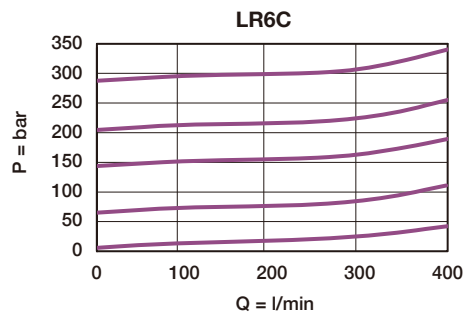
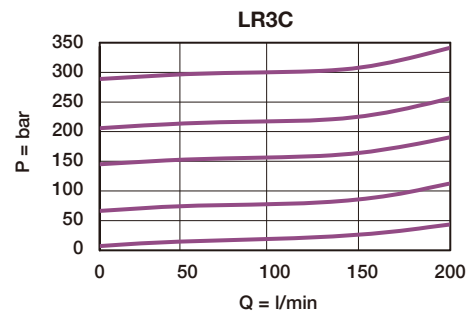
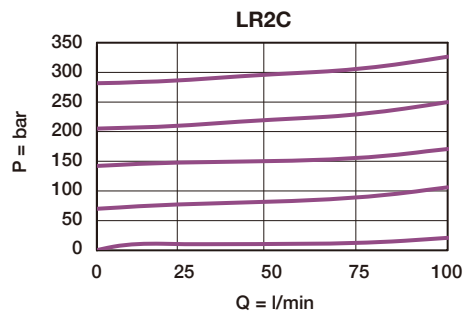
|   |                   |                                               |
|---|-------------------|-----------------------------------------------|
| 1 | Model Name        | LR                                            |
| 2 | Valve Size        | 2, 3, 6, 8                                    |
| 3 | Type              | C external pilot                              |
| 4 | Cavity            | T11A, T2A, T17A, T19A                         |
| 5 | Control Manner    | X unadjustable<br>L standard screw adjustment |
| 6 | Cracking Pressure | D 3.5 bar<br>F 7.0 bar<br>G 10.0 bar          |
| 7 | Material of Seal  | N buna-N<br>V viton                           |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| LR2C  | T11A   | 60                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.12           |
| LR3C  | T2A    | 120                 | 350                    | 60/70                       |                              | 0.22           |
| LR6C  | T17A   | 240                 | 350                    | 200/215                     |                              | 0.50           |
| LR8C  | T19A   | 480                 | 350                    | 465/500                     |                              | 1.15           |

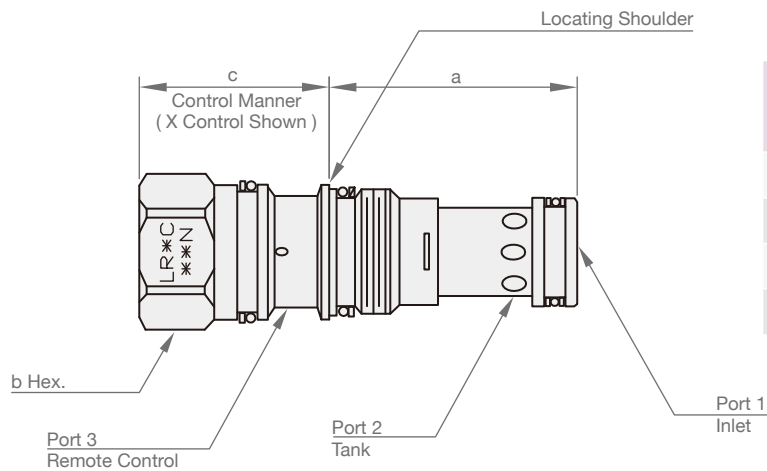
## PERFORMANCE CURVES

### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

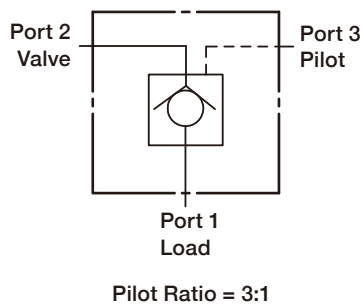


| Model | a    | b    | c  |     |
|-------|------|------|----|-----|
|       |      |      | X  | L   |
| LR2C  | 34.9 | 22.2 | 31 | 64  |
| LR3C  | 34.9 | 28.6 | 35 | 72  |
| LR6C  | 46.0 | 31.8 | 46 | 84  |
| LR8C  | 63.5 | 41.3 | 59 | 100 |

# CKA



## SYMBOLS



## ORDER CODES

|    |   |   |   |      |   |   |   |   |
|----|---|---|---|------|---|---|---|---|
| CK | 2 | A | - | T11A | - | X | C | N |
| 1  | 2 | 3 |   | 4    |   | 5 | 6 | 7 |

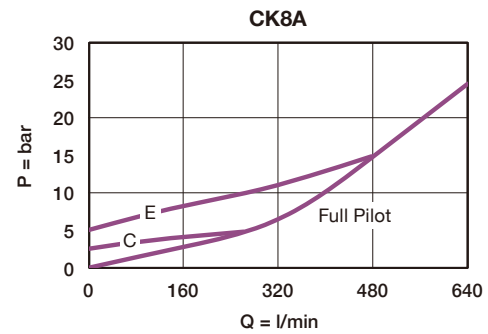
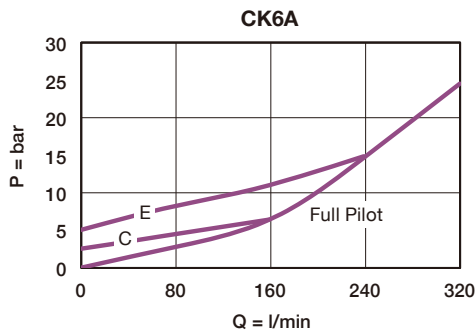
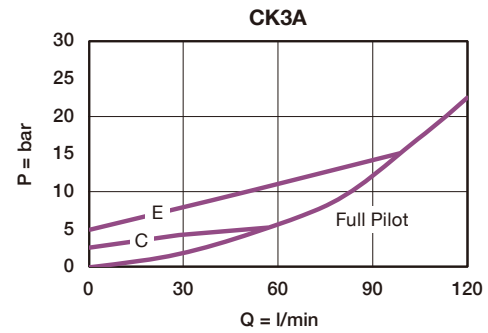
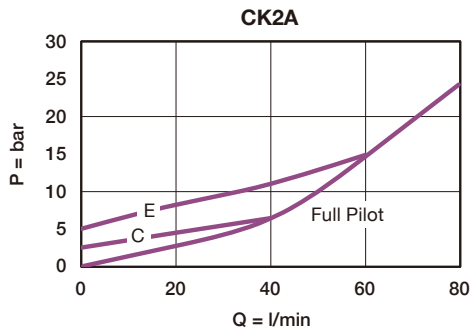
|   |                   |                       |
|---|-------------------|-----------------------|
| 1 | Model Name        | CK                    |
| 2 | Valve Size        | 2, 3, 6, 8            |
| 3 | Pilot Version     | A bleed through pilot |
| 4 | Cavity            | T11A, T2A, T17A, T19A |
| 5 | Control Manner    | X standard pilot      |
|   |                   | L manual load release |
| 6 | Cracking Pressure | A 0.3 bar             |
|   |                   | C 2.0 bar             |
|   |                   | E 5.0 bar             |
| 7 | Material of Seal  | N buna-N              |
|   |                   | V viton               |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CK2A  | T11A   | 60                  | 350                    | 45/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.13           |
| CK3A  | T2A    | 120                 | 350                    | 60/70                       |                              | 0.24           |
| CK6A  | T17A   | 240                 | 350                    | 200/215                     |                              | 0.53           |
| CK8A  | T19A   | 480                 | 350                    | 465/500                     |                              | 1.16           |

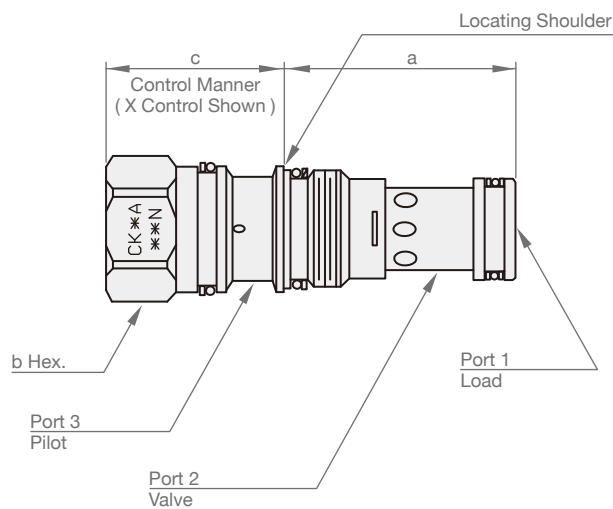
## PERFORMANCE CURVES

### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

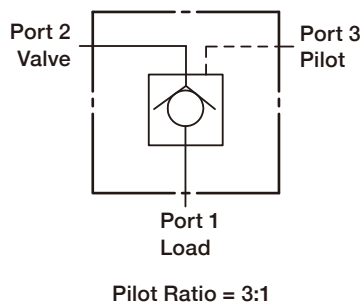


| Model | a    | b    | c  |     |
|-------|------|------|----|-----|
|       |      |      | X  | L   |
| CK2A  | 34.9 | 22.2 | 31 | 64  |
| CK3A  | 34.9 | 28.6 | 35 | 72  |
| CK6A  | 46.0 | 31.8 | 46 | 84  |
| CK8A  | 63.5 | 41.3 | 59 | 100 |

# CKB



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>CK</b> | <b>2</b> | <b>B</b> | - | <b>T11A</b> | - | <b>X</b> | <b>C</b> | <b>N</b> |
| 1         | 2        | 3        |   | 4           |   | 5        | 6        | 7        |

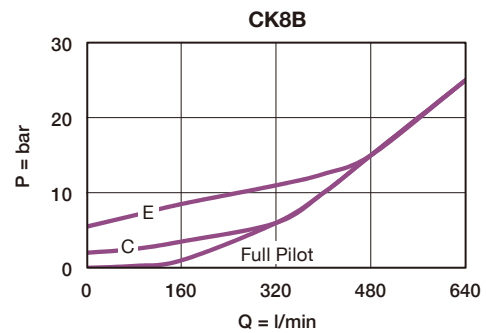
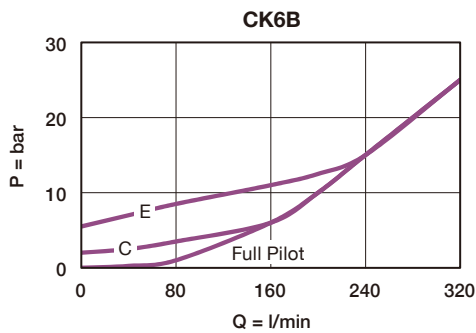
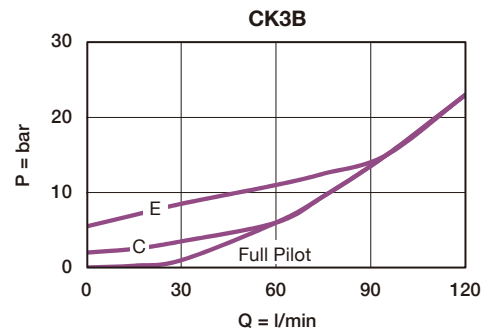
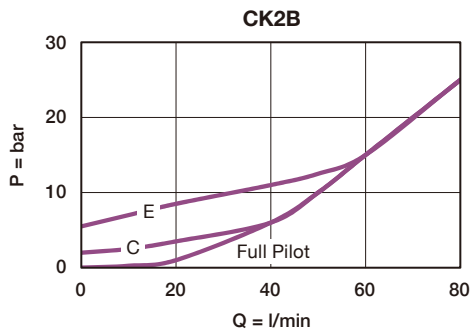
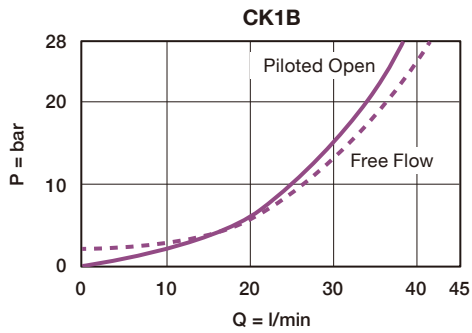
|   |                   |                              |
|---|-------------------|------------------------------|
| 1 | Model Name        | CK                           |
| 2 | Valve Size        | 1, 2, 3, 6, 8                |
| 3 | Pilot Version     | B bleed through pilot        |
| 4 | Cavity            | T163A, T11A, T2A, T17A, T19A |
| 5 | Control Manner    | X standard pilot             |
|   |                   | L manual load release        |
| 6 | Cracking Pressure | A 0.3 bar                    |
|   |                   | C 2.0 bar                    |
|   |                   | E 5.0 bar                    |
| 7 | Material of Seal  | N buna-N                     |
|   |                   | V viton                      |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CK1B  | T163A  | 28.4                | 350                    | 40/48                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.09           |
| CK2B  | T11A   | 60                  | 350                    | 40/50                       |                              | 0.10           |
| CK3B  | T2A    | 120                 | 350                    | 60/70                       |                              | 0.24           |
| CK6B  | T17A   | 240                 | 350                    | 200/215                     |                              | 0.53           |
| CK8B  | T19A   | 480                 | 350                    | 465/500                     |                              | 1.16           |

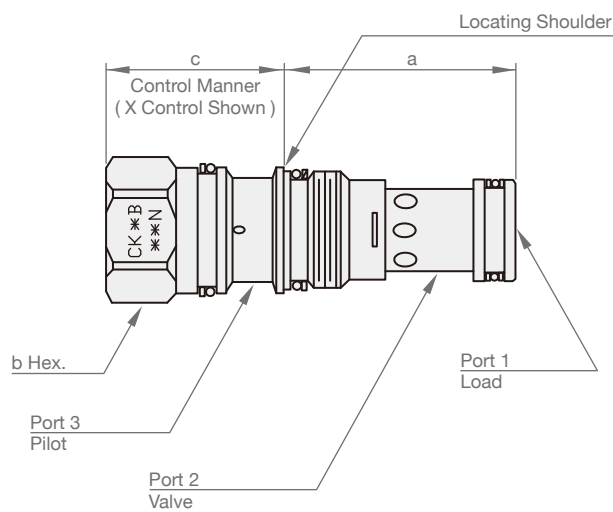
## PERFORMANCE CURVES

### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

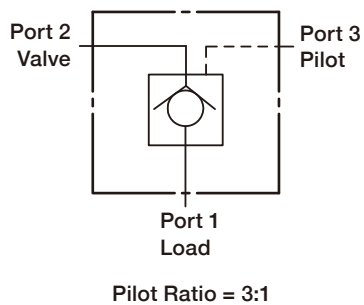


| Model | a    | b    | c  |     |
|-------|------|------|----|-----|
|       |      |      | X  | L   |
| CK1B  | 31.2 | 19   | 32 | 64  |
| CK2B  | 34.9 | 22.2 | 31 | 64  |
| CK3B  | 34.9 | 28.6 | 35 | 72  |
| CK6B  | 46.0 | 31.8 | 46 | 84  |
| CK8B  | 63.5 | 41.3 | 59 | 100 |

# CKC



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>CK</b> | <b>2</b> | <b>C</b> | - | <b>T11A</b> | - | <b>X</b> | <b>C</b> | <b>N</b> |
| 1         | 2        | 3        |   | 4           |   | 5        | 6        | 7        |

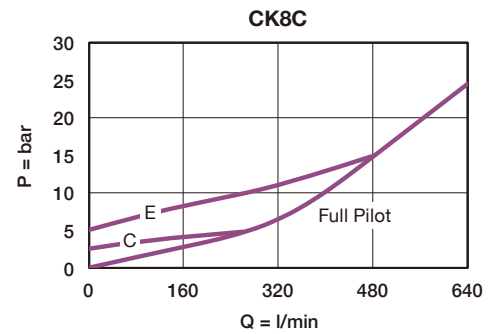
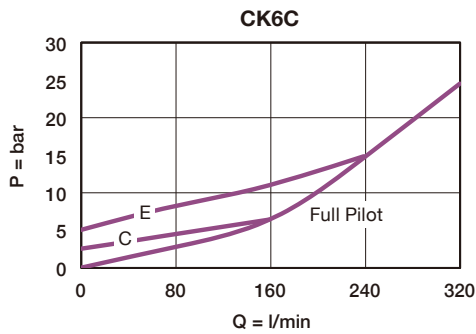
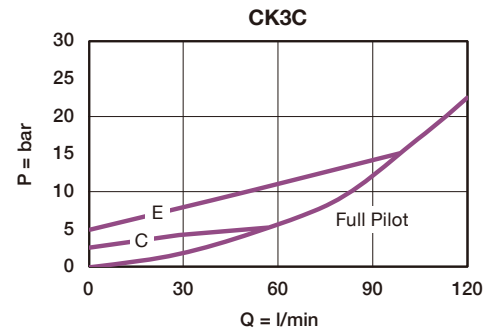
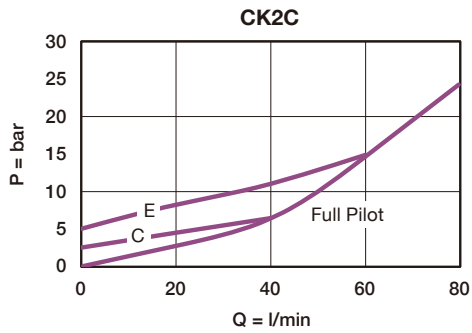
|   |                   |                       |
|---|-------------------|-----------------------|
| 1 | Model Name        | CK                    |
| 2 | Valve Size        | 2, 3, 6, 8            |
| 3 | Pilot Version     | C sealed pilot        |
| 4 | Cavity            | T11A, T2A, T17A, T19A |
| 5 | Control Manner    | X standard pilot      |
|   |                   | L manual load release |
| 6 | Cracking Pressure | A 0.3 bar             |
|   |                   | C 2.0 bar             |
|   |                   | E 5.0 bar             |
| 7 | Material of Seal  | N buna-N              |
|   |                   | V viton               |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CK2C  | T11A   | 60                  | 350                    | 45/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.13           |
| CK3C  | T2A    | 120                 | 350                    | 60/70                       |                              | 0.24           |
| CK6C  | T17A   | 240                 | 350                    | 200/215                     |                              | 0.53           |
| CK8C  | T19A   | 480                 | 350                    | 465/500                     |                              | 1.16           |

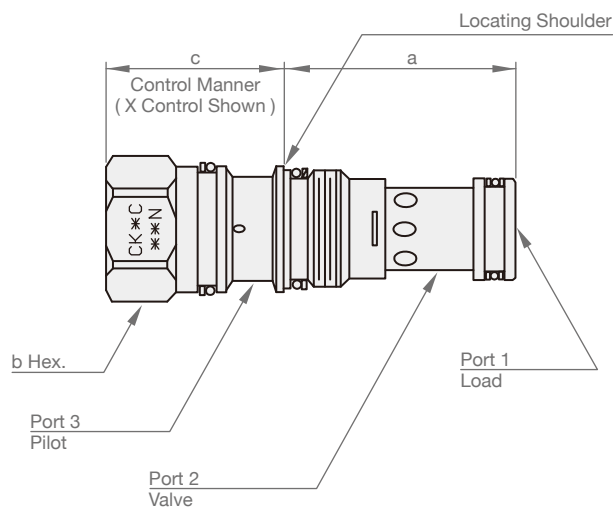
## PERFORMANCE CURVES

### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

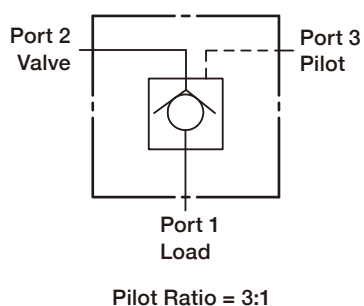


| Model | a    | b    | c  |     |
|-------|------|------|----|-----|
|       |      |      | X  | L   |
| CK2C  | 34.9 | 22.2 | 31 | 64  |
| CK3C  | 34.9 | 28.6 | 35 | 72  |
| CK6C  | 46.0 | 31.8 | 46 | 84  |
| CK8   | 63.5 | 41.3 | 59 | 100 |

# CKD



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>CK</b> | <b>2</b> | <b>D</b> | - | <b>T11A</b> | - | <b>X</b> | <b>C</b> | <b>N</b> |
| 1         | 2        | 3        |   | 4           |   | 5        | 6        | 7        |

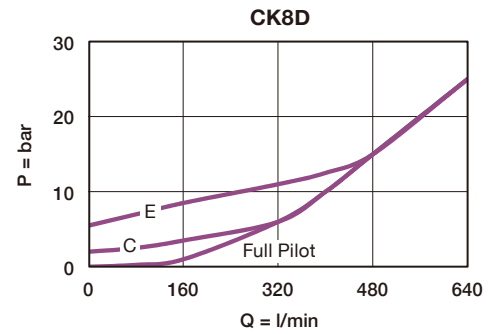
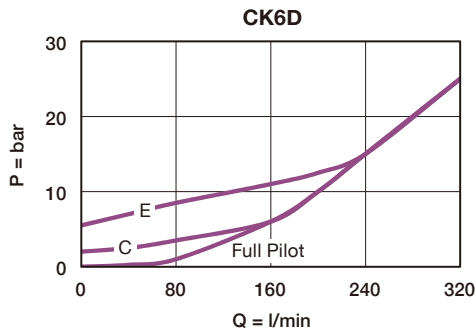
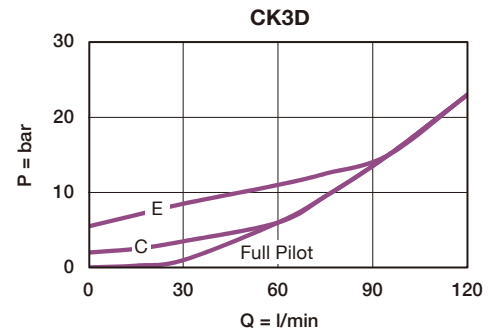
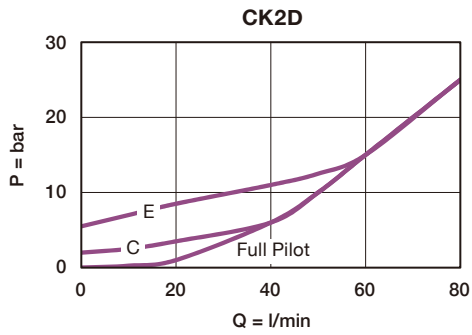
|   |                   |                       |
|---|-------------------|-----------------------|
| 1 | Model Name        | CK                    |
| 2 | Valve Size        | 2, 3, 6, 8            |
| 3 | Pilot Version     | D sealed pilot        |
| 4 | Cavity            | T11A, T2A, T17A, T19A |
| 5 | Control Manner    | X standard pilot      |
|   |                   | L manual load release |
| 6 | Cracking Pressure | A 0.3 bar             |
|   |                   | C 2.0 bar             |
|   |                   | E 5.0 bar             |
| 7 | Material of Seal  | N buna-N              |
|   |                   | V viton               |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CK2D  | T11A   | 60                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.13           |
| CK3D  | T2A    | 120                 | 350                    | 60/70                       |                              | 0.24           |
| CK6D  | T17A   | 240                 | 350                    | 200/215                     |                              | 0.53           |
| CK8D  | T19A   | 480                 | 350                    | 465/500                     |                              | 1.16           |

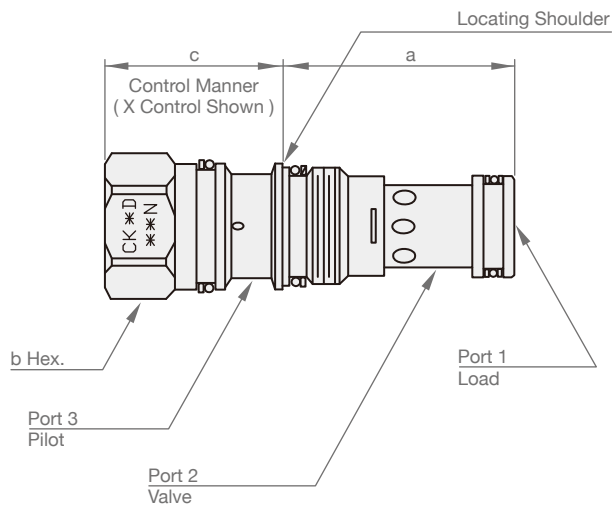
## PERFORMANCE CURVES

### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

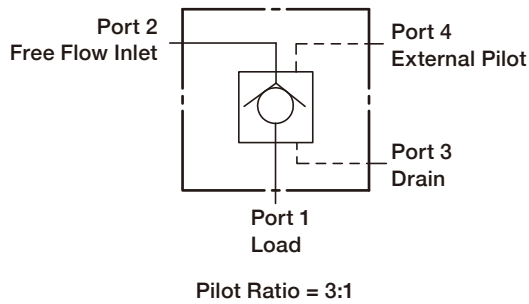


| Model | a    | b    | c  |     |
|-------|------|------|----|-----|
|       |      |      | X  | L   |
| CK2D  | 34.9 | 22.2 | 31 | 64  |
| CK3D  | 34.9 | 28.6 | 35 | 72  |
| CK6D  | 46.0 | 31.8 | 46 | 84  |
| CK8D  | 63.5 | 41.3 | 59 | 100 |

# CKF



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>CK</b> | <b>2</b> | <b>F</b> | - | <b>T11A</b> | - | <b>V</b> | <b>C</b> | <b>N</b> |
| 1         | 2        | 3        |   | 4           |   | 5        | 6        | 7        |

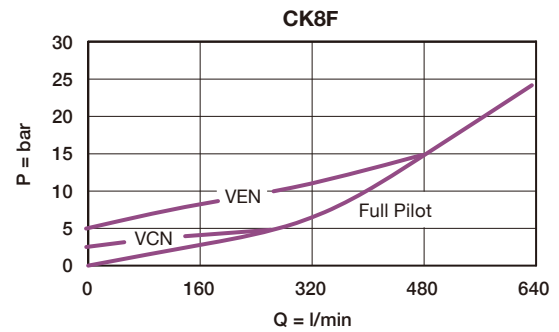
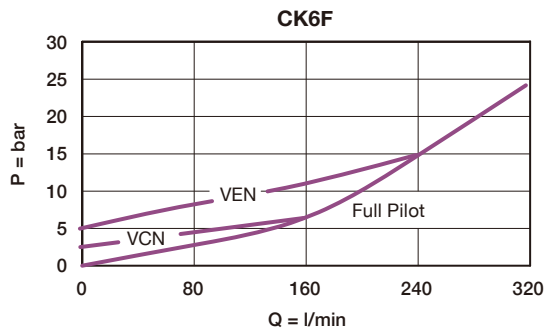
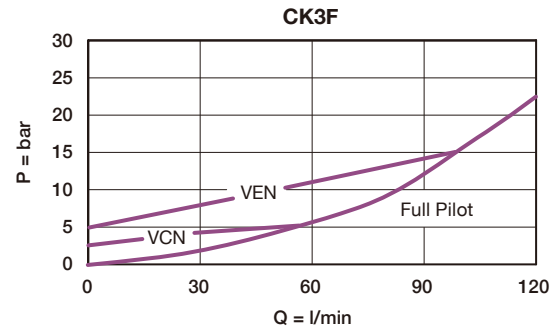
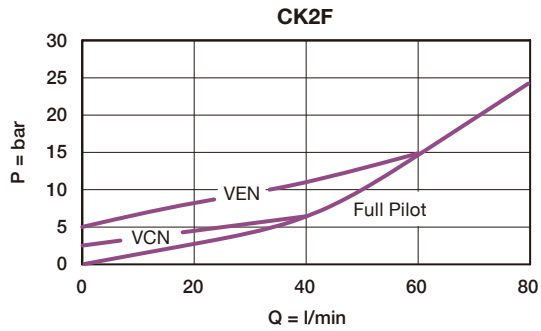
|   |                   |                       |
|---|-------------------|-----------------------|
| 1 | Model Name        | CK                    |
| 2 | Valve Size        | 2, 3, 6, 8            |
| 3 | Pilot Version     | F external pilot      |
| 4 | Cavity            | T11A, T2A, T17A, T19A |
| 5 | Control Manner    | V external pilot port |
| 6 | Cracking Pressure | A 0.3 bar             |
|   |                   | C 2.0 bar             |
|   |                   | E 5.0 bar             |
| 7 | Material of Seal  | N buna-N              |
|   |                   | V viton               |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CK2F  | T11A   | 60                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.13           |
| CK3F  | T2A    | 120                 | 350                    | 60/70                       |                              | 0.24           |
| CK6F  | T17A   | 240                 | 350                    | 200/215                     |                              | 0.53           |
| CK8F  | T19A   | 480                 | 350                    | 465/500                     |                              | 1.16           |

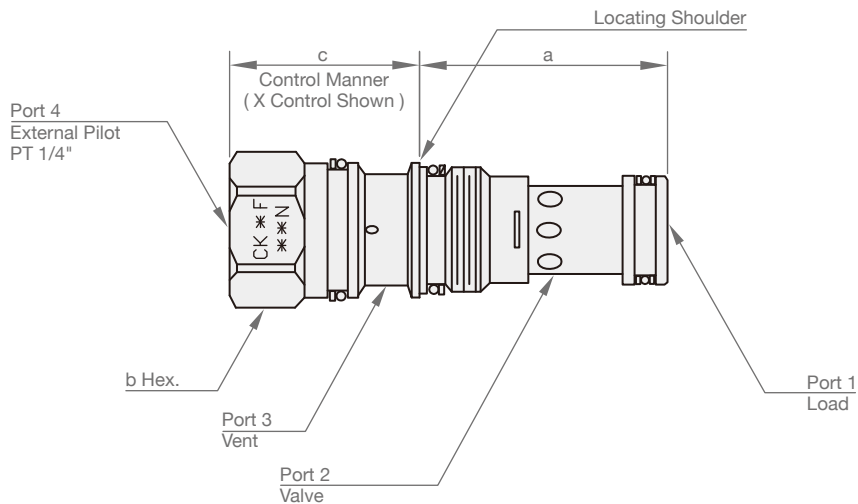
## PERFORMANCE CURVES

### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

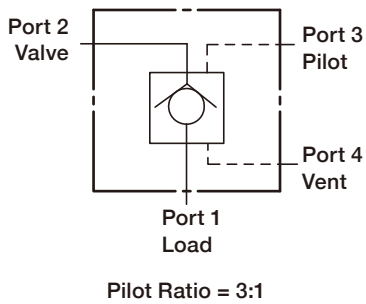


| Model | a    | b    | c  |     |
|-------|------|------|----|-----|
|       |      |      | X  | L   |
| CK2B  | 34.9 | 22.2 | 31 | 64  |
| CK3B  | 34.9 | 28.6 | 35 | 72  |
| CK6B  | 46.0 | 31.8 | 46 | 84  |
| CK8B  | 63.5 | 41.3 | 59 | 100 |

# CVV



## SYMBOLS



## ORDER CODES

**CV** **2V** - **T21A** - **X** **C** **N**

1 2 3 4 5 6

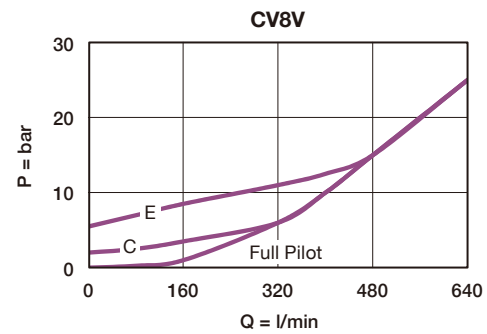
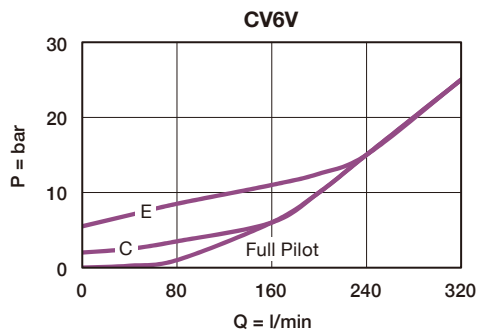
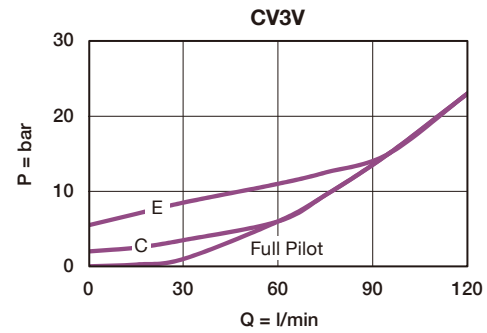
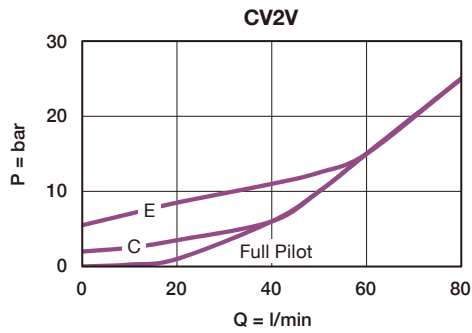
|   |                   |                        |                     |
|---|-------------------|------------------------|---------------------|
| 1 | Model Name        | CV                     |                     |
| 2 | Valve Size        | 2V, 3V, 6V, 8V         |                     |
| 3 | Cavity            | T21A, T22A, T23A, T24A |                     |
| 4 | Control Manner    | X                      | standard pilot      |
|   |                   | L                      | manual load release |
| 5 | Cracking Pressure | A                      | 0.3 bar             |
|   |                   | C                      | 2.0 bar             |
|   |                   | E                      | 5.0 bar             |
| 6 | Material of Seal  | N                      | buna-N              |
|   |                   | V                      | viton               |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CV2V  | T21A   | 60                  | 350                    | 45/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.18           |
| CV3V  | T22A   | 120                 | 350                    | 60/70                       |                              | 0.30           |
| CV6V  | T23A   | 240                 | 350                    | 200/215                     |                              | 0.68           |
| CV8V  | T24A   | 480                 | 350                    | 465/500                     |                              | 1.49           |

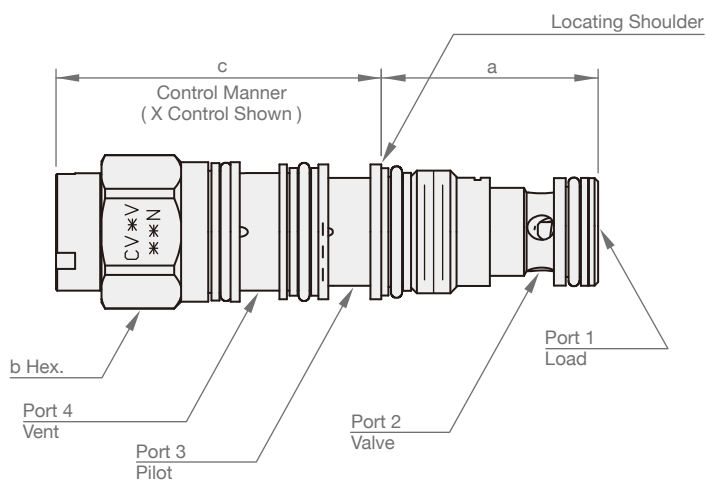
## PERFORMANCE CURVES

### ► Unloaded Pressure Drop



## DIMENSION

( UNIT : mm )

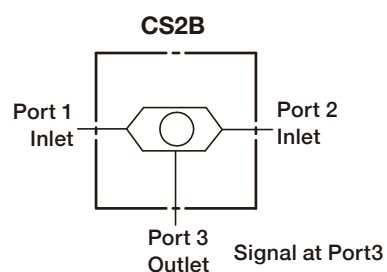
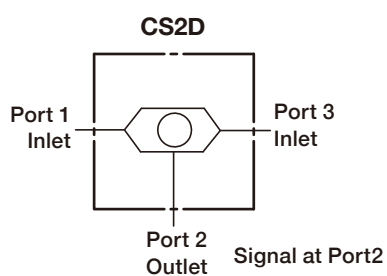


| Model | a    | b    | c    |      |
|-------|------|------|------|------|
|       |      |      | X    | L    |
| CV2V  | 35.1 | 22.2 | 53.3 | 59.4 |
| CV3V  | 35.1 | 28.6 | 59.4 | 65.0 |
| CV6V  | 46.0 | 31.8 | 71.4 | 77.0 |
| CV8V  | 63.5 | 41.3 | 88.9 | 95.8 |

# CSD, CSB



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>CS</b> | <b>2</b> | <b>D</b> | - | <b>T11A</b> | - | <b>X</b> | <b>X</b> | <b>N</b> |
| 1         | 2        | 3        |   | 4           |   | 5        | 6        | 7        |

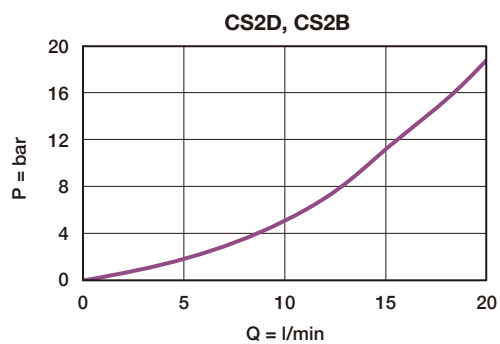
|   |                  |                          |
|---|------------------|--------------------------|
| 1 | Model Name       | CS                       |
| 2 | Valve Size       | 2                        |
| 3 | Operation        | D T11A, signal at port 2 |
|   |                  | B T11A, signal at port 3 |
| 4 | Cavity           | T11A                     |
| 5 | Control Manner   | X unadjustable           |
| 6 | Adjustment Range | X unadjustable           |
| 7 | Material of Seal | N buna-N                 |
|   |                  | V viton                  |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CS2D  | T11A   | 10                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.12           |
| CS2B  | T11A   | 10                  | 350                    | 40/50                       |                              | 0.12           |

## PERFORMANCE CURVES

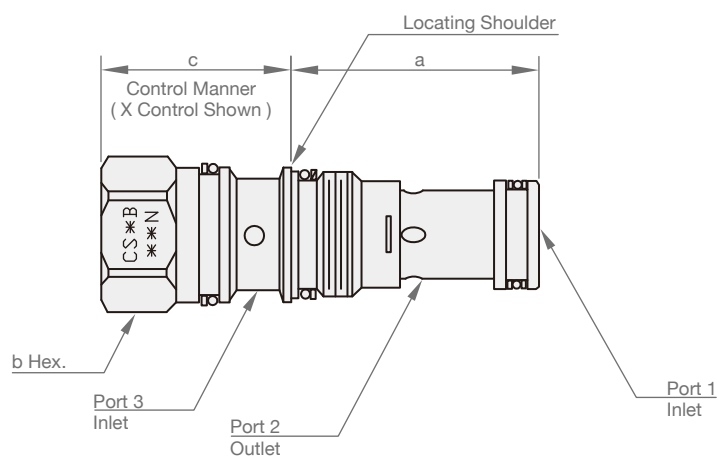
### ► Typical Pressure Drop



## DIMENSION

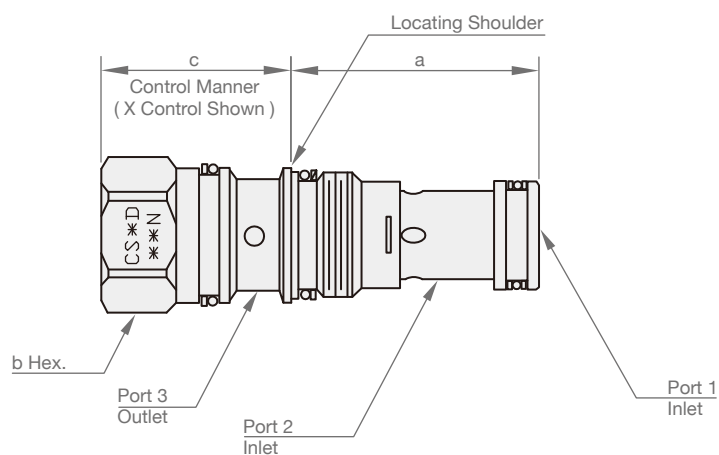
( UNIT : mm )

### ► CS2D



| Model | a    | b    | c  |
|-------|------|------|----|
|       |      |      | X  |
| CS2D  | 34.9 | 22.2 | 31 |
| CS2B  | 34.9 | 22.2 | 31 |

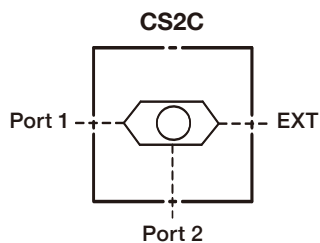
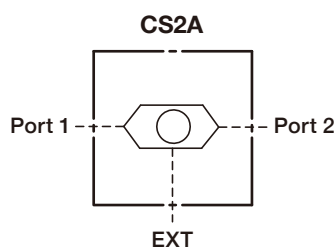
### ► CS2B



# CSA, CSC



## SYMBOLS



## ORDER CODES

**CS 2 A - T13A - E X N**

1 2 3 4 5 6 7

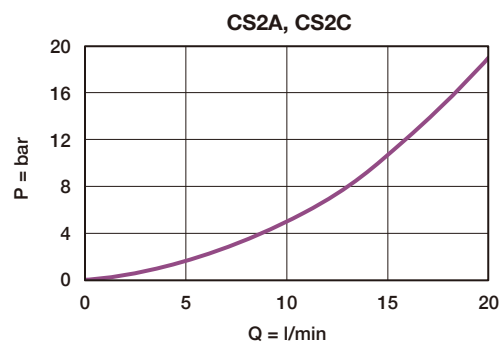
|   |                  |      |                     |
|---|------------------|------|---------------------|
| 1 | Model Name       | CS   |                     |
| 2 | Valve Size       | 2    |                     |
| 3 | Operation        | A    | signal external     |
|   |                  | C    | signal at port 2    |
| 4 | Cavity           | T13A |                     |
| 5 | Control Manner   | E    | external 4-SAE port |
| 6 | Adjustment Range | X    | unadjustable        |
| 7 | Material of Seal | N    | buna-N              |
|   |                  | V    | viton               |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CS2A  | T13A   | 10                  | 350                    | 45/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.1            |
| CS2C  | T13A   | 10                  | 350                    | 45/50                       |                              | 0.1            |

## PERFORMANCE CURVES

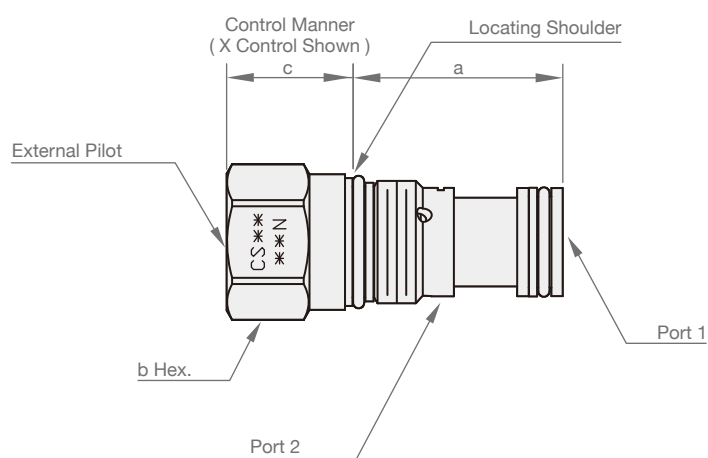
### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

### ► CS2A, CS2C

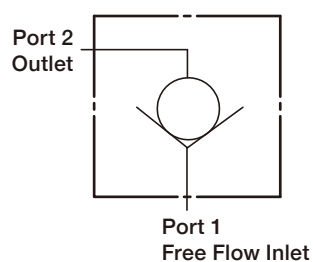


| Model | a    | b    | c  |
|-------|------|------|----|
|       |      |      | X  |
| CS2A  | 34.9 | 22.2 | 19 |
| CS2C  | 34.9 | 22.2 | 19 |

# CXA



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>CX</b> | <b>2</b> | <b>A</b> | - | <b>T13A</b> | - | <b>X</b> | <b>C</b> | <b>N</b> |
| 1         | 2        | 3        |   | 4           |   | 5        | 6        | 7        |

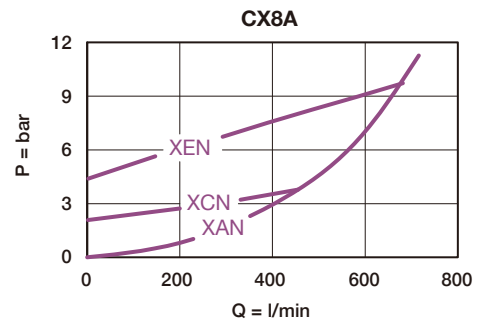
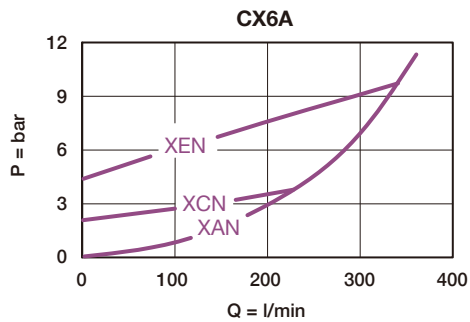
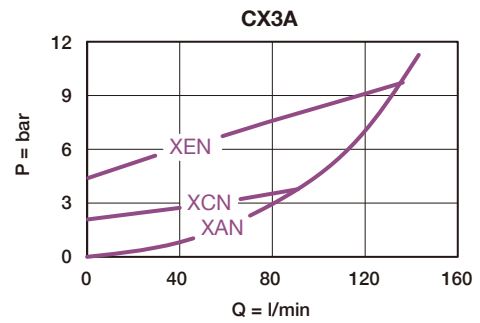
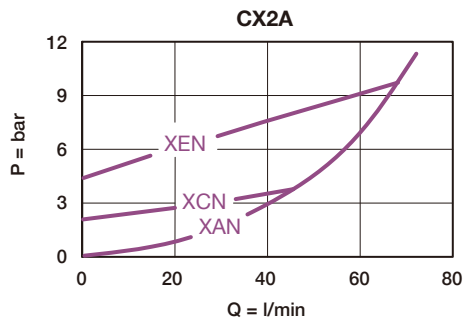
|   |                   |                            |
|---|-------------------|----------------------------|
| 1 | Model Name        | CX                         |
| 2 | Valve Size        | 2, 3, 6, 8                 |
| 3 | Operation         | A Free Flow Port1 to Port2 |
| 4 | Cavity            | T13A, T5A, T16A, T18A      |
| 5 | Control Manner    | X unadjustable             |
| 6 | Cracking Pressure | A 0.3 bar                  |
|   |                   | B 1.0 bar                  |
|   |                   | C 2.0 bar                  |
|   |                   | D 3.5 bar                  |
|   |                   | E 5.0 bar                  |
| 7 | Material of Seal  | N buna-N                   |
|   |                   | V viton                    |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CX2A  | T13A   | 80                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.12           |
| CX3A  | T5A    | 160                 | 350                    | 60/70                       |                              | 0.18           |
| CX6A  | T16A   | 320                 | 350                    | 200/215                     |                              | 0.42           |
| CX8A  | T18A   | 640                 | 350                    | 465/500                     |                              | 0.93           |

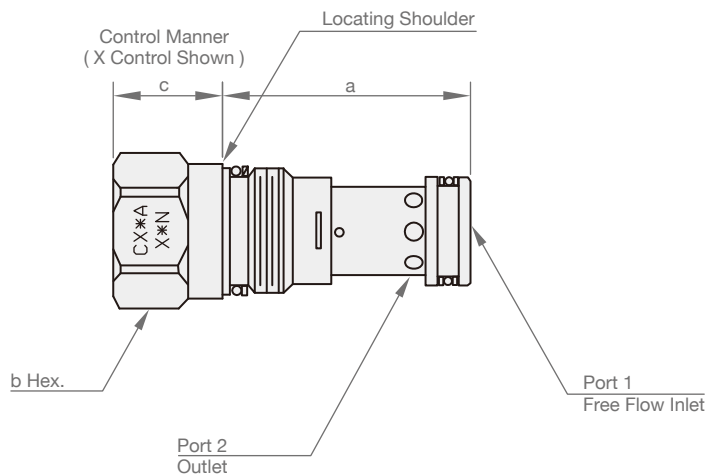
## PERFORMANCE CURVES

### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

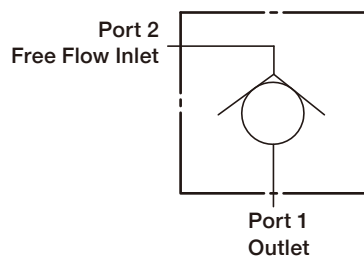


| Model | a    | b    | c  |
|-------|------|------|----|
|       |      |      | X  |
| CX2A  | 34.9 | 22.2 | 19 |
| CX3A  | 41.1 | 28.6 | 18 |
| CX6A  | 61.9 | 31.8 | 25 |
| CX8A  | 79.4 | 41.3 | 31 |

# CXB



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>CX</b> | <b>2</b> | <b>B</b> | - | <b>T13A</b> | - | <b>X</b> | <b>C</b> | <b>N</b> |
| 1         | 2        | 1        |   | 3           |   | 4        | 5        | 6        |

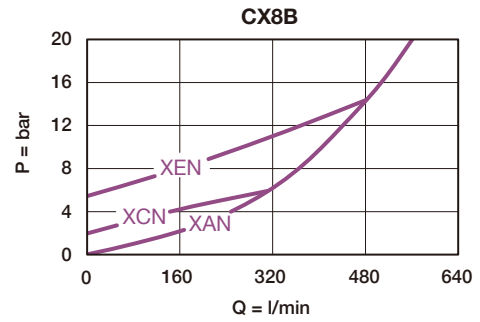
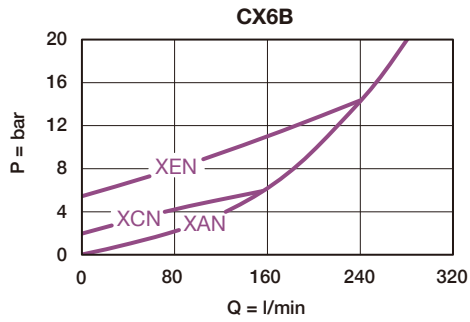
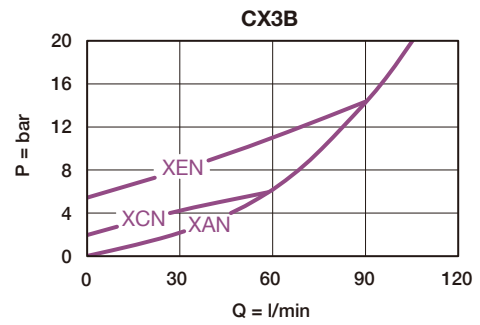
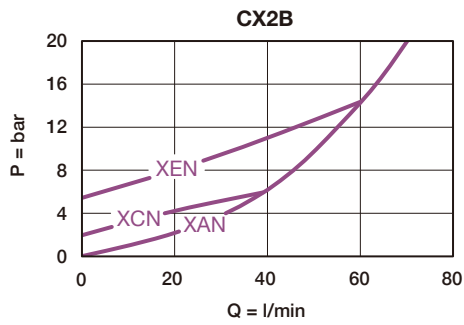
|   |                   |                       |              |
|---|-------------------|-----------------------|--------------|
| 1 | Model Name        | CXB                   |              |
| 2 | Valve Size        | 2, 3, 6, 8            |              |
| 3 | Cavity            | T13A, T5A, T16A, T18A |              |
| 4 | Control Manner    | X                     | unadjustable |
| 5 | Cracking Pressure | A                     | 0.3 bar      |
|   |                   | B                     | 1.0 bar      |
|   |                   | C                     | 2.0 bar      |
|   |                   | D                     | 3.5 bar      |
|   |                   | E                     | 5.0 bar      |
| 6 | Material of Seal  | N                     | buna-N       |
|   |                   | V                     | viton        |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CX2B  | T13A   | 60                  | 350                    | 45/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.12           |
| CX3B  | T5A    | 120                 | 350                    | 60/70                       |                              | 0.18           |
| CX6B  | T16A   | 240                 | 350                    | 200/215                     |                              | 0.42           |
| CX8B  | T18A   | 480                 | 350                    | 465/500                     |                              | 0.93           |

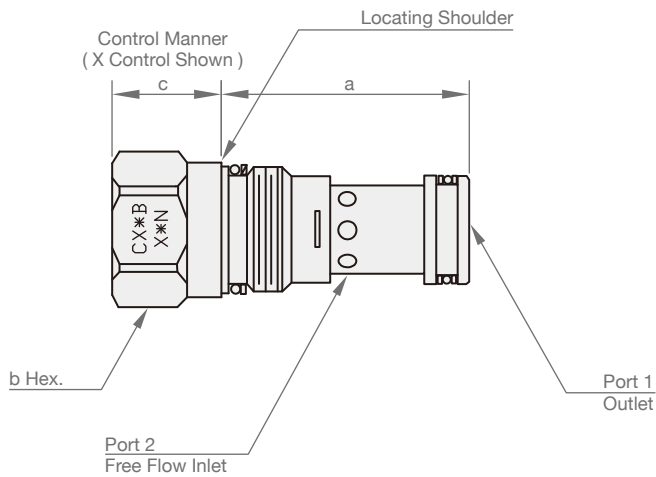
## PERFORMANCE CURVES

### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

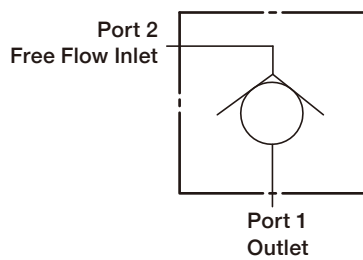


| Model | a    | b    | c  |
|-------|------|------|----|
|       |      |      | X  |
| CX2B  | 34.9 | 22.2 | 19 |
| CX3B  | 41.1 | 28.6 | 18 |
| CX6B  | 61.9 | 31.8 | 25 |
| CX8B  | 79.4 | 41.3 | 31 |

# CXD



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>CX</b> | <b>2</b> | <b>D</b> | - | <b>T13A</b> | - | <b>X</b> | <b>C</b> | <b>N</b> |
| 1         | 2        | 3        |   | 4           |   | 5        | 6        | 7        |

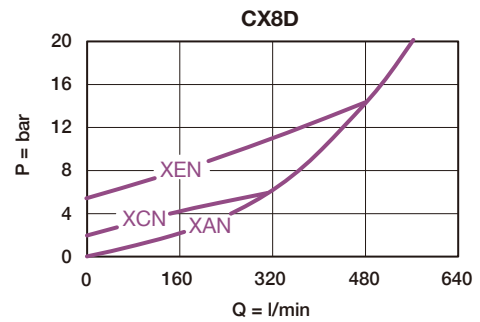
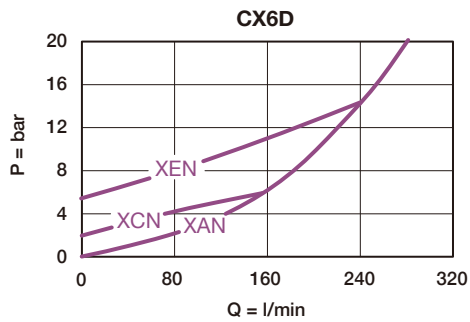
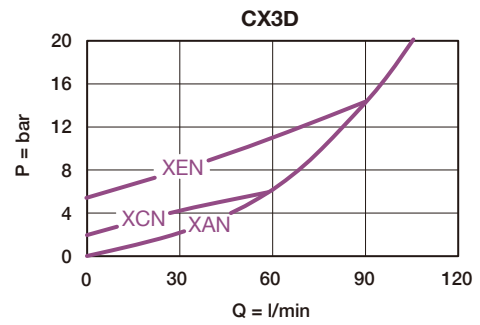
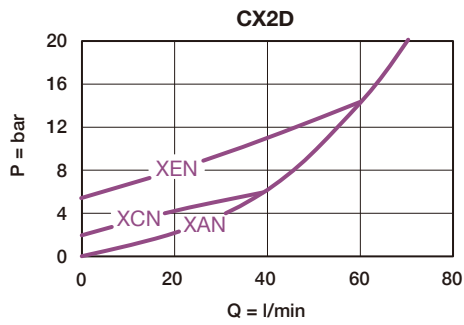
|   |                   |                           |
|---|-------------------|---------------------------|
| 1 | Model Name        | CX                        |
| 2 | Valve Size        | 2, 3, 6, 8                |
| 3 | Operation         | D Free Flow Por2 to Port1 |
| 4 | Cavity            | T13A, T5A, T16A, T18A     |
| 5 | Control Manner    | X unadjustable            |
| 6 | Cracking Pressure | A 0.3 bar                 |
|   |                   | B 1.0 bar                 |
|   |                   | C 2.0 bar                 |
|   |                   | D 3.5 bar                 |
|   |                   | E 5.0 bar                 |
| 7 | Material of Seal  | N buna-N                  |
|   |                   | V viton                   |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating<br>Temperature     | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CX2D  | T13A   | 60                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.12           |
| CX3D  | T5A    | 120                 | 350                    | 60/70                       |                              | 0.18           |
| CX6D  | T16A   | 240                 | 350                    | 200/215                     |                              | 0.42           |
| CX8D  | T18A   | 480                 | 350                    | 465/500                     |                              | 0.93           |

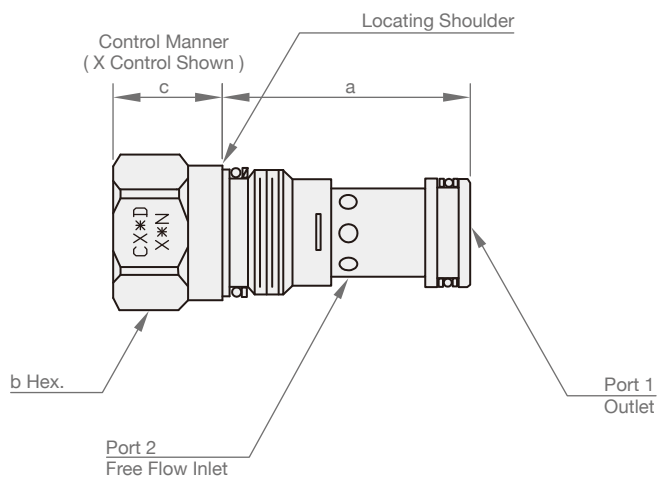
## PERFORMANCE CURVES

### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

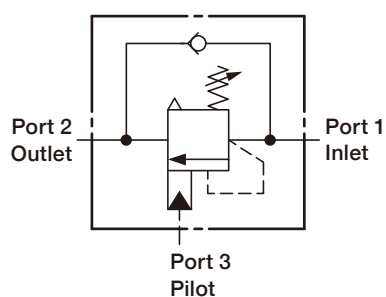


| Model | a    | b    | c  |
|-------|------|------|----|
|       |      |      | X  |
| CX2D  | 34.9 | 22.2 | 19 |
| CX3D  | 41.1 | 28.6 | 18 |
| CX6D  | 61.9 | 31.8 | 25 |
| CX8D  | 79.4 | 41.3 | 31 |

# CAA



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>CA</b> | <b>2</b> | <b>A</b> | - | <b>T11A</b> | - | <b>L</b> | <b>I</b> | <b>N</b> |
| 1         | 2        | 3        |   | 4           |   | 5        | 6        | 7        |

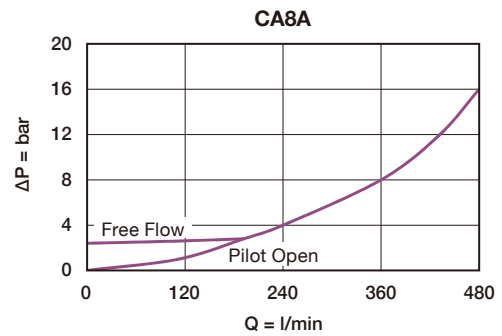
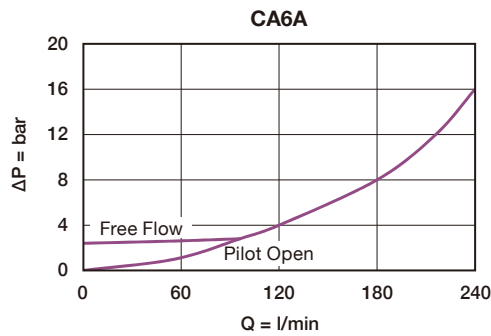
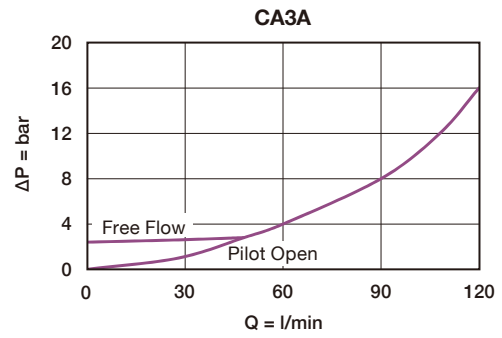
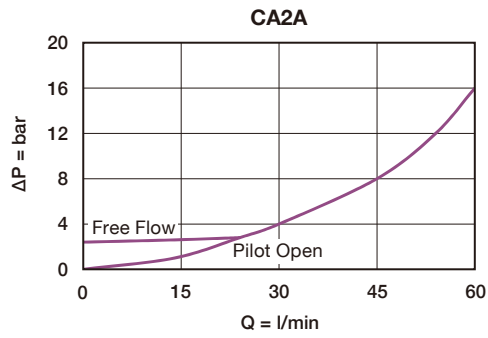
|   |                  |                                              |
|---|------------------|----------------------------------------------|
| 1 | Model Name       | CA                                           |
| 2 | Valve Size       | 2, 3, 6, 8                                   |
| 3 | Pilot Pressure   | A 3:1                                        |
| 4 | Cavity           | T11A, T2A, T17A, T19A                        |
| 5 | Control Manner   | L standard screw adjustment                  |
| 6 | Adjustable Range | H 70 ~ 280 bar,<br>210 bar initially setting |
|   |                  | I 25 ~ 105 bar,<br>70 bar initially setting  |
| 7 | Material of Seal | N buna-N                                     |
|   |                  | V viton                                      |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CA2A  | T11A   | 60                  | 350                    | 45/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.20           |
| CA3A  | T2A    | 120                 | 350                    | 60/70                       |                              | 0.38           |
| CA6A  | T17A   | 240                 | 350                    | 200/215                     |                              | 0.74           |
| CA8A  | T19A   | 480                 | 350                    | 465/500                     |                              | 1.62           |

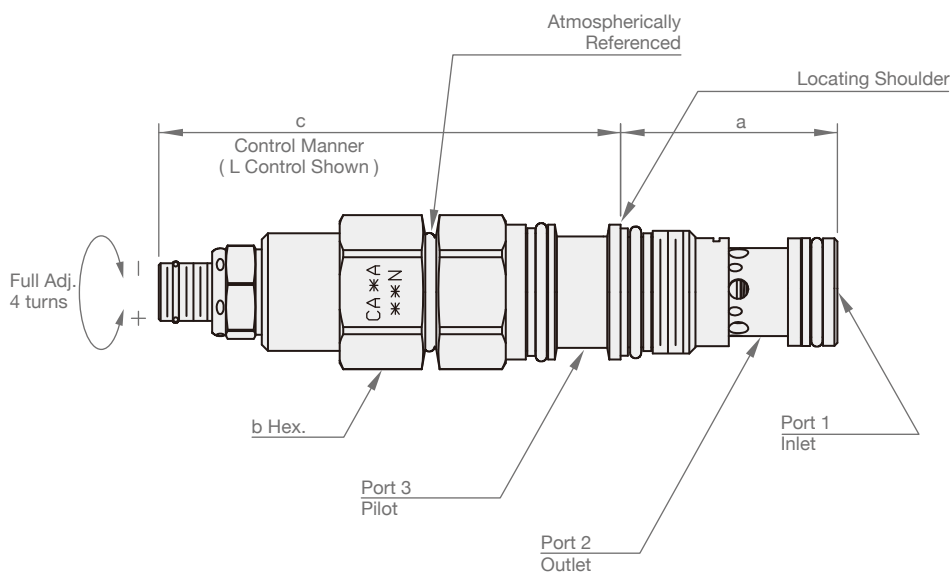
## PERFORMANCE CURVES

### ► Free Flow & Piloted Open Pressure Drop



## DIMENSION

( UNIT : mm )

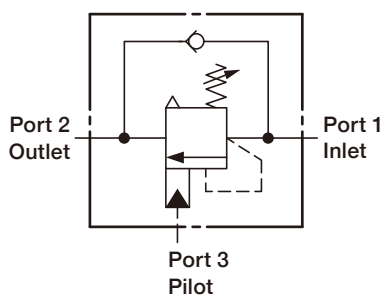


| Model | a    | b    | c     |
|-------|------|------|-------|
|       |      |      | L     |
| CA2A  | 35.1 | 22.2 | 73.4  |
| CA3A  | 35.1 | 28.6 | 83.6  |
| CA6A  | 46.0 | 31.8 | 95.0  |
| CA8A  | 63.5 | 41.3 | 116.3 |

# CAG



## SYMBOLS



## ORDER CODES

|    |   |   |   |      |   |   |   |   |
|----|---|---|---|------|---|---|---|---|
| CA | 2 | G | - | T11A | - | L | G | N |
| 1  | 2 | 3 |   | 4    |   | 5 | 6 | 7 |

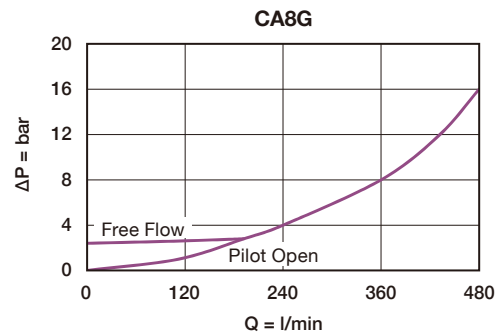
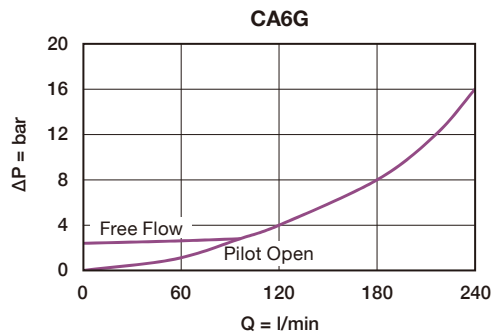
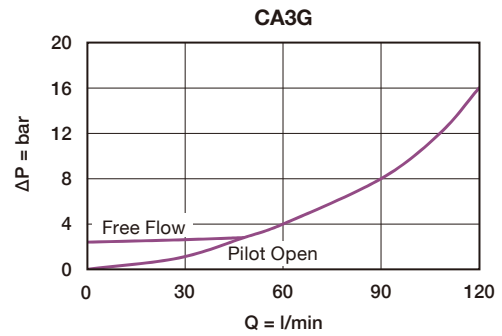
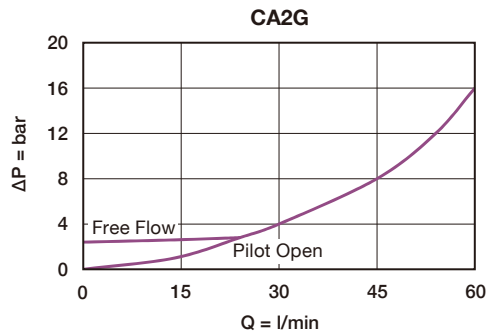
|   |                  |                                               |
|---|------------------|-----------------------------------------------|
| 1 | Model Name       | CA                                            |
| 2 | Valve Size       | 2, 3, 6, 8                                    |
| 3 | Pilot Pressure   | G 5:1                                         |
| 4 | Cavity           | T11A, T2A, T17A, T19A                         |
| 5 | Control Manner   | L standard screw adjustment                   |
| 6 | Adjustable Range | G 140 ~ 420 bar,<br>280 bar initially setting |
|   |                  | F 70 ~ 175 bar,<br>140 bar initially setting  |
| 7 | Material of Seal | N buna-N                                      |
|   |                  | V viton                                       |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CA2G  | T11A   | 60                  | 350                    | 45/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.20           |
| CA3G  | T2A    | 120                 | 350                    | 60/70                       |                              | 0.38           |
| CA6G  | T17A   | 240                 | 350                    | 200/215                     |                              | 0.74           |
| CA8G  | T19A   | 480                 | 350                    | 465/500                     |                              | 1.62           |

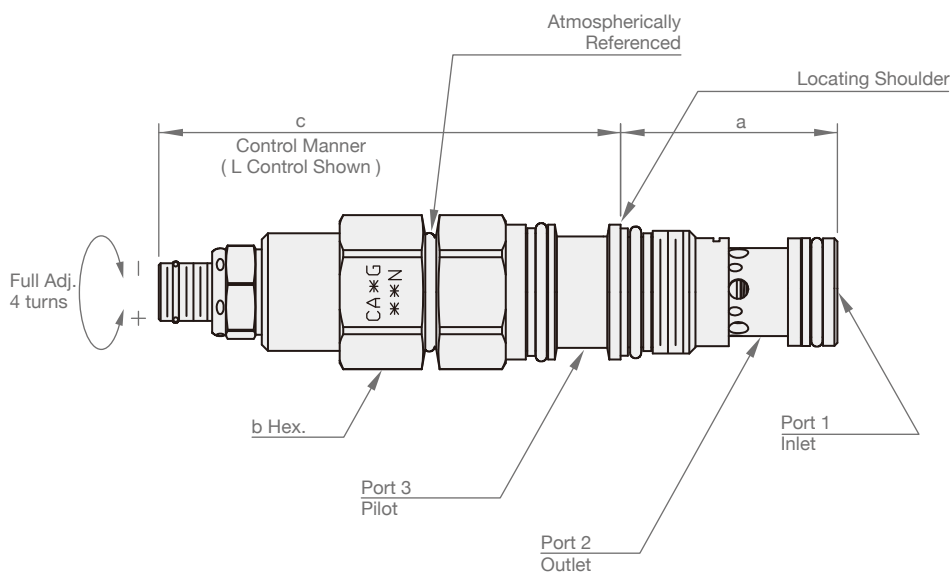
## PERFORMANCE CURVES

### ► Free Flow & Piloted Open Pressure Drop



## DIMENSION

( UNIT : mm )

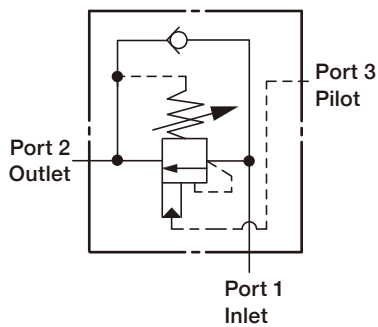


| Model | a    | b    | c     |
|-------|------|------|-------|
|       |      |      | L     |
| CA2G  | 35.1 | 22.2 | 73.4  |
| CA3G  | 35.1 | 28.6 | 83.6  |
| CA6G  | 46.0 | 31.8 | 95.0  |
| CA8G  | 63.5 | 41.3 | 116.3 |

# CBA



## SYMBOLS



## ORDER CODES

|    |   |   |   |      |   |   |   |   |
|----|---|---|---|------|---|---|---|---|
| CB | 2 | A | - | T11A | - | L | I | N |
| 1  | 2 | 3 |   | 4    |   | 5 | 6 | 7 |

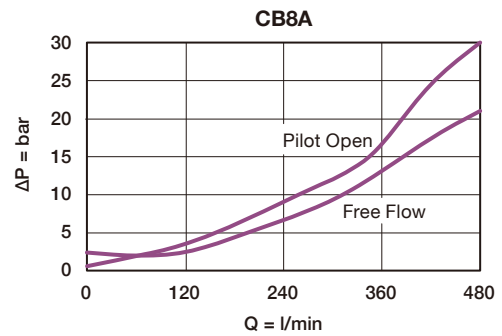
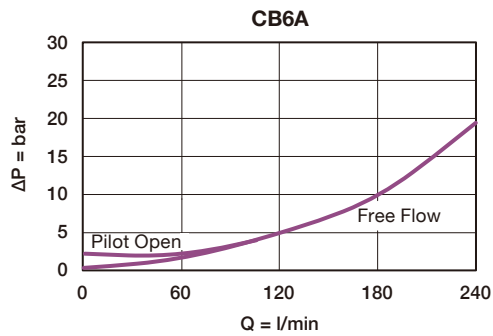
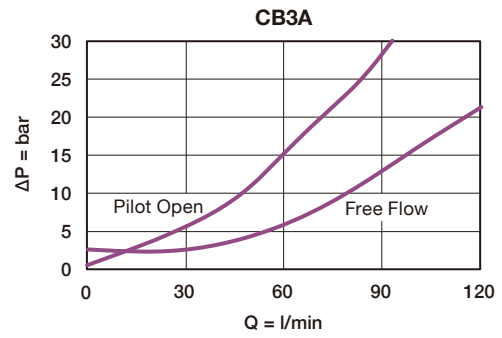
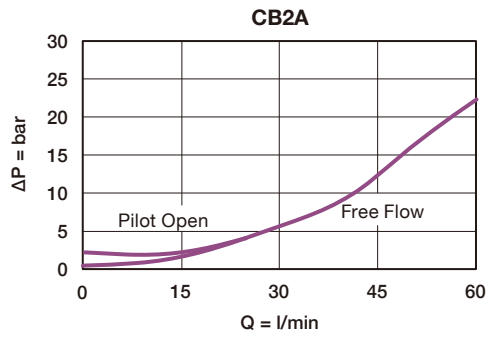
|   |                  |                                                            |
|---|------------------|------------------------------------------------------------|
| 1 | Model Name       | CB                                                         |
| 2 | Valve Size       | 2, 3, 6, 8                                                 |
| 3 | Pilot Ratio      | A 3:1                                                      |
| 4 | Cavity           | T11A, T2A, T17A, T19A                                      |
| 5 | Control Manner   | L standard screw adjustment                                |
| 6 | Adjustable Range | H 70 ~ 280 bar, w/1.7 bar check, 210 bar initially setting |
|   |                  | I 25 ~ 105 bar, w/1.7 bar check, 70 bar initially setting  |
|   |                  | A 70 ~ 280 bar, w/0.3 bar check, 210 bar initially setting |
|   |                  | B 25 ~ 105 bar, w/0.3 bar check, 70 bar initially setting  |
| 7 | Material of Seal | N buna-N                                                   |
|   |                  | V viton                                                    |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CB2A  | T11A   | 60                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.17           |
| CB3A  | T2A    | 120                 | 350                    | 60/70                       |                              | 0.30           |
| CB6A  | T17A   | 240                 | 350                    | 200/215                     |                              | 0.64           |
| CB8A  | T19A   | 480                 | 350                    | 465/500                     |                              | 1.47           |

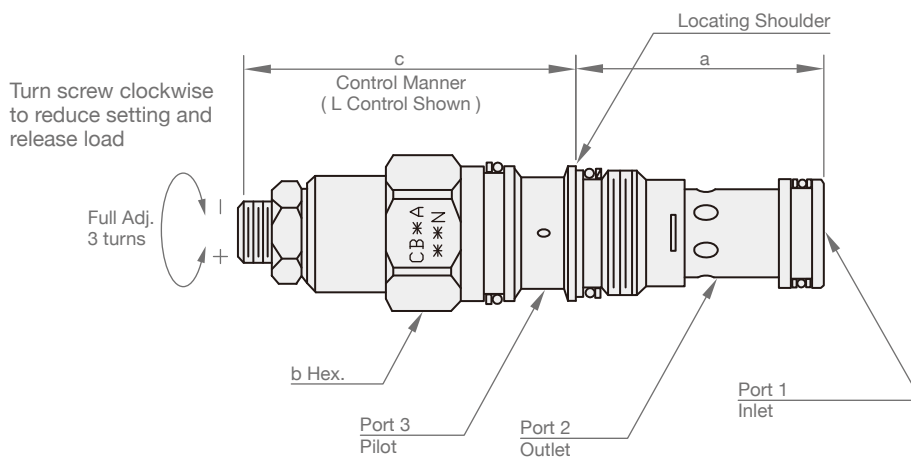
## PERFORMANCE CURVES

### ► Free Flow & Piloted Open Pressure Drop



## DIMENSION

( UNIT : mm )

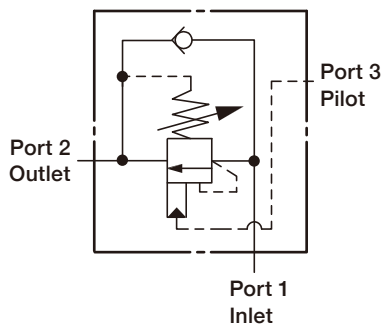


| Model | a    | b    | c  |
|-------|------|------|----|
|       |      |      | L  |
| CB2A  | 34.9 | 22.2 | 50 |
| CB3A  | 34.9 | 28.6 | 61 |
| CB6A  | 46.0 | 31.8 | 70 |
| CB8A  | 63.5 | 41.3 | 90 |

# CBG



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>CB</b> | <b>2</b> | <b>G</b> | - | <b>T11A</b> | - | <b>L</b> | <b>K</b> | <b>N</b> |
| 1         | 2        | 3        |   | 4           |   | 5        | 6        | 7        |

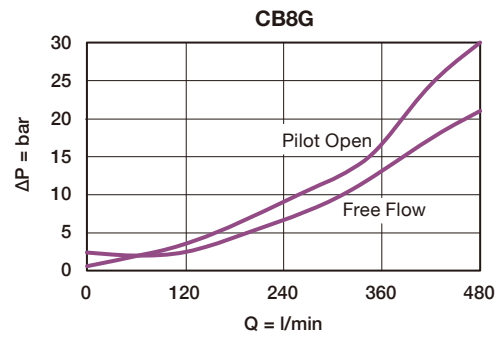
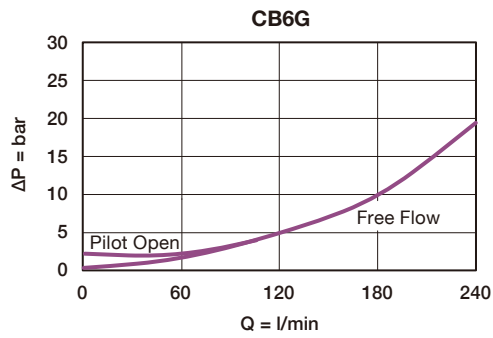
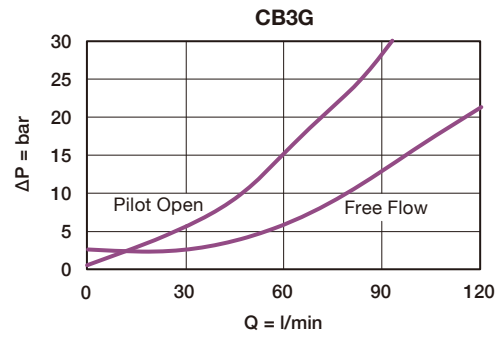
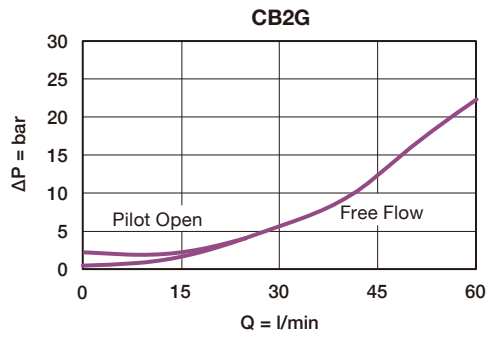
|   |                  |                                                             |
|---|------------------|-------------------------------------------------------------|
| 1 | Model Name       | CB                                                          |
| 2 | Valve Size       | 2, 3, 6, 8                                                  |
| 3 | Pilot Ratio      | G 4.5:1                                                     |
| 4 | Cavity           | T11A, T2A, T17A, T19A                                       |
| 5 | Control Manner   | L standard screw adjustment                                 |
| 6 | Adjustable Range | J 140 ~ 350 bar, w/1.7 bar check, 210 bar initially setting |
|   |                  | K 70 ~ 175 bar, w/1.7 bar check, 140 bar initially setting  |
|   |                  | C 140 ~ 350 bar, w/0.3 bar check, 210 bar initially setting |
|   |                  | D 70 ~ 175 bar, w/0.3 bar check, 140 bar initially setting  |
| 7 | Material of Seal | N buna-N                                                    |
|   |                  | V viton                                                     |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CB2G  | T11A   | 60                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.17           |
| CB3G  | T2A    | 120                 | 350                    | 60/70                       |                              | 0.30           |
| CB6G  | T17A   | 240                 | 350                    | 200/215                     |                              | 0.64           |
| CB8G  | T19A   | 480                 | 350                    | 465/500                     |                              | 1.47           |

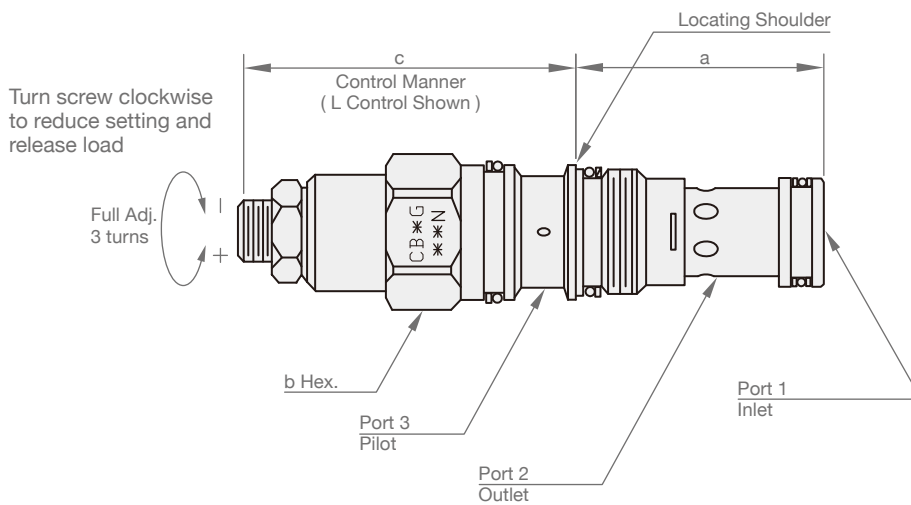
## PERFORMANCE CURVES

### ► Free Flow & Piloted Open Pressure Drop



## DIMENSION

( UNIT : mm )

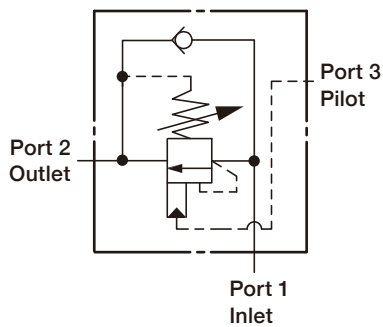


| Model | a    | b    | c  |
|-------|------|------|----|
|       |      |      | L  |
| CB2G  | 34.9 | 22.2 | 50 |
| CB3G  | 34.9 | 28.6 | 61 |
| CB6G  | 46.0 | 31.8 | 70 |
| CB8G  | 63.5 | 41.3 | 90 |

# CBH



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>CB</b> | <b>2</b> | <b>H</b> | - | <b>T11A</b> | - | <b>L</b> | <b>K</b> | <b>N</b> |
| 1         | 2        | 3        |   | 4           |   | 5        | 6        | 7        |

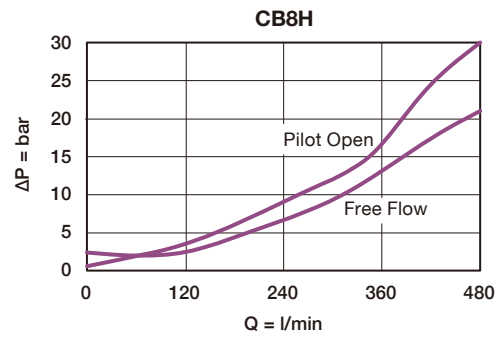
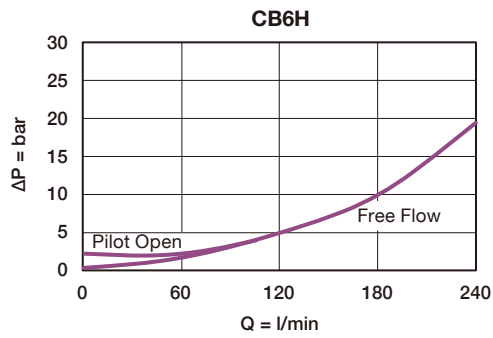
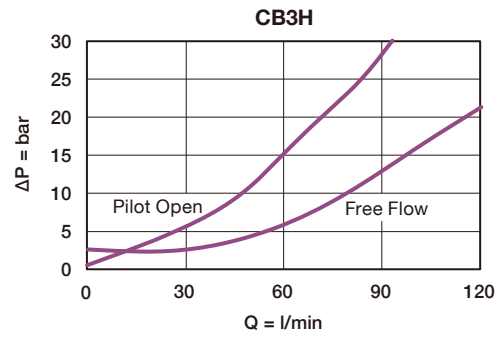
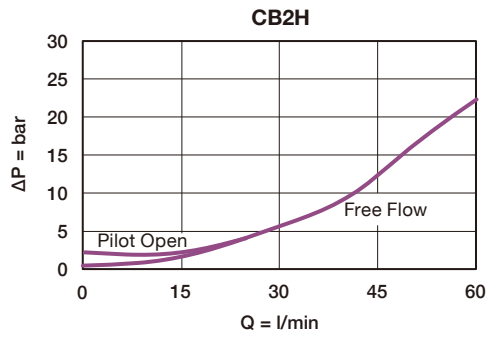
|   |                  |                                                             |
|---|------------------|-------------------------------------------------------------|
| 1 | Model Name       | CB                                                          |
| 2 | Valve Size       | 2, 3, 6, 8                                                  |
| 3 | Pilot Ratio      | H 10:1                                                      |
| 4 | Cavity           | T11A, T2A, T17A, T19A                                       |
| 5 | Control Manner   | L standard screw adjustment                                 |
| 6 | Adjustable Range | J 140 ~ 350 bar, w/1.7 bar check, 210 bar initially setting |
|   |                  | K 70 ~ 175 bar, w/1.7 bar check, 140 bar initially setting  |
|   |                  | C 140 ~ 350 bar, w/0.3 bar check, 210 bar initially setting |
|   |                  | D 70 ~ 175 bar, w/0.3 bar check, 140 bar initially setting  |
| 7 | Material of Seal | N buna-N                                                    |
|   |                  | V viton                                                     |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CB2H  | T11A   | 60                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.17           |
| CB3H  | T2A    | 120                 | 350                    | 60/70                       |                              | 0.30           |
| CB6H  | T17A   | 240                 | 350                    | 200/215                     |                              | 0.64           |
| CB8H  | T19A   | 480                 | 350                    | 465/500                     |                              | 1.47           |

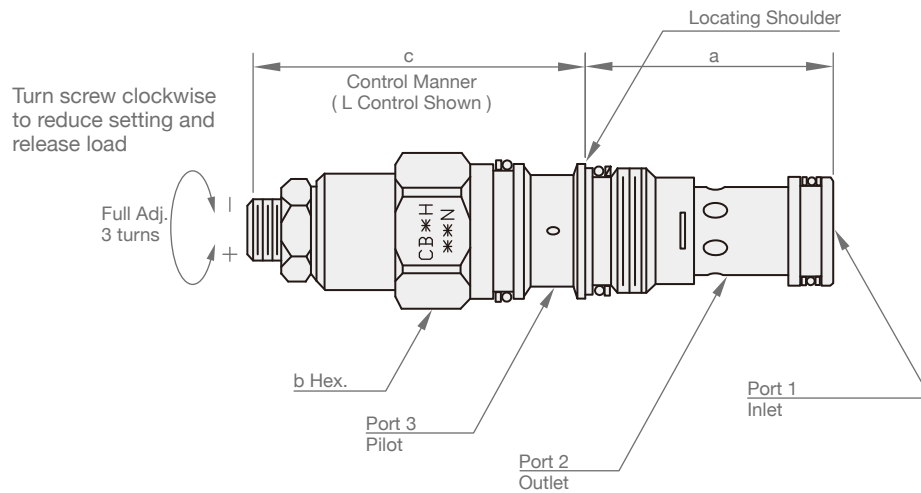
## PERFORMANCE CURVES

### ► Free Flow & Piloted Open Pressure Drop



## DIMENSION

( UNIT : mm )

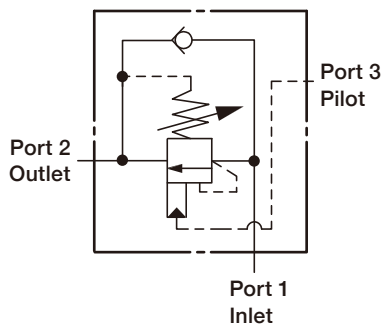


| Model | a    | b    | c  |
|-------|------|------|----|
|       |      |      | L  |
| CB2H  | 34.9 | 22.2 | 50 |
| CB3H  | 34.9 | 28.6 | 61 |
| CB6H  | 46.0 | 31.8 | 70 |
| CB8H  | 63.5 | 41.3 | 90 |

# CBC



## SYMBOLS



## ORDER CODES

**CB 2 C - T11A - L I N**

1 2 3 4 5 6 7

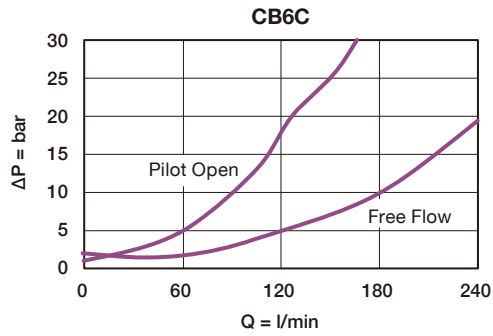
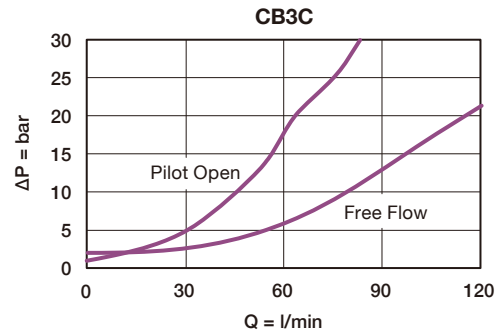
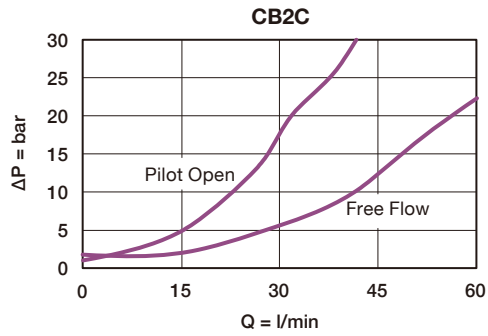
|   |                  |                                                            |
|---|------------------|------------------------------------------------------------|
| 1 | Model Name       | CB                                                         |
| 2 | Valve Size       | 2, 3, 6                                                    |
| 3 | Pilot Ratio      | C 3:1                                                      |
| 4 | Cavity           | T11A, T2A, T17A                                            |
| 5 | Control Manner   | L standard screw adjustment                                |
| 6 | Adjustable Range | H 70 ~ 280 bar, w/1.7 bar check, 210 bar initially setting |
|   |                  | I 25 ~ 105 bar, w/1.7 bar check, 70 bar initially setting  |
|   |                  | A 70 ~ 280 bar, w/0.3 bar check, 210 bar initially setting |
|   |                  | B 25 ~ 105 bar, w/0.3 bar check, 70 bar initially setting  |
| 7 | Material of Seal | N buna-N                                                   |
|   |                  | V viton                                                    |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CB2C  | T11A   | 40                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.17           |
| CB3C  | T2A    | 80                  | 350                    | 60/70                       |                              | 0.30           |
| CB6C  | T17A   | 160                 | 350                    | 200/215                     |                              | 0.64           |

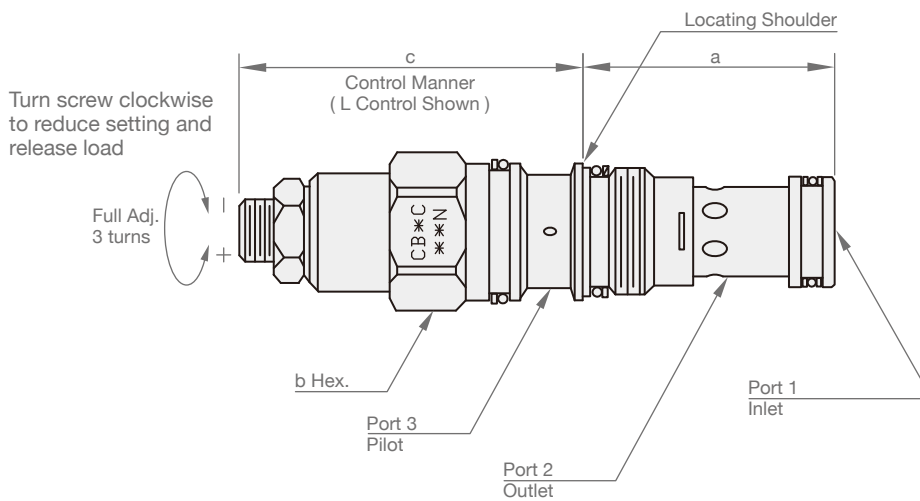
## PERFORMANCE CURVES

### ► Free Flow & Piloted Open Pressure Drop



## DIMENSION

( UNIT : mm )

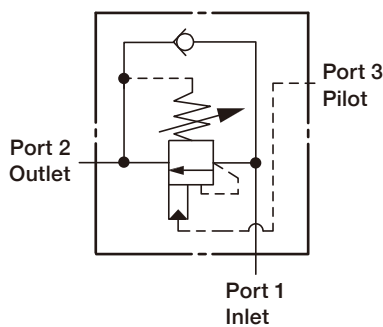


| Model | a    | b    | c  |
|-------|------|------|----|
|       |      |      | L  |
| CB2C  | 34.9 | 22.2 | 50 |
| CB3C  | 34.9 | 28.6 | 61 |
| CB6C  | 46.0 | 31.8 | 70 |

# CBD



## SYMBOLS



## ORDER CODES

**CB 2 D - T11A - L J N**

1 2 3 4 5 6 7

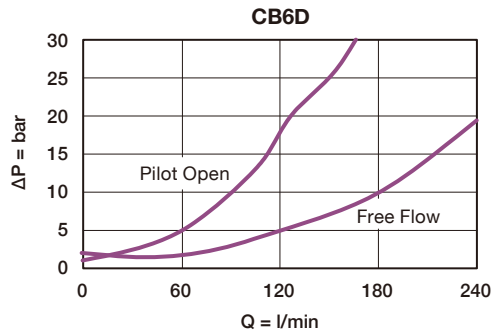
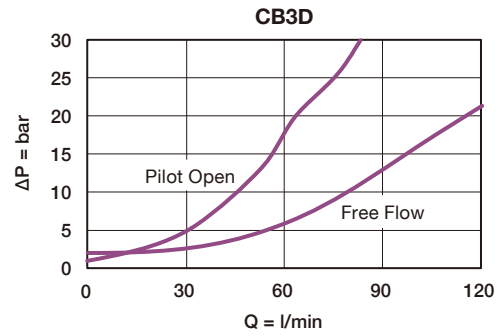
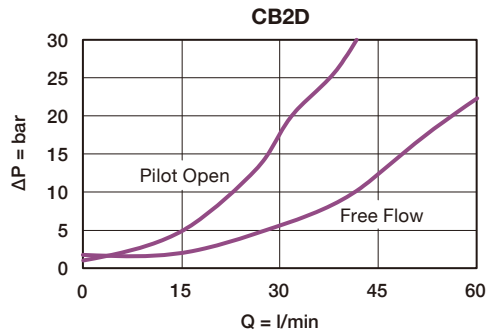
|   |                  |                                                             |
|---|------------------|-------------------------------------------------------------|
| 1 | Model Name       | CB                                                          |
| 2 | Valve Size       | 2, 3, 6                                                     |
| 3 | Pilot Ratio      | D 4.5:1                                                     |
| 4 | Cavity           | T11A, T2A, T17A                                             |
| 5 | Control Manner   | L standard screw adjustment                                 |
| 6 | Adjustable Range | J 140 ~ 350 bar, w/1.7 bar check, 210 bar initially setting |
|   |                  | K 70 ~ 175 bar, w/1.7 bar check, 140 bar initially setting  |
|   |                  | C 140 ~ 350 bar, w/0.3 bar check, 210 bar initially setting |
|   |                  | D 70 ~ 175 bar, w/0.3 bar check, 140 bar initially setting  |
| 7 | Material of Seal | N buna-N                                                    |
|   |                  | V viton                                                     |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CB2D  | T11A   | 40                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.17           |
| CB3D  | T2A    | 80                  | 350                    | 60/70                       |                              | 0.30           |
| CB6D  | T17A   | 160                 | 350                    | 200/215                     |                              | 0.64           |

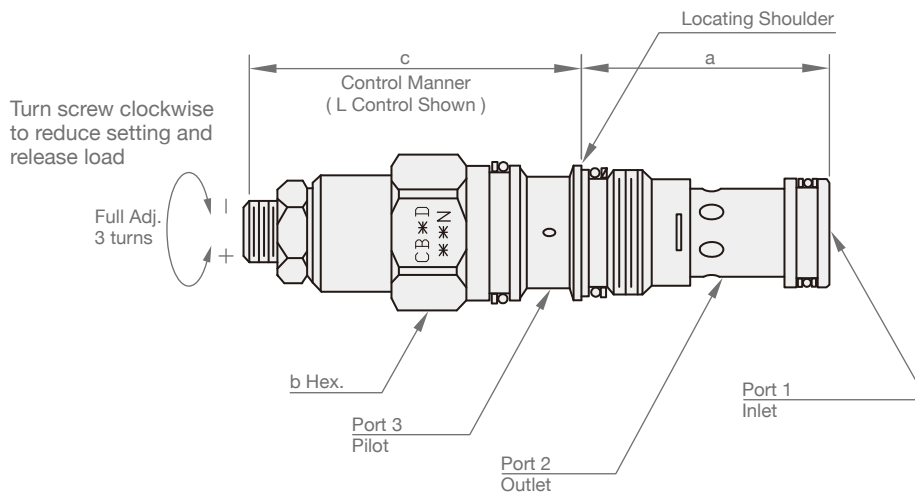
## PERFORMANCE CURVES

### ► Free Flow & Piloted Open Pressure Drop



## DIMENSION

( UNIT : mm )

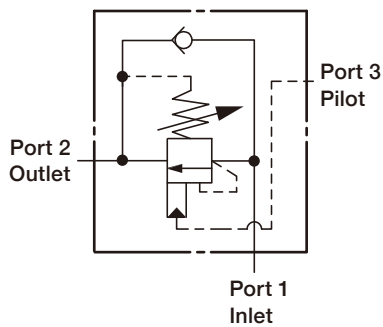


| Model | a    | b    | c  |
|-------|------|------|----|
|       |      |      | L  |
| CB2D  | 34.9 | 22.2 | 50 |
| CB3D  | 34.9 | 28.6 | 61 |
| CB6D  | 46.0 | 31.8 | 70 |

# CBE



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>CB</b> | <b>2</b> | <b>E</b> | - | <b>T11A</b> | - | <b>L</b> | <b>I</b> | <b>N</b> |
| 1         | 2        | 3        |   | 4           |   | 5        | 6        | 7        |

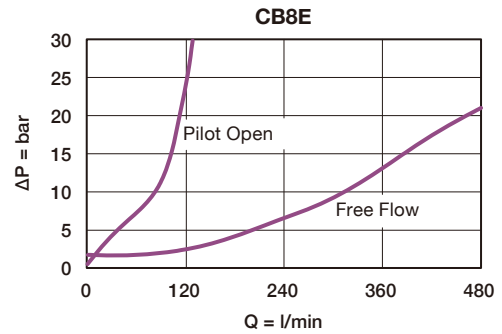
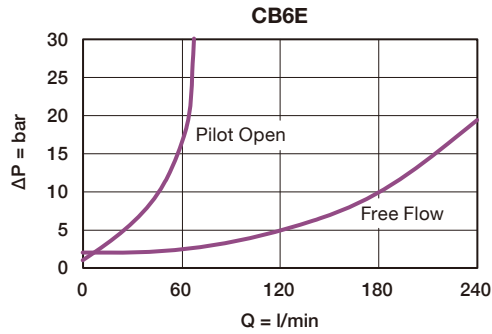
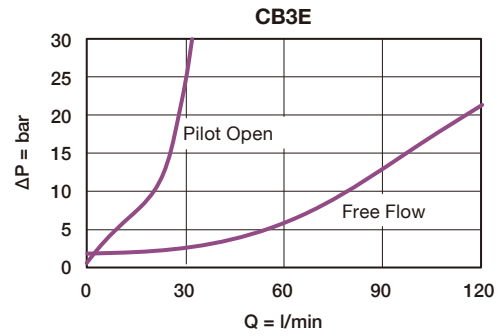
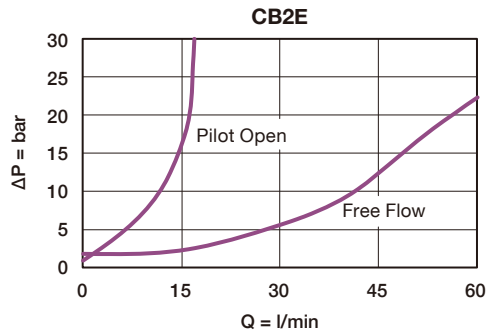
|   |                  |                                                            |
|---|------------------|------------------------------------------------------------|
| 1 | Model Name       | CB                                                         |
| 2 | Valve Size       | 2, 3, 6, 8                                                 |
| 3 | Pilot Ratio      | E 3:1                                                      |
| 4 | Cavity           | T11A, T2A, T17A, T19A                                      |
| 5 | Control Manner   | L standard screw adjustment                                |
| 6 | Adjustable Range | H 70 ~ 280 bar, w/1.7 bar check, 210 bar initially setting |
|   |                  | I 25 ~ 105 bar, w/1.7 bar check, 70 bar initially setting  |
|   |                  | A 70 ~ 280 bar, w/0.3 bar check, 210 bar initially setting |
|   |                  | B 25 ~ 105 bar, w/0.3 bar check, 70 bar initially setting  |
| 7 | Material of Seal | N buna-N                                                   |
|   |                  | V viton                                                    |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CB2E  | T11A   | 15                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.17           |
| CB3E  | T2A    | 30                  | 350                    | 60/70                       |                              | 0.30           |
| CB6E  | T17A   | 60                  | 350                    | 200/215                     |                              | 0.64           |
| CB8E  | T19A   | 80                  | 350                    | 465/500                     |                              | 1.47           |

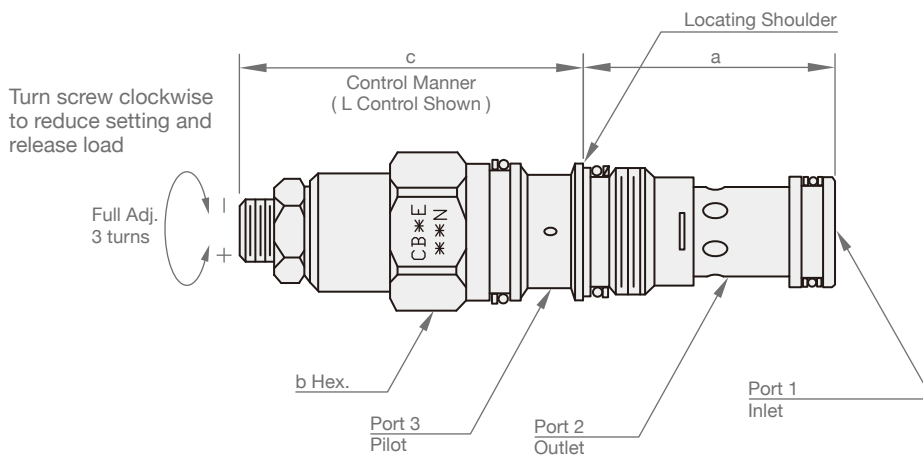
## PERFORMANCE CURVES

### ► Free Flow & Piloted Open Pressure Drop



## DIMENSION

( UNIT : mm )

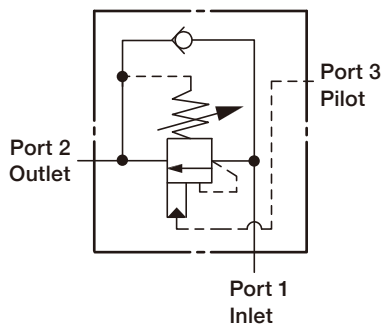


| Model | a    | b    | c  |
|-------|------|------|----|
|       |      |      | L  |
| CB2E  | 34.9 | 22.2 | 50 |
| CB3E  | 34.9 | 28.6 | 61 |
| CB6E  | 46.0 | 31.8 | 70 |
| CB8E  | 63.5 | 41.3 | 90 |

# CBF



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>CB</b> | <b>2</b> | <b>F</b> | - | <b>T11A</b> | - | <b>L</b> | <b>K</b> | <b>N</b> |
| 1         | 2        | 3        |   | 4           |   | 5        | 6        | 7        |

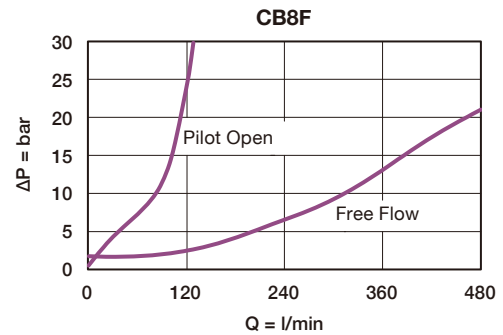
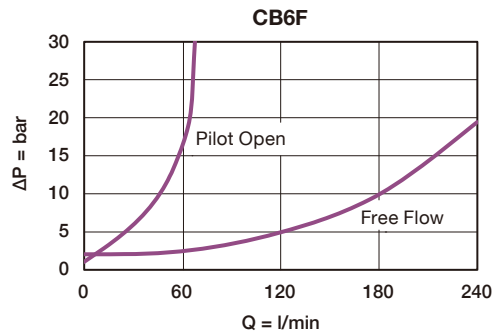
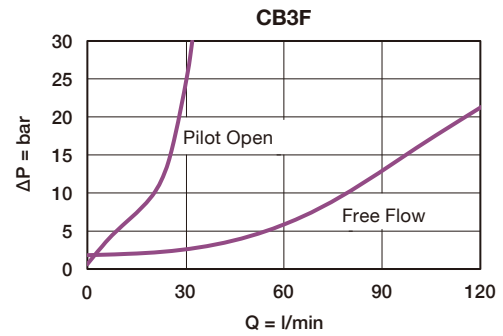
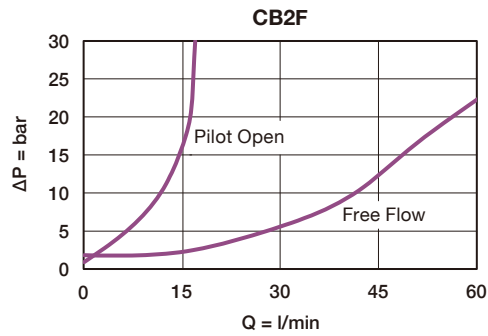
|   |                  |                                                             |
|---|------------------|-------------------------------------------------------------|
| 1 | Model Name       | CB                                                          |
| 2 | Valve Size       | 2, 3, 6, 8                                                  |
| 3 | Pilot Ratio      | F 4.5:1                                                     |
| 4 | Cavity           | T11A, T2A, T17A, T19A                                       |
| 5 | Control Manner   | L standard screw adjustment                                 |
| 6 | Adjustable Range | J 140 ~ 350 bar, w/1.7 bar check, 210 bar initially setting |
|   |                  | K 70 ~ 175 bar, w/1.7 bar check, 140 bar initially setting  |
|   |                  | C 140 ~ 350 bar, w/0.3 bar check, 210 bar initially setting |
|   |                  | D 70 ~ 175 bar, w/0.3 bar check, 140 bar initially setting  |
| 7 | Material of Seal | N buna-N                                                    |
|   |                  | V viton                                                     |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CB2F  | T11A   | 15                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.17           |
| CB3F  | T2A    | 30                  | 350                    | 60/70                       |                              | 0.30           |
| CB6F  | T17A   | 60                  | 350                    | 200/215                     |                              | 0.64           |
| CB8F  | T19A   | 80                  | 350                    | 465/500                     |                              | 1.47           |

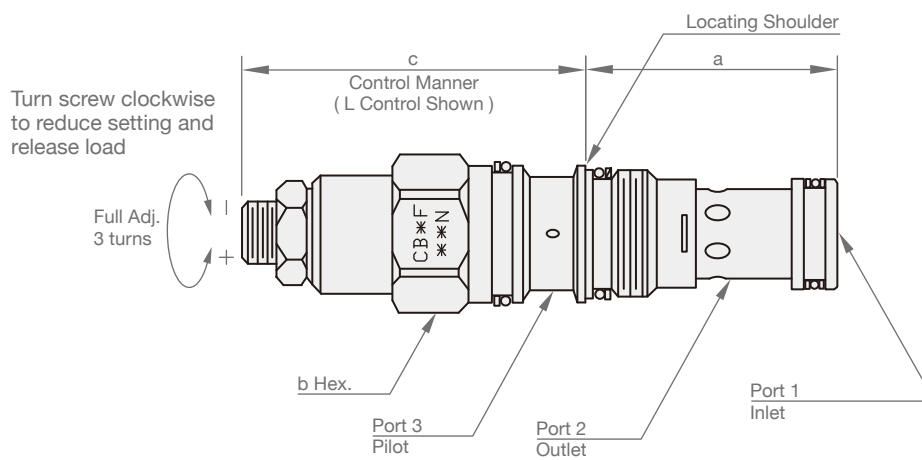
## PERFORMANCE CURVES

### ► Free Flow & Piloted Open Pressure Drop



## DIMENSION

( UNIT : mm )

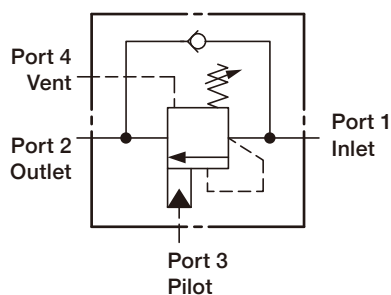


| Model | a    | b    | c  |
|-------|------|------|----|
|       |      |      | L  |
| CB2F  | 34.9 | 22.2 | 50 |
| CB3F  | 34.9 | 28.6 | 61 |
| CB6F  | 46.0 | 31.8 | 70 |
| CB8F  | 63.5 | 41.3 | 90 |

# CWA



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>CW</b> | <b>2</b> | <b>A</b> | - | <b>T21A</b> | - | <b>L</b> | <b>I</b> | <b>N</b> |
| 1         | 2        | 3        |   | 4           |   | 5        | 6        | 7        |

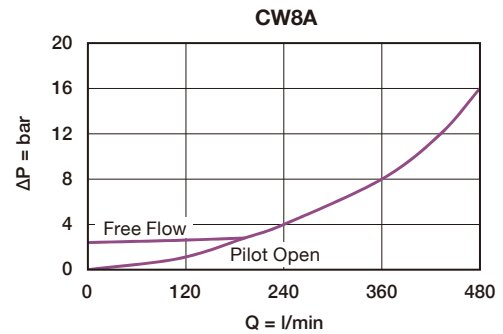
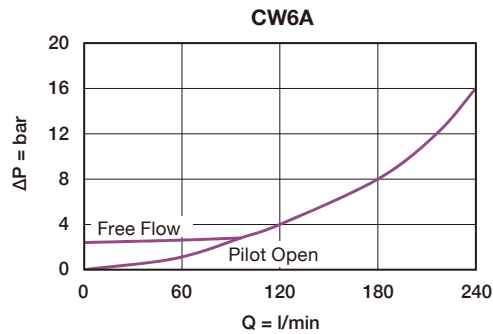
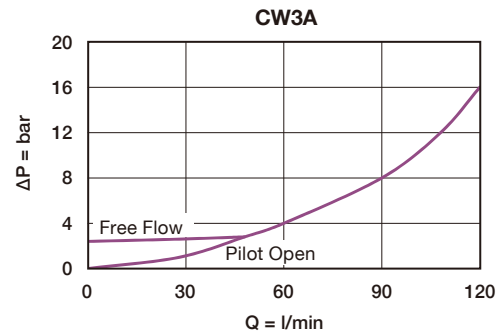
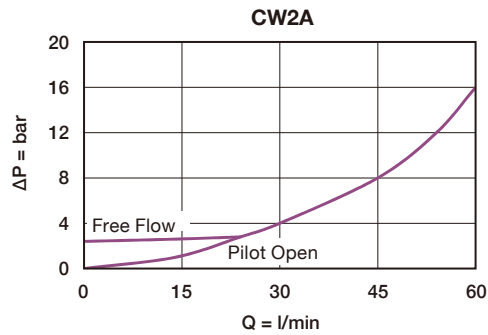
|   |                  |                                              |
|---|------------------|----------------------------------------------|
| 1 | Model Name       | CW                                           |
| 2 | Valve Size       | 2, 3, 6, 8                                   |
| 3 | Pilot Ratio      | A 3:1                                        |
| 4 | Cavity           | T21A, T22A, T23A, T24A                       |
| 5 | Control Manner   | L standard screw adjustment                  |
| 6 | Adjustable Range | H 70 ~ 280 bar,<br>210 bar initially setting |
|   |                  | I 25 ~ 105 bar,<br>70 bar initially setting  |
| 7 | Material of Seal | N buna-N                                     |
|   |                  | V viton                                      |

## MODEL SPEC.

| Model | Cavity | Capacity<br>( l/min ) | Max. Pressure<br>( bar ) | Installation Torque<br>( Nm ) | Operating Temperature          | Weight<br>( kg ) |
|-------|--------|-----------------------|--------------------------|-------------------------------|--------------------------------|------------------|
| CW2A  | T21A   | 60                    | 350                      | 45/50                         | -35 ~ 100°C<br>( -31 ~ 212°F ) | 0.19             |
| CW3A  | T22A   | 120                   | 350                      | 60/70                         |                                | 0.36             |
| CW6A  | T23A   | 240                   | 350                      | 200/215                       |                                | 0.72             |
| CW8A  | T24A   | 480                   | 350                      | 465/500                       |                                | 1.60             |

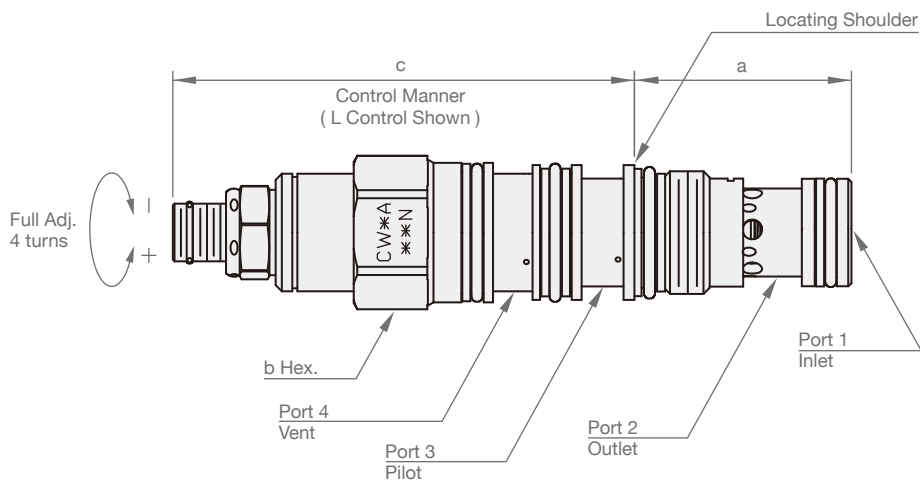
## PERFORMANCE CURVES

### ► Free Flow & Piloted Open Pressure Drop



## DIMENSION

( UNIT : mm )

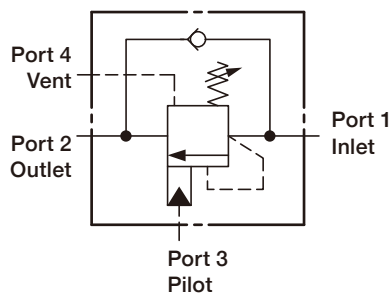


| Model | a    | b    | c     |
|-------|------|------|-------|
|       |      |      | L     |
| CW2A  | 34.9 | 22.2 | 74.0  |
| CW3A  | 34.9 | 28.6 | 84.0  |
| CW6A  | 46.0 | 31.8 | 95.3  |
| CW8A  | 63.5 | 41.3 | 117.0 |

# CWG



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>CW</b> | <b>2</b> | <b>G</b> | - | <b>T21A</b> | - | <b>L</b> | <b>F</b> | <b>N</b> |
| 1         | 2        | 3        |   | 4           |   | 5        | 6        | 7        |

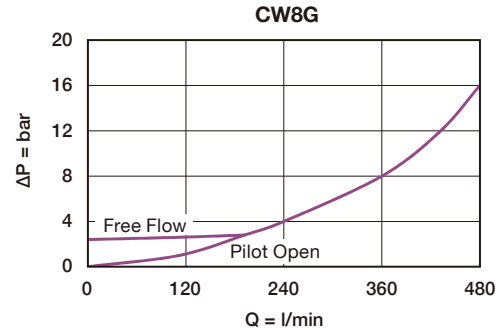
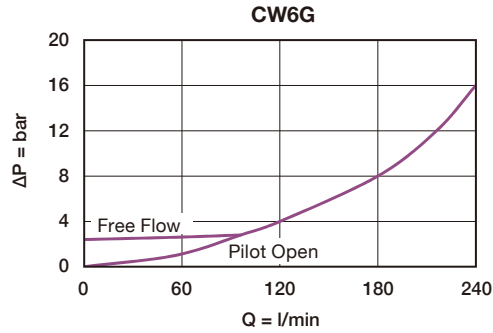
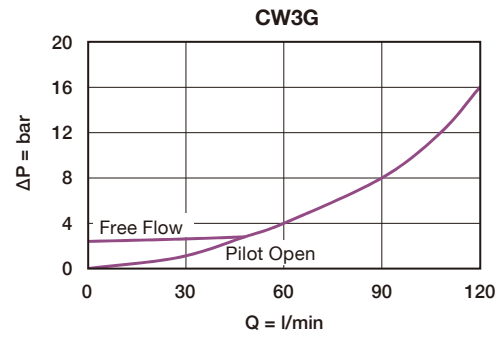
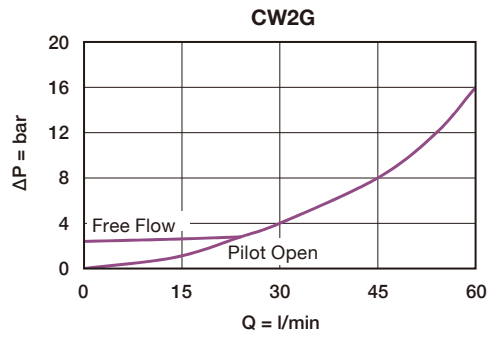
|   |                  |                                               |
|---|------------------|-----------------------------------------------|
| 1 | Model Name       | CW                                            |
| 2 | Valve Size       | 2, 3, 6, 8                                    |
| 3 | Pilot Ratio      | G 5:1                                         |
| 4 | Cavity           | T21A, T22A, T23A, T24A                        |
| 5 | Control Manner   | L standard screw adjustment                   |
| 6 | Adjustable Range | G 140 ~ 420 bar,<br>280 bar initially setting |
|   |                  | F 70 ~ 175 bar,<br>140 bar initially setting  |
| 7 | Material of Seal | N buna-N                                      |
|   |                  | V viton                                       |

## MODEL SPEC.

| Model | Cavity | Capacity<br>( l/min ) | Max. Pressure<br>( bar ) | Installation Torque<br>( Nm ) | Operating Temperature          | Weight<br>( kg ) |
|-------|--------|-----------------------|--------------------------|-------------------------------|--------------------------------|------------------|
| CW2G  | T21A   | 60                    | 350                      | 45/50                         | -35 ~ 100°C<br>( -31 ~ 212°F ) | 0.19             |
| CW3G  | T22A   | 120                   | 350                      | 60/70                         |                                | 0.36             |
| CW6G  | T23A   | 240                   | 350                      | 200/215                       |                                | 0.72             |
| CW8G  | T24A   | 480                   | 350                      | 465/500                       |                                | 1.60             |

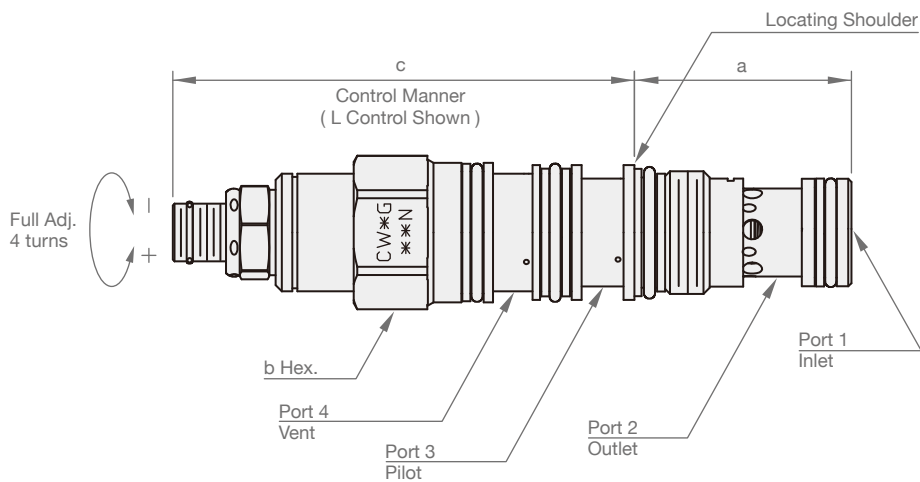
## PERFORMANCE CURVES

### ► Free Flow & Piloted Open Pressure Drop



## DIMENSION

( UNIT : mm )



| Model | a    | b    | c     |
|-------|------|------|-------|
|       |      |      | L     |
| CW2G  | 34.9 | 22.2 | 74.0  |
| CW3G  | 34.9 | 28.6 | 84.0  |
| CW6G  | 46.0 | 31.8 | 95.3  |
| CW8G  | 63.5 | 41.3 | 117.0 |

# LO



## ORDER CODES

**LO 2 C - T11A - X D N**

1 2 3 4 5 6 7

|   |                |                                               |
|---|----------------|-----------------------------------------------|
| 1 | Model Name     | LO                                            |
| 2 | Valve Size     | 2, 3, 6, 8                                    |
| 3 | Operation      | A, B, C, D, O                                 |
| 4 | Cavity         | T11A, T2A, T17A, T19A                         |
| 5 | Control Manner | X unadjustable<br>L standard screw adjustment |

|   |                         |   |                                                     |
|---|-------------------------|---|-----------------------------------------------------|
| 6 | Cracking Pressure (bar) | D | Type A, B, C, D, Port 1 : 3.5<br>Type O, Port 3 : 2 |
| 7 | Material of Seal        | N | buna-N                                              |
|   |                         | V | viton                                               |

## SYMBOLS

| LO*A                                              | LO*B                                              | LO*C                                              | LO*D                                                           | LO*O                                            |
|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|----------------------------------------------------------------|-------------------------------------------------|
| <b>Vent-to-Open</b><br>                           | <b>Vent-to-Open</b><br>                           | <b>Pilot-to-Close</b><br>                         | <b>Vent-to-Open</b><br>                                        | <b>Pilot-to-Close</b><br>                       |
|                                                   |                                                   |                                                   |                                                                |                                                 |
| Spring biased closed,<br>pilot source from port 1 | Spring biased closed,<br>pilot source from port 2 | Spring biased closed,<br>pilot source from port 3 | Spring biased closed,<br>higher of port 1 or 2<br>pilot source | Spring biased open,<br>pilot source from port 3 |

## MODEL SPEC.

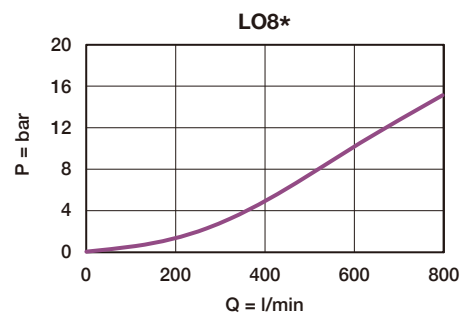
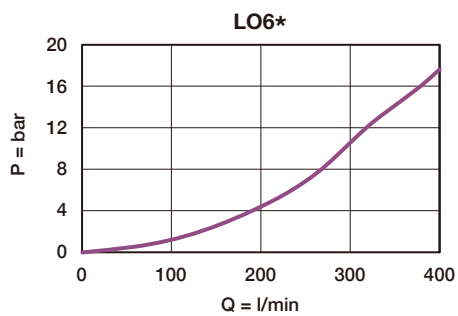
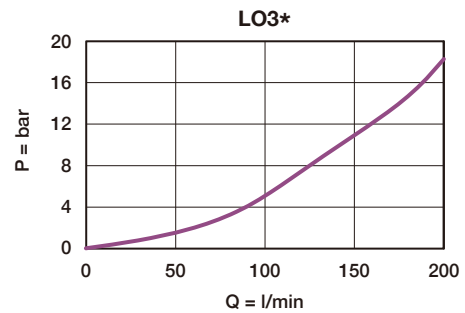
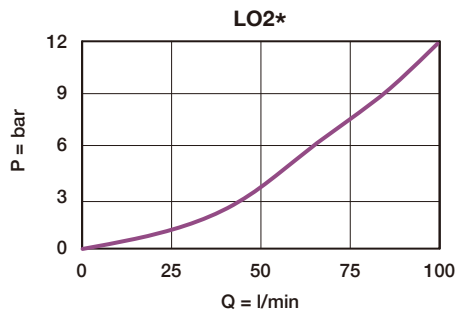
| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Control Orifice Diameter<br>(mm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|----------------------------------|------------------------------|----------------|
| LO2*  | T11A   | 80                  | 350                    | 40/50                       | Ø0.5                             | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.12           |
| LO3*  | T2A    | 160                 | 350                    | 60/70                       | Ø0.5                             |                              | 0.22           |
| LO6*  | T17A   | 320                 | 350                    | 200/215                     | Ø0.8                             |                              | 0.50           |
| LO8*  | T19A   | 640                 | 350                    | 465/500                     | Ø0.9                             |                              | 1.15           |

Area ratio, A3 to A1 : 1.8:1 ( with sealed piston )

Area ratio, A3 to A2 : 2.25:1 ( with sealed piston )

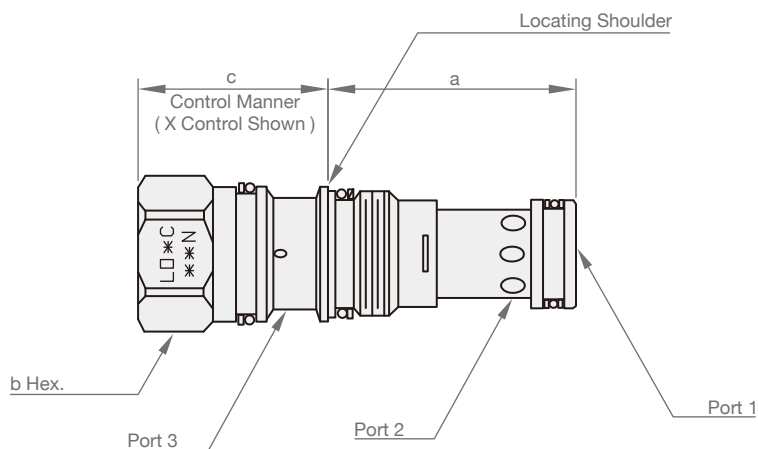
## PERFORMANCE CURVES

### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

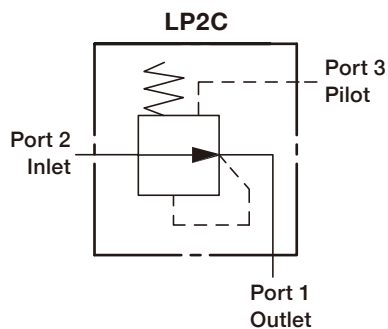
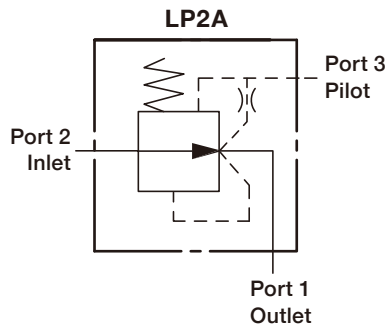


| Model | a    | b    | c  |     |
|-------|------|------|----|-----|
|       |      |      | X  | L   |
| LO2*  | 34.9 | 22.2 | 31 | 64  |
| LO3*  | 34.9 | 28.6 | 35 | 72  |
| LO6*  | 46.0 | 31.8 | 46 | 84  |
| LO8*  | 63.5 | 41.3 | 59 | 100 |

# LP



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>LP</b> | <b>2</b> | <b>C</b> | - | <b>T11A</b> | - | <b>X</b> | <b>D</b> | <b>N</b> |
| 1         | 2        | 3        |   | 4           |   | 5        | 6        | 7        |

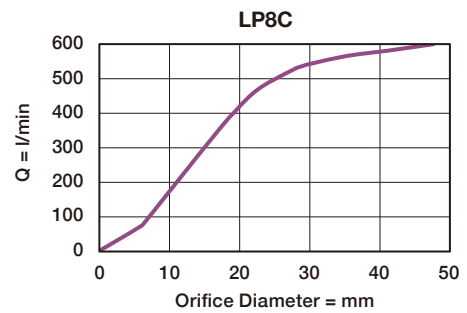
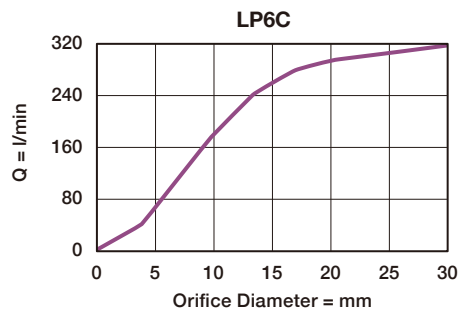
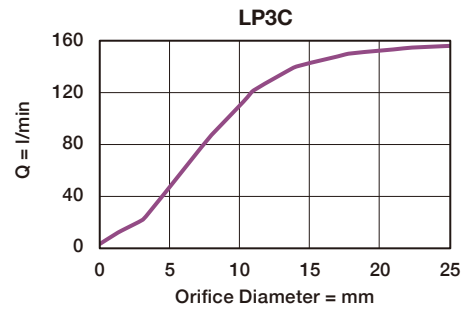
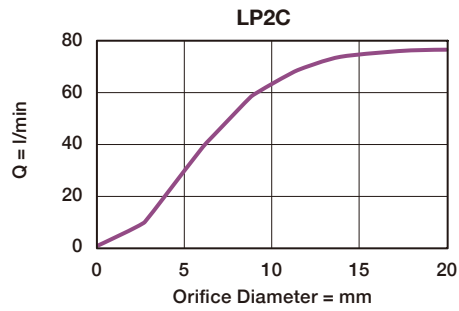
|   |                   |                             |
|---|-------------------|-----------------------------|
| 1 | Model Name        | LP                          |
| 2 | Valve Size        | 2, 3, 6, 8                  |
| 3 | Type              | A internal pilot            |
|   |                   | C external pilot            |
| 4 | Cavity            | T11A, T2A, T17A, T19A       |
| 5 | Control Manner    | X unadjustable              |
|   |                   | L standard screw adjustment |
| 6 | Cracking Pressure | D 3.5 bar                   |
|   |                   | F 7.0 bar                   |
|   |                   | G 10.0 bar                  |
|   |                   | H 14.0 bar                  |
| 7 | Material of Seal  | N buna-N                    |
|   |                   | V viton                     |

## MODEL SPEC.

| Model      | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|------------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| LP2A, LP2C | T11A   | 60                  | 350                    | 45/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.15           |
| LP3A, LP3C | T2A    | 120                 | 350                    | 60/70                       |                              | 0.25           |
| LP6A, LP6C | T17A   | 240                 | 350                    | 200/215                     |                              | 0.55           |
| LP8A, LP8C | T19A   | 480                 | 350                    | 465/500                     |                              | 1.17           |

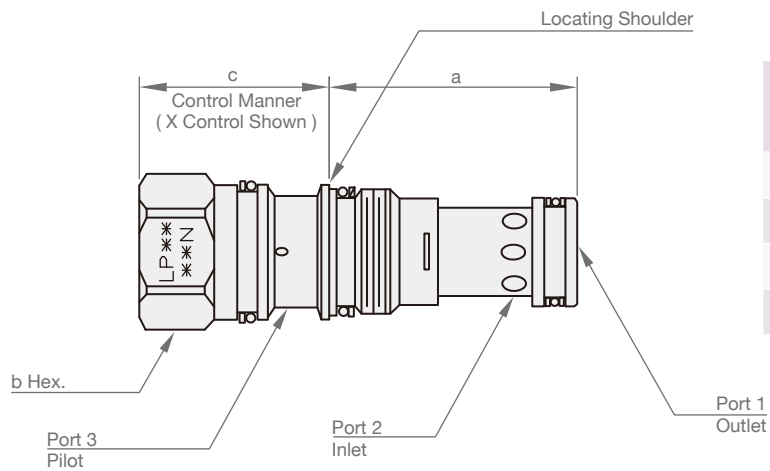
## PERFORMANCE CURVES

### ► Capacity as a Restrictive Compensator



## DIMENSION

( UNIT : mm )

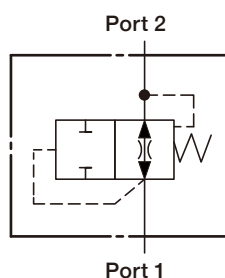


| Model | a    | b    | c  |     |
|-------|------|------|----|-----|
|       |      |      | X  | L   |
| LP2*  | 34.9 | 22.2 | 31 | 64  |
| LP3*  | 34.9 | 28.6 | 35 | 72  |
| LP6*  | 46.0 | 31.8 | 46 | 84  |
| LP8*  | 63.5 | 41.3 | 59 | 100 |

# FQ



## SYMBOLS



## ORDER CODES

|           |           |   |             |   |          |          |          |
|-----------|-----------|---|-------------|---|----------|----------|----------|
| <b>FQ</b> | <b>2A</b> | - | <b>T13A</b> | - | <b>X</b> | <b>A</b> | <b>N</b> |
| 1         | 2         |   | 3           |   | 4        | 5        | 6        |

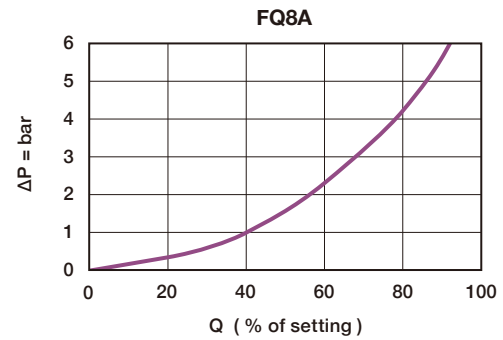
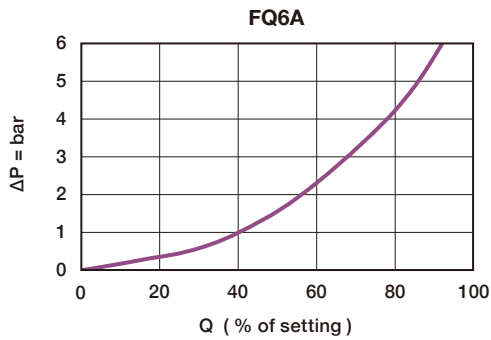
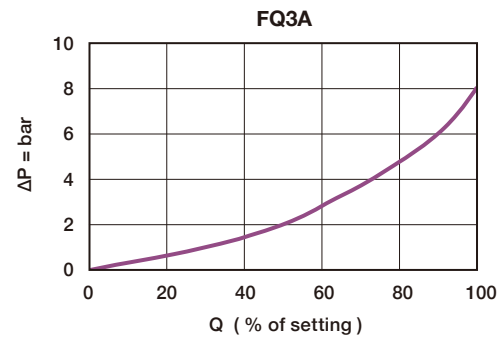
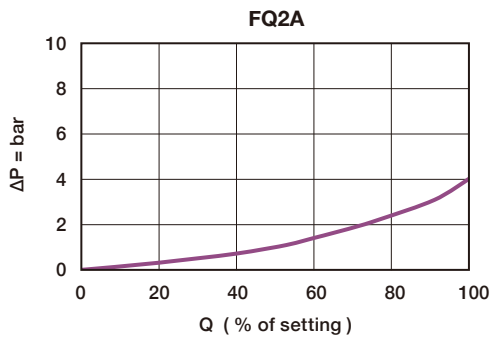
|   |                  |                       |
|---|------------------|-----------------------|
| 1 | Model Name       | FQ                    |
| 2 | Valve Size       | 2A, 3A, 6A, 8A        |
| 3 | Cavity           | T13A, T5A, T16A, T18A |
| 4 | Control Manner   | X unadjustable        |
| 5 | Orifice Type     | A replaceable         |
|   |                  | B permanent           |
| 6 | Material of Seal | N buna-N              |
|   |                  | V viton               |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| FQ2A  | T13A   | 23                  | 350                    | 45/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.10           |
| FQ3A  | T5A    | 60                  | 350                    | 60/70                       |                              | 0.19           |
| FQ6A  | T16A   | 95                  | 350                    | 200/215                     |                              | 0.46           |
| FQ8A  | T18A   | 200                 | 350                    | 465/500                     |                              | 0.92           |

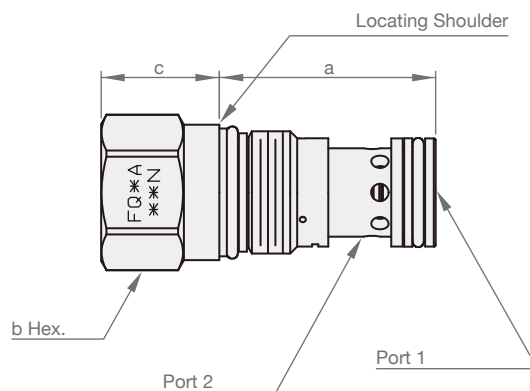
## PERFORMANCE CURVES

### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

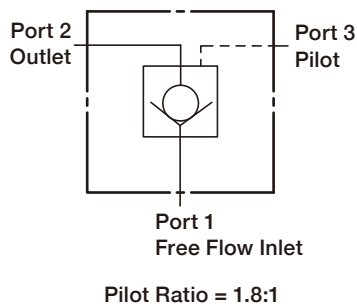


| Model | a    | b    | c    |
|-------|------|------|------|
|       |      |      | X    |
| FQ2A  | 35.1 | 22.2 | 19.1 |
| FQ3A  | 41.1 | 28.6 | 17.5 |
| FQ6A  | 62.0 | 31.8 | 24.6 |
| FQ8A  | 79.5 | 41.3 | 30.2 |

# COA



## SYMBOLS



## ORDER CODES

|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>CO</b> | <b>2</b> | <b>A</b> | - | <b>T11A</b> | - | <b>X</b> | <b>C</b> | <b>N</b> |
| 1         | 2        | 3        |   | 4           |   | 5        | 6        | 7        |

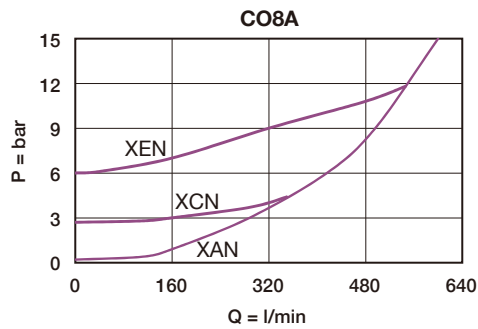
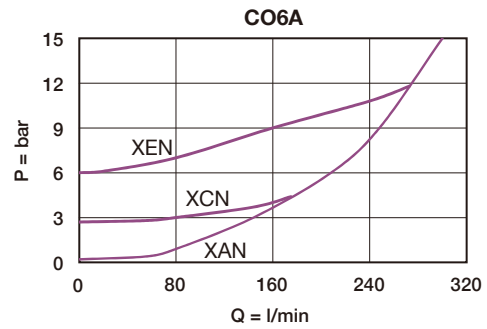
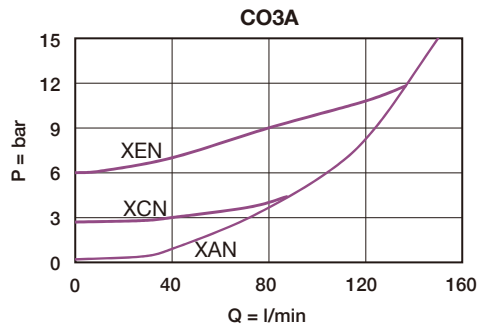
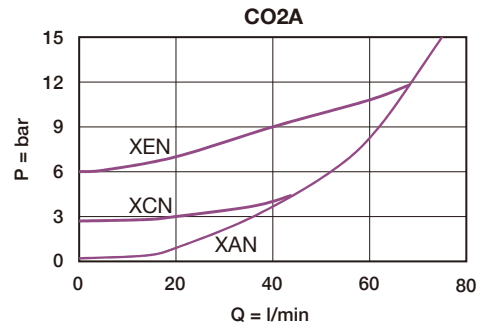
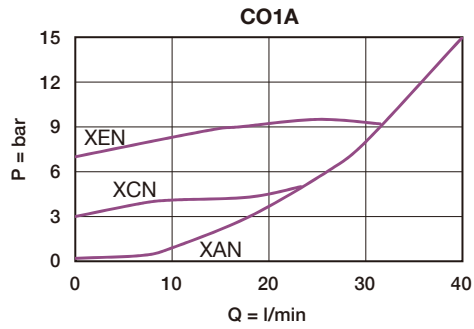
|   |                   |                              |                |
|---|-------------------|------------------------------|----------------|
| 1 | Model Name        | CO                           |                |
| 2 | Valve Size        | 1, 2, 3, 6, 8                |                |
| 3 | Pilot Ratio       | A                            | 1.8:1          |
| 4 | Cavity            | T163A, T11A, T2A, T17A, T19A |                |
| 5 | Control Manner    | X                            | standard pilot |
| 6 | Cracking Pressure | A                            | 0.3 bar        |
|   |                   | C                            | 2.0 bar        |
|   |                   | E                            | 5.0 bar        |
| 7 | Material of Seal  | N                            | buna-N         |
|   |                   | V                            | viton          |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CO1A  | T163A  | 40                  | 350                    | 30/40                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.10           |
| CO2A  | T11A   | 80                  | 350                    | 40/50                       |                              | 0.13           |
| CO3A  | T2A    | 160                 | 350                    | 60/70                       |                              | 0.24           |
| CO6A  | T17A   | 320                 | 350                    | 200/215                     |                              | 0.53           |
| CO8A  | T19A   | 640                 | 350                    | 465/500                     |                              | 1.19           |

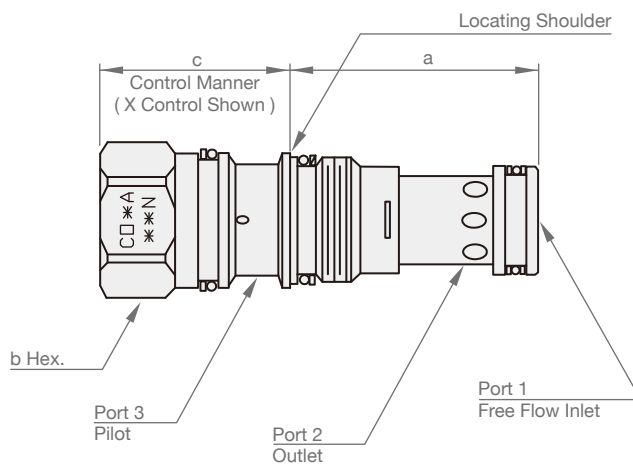
## PERFORMANCE CURVES

### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

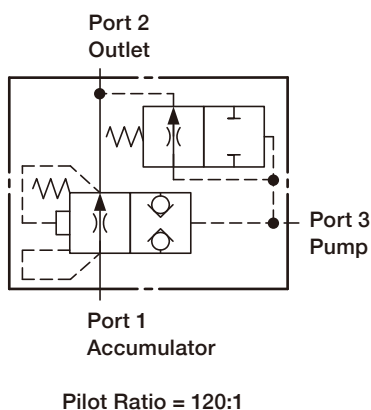


| Model | a    | b    | c  |
|-------|------|------|----|
|       |      |      | X  |
| CO1A  | 31.0 | 19.1 | 32 |
| CO2A  | 34.9 | 22.2 | 31 |
| CO3A  | 34.9 | 28.6 | 35 |
| CO6A  | 46.0 | 31.8 | 46 |
| CO8A  | 63.5 | 41.3 | 59 |

# COO



## SYMBOLS



## ORDER CODES

|    |   |   |   |     |   |   |   |   |
|----|---|---|---|-----|---|---|---|---|
| CO | 3 | O | - | T2A | - | X | D | N |
| 1  | 2 | 3 |   | 4   |   | 5 | 6 | 7 |

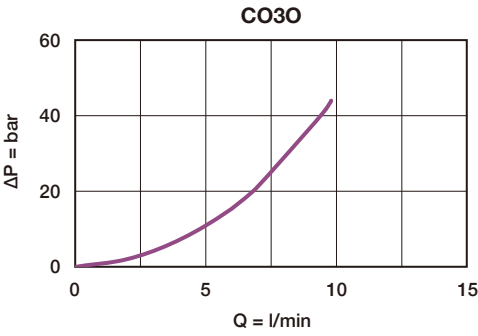
|   |                     |                  |
|---|---------------------|------------------|
| 1 | Model Name          | CO               |
| 2 | Valve Size          | 3                |
| 3 | Pilot Ratio         | O 120:1          |
| 4 | Cavity              | T2A              |
| 5 | Control Manner      | X standard pilot |
| 6 | Min. Pilot Pressure | D 4 bar          |
| 7 | Material of Seal    | N buna-N         |
|   |                     | V viton          |

## MODEL SPEC.

| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CO3O  | T2A    | 4                   | 350                    | 60/70                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.22           |

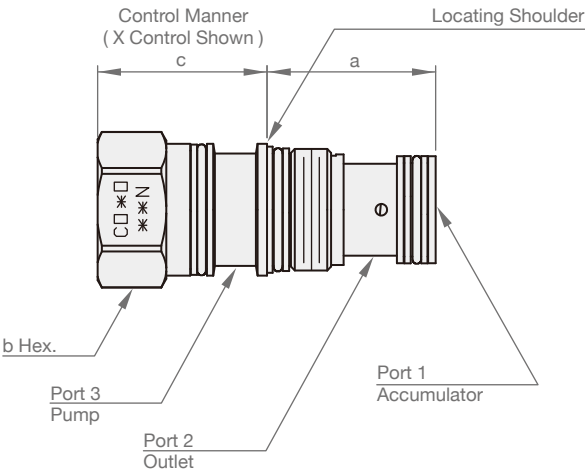
PERFORMANCE CURVES

► Pressure Differential v.s. Flow



DIMENSION

( UNIT : mm )

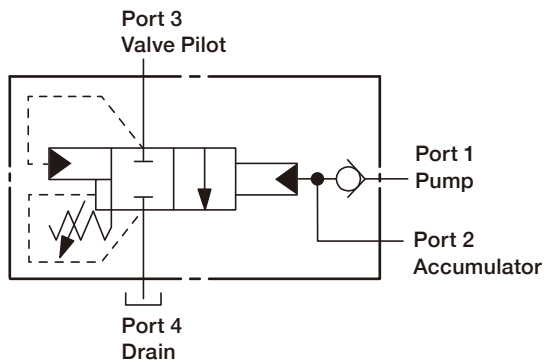


| Model | a    | b    | c    |
|-------|------|------|------|
|       |      |      | X    |
| CO30  | 35.1 | 28.6 | 35.1 |

# QC



## SYMBOLS



## ORDER CODES

**QC 2 C - T21A - L A N**

1 2 3 4 5 6 7

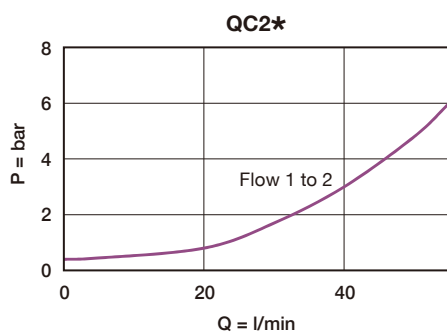
|   |                                                 |      |                           |
|---|-------------------------------------------------|------|---------------------------|
| 1 | Model Name                                      | QC   |                           |
| 2 | Capacity                                        | 2    | 60                        |
| 3 | Pressure Differential Ratio btw. Unload & Reset | A    | 10%                       |
|   |                                                 | B    | 15%                       |
|   |                                                 | C    | 30%                       |
| 4 | Cavity                                          | T21A |                           |
| 5 | Control Manner                                  | L    | standard screw adjustment |
|   |                                                 | K    | hand knob with lock knob  |
| 6 | Adjustable Range                                | A    | 7 ~ 210 bar               |
|   |                                                 | B    | 3.5 ~ 105 bar             |
|   |                                                 | C    | 140 ~ 350 bar             |
|   |                                                 | D    | 18 ~ 55 bar               |
| 7 | Material of Seal                                | N    | buna-N                    |
|   |                                                 | V    | viton                     |

## MODEL SPEC.

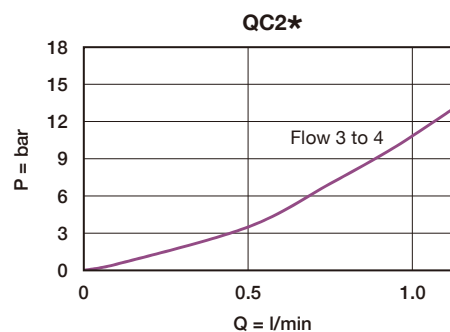
| Model | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|-------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| QC2*  | T21A   | 60                  | 350                    | 60/70                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.22           |

## PERFORMANCE CURVES

### ► Pressure Differential vs. Flow

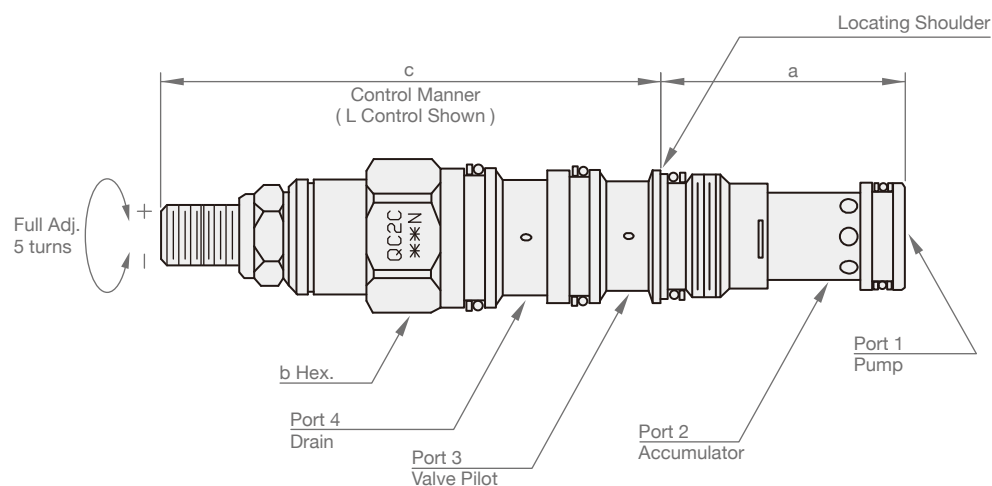


### ► Pressure Differential vs. Flow (Full Piloted Open)



## DIMENSION

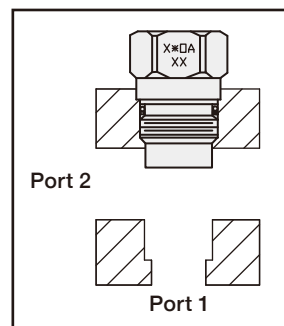
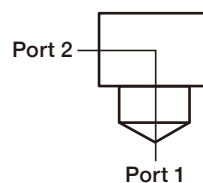
( UNIT : mm )



| Model | a    | b    | c    |      |
|-------|------|------|------|------|
|       |      |      | L    | K    |
| QC2C  | 34.9 | 22.2 | 78.5 | 84.8 |

# OA2

## SYMBOLS

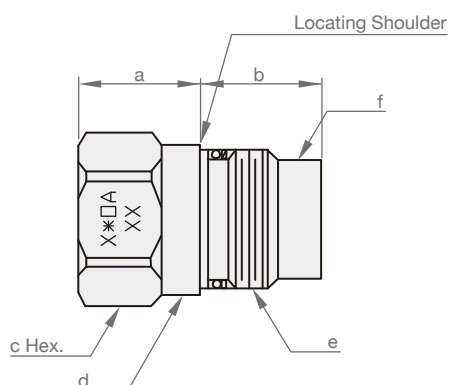


## MODEL SPEC.

| Model          | Cavity | Thread      | Material of Seal | Weight (kg) |
|----------------|--------|-------------|------------------|-------------|
| X10A2-T162A-XX | T162A  | M16 P1.5    | buna-N           | 0.05        |
| X20A2-T10A-XX  | T10A   | M20 P1.5    |                  | 0.09        |
| X20A2-T13A-XX  | T13A   | M20 P1.5    |                  | 0.09        |
| X30A2-T3A-XX   | T3A    | 1"-14UNS-2B |                  | 0.13        |
| X30A2-T5A-XX   | T5A    | 1"-14UNS-2B |                  | 0.13        |
| X60A2-T16A-XX  | T16A   | M36 P2      |                  | 0.28        |
| X80A2-T18A-XX  | T18A   | M48 P2      |                  | 0.57        |

## DIMENSION

( UNIT : mm )

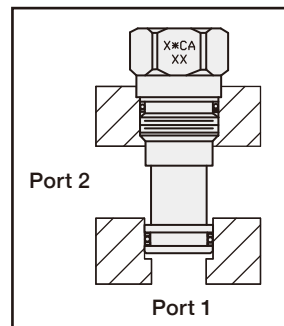
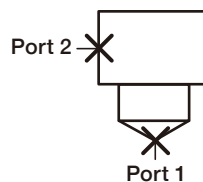


| Model | a    | b    | c    | d     | e           | f     |
|-------|------|------|------|-------|-------------|-------|
| X20A2 | 20.3 | 16.3 | 22.2 | Ø21.7 | M16 P1.5-6H | Ø17.4 |
| X30A2 | 17.8 | 22.2 | 28.6 | Ø27.3 | 1"-14UNS-2B | Ø22.6 |
| X60A2 | 26   | 25   | 31.7 | Ø39.7 | M36 P2.0-6H | Ø33   |
| X80A2 | 30.4 | 26.8 | 41.2 | Ø52.5 | M48 P2.0-6H | Ø43   |

# CA2



## SYMBOLS

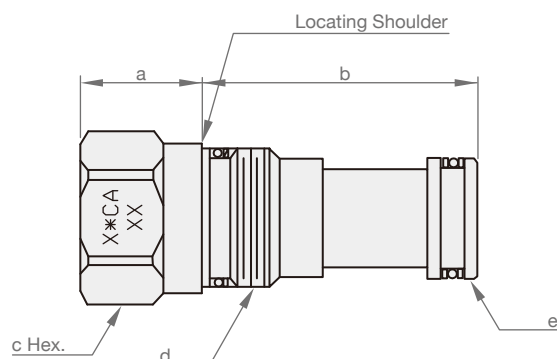


## MODEL SPEC.

| Model          | Cavity | Thread      | Material of Seal | Weight (kg) |
|----------------|--------|-------------|------------------|-------------|
| X1CA2-T162A-XX | T162A  | M16 P1.5    | buna-N           | 0.07        |
| X2CA2-T10A-XX  | T10A   | M20 P1.5    |                  | 0.12        |
| X2CA2-T13A-XX  | T13A   | M20 P1.5    |                  | 0.12        |
| X3CA2-T3A-XX   | T3A    | 1"-14UNS-2B |                  | 0.21        |
| X3CA2-T5A-XX   | T5A    | 1"-14UNS-2B |                  | 0.20        |
| X6CA2-T16A-XX  | T16A   | M36 P2      |                  | 0.49        |
| X8CA2-T18A-XX  | T18A   | M48 P2      |                  | 1.10        |

## DIMENSION

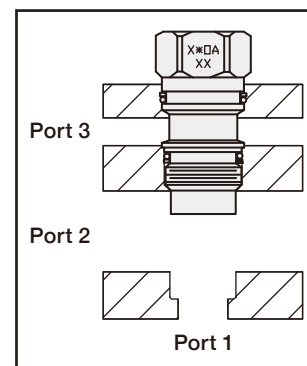
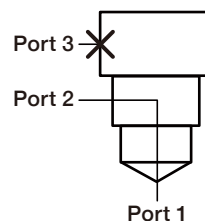
( UNIT : mm )



| Model | a    | b    | c    | d           | e     |
|-------|------|------|------|-------------|-------|
| X2CA2 | 20.2 | 38.2 | 22.2 | M16 P1.5-6H | Ø17.4 |
| X3CA2 | 17.8 | 47.7 | 28.6 | 1"-14UNS-2B | Ø22.2 |
| X6CA2 | 25.7 | 60.8 | 31.7 | M32 P2.0-6H | Ø31.7 |
| X8CA2 | 30   | 79.6 | 41.2 | M48 P2.0-6H | Ø41.2 |

# OA3

## SYMBOLS

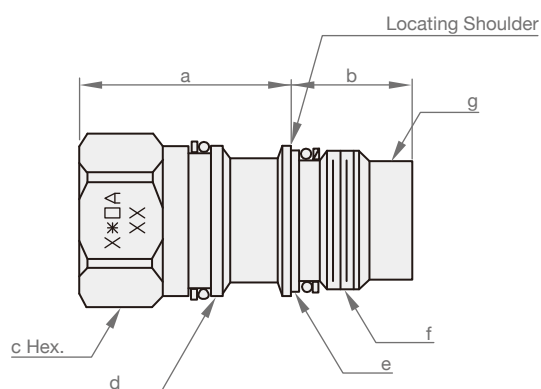


## MODEL SPEC.

| Model          | Cavity | Thread      | Material of Seal | Weight (kg) |
|----------------|--------|-------------|------------------|-------------|
| X10A3-T163A-XX | T163A  | M16 P1.5    | buna-N           | 0.06        |
| X20A3-T11A-XX  | T11A   | M20 P1.5    |                  | 0.09        |
| X30A3-T2A-XX   | T2A    | 1"-14UNS-2B |                  | 0.16        |
| X60A3-T17A-XX  | T17A   | M36 P2      |                  | 0.31        |
| X80A3-T19A-XX  | T19A   | M48 P2      |                  | 0.68        |

## DIMENSION

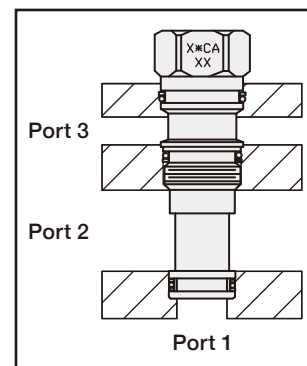
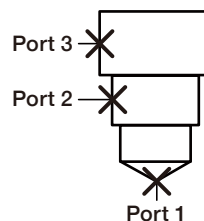
( UNIT : mm )



| Model | a     | b     | c    | d     | e     | f           | g     |
|-------|-------|-------|------|-------|-------|-------------|-------|
| X10A3 | 31.86 | 14.54 | 19.1 | Ø17.8 | Ø16.6 | M16 P1.5-6H | Ø13.9 |
| X20A3 | 30    | 17.8  | 22.2 | Ø21.7 | Ø20.5 | M16 P1.5-6H | Ø17.4 |
| X30A3 | 35.2  | 15.2  | 28.6 | Ø27.3 | Ø26   | 1"-14UNS-2B | Ø22.8 |
| X60A3 | 46.2  | 18.3  | 31.6 | Ø39.6 | Ø36.4 | M36 P2.0-6H | Ø32.5 |
| X80A3 | 59    | 23.5  | 41   | Ø52.4 | Ø48.2 | M36 P2.0-6H | Ø43   |

# CA3

## SYMBOLS

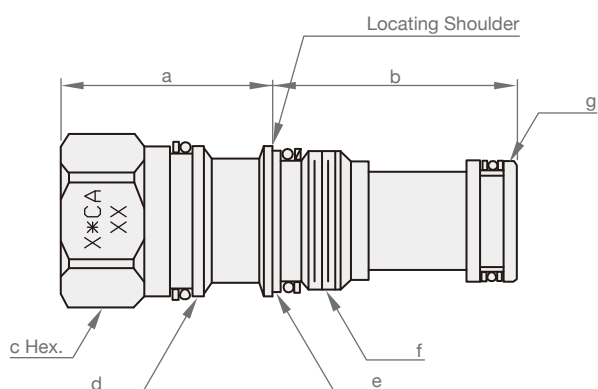


## MODEL SPEC.

| Model          | Cavity | Thread      | Material of Seal | Weight (kg) |
|----------------|--------|-------------|------------------|-------------|
| X1CA3-T163A-XX | T163A  | M16 P1.5    | buna-N           | 0.08        |
| X2CA3-T11A-XX  | T11A   | M20 P1.5    |                  | 0.12        |
| X3CA3-T2A-XX   | T2A    | 1"-14UNS-2B |                  | 0.22        |
| X6CA3-T17A-XX  | T17A   | M36 P2      |                  | 0.52        |
| X8CA3-T19A-XX  | T19A   | M48 P2      |                  | 1.20        |

## DIMENSION

( UNIT : mm )



| Model | a    | b    | c    | d     | e     | f           | g     |
|-------|------|------|------|-------|-------|-------------|-------|
| X1CA3 | 32   | 31   | 19.1 | Ø17.8 | Ø16.6 | M16 P1.5-6H | Ø13.9 |
| X2CA3 | 30.5 | 34.8 | 22.2 | Ø21.8 | Ø20.5 | M16 P1.5-6H | Ø17.3 |
| X3CA3 | 35   | 35   | 28.6 | Ø27.3 | Ø26   | 1"-14UNS-2B | Ø22.1 |
| X6CA3 | 46.4 | 46   | 31.6 | Ø39.6 | Ø36.4 | M36 P2.0-6H | Ø31.6 |
| X8CA3 | 46.4 | 46   | 31.6 | Ø39.6 | Ø36.4 | M36 P2.0-6H | Ø31.6 |

# SY-DPCA-C-1



## FEATURES

1. Precise Control  
Digital microprocessor
2. Simple Setup  
Digital display and buttons
3. Full Function  
Adjustable input signal and output current
4. Safety  
Short, open circuit protection with error code

## ORDER CODES

**SY** - **DPCA** - **C** - **1**

1                      2                      3                      4

|   |              |      |                                 |
|---|--------------|------|---------------------------------|
| 1 | Model Name   | SY   |                                 |
| 2 | Control Mode | DPCA | Digital Proportional Controller |
| 3 | Type         | C    | Case with Din-35 Rail Clamps    |
| 4 | Output       | 1    | single coil                     |

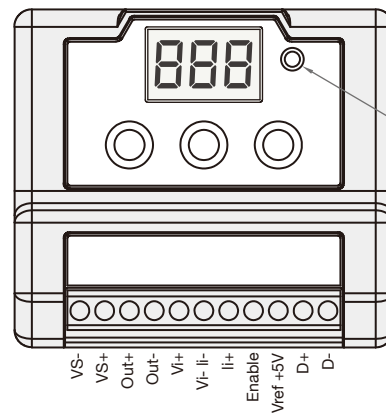
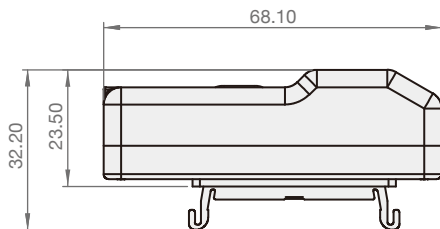
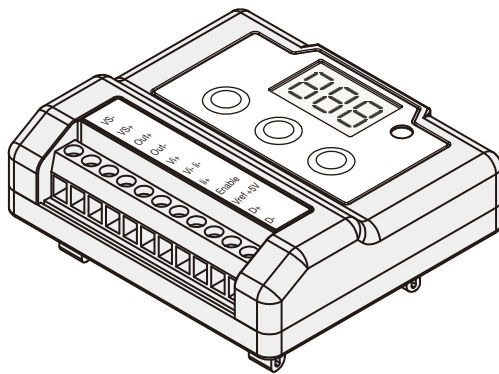
## MODEL SPEC.

| Model                   | SY-DPCA-C-1                |
|-------------------------|----------------------------|
| Operating Voltage       | 9 ~ 32VDC                  |
| Voltage Tolerance       | 5%                         |
| Input Signal Options    | 0~5V, 0~10V, 4~20mA, RS485 |
| Output Current          | 3A max.                    |
| Dither Frequency        | 70 ~ 350Hz                 |
| Ramp Up and Down        | 0.1 ~ 5.0s                 |
| Reference Voltage       | 5V ( max. current 5mA )    |
| Communication Interface | RS485                      |
| Communication Protocol  | Modbus RTU                 |
| Operating Conditions    | -20 ~ 60°C                 |
| Weight                  | 0.1kg                      |

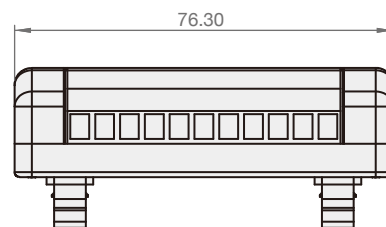
Wiring Instruction

|    |          |                       |
|----|----------|-----------------------|
| 1  | VS-      | Power-                |
| 2  | VS+      | Power+                |
| 3  | Out+     | Coil+                 |
| 4  | Out-     | Coil-                 |
| 5  | Vi+      | Input voltage signal  |
| 6  | Vi- li-  | Signal ground         |
| 7  | li+      | Input current signal  |
| 8  | Enable   | Enable *              |
| 9  | Vref +5V | +5V reference voltage |
| 10 | D+       | RS485+ (optional)     |
| 11 | D-       | RS485- (optional)     |

\* Default off. Ground this pin to enable controller when PEA function is on.



When Enable function is on,  
LED shows Enable OK



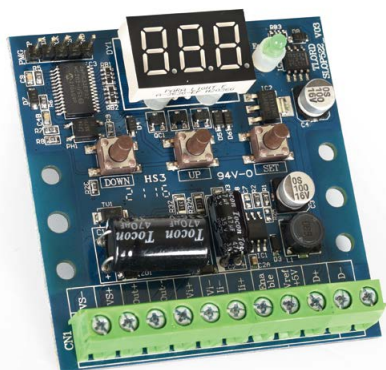
This product has been designed and tested to meet specific standards outlined in the European Electromagnetic Compatibility Directive (EMC)2014/30/EU.

Emission: EN 61000-6-4:2019

Immunity: EN 61000-6-2:2019; EN 61000-4-2:2009, EN 61000-4-3:2020, EN 61000-4-8:2010

Certificate No. NE1105240044

# SY-DPCA-P-1



## FEATURES

1. Precise Control  
Digital microprocessor
2. Simple Setup  
Digital display and buttons
3. Full Function  
Adjustable input signal and output current
4. Safety  
Short, open circuit protection with error code

## ORDER CODES

**SY** - **DPCA** - **P** - **1**

1                      2                      3                      4

|   |              |      |                                 |
|---|--------------|------|---------------------------------|
| 1 | Model Name   | SY   |                                 |
| 2 | Control Mode | DPCA | Digital Proportional Controller |
| 3 | Type         | P    | PCB only                        |
| 4 | Output       | 1    | single coil                     |

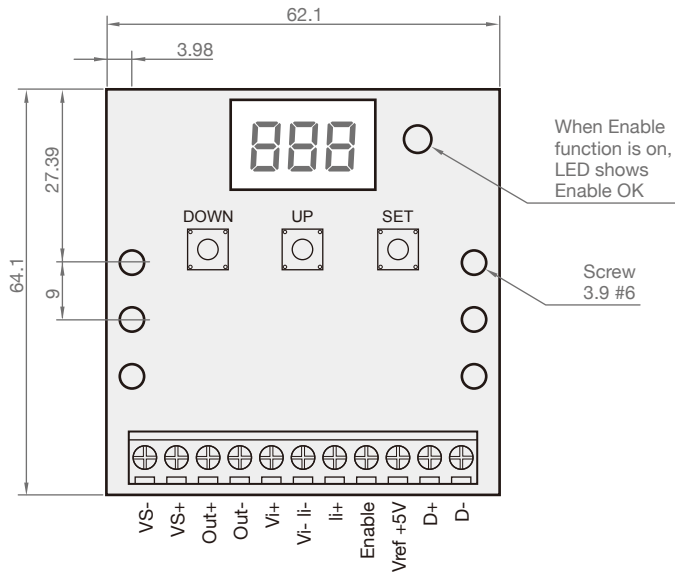
## MODEL SPEC.

| Model                   | SY-DPCA-P-1                |
|-------------------------|----------------------------|
| Operating Voltage       | 9 ~ 32VDC                  |
| Voltage Tolerance       | 5%                         |
| Input Signal Options    | 0~5V, 0~10V, 4~20mA, RS485 |
| Output Current          | 3A max.                    |
| Dither Frequency        | 70 ~ 350Hz                 |
| Ramp Up and Down        | 0.1 ~ 5.0s                 |
| Reference Voltage       | 5V ( max. current 5mA )    |
| Communication Interface | RS485                      |
| Communication Protocol  | Modbus RTU                 |
| Operating Conditions    | -20 ~ 60°C                 |
| Weight                  | 0.06kg                     |

Wiring Instruction

|    |          |                       |
|----|----------|-----------------------|
| 1  | VS-      | Power-                |
| 2  | VS+      | Power+                |
| 3  | Out+     | Coil+                 |
| 4  | Out-     | Coil-                 |
| 5  | Vi+      | Input voltage signal  |
| 6  | Vi- li-  | Signal ground         |
| 7  | li+      | Input current signal  |
| 8  | Enable   | Enable *              |
| 9  | Vref +5V | +5V reference voltage |
| 10 | D+       | RS485+ (optional)     |
| 11 | D-       | RS485- (optional)     |

\* Default off. Ground this pin to enable controller when PEA function is on.



This product has been designed and tested to meet specific standards outlined in the European Electromagnetic Compatibility Directive (EMC)2014/30/EU.

Emission: EN 61000-6-4:2019

Immunity: EN 61000-6-2:2019; EN 61000-4-2:2009, EN 61000-4-3:2020, EN 61000-4-8:2010

Certificate No. NE1105240044

# SY-DPCA-D-P9-1



## FEATURES

- Direct assembly on the DIN43650 solenoid valve
- Control with digital microprocessor
- Simple setup via physical screen and button
- Short, open circuit protection with error code

## ORDER CODES

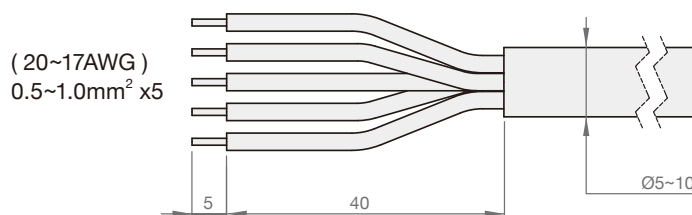
| 1  | 2    | 3 | 4  | 5 |
|----|------|---|----|---|
| SY | DPCA | D | P9 | 1 |

|   |              |      |                                 |
|---|--------------|------|---------------------------------|
| 1 | Model Name   | SY   |                                 |
| 2 | Control Mode | DPCA | Digital Proportional Controller |
| 3 | Type         | D    | DIN43650A Plug                  |
| 4 | Connection   | P9   | PG9 Cable Gland                 |
| 5 | Output       | 1    | single coil                     |

## MODEL SPEC.

| Model                | SY-DPCA-D-P9-1          |
|----------------------|-------------------------|
| Operating Voltage    | 9 ~ 32VDC               |
| Voltage Tolerance    | 5%                      |
| Input Signal Options | 0~5V, 0~10V, 4~20mA     |
| Output Current       | 3A max.                 |
| Dither Frequency     | 70 ~ 350Hz              |
| Ramp Up and Down     | 0.1 ~ 5.0s              |
| Reference Voltage    | 5V ( max. current 5mA ) |
| Operating Conditions | -20 ~ 60°C              |
| Weight               | 0.2kg                   |

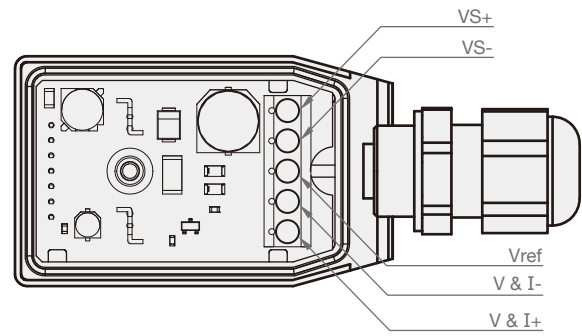
## WIRING PREPARATION



## CONNECTIONS

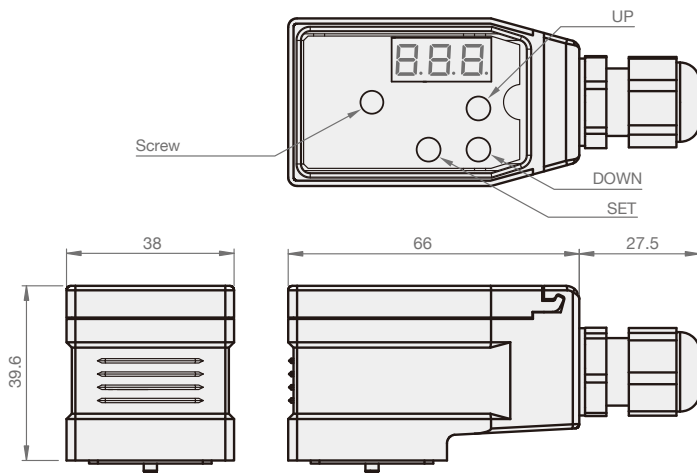
### Wiring Instruction

|   |        |                       |
|---|--------|-----------------------|
| 1 | VS+    | Power+                |
| 2 | VS-    | Power-                |
| 3 | Vref   | +5V reference voltage |
| 4 | V & I- | Command ground        |
| 5 | V & I+ | Command               |

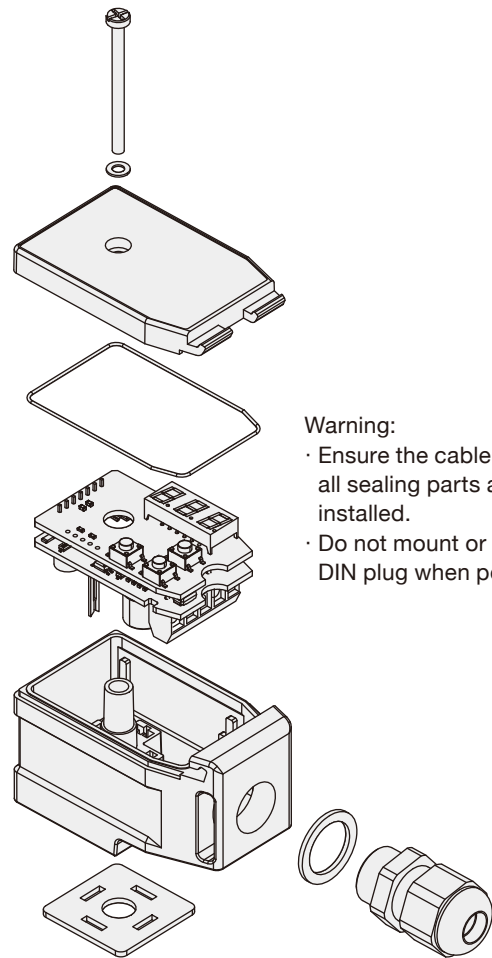


## DIMENSIONS

(UNIT : mm)



## ASSEMBLY



### Warning:

- Ensure the cable gland and all sealing parts are properly installed.
- Do not mount or dismount the DIN plug when power is on.



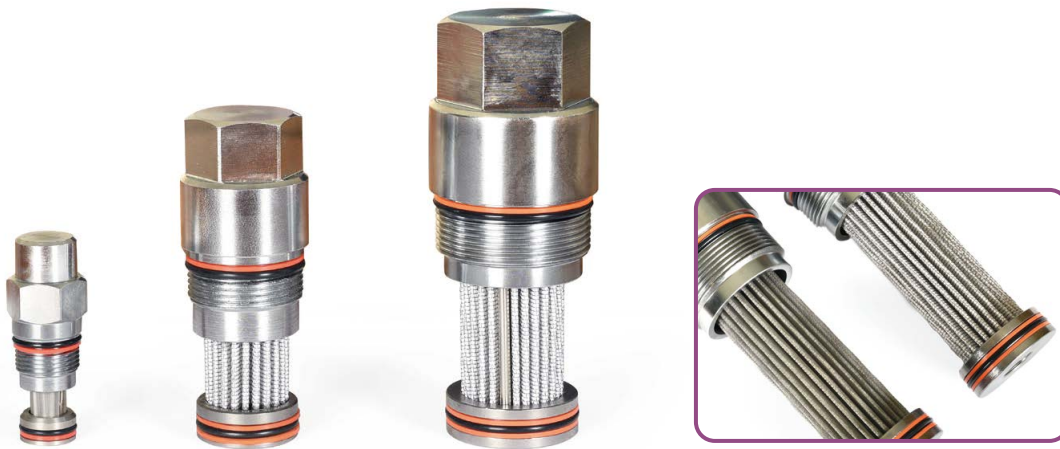
This product has been designed and tested to meet specific standards outlined in the European Electromagnetic Compatibility Directive (EMC)2014/30/EU.

Emission: EN 61000-6-4:2019

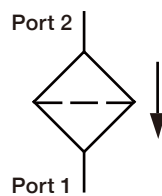
Immunity: EN 61000-6-2:2019; EN 61000-4-2:2009, EN 61000-4-3:2020, EN 61000-4-8:2010

Certificate No. NE1105240044

# FLA



## SYMBOLS



## ORDER CODES

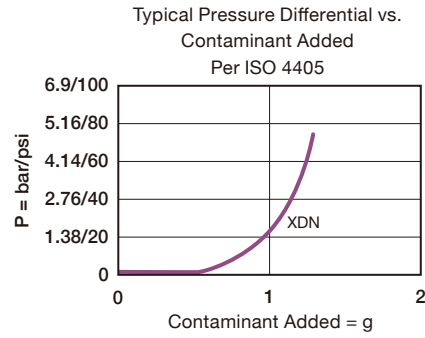
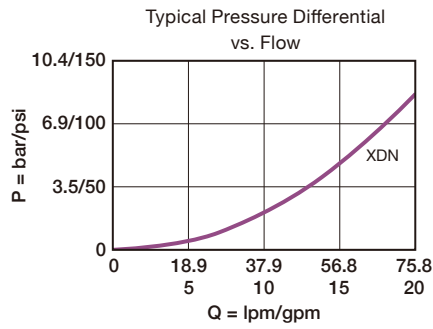
|           |          |          |   |             |   |          |          |          |
|-----------|----------|----------|---|-------------|---|----------|----------|----------|
| <b>FL</b> | <b>2</b> | <b>A</b> | - | <b>T13A</b> | - | <b>X</b> | <b>D</b> | <b>N</b> |
| 1         | 2        | 1        |   | 3           |   | 4        | 5        | 6        |

|   |                              |                       |                       |
|---|------------------------------|-----------------------|-----------------------|
| 1 | Model Name                   | FLA                   |                       |
| 2 | Valve Size                   | 2, 3, 6, 8            |                       |
| 3 | Cavity                       | T13A, T5A, T16A, T18A |                       |
| 4 | Control Manner               | X                     | unadjustable          |
| 5 | Filter Rating ( FL2A, FL3A ) | D                     | 40um ( surface type ) |
| 5 | Filter Rating ( FL6A, FL8A ) | D                     | 40um ( surface type ) |
|   |                              | A                     | 3um ( depth type )    |
|   |                              | B                     | 10um ( depth type )   |
|   |                              | C                     | 25um ( depth type )   |
| 6 | Material of Seal             | N                     | buna-N                |
|   |                              | V                     | viton                 |

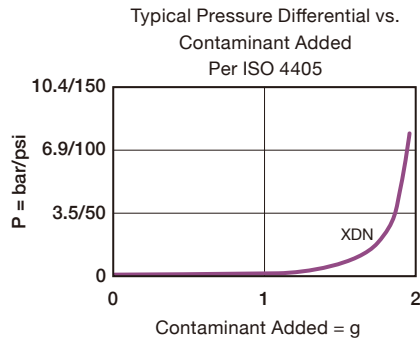
## MODEL SPEC.

| Model | Cavity | Capacity             | Max. Pressure         | Installation Torque<br>( Nm ) | Operating Temperature          | Weight<br>( kg ) |
|-------|--------|----------------------|-----------------------|-------------------------------|--------------------------------|------------------|
| FL2A  | T13A   | 37.9 l/min / 10 gpm  | 345 bar /<br>5000 psi | 40/50                         | -35 ~ 100°C<br>( -31 ~ 212°F ) | 0.09             |
| FL3A  | T5A    | 75.7 l/min / 20 gpm  |                       | 60/70                         |                                | 0.19             |
| FL6A  | T16A   | 151.4 l/min / 40 gpm |                       | 200/215                       |                                | 0.315            |
| FL8A  | T18A   | 302.8 l/min / 80 gpm |                       | 465/500                       |                                | 0.71             |

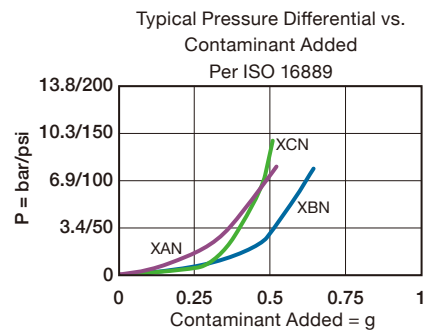
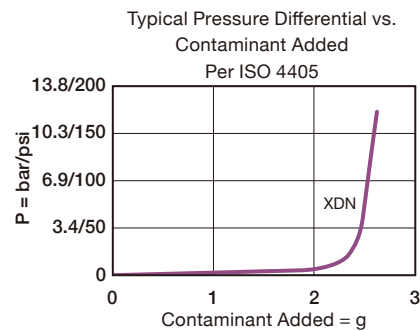
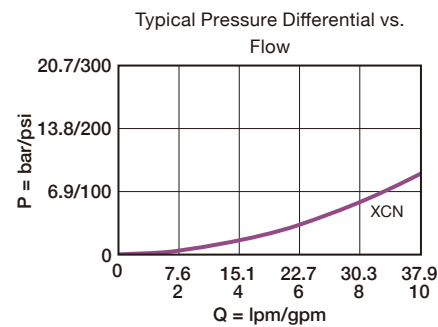
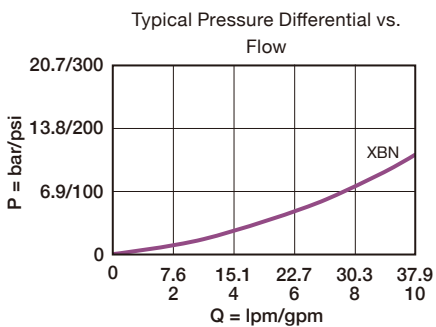
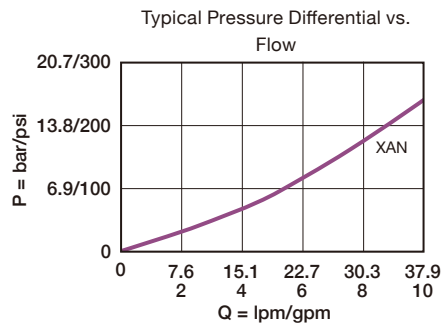
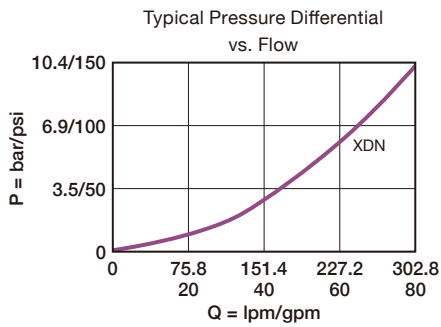
## ► FL2A



## ► FL3A

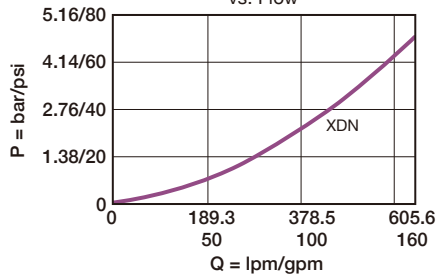


## ► FL6A

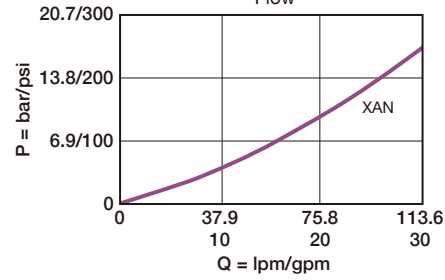


## ► FL8A

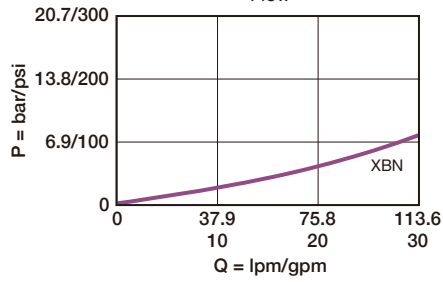
Typical Pressure Differential  
vs. Flow



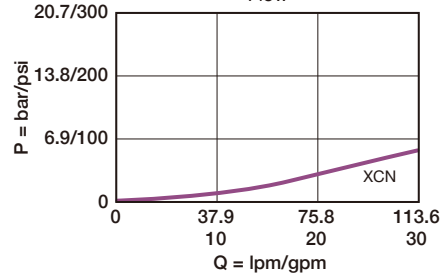
Typical Pressure Differential vs.  
Flow



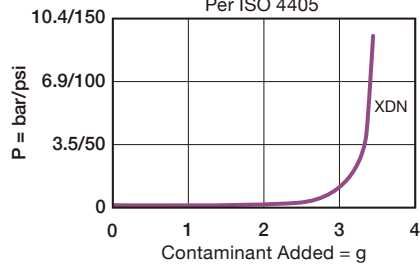
Typical Pressure Differential vs.  
Flow



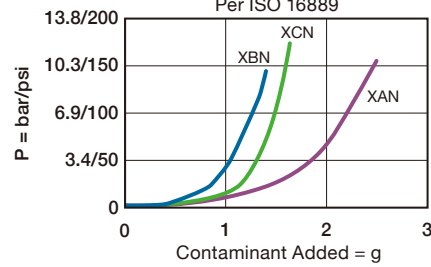
Typical Pressure Differential vs.  
Flow

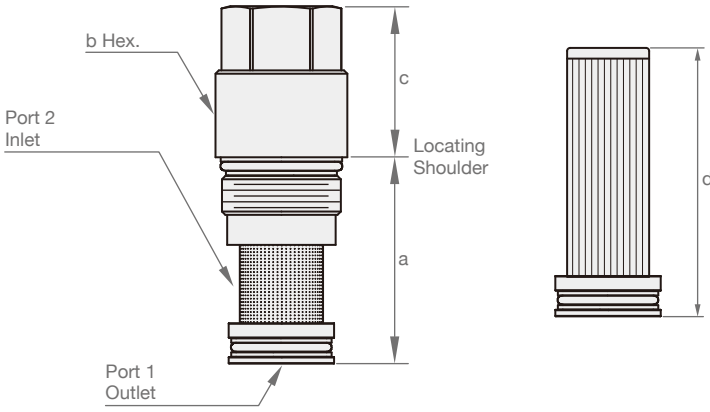


Typical Pressure Differential vs.  
Contaminant Added  
Per ISO 4405



Typical Pressure Differential vs.  
Contaminant Added  
Per ISO 16889



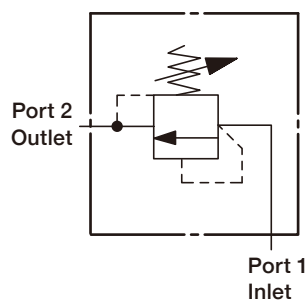


| Model | a    | b    | c    | d    |
|-------|------|------|------|------|
| FL2A  | 40.0 | 22.2 | 30.7 | 59.5 |
| FL3A  | 41.7 | 28.6 | 33.3 | 66.0 |
| FL6A  | 62.2 | 31.8 | 41.4 | 97.5 |
| FL8A  | 79.5 | 41.3 | 54.1 | 126  |

# MH



## SYMBOLS



## ORDER CODES

**MH** - **082** - **L** **A** **N**

1 2 3 4 5

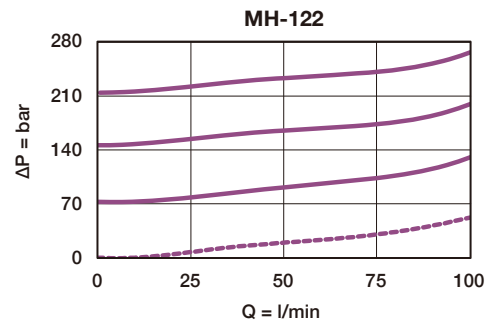
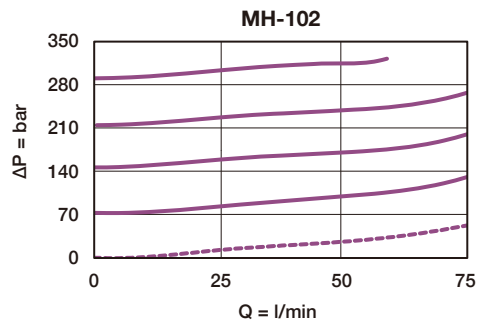
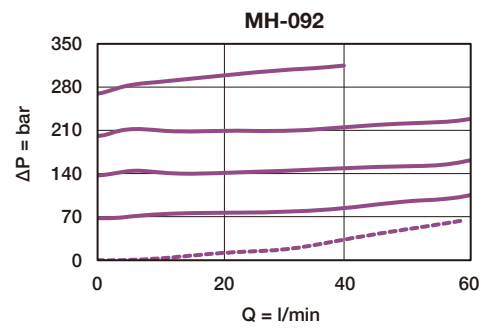
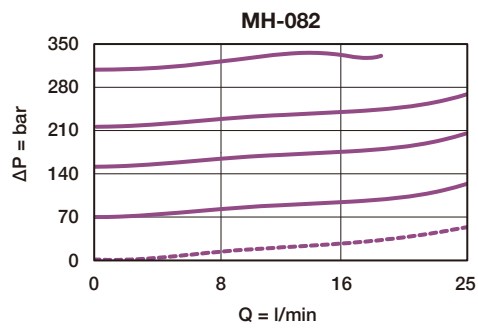
|   |                     |                             |
|---|---------------------|-----------------------------|
| 1 | Model Name          | MH                          |
| 2 | Valve Size & Cavity | 082, 092, 102, 122          |
| 3 | Control Manner      | L standard screw adjustment |
|   |                     | K hand knob with lock knob  |
|   |                     | C tamper resistant cover    |
| 4 | Adjustable Range    | A 7 ~ 210 bar               |
|   |                     | B 3.5 ~ 105 bar             |
|   |                     | C 90 ~ 350 bar              |
| 5 | Material of Seal    | N buna-N                    |
|   |                     | V viton                     |

## MODEL SPEC.

| Model  | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|--------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| MH-082 | T082   | 25                  | 350                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.15           |
| MH-092 | T092   | 45                  | 350                    | 40/50                       |                              | 0.25           |
| MH-102 | T102   | 55                  | 350                    | 40/50                       |                              | 0.20           |
| MH-122 | T122   | 85                  | 280                    | 45/50                       |                              | 0.32           |

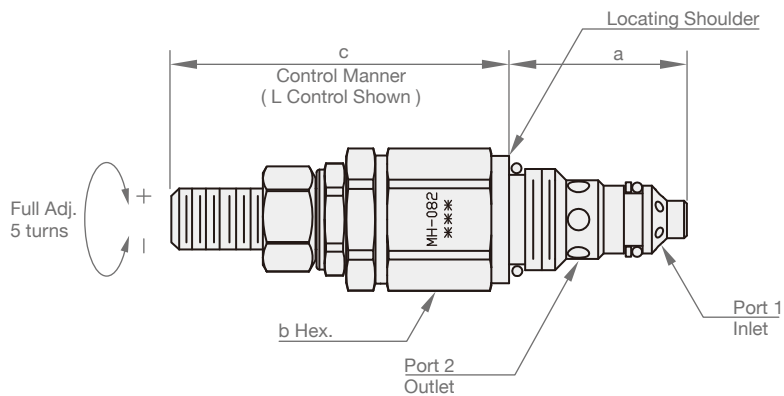
## PERFORMANCE CURVES

### ► Typical Pressure Rise



## DIMENSION

( UNIT : mm )

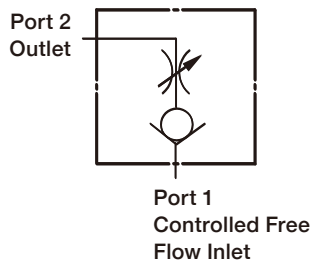


| Model  | a    | b    | c  |    |    |
|--------|------|------|----|----|----|
|        |      |      | L  | K  | C  |
| MH-082 | 34   | 24   | 60 | 66 | 48 |
| MH-092 | 54   | 26   | 58 | 93 | 36 |
| MH-102 | 38.8 | 25.4 | 58 | 64 | 36 |
| MH-122 | 59   | 31.8 | 61 | -  | 67 |

# CN



## SYMBOLS



## ORDER CODES

**CN** - **082** - **L** **A** **N**

1 2 3 4 5

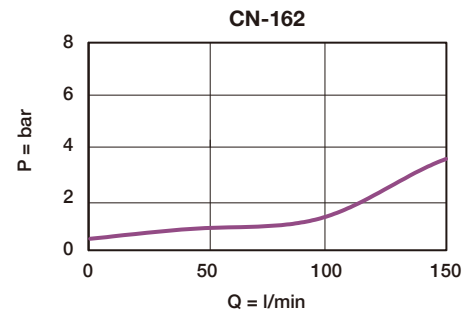
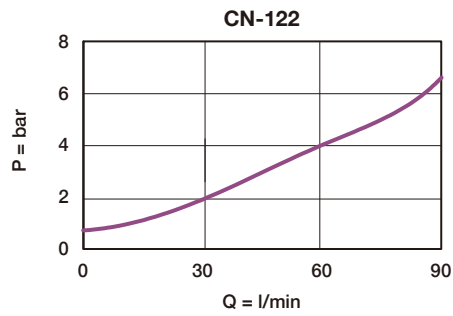
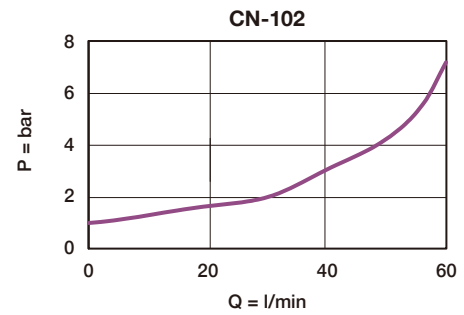
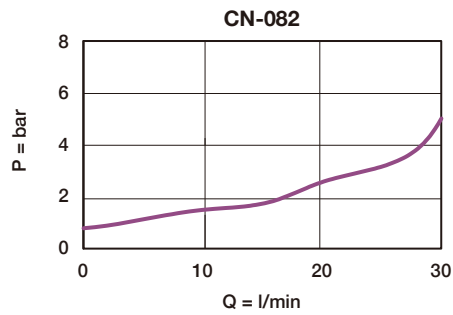
|   |                       |                             |
|---|-----------------------|-----------------------------|
| 1 | Model Name            | CN                          |
| 2 | Cavity & Max. Orifice | 082, 102, 122, 162          |
| 3 | Control Manner        | L standard screw adjustment |
|   |                       | K hand knob with lock knob  |
| 4 | Cracking Pressure     | A 0.3 bar                   |
|   |                       | C 2.0 bar                   |
|   |                       | E 5.0 bar                   |
| 5 | Material of Seal      | N buna-N                    |
|   |                       | V viton                     |

## MODEL SPEC.

| Model  | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating<br>Temperature     | Weight<br>(kg) |
|--------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CN-082 | T082   | 30                  | 300                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.11           |
| CN-102 | T102   | 50                  | 300                    | 40/50                       |                              | 0.14           |
| CN-122 | T122   | 80                  | 300                    | 40/50                       |                              | 0.26           |
| CN-162 | T162   | 150                 | 300                    | 40/50                       |                              | 0.39           |

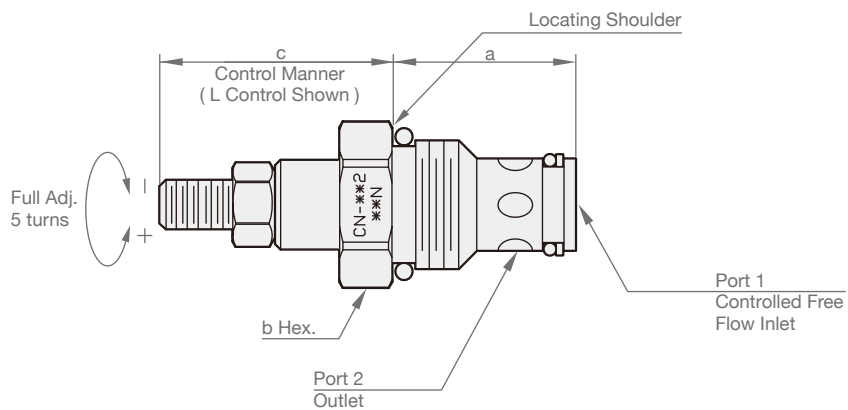
## PERFORMANCE CURVES

### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

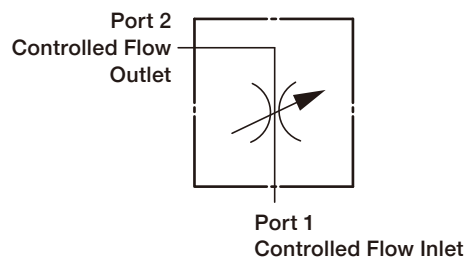


| Model  | a    | b    | c  |    |
|--------|------|------|----|----|
|        |      |      | L  | K  |
| CN-082 | 27.7 | 22.4 | 48 | 53 |
| CN-102 | 31.8 | 25.4 | 51 | 56 |
| CN-122 | 46.0 | 31.8 | 53 | 58 |
| CN-162 | 44.5 | 38.1 | 59 | 64 |

# NV



## SYMBOLS



## ORDER CODES

**NV** - **082** - **L** **A** **N**

1 2 3 4

|   |                       |                             |
|---|-----------------------|-----------------------------|
| 1 | Model Name            | NV                          |
| 2 | Cavity & Max. Orifice | 082 T082, 6.5mm             |
|   |                       | 102 T102, 8.5mm             |
|   |                       | 122 T122, 12.5mm            |
|   |                       | 162 T162, 16mm              |
| 3 | Control Manner        | L standard screw adjustment |
|   |                       | K hand knob with lock knob  |
| 4 | Material of Seal      | N buna-N                    |
|   |                       | V viton                     |

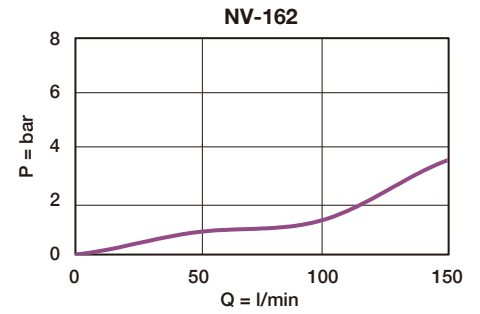
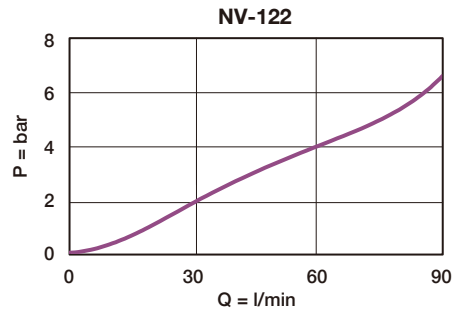
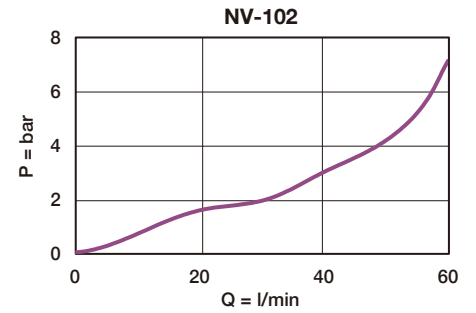
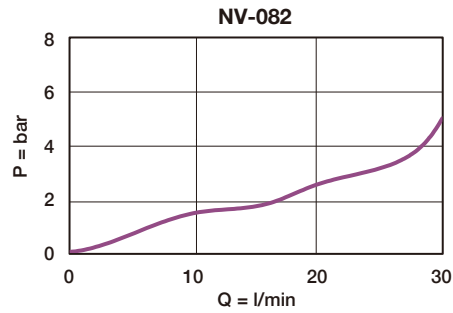
## MODEL SPEC.

| Model  | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|--------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| NV-082 | T082   | 30                  | 300                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.11           |
| NV-102 | T102   | 50                  | 300                    | 40/50                       |                              | 0.14           |
| NV-122 | T122   | 80                  | 300                    | 40/50                       |                              | 0.26           |
| NV-162 | T162   | 150                 | 300                    | 40/50                       |                              | 0.39           |

## PERFORMANCE CURVES

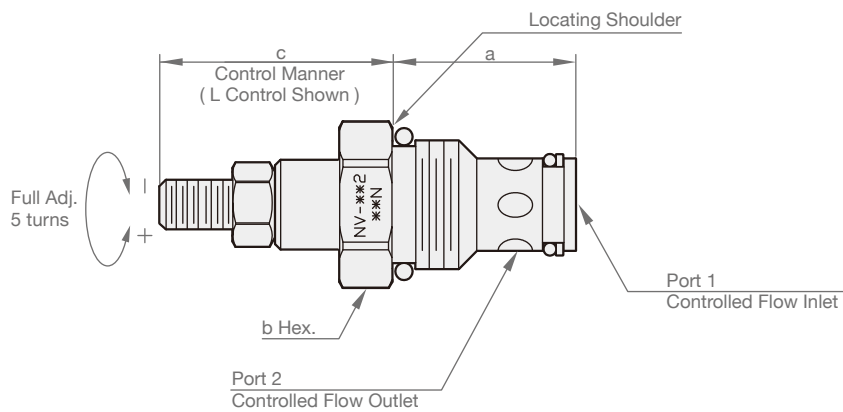
### ► Typical Pressure Drop

— Fully Open, Port1 ~ Port2



## DIMENSION

( UNIT : mm )

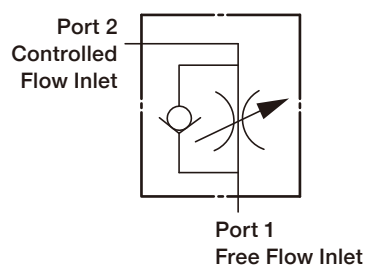


| Model  | a    | b    | c  |    |
|--------|------|------|----|----|
|        |      |      | L  | K  |
| NC-082 | 27.7 | 22.4 | 48 | 53 |
| NC-102 | 31.8 | 25.4 | 51 | 56 |
| NC-122 | 46.0 | 31.8 | 53 | 58 |
| NC-162 | 44.5 | 38.1 | 59 | 64 |

# NC



## SYMBOLS



## ORDER CODES

**NC** - **082** - **L** **C** **N**

1 2 3 4 5

|   |                       |                             |
|---|-----------------------|-----------------------------|
| 1 | Model Name            | NC                          |
| 2 | Cavity & Max. Orifice | 082 T082, 5.9mm             |
|   |                       | 102 T102, 8mm               |
|   |                       | 122 T122, 11mm              |
|   |                       | 162 T162, 13mm              |
| 3 | Control Manner        | L standard screw adjustment |
|   |                       | K hand knob with lock knob  |
| 4 | Cracking Pressure     | C 2.0 bar                   |
| 5 | Material of Seal      | N buna-N                    |
|   |                       | V viton                     |

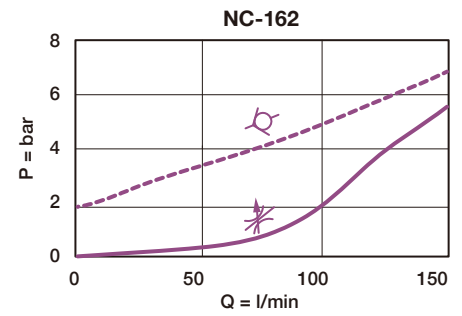
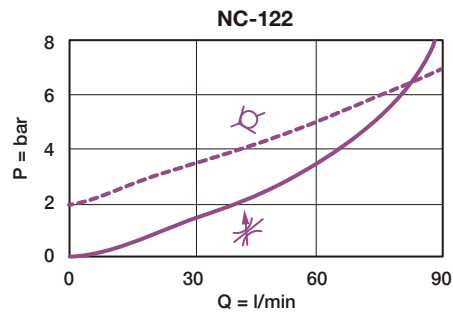
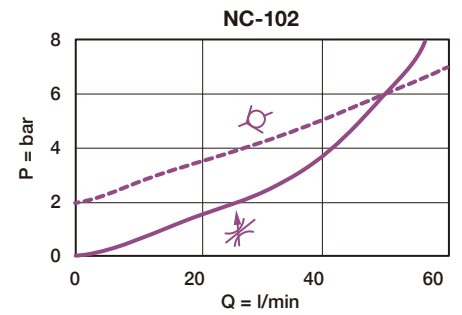
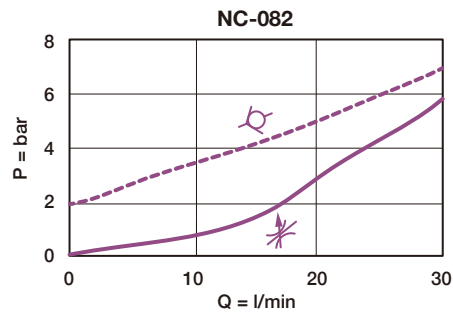
## MODEL SPEC.

| Model  | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|--------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| NC-082 | T082   | 30                  | 300                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.11           |
| NC-102 | T102   | 50                  | 300                    | 40/50                       |                              | 0.14           |
| NC-122 | T122   | 80                  | 300                    | 40/50                       |                              | 0.26           |
| NC-162 | T162   | 150                 | 300                    | 40/50                       |                              | 0.39           |

## PERFORMANCE CURVES

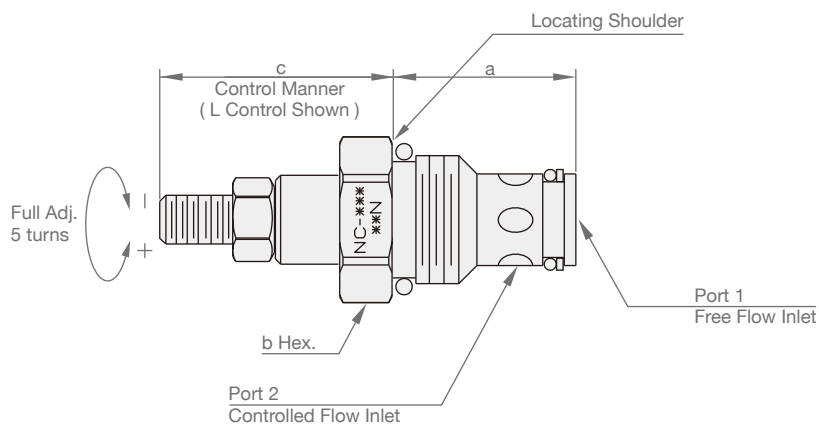
### Typical Pressure Drop

- Free Flow, Port1 ~ Port2
- Fully Open, Port2 ~ Port1



## DIMENSION

( UNIT : mm )

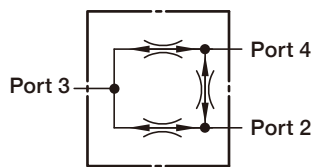


| Model  | a    | b    | c  |    |
|--------|------|------|----|----|
|        |      |      | L  | K  |
| NC-082 | 27.7 | 22.4 | 48 | 53 |
| NC-102 | 31.8 | 25.4 | 51 | 56 |
| NC-122 | 46.0 | 31.8 | 53 | 58 |
| NC-162 | 44.5 | 38.1 | 59 | 64 |

# CP



## SYMBOLS



Flow Ratio:  
Port 2 : Port 4 = 1:1

## ORDER CODES

**CP** - **104** - **2** - **X** **C** **N**

1 2 3 4 5 6

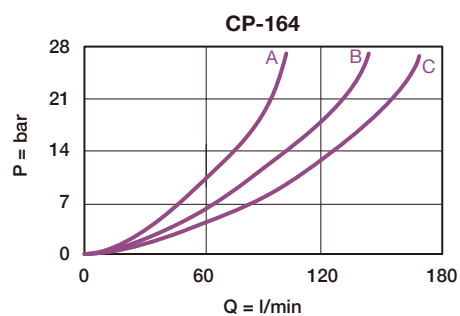
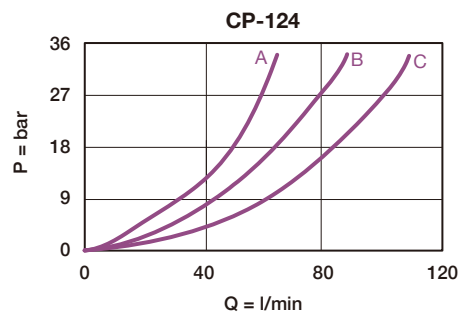
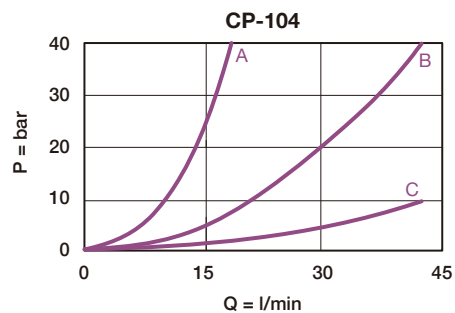
|   |                     |               |                                     |
|---|---------------------|---------------|-------------------------------------|
| 1 | Model Name          | CP            |                                     |
| 2 | Valve Size & Cavity | 104, 124, 164 |                                     |
| 3 | Type                | none          | standard                            |
|   |                     | 2             | anti-stall                          |
| 4 | Control Manner      | X             | unadjustable                        |
| 5 | Capacity (l/min)    | A             | CP-104: 7.6, CP-124: 38, CP-164: 91 |
|   |                     | B             | CP-104: 23, CP-124: 53, CP-164: 114 |
|   |                     | C             | CP-104: 45, CP-124: 90, CP-164: 150 |
| 6 | Material of Seal    | N             | buna-N                              |
|   |                     | V             | viton                               |

## MODEL SPEC.

| Model  | Cavity | Capacity (l/min) | Max. Pressure (bar) | Installation Torque (Nm) | Operating Temperature        | Weight (kg) |
|--------|--------|------------------|---------------------|--------------------------|------------------------------|-------------|
| CP-104 | T104   | 45               | 210                 | 35/45                    | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.11        |
| CP-124 | T124   | 90               | 210                 | 45/55                    |                              | 0.23        |
| CP-164 | T164   | 150              | 210                 | 60/70                    |                              | 0.37        |

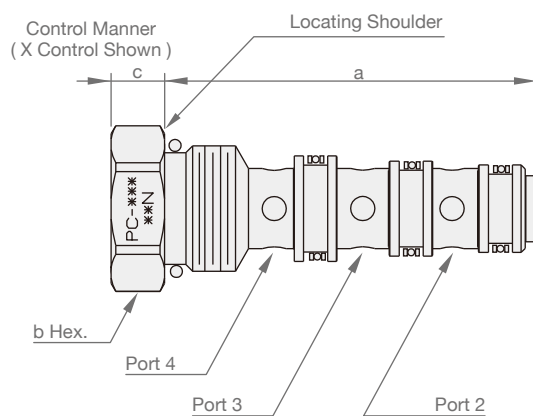
## PERFORMANCE CURVES

### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

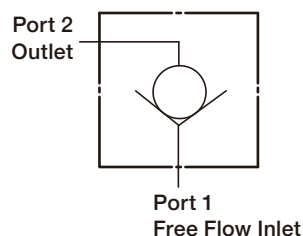


| Model  | a     | b    | c    |
|--------|-------|------|------|
|        |       |      | X    |
| CP-104 | 64.8  | 25.4 | 7.9  |
| CP-124 | 85.1  | 31.8 | 9.5  |
| CP-164 | 105.0 | 38.1 | 12.7 |

# CV



## SYMBOLS



## ORDER CODES

**CV** - **082** - **X** **A** **N**

1 2 3 4 5

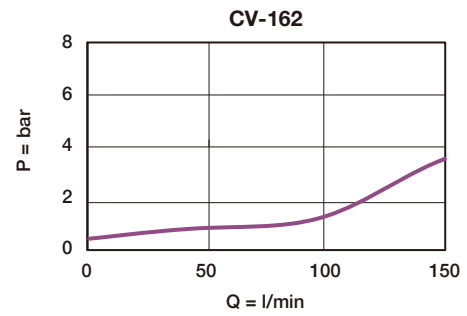
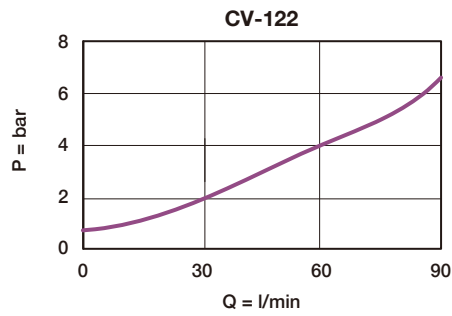
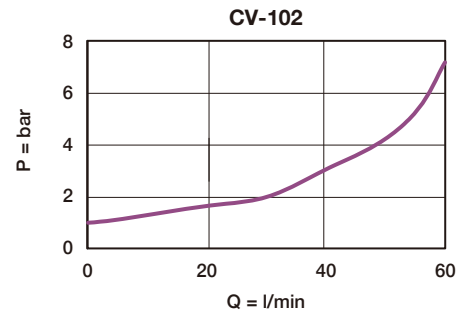
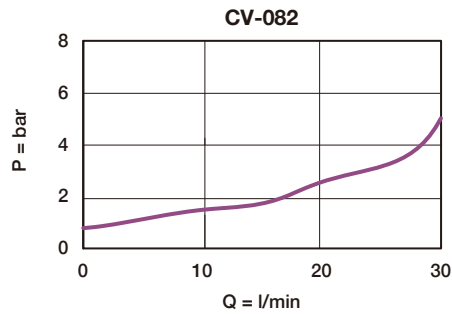
|   |                     |                    |              |
|---|---------------------|--------------------|--------------|
| 1 | Model Name          | CV                 |              |
| 2 | Valve Size & Cavity | 082, 102, 122, 162 |              |
| 3 | Control Manner      | X                  | unadjustable |
| 4 | Cracking Pressure   | A                  | 0.3 bar      |
|   |                     | C                  | 2.0 bar      |
|   |                     | E                  | 5.0 bar      |
| 5 | Material of Seal    | N                  | buna-N       |
|   |                     | V                  | viton        |

## MODEL SPEC.

| Model  | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|--------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| CV-082 | T082   | 30                  | 300                    | 40/50                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.06           |
| CV-102 | T102   | 50                  | 300                    | 40/50                       |                              | 0.09           |
| CV-122 | T122   | 80                  | 300                    | 40/50                       |                              | 0.15           |
| CV-162 | T162   | 150                 | 300                    | 40/50                       |                              | 0.27           |

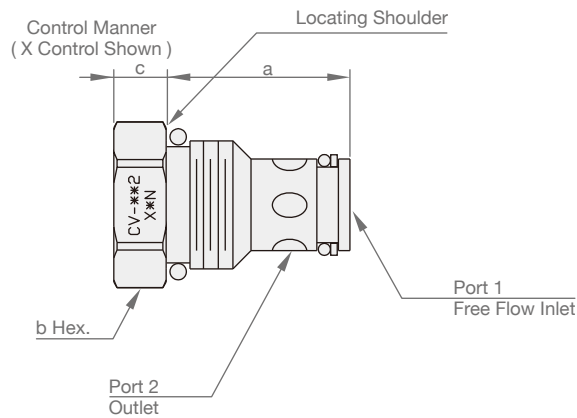
## PERFORMANCE CURVES

### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

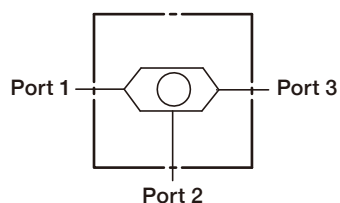


| Model  | a    | b    | c    |
|--------|------|------|------|
|        |      |      | X    |
| CV-082 | 27.7 | 22.4 | 7.9  |
| CV-102 | 31.8 | 25.4 | 7.9  |
| CV-122 | 46.0 | 31.8 | 9.5  |
| CV-162 | 44.5 | 38.1 | 14.0 |

# LS



## SYMBOLS



## ORDER CODES

**LS** - **083** - **X** X **N**

1 2 3 4

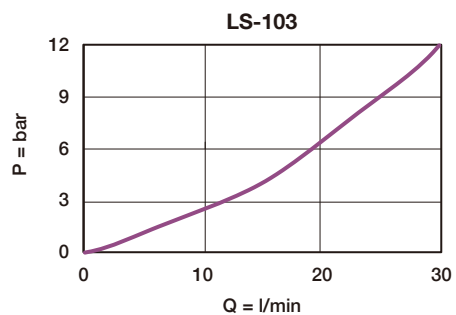
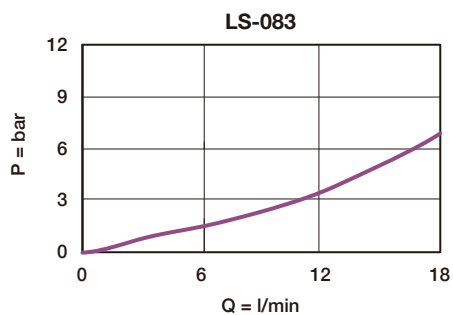
|   |                     |          |              |
|---|---------------------|----------|--------------|
| 1 | Model Name          | LS       |              |
| 2 | Valve Size & Cavity | 083, 103 |              |
| 3 | Control Manner      | X        | unadjustable |
| 4 | Material of Seal    | N        | buna-N       |
|   |                     | V        | viton        |

## MODEL SPEC.

| Model  | Cavity | Capacity<br>(l/min) | Max. Pressure<br>(bar) | Installation Torque<br>(Nm) | Operating Temperature        | Weight<br>(kg) |
|--------|--------|---------------------|------------------------|-----------------------------|------------------------------|----------------|
| LS-083 | T083   | 15                  | 240                    | 30/40                       | -35 ~ 100°C<br>(-31 ~ 212°F) | 0.06           |
| LS-103 | T103   | 30                  | 240                    | 40/50                       |                              | 0.10           |

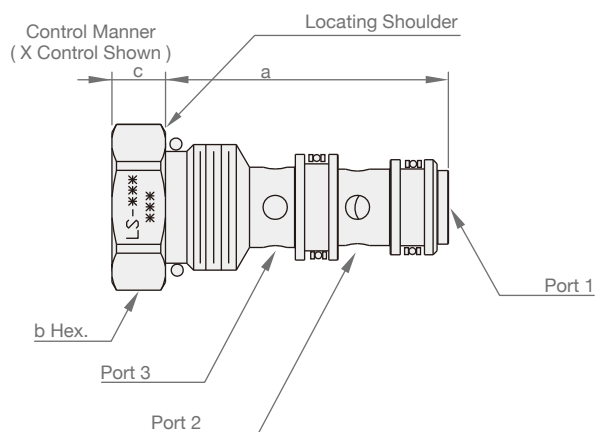
## PERFORMANCE CURVES

### ► Typical Pressure Drop



## DIMENSION

( UNIT : mm )

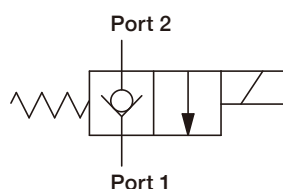


| Model  | a    | b    | c |
|--------|------|------|---|
|        |      |      | X |
| LS-083 | 42.2 | 22.4 | 8 |
| LS-103 | 46.0 | 25.4 | 8 |

# HS, JS, LS, PS-2A



## SYMBOLS



## ORDER CODES

**HS** - **2A** - **16** - **A1**

1 2 3 4

|   |               |    |         |
|---|---------------|----|---------|
| 1 | Cavity        | HS | T082    |
|   |               | JS | T102    |
|   |               | LS | T122    |
|   |               | PS | T162    |
| 2 | Type of Valve | 2A |         |
| 3 | Tube Diameter | 16 |         |
| 4 | Power Source  | A1 | RAC110V |
|   |               | A2 | RAC220V |
|   |               | D1 | DC12V   |
|   |               | D2 | DC24V   |

## MODEL SPEC.

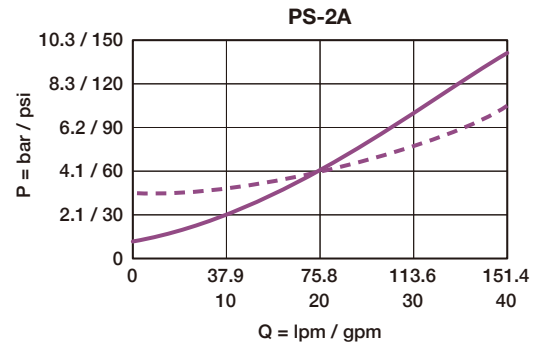
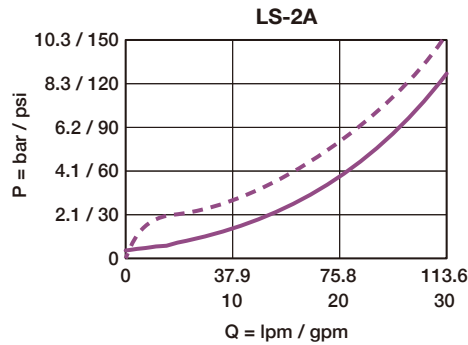
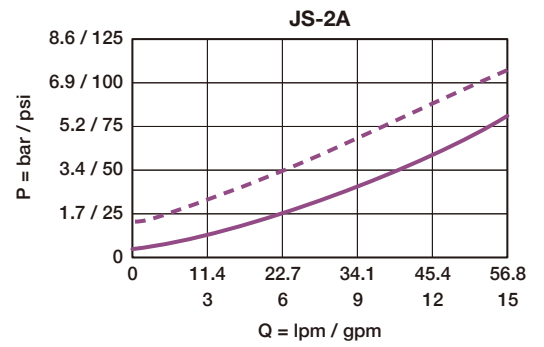
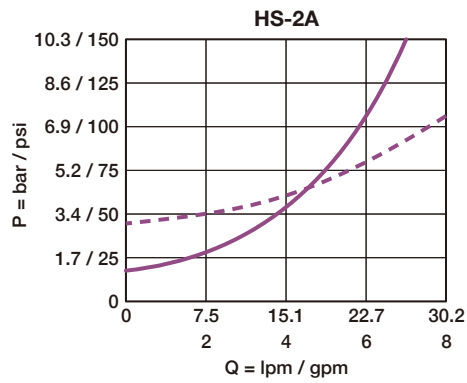
| Model | Cavity | Tube Diameter | Capacity (l/min) | Max. Pressure (bar) | Installation Torque (Nm) | Weight (kg) |
|-------|--------|---------------|------------------|---------------------|--------------------------|-------------|
| HS-2A | T082   | 16            | 28               | 250                 | 39/51                    | 0.41        |
| JS-2A | T102   | 16            | 50               | 250                 | 39/51                    | 0.43        |
| LS-2A | T122   | 16            | 100              | 250                 | 39/51                    | 0.53        |
| PS-2A | T162   | 16            | 150              | 250                 | 39/51                    | 0.62        |

## PERFORMANCE CURVES

### Typical Pressure Drop

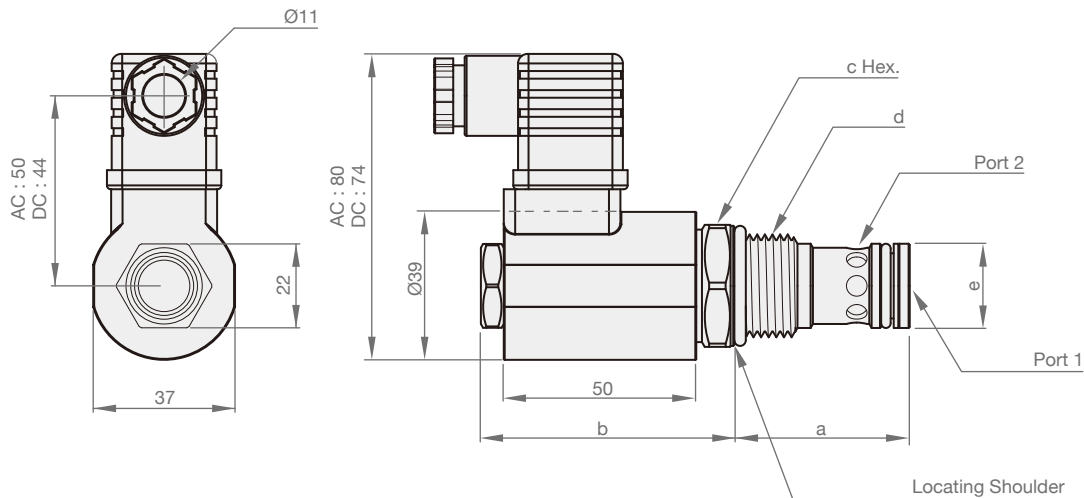
- - - de-energized,  
Port 1 → Port 2  
 — energized,  
Port 2 → Port 1

\* 32cSt / 150 ssu oil at 40°C



## DIMENSION

( UNIT : mm )

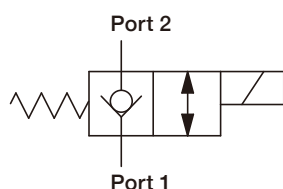


| Model | a  | b  | c    | d             | e    |
|-------|----|----|------|---------------|------|
| HS-2A | 28 | 64 | 22   | 3/4"-16UNF    | 12.7 |
| JS-2A | 32 | 64 | 25.4 | 7/8"-14UNF    | 15.8 |
| LS-2A | 45 | 64 | 32   | 1 1/16"-12UNF | 22.2 |
| PS-2A | 45 | 65 | 38   | 1 5/16"-12UNF | 28.6 |

# HS, JS, LS, PS-2B



## SYMBOLS



## ORDER CODES

**HS** - **2B** - **16** - **A2**

1 2 3 4

|                   |    |         |
|-------------------|----|---------|
| 1 ▶ Cavity        | HS | T082    |
|                   | JS | T102    |
|                   | LS | T122    |
|                   | PS | T162    |
| 2 ▶ Type of Valve | 2B |         |
| 3 ▶ Tube Diameter | 16 |         |
| 4 ▶ Power Source  | A1 | RAC110V |
|                   | A2 | RAC220V |
|                   | D1 | DC12V   |
|                   | D2 | DC24V   |

## MODEL SPEC.

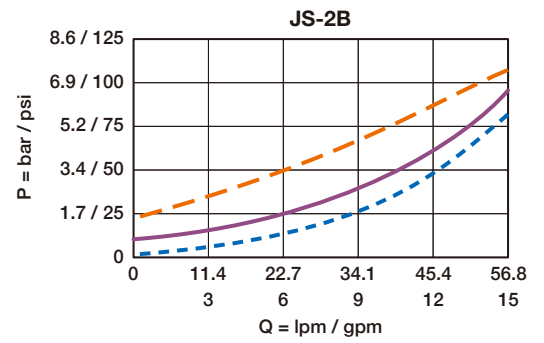
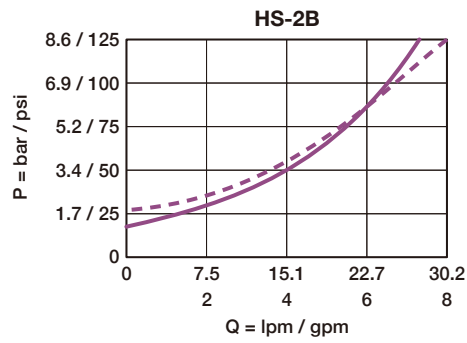
| Model | Cavity | Tube Diameter | Capacity (l/min) | Max. Pressure (bar) | Installation Torque (Nm) | Weight (kg) |
|-------|--------|---------------|------------------|---------------------|--------------------------|-------------|
| HS-2B | T082   | 16            | 28               | 250                 | 39/51                    | 0.41        |
| JS-2B | T102   | 16            | 50               | 250                 | 39/51                    | 0.43        |
| LS-2B | T122   | 16            | 100              | 250                 | 39/51                    | 0.53        |
| PS-2B | T162   | 16            | 150              | 250                 | 39/51                    | 0.62        |

## PERFORMANCE CURVES

### Typical Pressure Drop

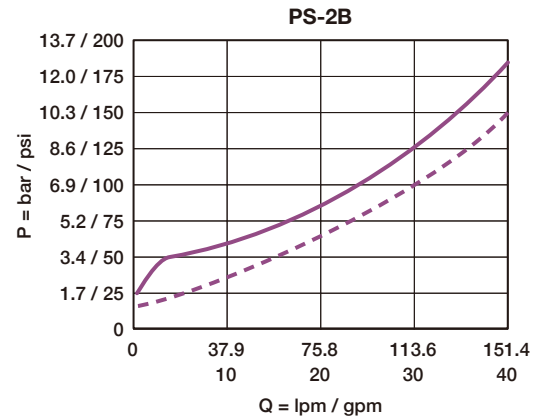
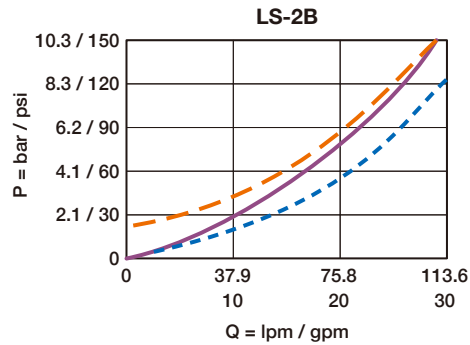
#### HS-2B, PS-2B

- de-energized,  
Port 1 → Port 2
- energized,  
Port 2 → Port 1



#### JS-2B, LS-2B

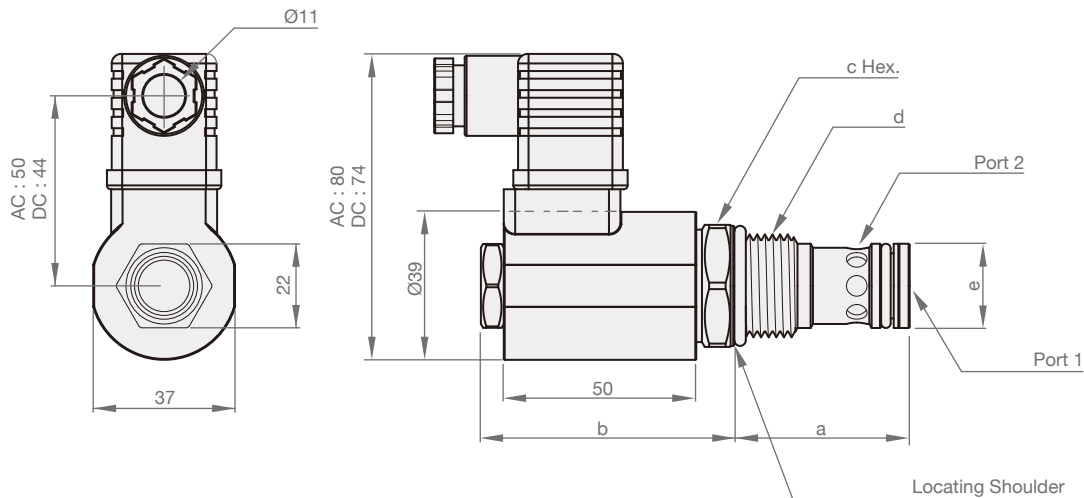
- de-energized,  
Port 1 → Port 2
- energized,  
Port 2 → Port 1
- energized,  
Port 1 → Port 2



\* 32cSt / 150 ssu oil at 40°C

## DIMENSION

( UNIT : mm )

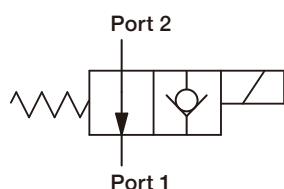


| Model | a  | b  | c    | d             | e    |
|-------|----|----|------|---------------|------|
| HS-2B | 28 | 64 | 22   | 3/4"-16UNF    | 12.7 |
| JS-2B | 32 | 64 | 25.4 | 7/8"-14UNF    | 15.8 |
| LS-2B | 45 | 64 | 32   | 1 1/16"-12UNF | 22.2 |
| PS-2B | 45 | 65 | 38   | 1 5/16"-12UNF | 28.6 |

# HS, JS, LS, PS-2C



## SYMBOLS



## ORDER CODES

**JS** - **2C** - **16** - **A1**

1 2 3 4

|                   |    |         |
|-------------------|----|---------|
| 1 ▶ Cavity        | HS | T082    |
|                   | JS | T102    |
|                   | LS | T122    |
|                   | PS | T162    |
| 2 ▶ Type of Valve | 2C |         |
| 3 ▶ Tube Diameter | 16 |         |
| 4 ▶ Power Source  | A1 | RAC110V |
|                   | A2 | RAC220V |
|                   | D1 | DC12V   |
|                   | D2 | DC24V   |

## MODEL SPEC.

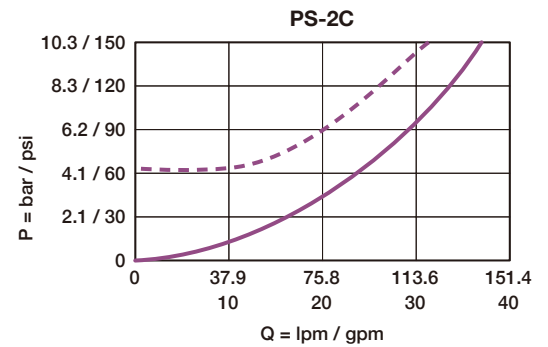
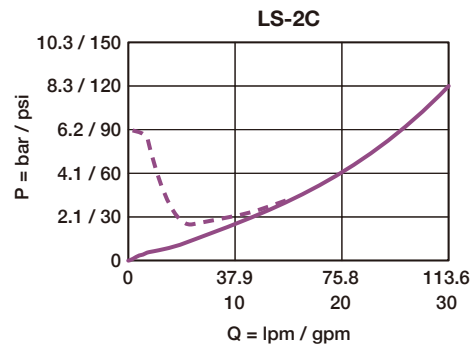
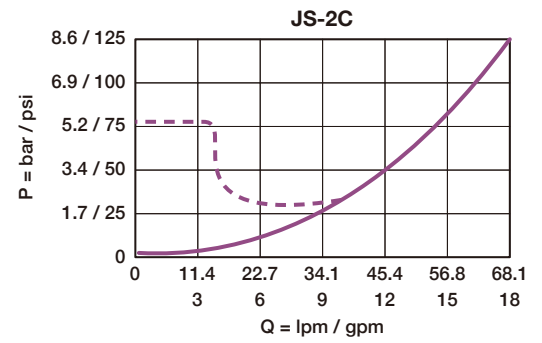
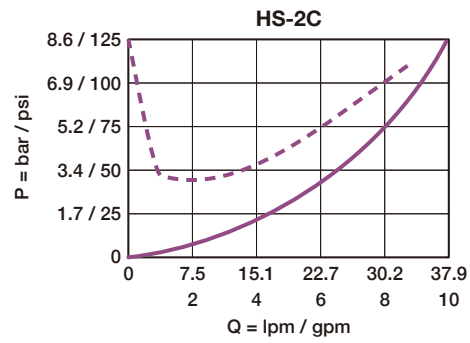
| Model | Cavity | Tube Diameter | Capacity (l/min) | Max. Pressure (bar) | Installation Torque (Nm) | Weight (kg) |
|-------|--------|---------------|------------------|---------------------|--------------------------|-------------|
| HS-2C | T082   | 16            | 28               | 250                 | 39/51                    | 0.41        |
| JS-2C | T102   | 16            | 50               | 250                 | 39/51                    | 0.43        |
| LS-2C | T122   | 16            | 100              | 250                 | 39/51                    | 0.56        |
| PS-2C | T162   | 16            | 150              | 250                 | 39/51                    | 0.67        |

## PERFORMANCE CURVES

### Typical Pressure Drop

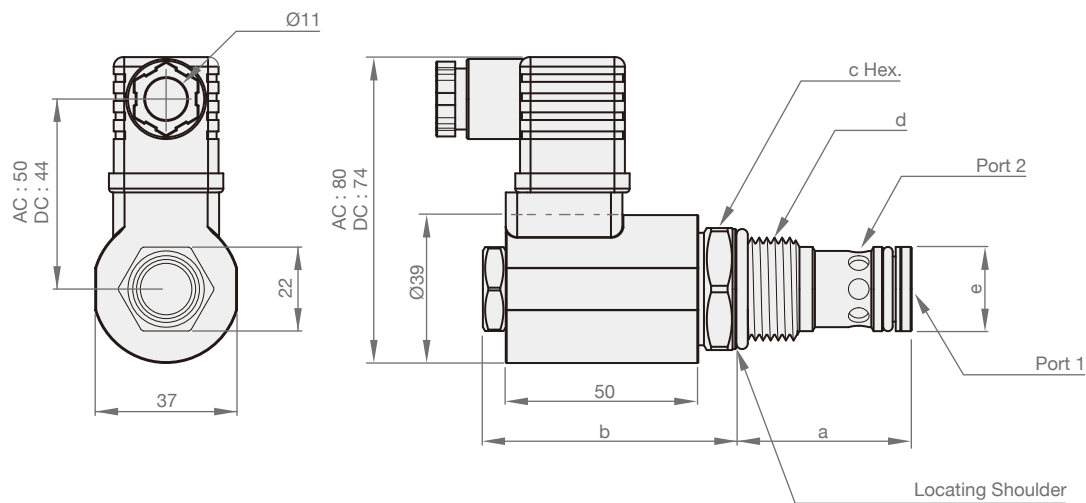
- energized,  
Port 1 → Port 2
- de-energized,  
Port 2 → Port 1

\* 32cSt / 150 ssu oil at 40°C



## DIMENSION

( UNIT : mm )

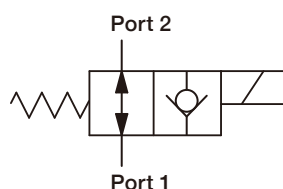


| Model | a  | b  | c    | d             | e    |
|-------|----|----|------|---------------|------|
| HS-2C | 28 | 64 | 22   | 3/4"-16UNF    | 12.7 |
| JS-2C | 32 | 64 | 25.4 | 7/8"-14UNF    | 15.8 |
| LS-2C | 45 | 64 | 32   | 1 1/16"-12UNF | 22.2 |
| PS-2C | 45 | 65 | 38   | 1 5/16"-12UNF | 28.6 |

# HS, JS, LS, PS-2D



## SYMBOLS



## ORDER CODES

**JS** - **2D** - **16** - **A2**

1 2 3 4

|                   |    |         |
|-------------------|----|---------|
| 1 ▶ Cavity        | HS | T082    |
|                   | JS | T102    |
|                   | LS | T122    |
|                   | PS | T162    |
| 2 ▶ Type of Valve | 2D |         |
| 3 ▶ Tube Diameter | 16 |         |
| 4 ▶ Power Source  | A1 | RAC110V |
|                   | A2 | RAC220V |
|                   | D1 | DC12V   |
|                   | D2 | DC24V   |

## MODEL SPEC.

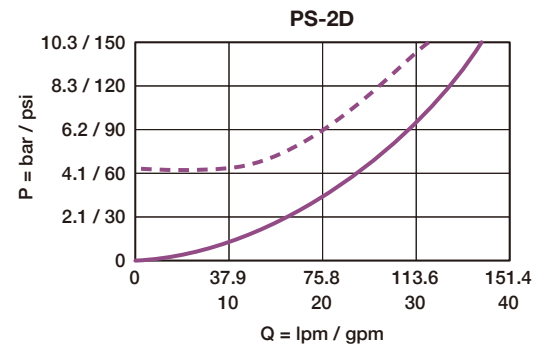
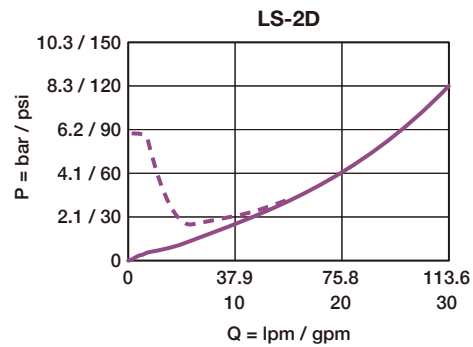
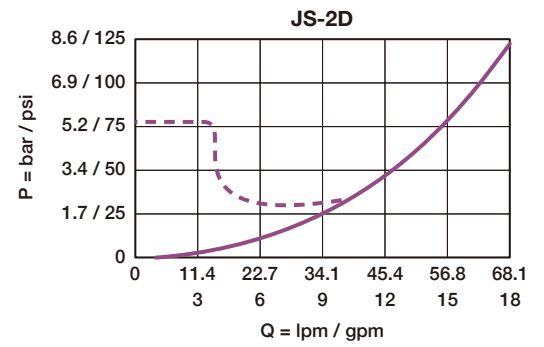
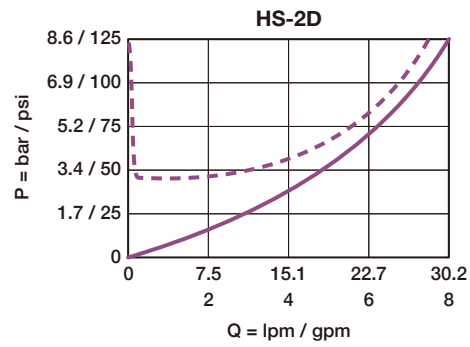
| Model | Cavity | Tube Diameter | Capacity (l/min) | Max. Pressure (bar) | Installation Torque (Nm) | Weight (kg) |
|-------|--------|---------------|------------------|---------------------|--------------------------|-------------|
| HS-2D | T082   | 16            | 28               | 250                 | 39/51                    | 0.41        |
| JS-2D | T102   | 16            | 50               | 250                 | 39/51                    | 0.46        |
| LS-2D | T122   | 16            | 100              | 250                 | 39/51                    | 0.56        |
| PS-2D | T162   | 16            | 150              | 250                 | 39/51                    | 0.67        |

## PERFORMANCE CURVES

### ► Typical Pressure Drop

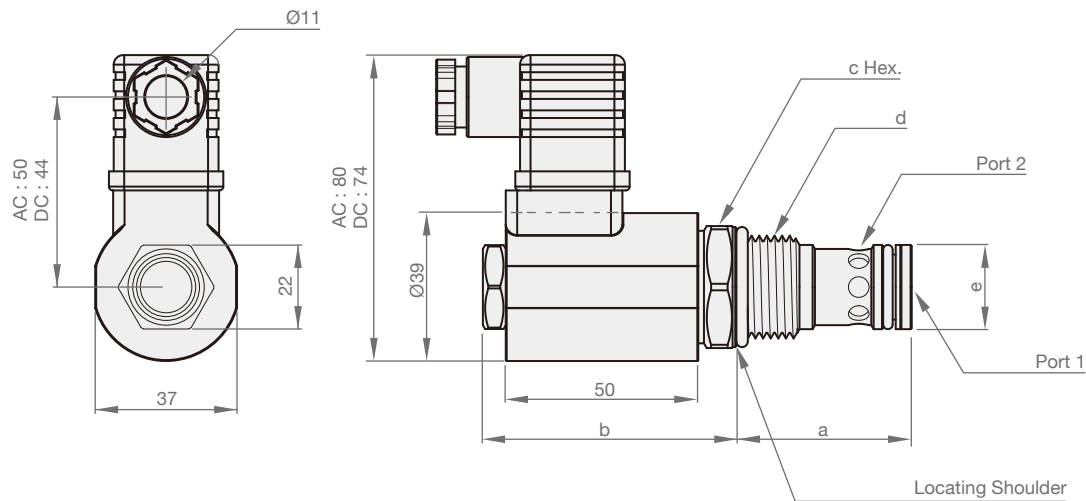
- energized,  
Port 1 → Port 2
- de-energized,  
Port 2 → Port 1

\* 32cSt / 150 ssu oil at 40°C



## DIMENSION

( UNIT : mm )

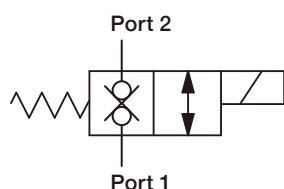


| Model | a  | b  | c    | d             | e    |
|-------|----|----|------|---------------|------|
| HS-2D | 28 | 64 | 22   | 3/4"-16UNF    | 12.7 |
| JS-2D | 32 | 64 | 25.4 | 7/8"-14UNF    | 15.8 |
| LS-2D | 45 | 64 | 32   | 1 1/16"-12UNF | 22.2 |
| PS-2D | 45 | 65 | 38   | 1 5/16"-12UNF | 28.6 |

# HS, JS, LS, PS-2I



## SYMBOLS



## ORDER CODES

**PS** - **2I** - **19** - **D1**

1 2 3 4

|                   |        |         |
|-------------------|--------|---------|
| 1 ▶ Cavity        | HS     | T082    |
|                   | JS     | T102    |
|                   | LS     | T122    |
|                   | PS     | T162    |
| 2 ▶ Type of Valve | 2I     |         |
| 3 ▶ Tube Diameter | 16, 19 |         |
| 4 ▶ Power Source  | A1     | RAC110V |
|                   | A2     | RAC220V |
|                   | D1     | DC12V   |
|                   | D2     | DC24V   |

## MODEL SPEC.

| Model | Cavity | Tube Diameter | Capacity (l/min) | Max. Pressure (bar) | Installation Torque (Nm) | Weight (kg) |
|-------|--------|---------------|------------------|---------------------|--------------------------|-------------|
| HS-2I | T082   | 16            | 28               | 250                 | 39/51                    | 0.41        |
| JS-2I | T102   | 16            | 50               | 250                 | 39/51                    | 0.45        |
| LS-2I | T122   | 16            | 100              | 250                 | 39/51                    | 0.56        |
| PS-2I | T162   | 19            | 150              | 250                 | 39/51                    | 0.67        |

## PERFORMANCE CURVES

### Typical Pressure Drop

#### HS-2I

energized,  
Port 2 ↔ Port 1

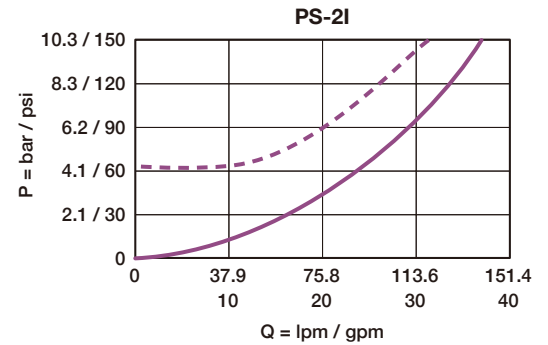
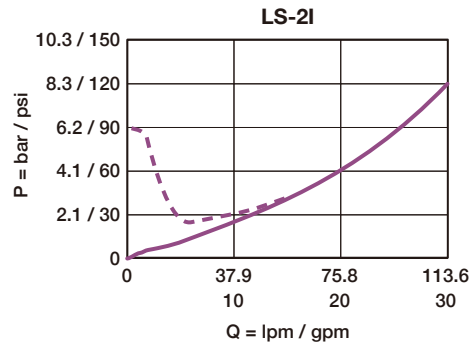
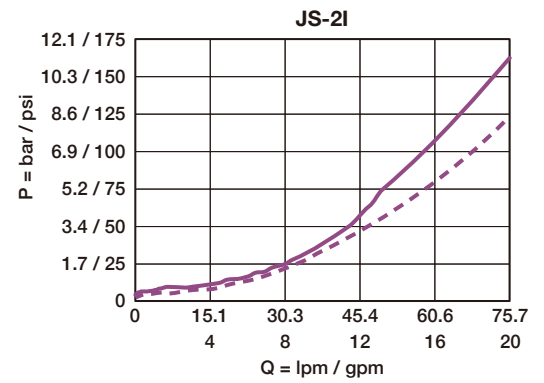
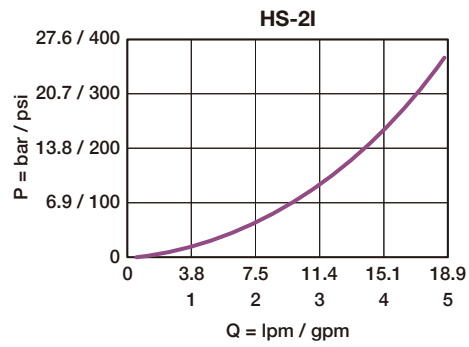
#### JS-2I

energized,  
Port 1 → Port 2  
energized,  
Port 2 → Port 1

#### LS-2I, PS-2I

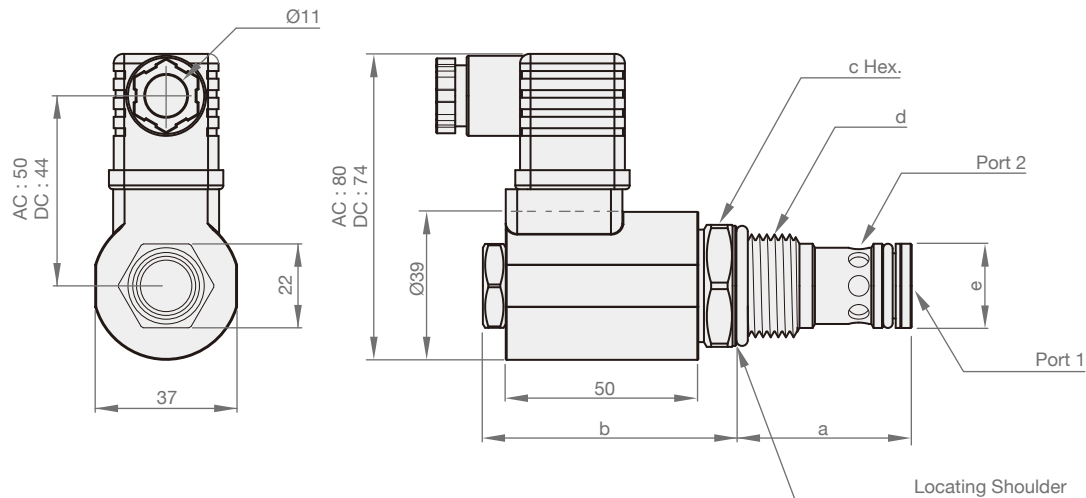
energized,  
Port 1 → Port 2  
de-energized,  
Port 2 → Port 1

\* 32cSt / 150 ssu oil at 40°C



## DIMENSION

( UNIT : mm )

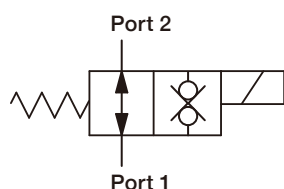


| Model | a  | b  | c    | d             | e    |
|-------|----|----|------|---------------|------|
| HS-2I | 28 | 64 | 22   | 3/4"-16UNF    | 12.7 |
| JS-2I | 32 | 64 | 25.4 | 7/8"-14UNF    | 15.8 |
| LS-2I | 45 | 64 | 32   | 1 1/16"-12UNF | 22.2 |
| PS-2I | 45 | 65 | 38   | 1 5/16"-12UNF | 28.6 |

# HS, JS, LS, PS-2J



## SYMBOLS



## ORDER CODES

**LS** - **2J** - **16** - **D2**

1 2 3 4

|                   |    |         |
|-------------------|----|---------|
| 1 ▶ Cavity        | HS | T082    |
|                   | JS | T102    |
|                   | LS | T122    |
|                   | PS | T162    |
| 2 ▶ Type of Valve | 2J |         |
| 3 ▶ Tube Diameter | 16 |         |
| 4 ▶ Power Source  | A1 | RAC110V |
|                   | A2 | RAC220V |
|                   | D1 | DC12V   |
|                   | D2 | DC24V   |

## MODEL SPEC.

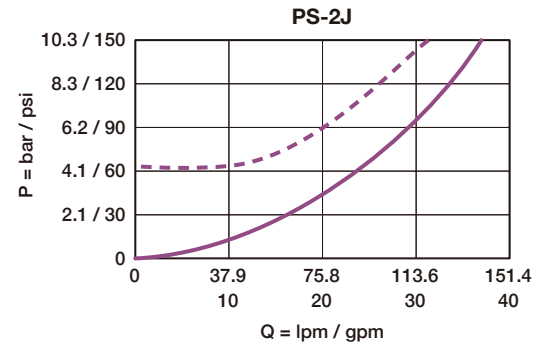
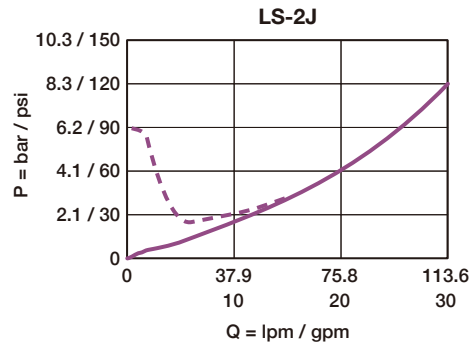
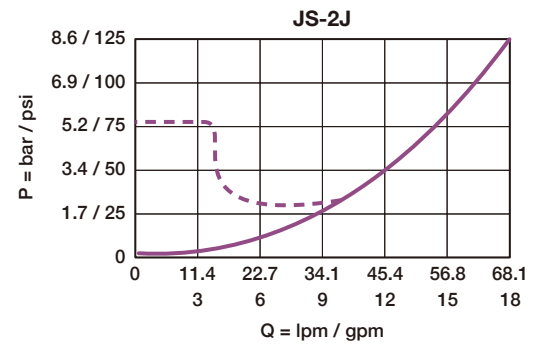
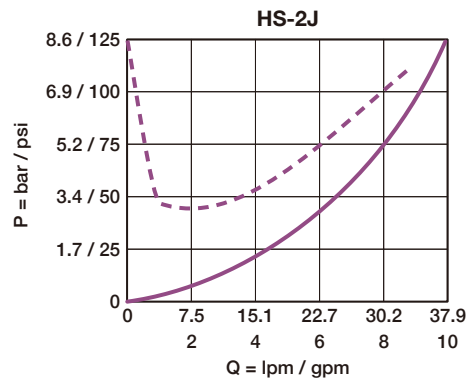
| Model | Cavity | Tube Diameter | Capacity (l/min) | Max. Pressure (bar) | Installation Torque (Nm) | Weight (kg) |
|-------|--------|---------------|------------------|---------------------|--------------------------|-------------|
| HS-2J | T082   | 16            | 28               | 250                 | 39/51                    | 0.41        |
| JS-2J | T102   | 16            | 50               | 250                 | 39/51                    | 0.43        |
| LS-2J | T122   | 16            | 100              | 250                 | 39/51                    | 0.56        |
| PS-2J | T162   | 16            | 150              | 250                 | 39/51                    | 0.67        |

## PERFORMANCE CURVES

### Typical Pressure Drop

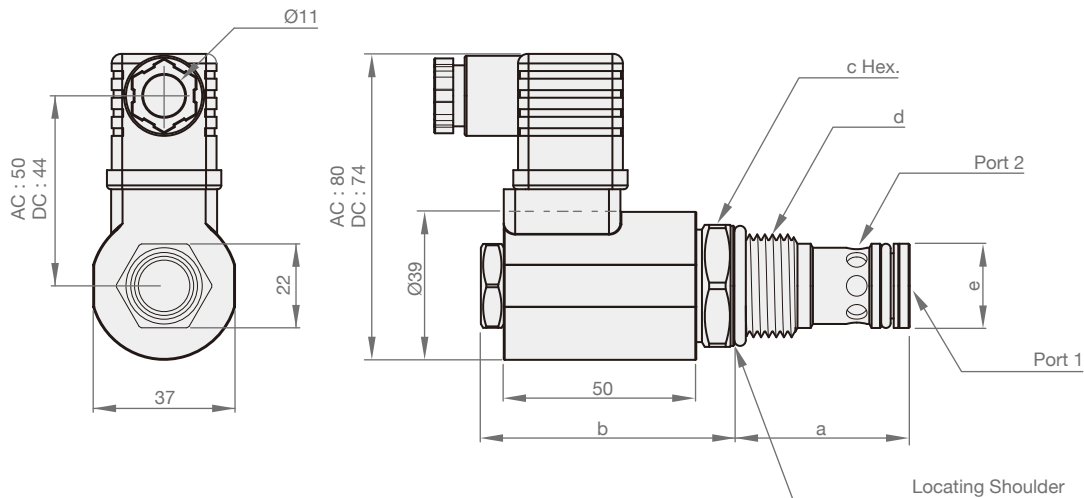
- energized,  
Port 1 → Port 2
- de-energized,  
Port 2 → Port 1

\* 32cSt / 150 ssu oil at 40°C



## DIMENSION

( UNIT : mm )

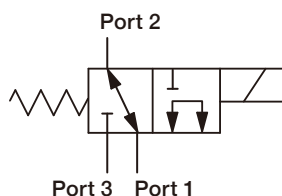


| Model | a  | b  | c    | d             | e    |
|-------|----|----|------|---------------|------|
| HS-2A | 28 | 64 | 22   | 3/4"-16UNF    | 12.7 |
| JS-2A | 32 | 64 | 25.4 | 7/8"-14UNF    | 15.8 |
| LS-2A | 45 | 64 | 32   | 1 1/16"-12UNF | 22.2 |
| PS-2A | 45 | 65 | 38   | 1 5/16"-12UNF | 28.6 |

# HS-3A



## SYMBOLS



## ORDER CODES

**HS** - **3A** - **16** - **D2**

1 2 3 4

|   |               |    |         |
|---|---------------|----|---------|
| 1 | Cavity        | HS | T082    |
|   |               | JS | T102    |
| 2 | Type of Valve | 3A |         |
| 3 | Tube Diameter | 16 |         |
| 4 | Power Source  | A1 | RAC110V |
|   |               | A2 | RAC220V |
|   |               | D1 | DC12V   |
|   |               | D2 | DC24V   |

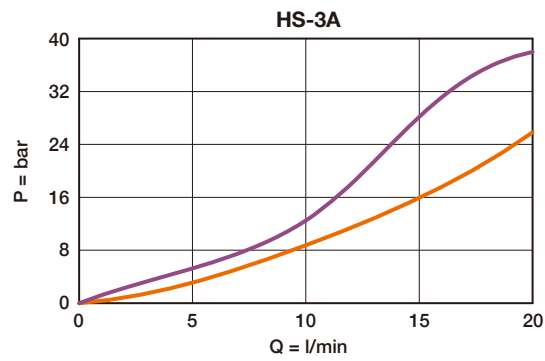
## MODEL SPEC.

| Model | Cavity | Tube Diameter | Capacity (l/min) | Max. Pressure (bar) | Installation Torque (Nm) | Weight (kg) |
|-------|--------|---------------|------------------|---------------------|--------------------------|-------------|
| HS-3A | T082   | 16            | 15               | 250                 | 39/51                    | 0.43        |
| JS-3A | T102   | 16            |                  | 250                 | 39/51                    |             |

## PERFORMANCE CURVES

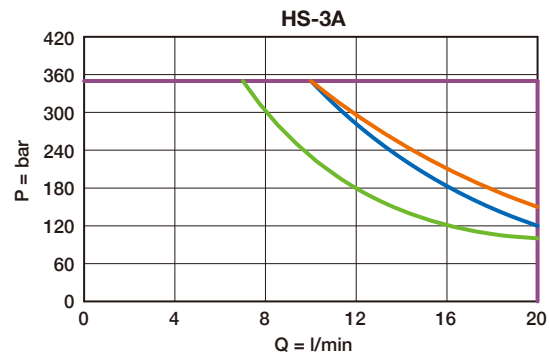
### ► Typical Pressure Drop

- Port 1 → Port 3
- Port 1 → Port 2  
Port 2 → Port 1



### ► Limits of Application

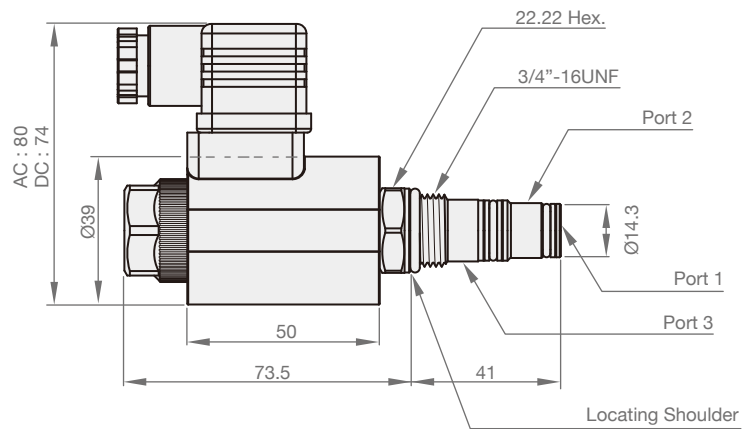
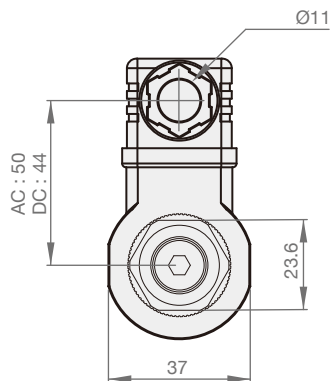
- Port 1 → Port 3
- Port 2 → Port 1
- Port 3 → Port 1
- Port 1 → Port 2



## DIMENSION

( UNIT : mm )

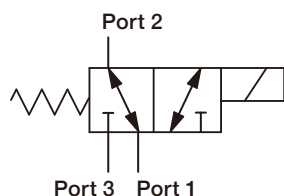
### ► HS-3A



# HS-3X



## SYMBOLS



## ORDER CODES

**HS** - **3X** - **16** - **A2**

1 2 3 4

|   |               |    |         |
|---|---------------|----|---------|
| 1 | Cavity        | HS | T082    |
|   |               | JS | T102    |
| 2 | Type of Valve | 3X |         |
| 3 | Tube Diameter | 16 |         |
| 4 | Power Source  | A1 | RAC110V |
|   |               | A2 | RAC220V |
|   |               | D1 | DC12V   |
|   |               | D2 | DC24V   |

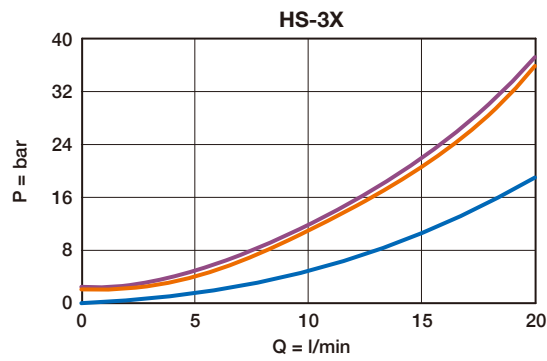
## MODEL SPEC.

| Model | Cavity | Tube Diameter | Capacity (l/min) | Max. Pressure (bar) | Installation Torque (Nm) | Weight (kg) |
|-------|--------|---------------|------------------|---------------------|--------------------------|-------------|
| HS-3X | T082   | 16            | 13               | 207                 | 39/51                    | 0.43        |
| JS-3X | T102   | 16            | 38               | 207                 | 39/51                    | 0.52        |

## PERFORMANCE CURVES

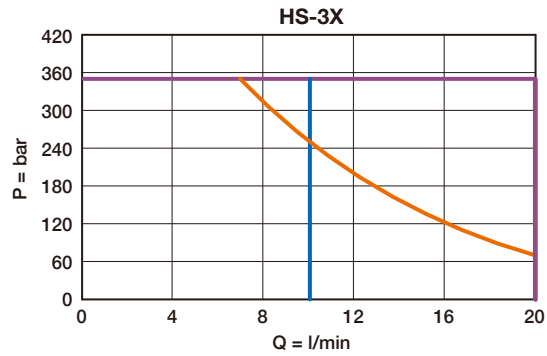
### ► Typical Pressure Drop

- Port 3 → Port 2
- Port 2 → Port 3
- Port 1 → Port 2  
Port 2 → Port 1



### ► Limits of Application

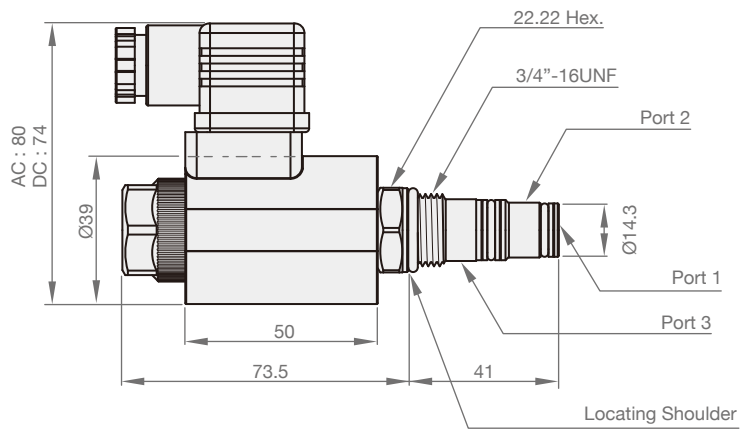
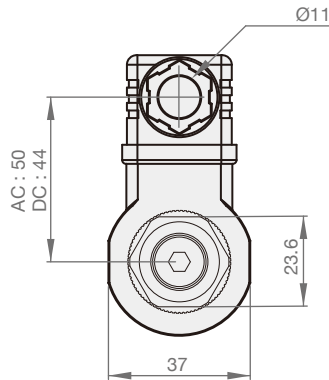
- Port 2 → Port 3  
Port 3 → Port 2
- Port 1 → Port 2
- Port 2 → Port 1



## DIMENSION

( UNIT : mm )

### ► HS-3X

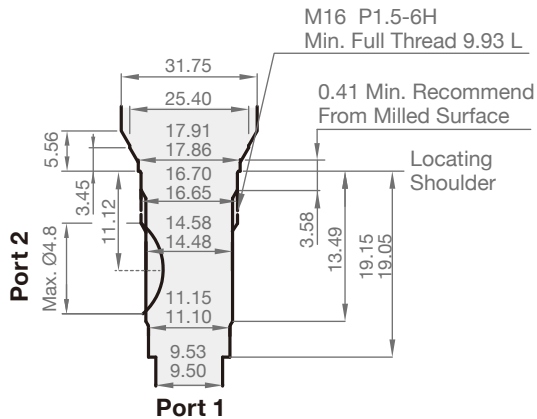


# Cavities Tooling

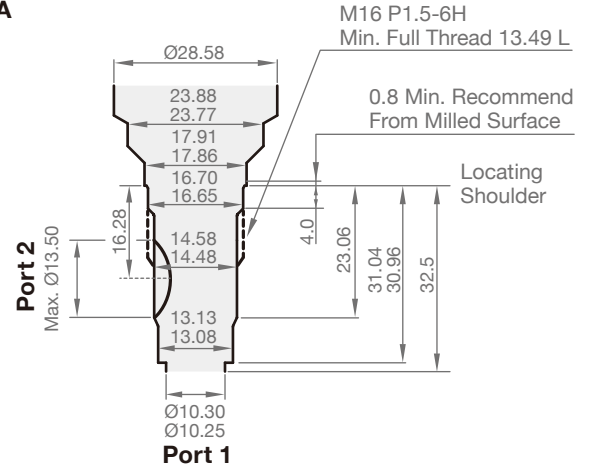
## 2 Port Cavities Tooling

( UNIT : mm )

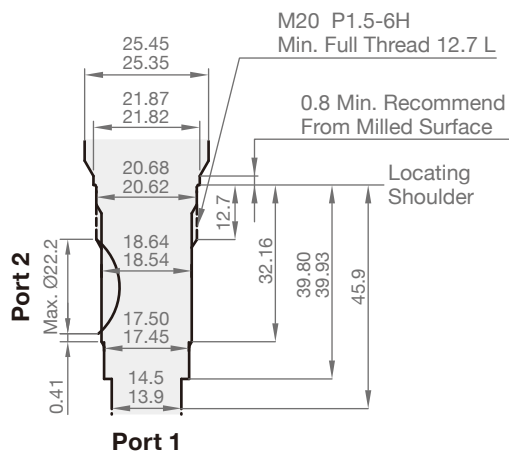
### ► T8A



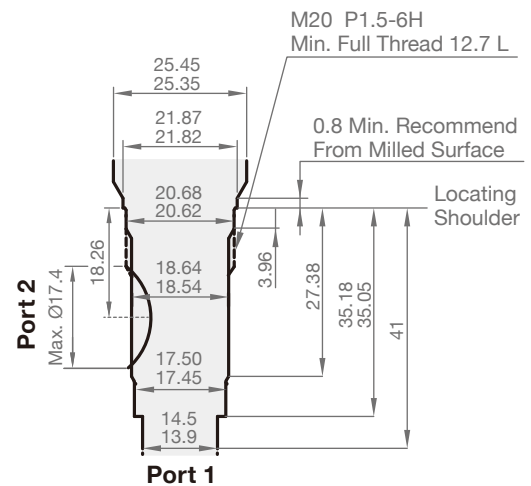
### ► T162A



### ► T10A

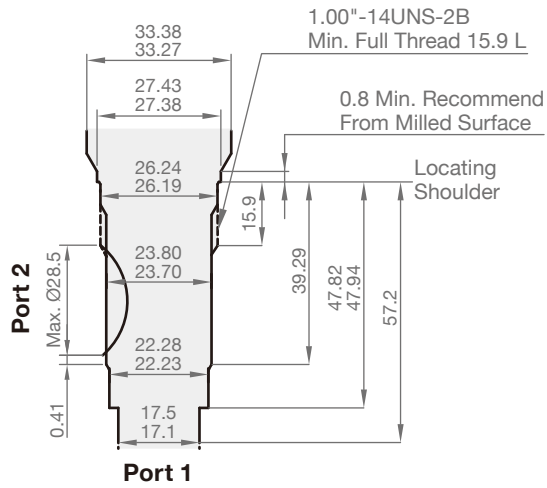


### ► T13A

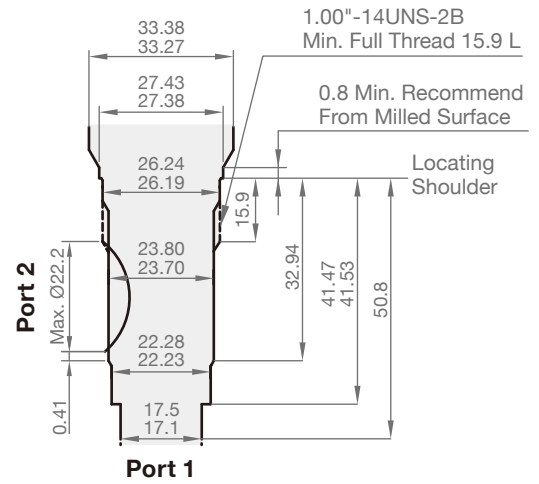


| Size | Cavity     |
|------|------------|
| 01   | T8A, T162A |
| 02   | T10A, T13A |
| 03   | T3A, T5A   |
| 06   | T16A       |
| 08   | T18A       |

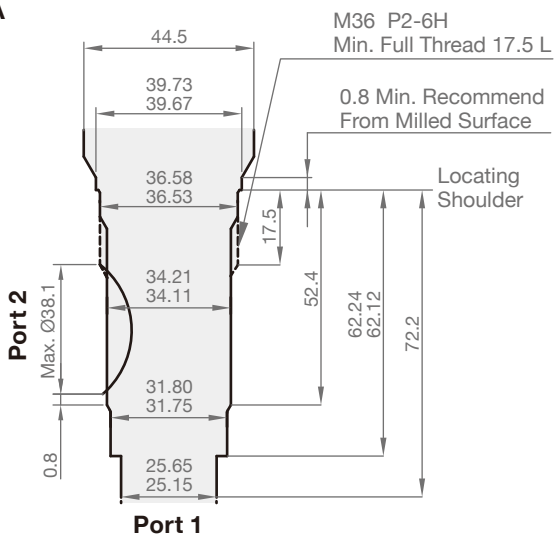
## ► T3A



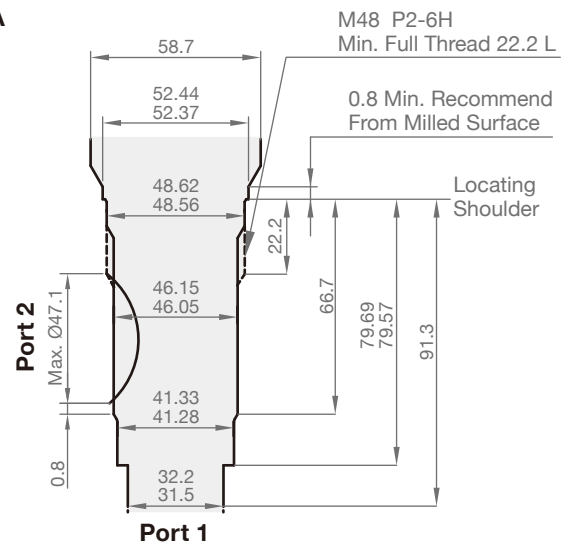
## ► T5A



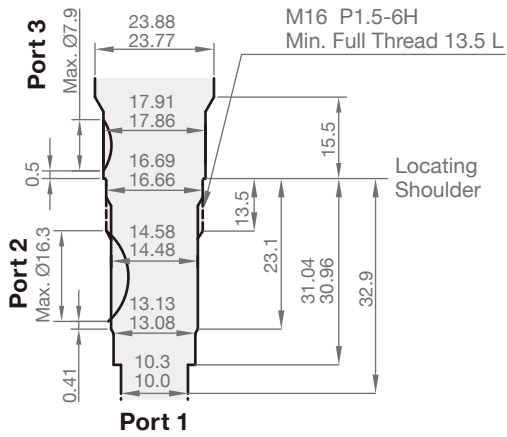
## ► T16A



## ► T18A

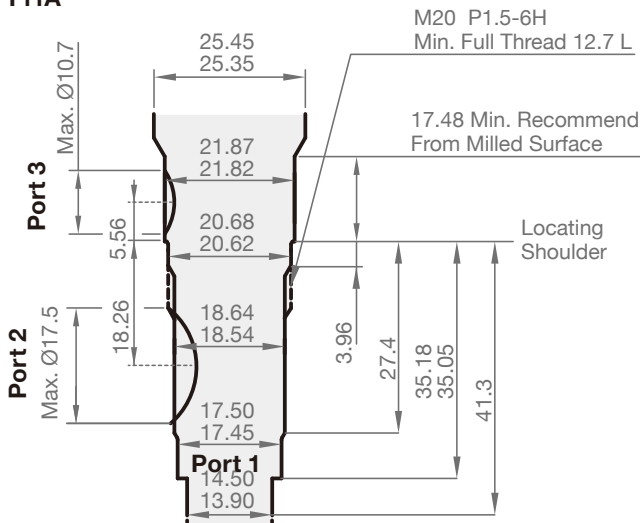


### ► T163A

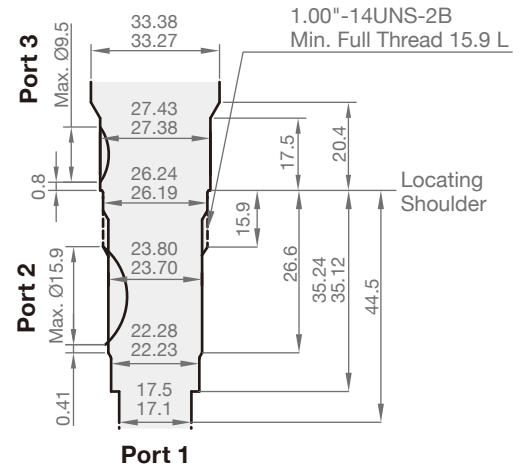


| Size | Cavity |
|------|--------|
| 01   | T163A  |
| 02   | T11A   |
| 03   | T2A    |
| 06   | T17A   |
| 08   | T19A   |

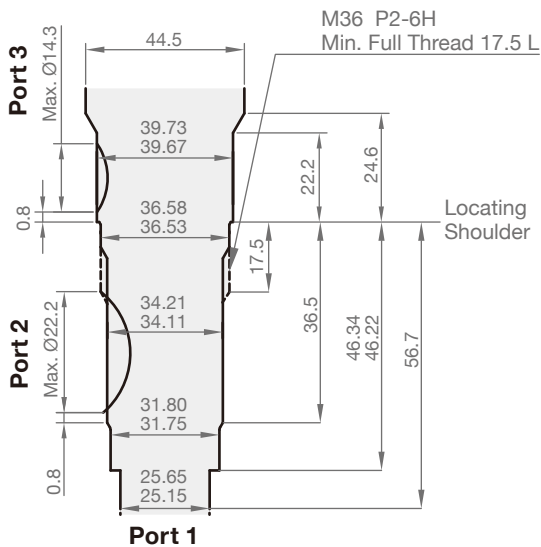
### ► T11A



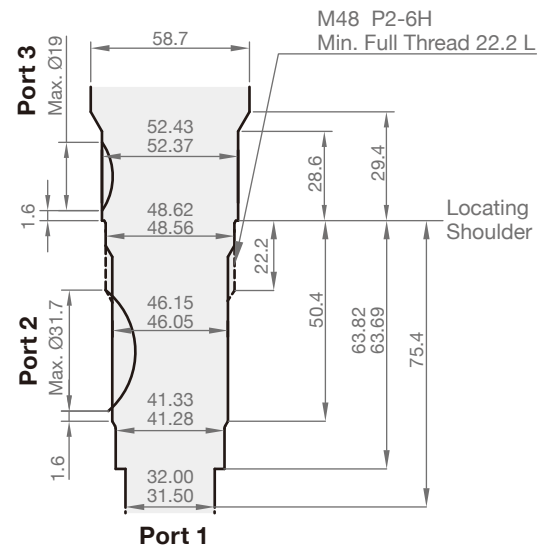
### ► T2A



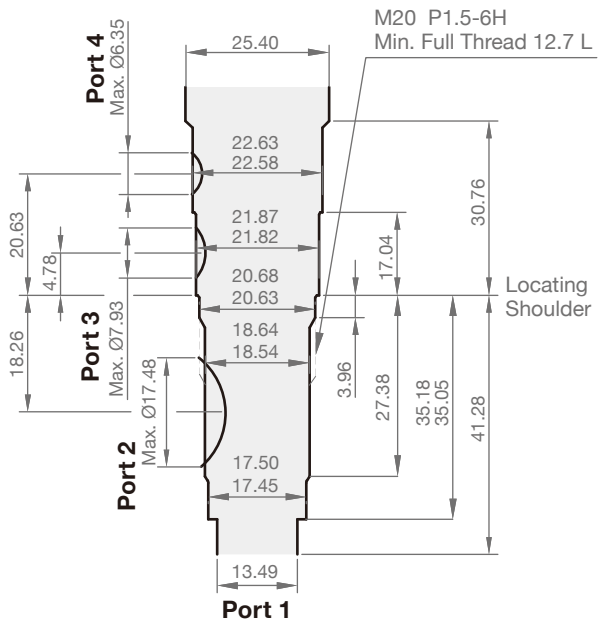
### ► T17A



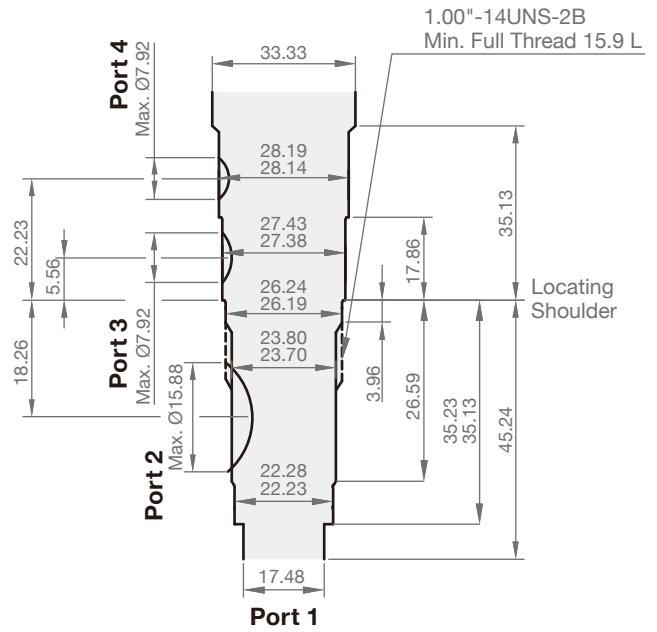
### ► T19A



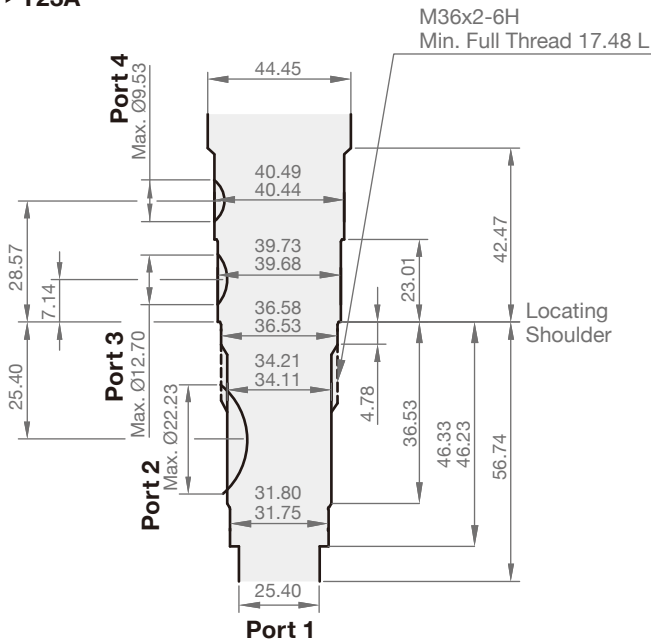
## ► T21A



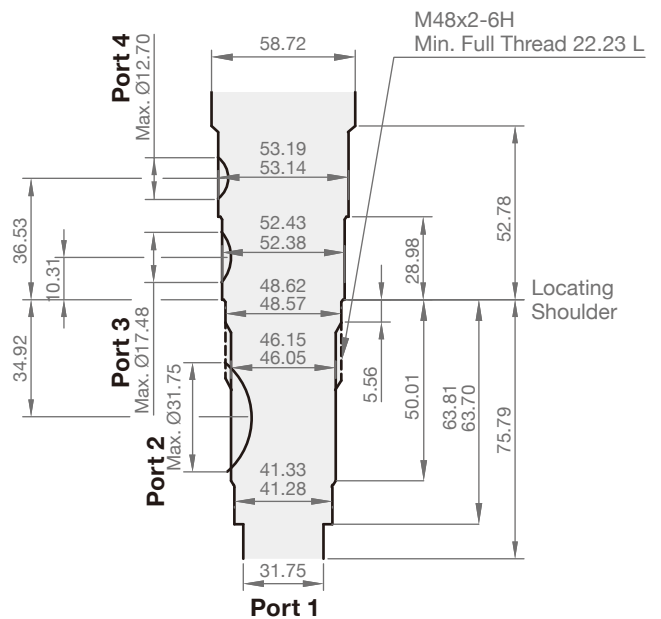
## ► T22A



## ► T23A



## ► T24A

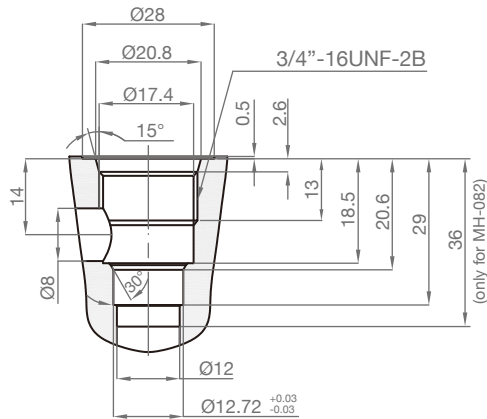


# Cavities Tooling ( SAE Cavity )

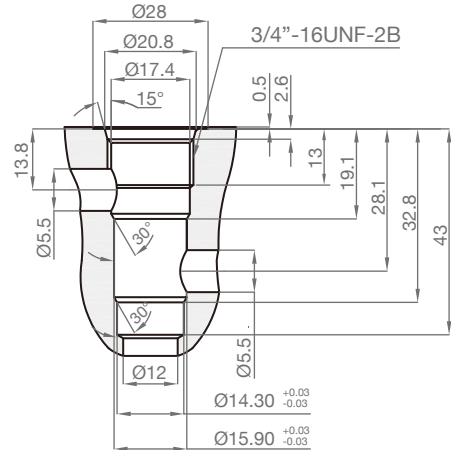
## DIMENSION

( UNIT : mm )

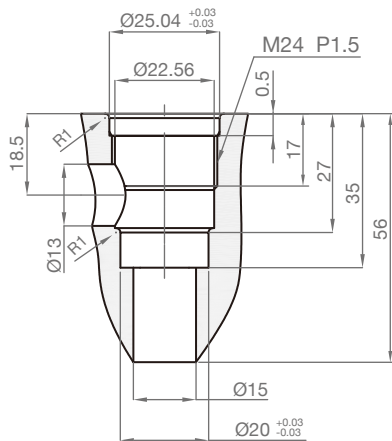
► T82



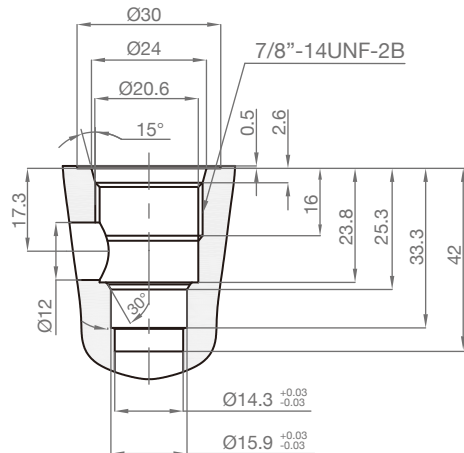
► T83



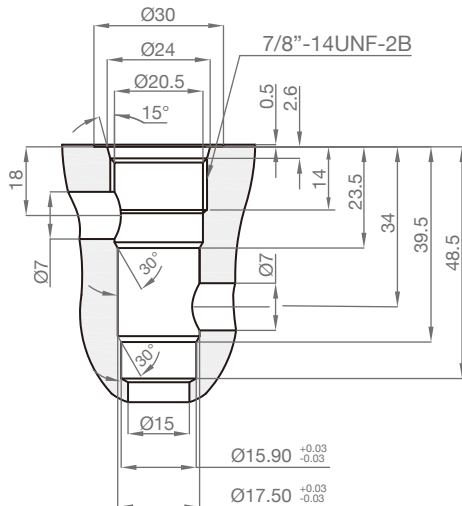
► T092



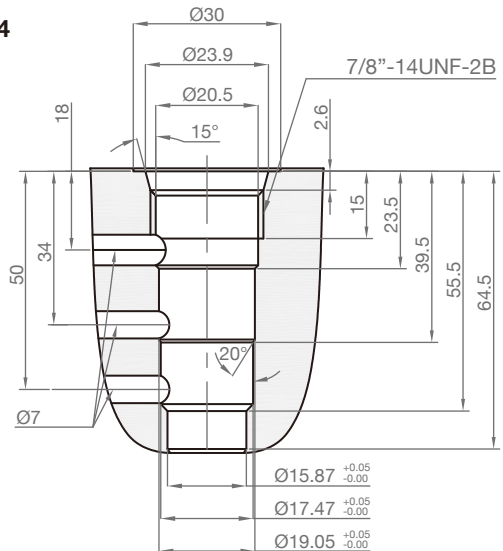
► T102



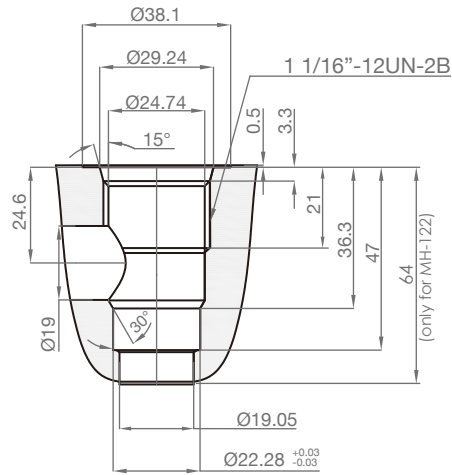
► T103



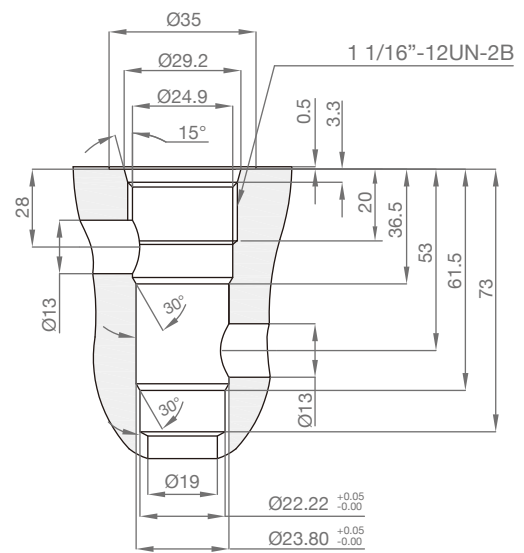
► T104



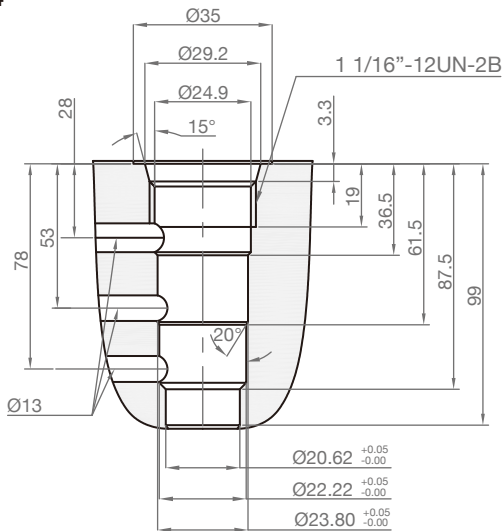
► T122



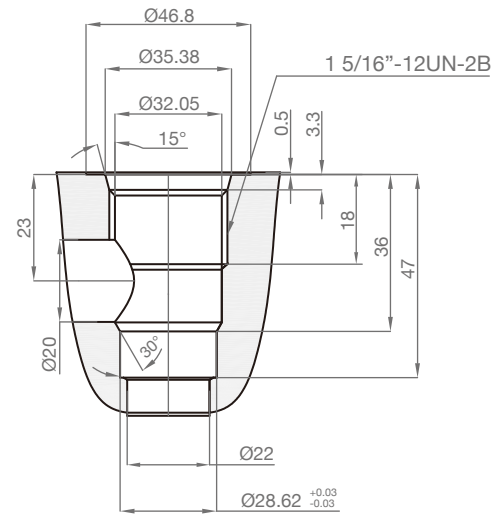
► T123



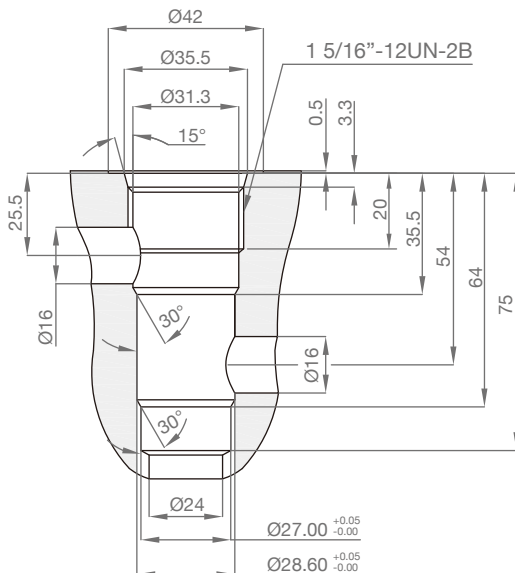
► T124



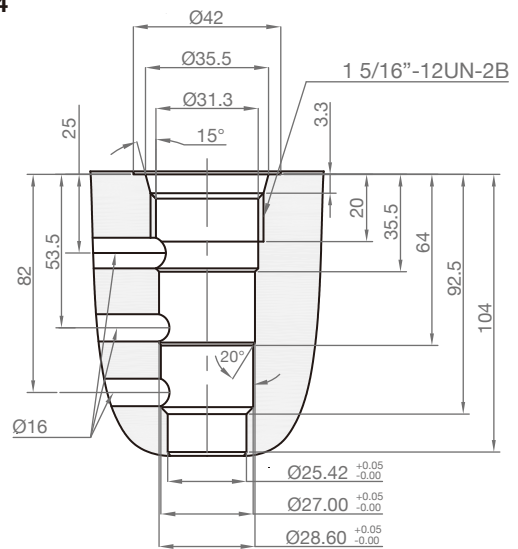
► T162



► T163



► T164



# Steed Machinery Co., Ltd.

No. 28, Ruiguang St., South Dist.,  
Taichung City 402006,  
Taiwan  
Tel : +886-4-2285-4867  
Fax : +886-4-2285-2848  
Email : [info@steedmachinery.com.tw](mailto:info@steedmachinery.com.tw)

more information  
[www.steedmachinery.com.tw](http://www.steedmachinery.com.tw)

