

**DPF-TS/S SERIES****ELECTRONIC  
EXPANSION VALVE**

TS/S series electronic expansion valves are designed for use in air conditioning and refrigeration systems or in heat pumps. The valve controls the automatic adjustment of refrigerant flow rate and makes the system work under optimized conditions for the purpose of fast cooling or heating, precise temperature control and energy saving. The valve can also be used e.g. for suction line pressure controls. These valves provide bidirectional operation to control the refrigerant flow rate in heating or cooling mode.

**FEATURES**

- APPLICABLE FOR REVERSIBLE SYSTEMS: BIDIRECTIONAL FLOW
- SMALLER INSTALLATION SPACE: LOW HEIGHT, SMALL VOLUME, LIGHT WEIGHT
- OPTIMIZED FLOW PATH DESIGN FOR NOISE REDUCTION
- FAST OPERATION, ENERGY SAVING

**GENERAL SPECIFICATIONS**

- Applicable for all common HFC, HFO refrigerants such as: R134a, R404A, R407A/F, R407C, R410A, R448A, R449A, R450A, R452A, R513A, R507A  
And also for flammable refrigerants like R32, R290, R1234ze(E), R1234yf
- Cooling capacity: 2 to 121 kW (for R410A)
- 500 steps (full stroke);  $32 \pm 20$  opening steps
- Medium temperature TS min./max.:  $-40^{\circ}\text{C}$  /  $+85^{\circ}\text{C}$  (duty cycle rate below 50%)
- Ambient temperature min./max.:  $-30^{\circ}\text{C}$  /  $+60^{\circ}\text{C}$  (duty cycle rate below 50%)
- Relative humidity: 0 to 95% RH
- Certifications: UL/CSA and declaration according to LVD or PED
- Suitable with the EN 60335-2-24 / 2-40 / 2-89



## ELECTRICAL PARAMETERS

- Rated voltage: 12V DC( $\pm 10\%$ ), rectangular wave
- Actuating mode: 4-phase 8-step permanent magnet stepping motor of direct-acting type
- Excitation mode: 1 ~ 2 phase excitation, unipolar actuation
- Excitation rate:
  - Seat  $\varnothing 1,3$  to 3,2 mm: 30 to 90pps
  - Seat  $\varnothing 4,0$  to 6,5 mm: 30 to 40pps
- Activation of self-holding mechanism: Maintain excitation in stop position min. 0,1~1,0 sec.
- Min. motion time from completely open to completely closed:
  - Seat  $\varnothing 1,0$  to 3,2 mm: 6s @ 90pps
  - Seat  $\varnothing 4,0$  to 6,5 mm: 13s @ 40pps
- Coil current:
  - Seat  $\varnothing 1,0$  to 3,2 mm: 260mA/phase (20°C)
  - Seat  $\varnothing 4,0$  to 6,5 mm: 375mA/phase (20°C)
- Coil resistance:
  - Seat  $\varnothing 1,0$  to 3,2 mm:  $46 \pm 3.7 \Omega$ /phase (20°C)
  - Seat  $\varnothing 4,0$  to 6,5 mm:  $32 \pm 3.2 \Omega$ /phase (20°C)
- Insulation class of coil: E
- Protection class: IP 67
- Compatible with Sanhua controller SEC series

## GENERAL CHARACTERISTICS

| Valve Model      | Part Number <sup>1)</sup> | Design Type | Seat $\Phi$ (mm) | Kv (m <sup>3</sup> /h) | MOP <sup>2)</sup> [Bar] | MOPD Direct <sup>3)</sup> [Bar] | MOPD Rev. <sup>4)</sup> [Bar] |
|------------------|---------------------------|-------------|------------------|------------------------|-------------------------|---------------------------------|-------------------------------|
| DPF(TS1)1.0C-15  | 10130391602               | n           | 1,0              | 0,03                   | 49                      | 35                              | $\geq 25$                     |
| DPF(TS1)1.0C-16  | 10130390002               | L           | 1.0              | 0,03                   |                         |                                 |                               |
| DPF(TS1)1.3C-21  | 10130389302               | n           | 1,3              | 0,05                   |                         |                                 |                               |
| DPF(TS1)1.3C-22  | 10130392002               | L           | 1,3              | 0,05                   |                         |                                 |                               |
| DPF(TS1)1.65C-36 | 10130391702               | n           | 1,65             | 0,08                   |                         |                                 |                               |
| DPF(TS1)1.65C-38 | 10130395102               | L           | 1,65             | 0,08                   |                         |                                 |                               |
| DPF(TS1)1.8C-69  | 10130391802               | n           | 1,8              | 0,1                    |                         |                                 |                               |
| DPF(TS1)1.8C-68  | 10130390402               | L           | 1,8              | 0,1                    |                         |                                 |                               |
| DPF(TS1)2.0C-33  | 10130392402               | n           | 2                | 0,16                   |                         |                                 |                               |
| DPF(TS1)2.0C-40  | 10130409402               | L           | 2                | 0,16                   |                         |                                 |                               |
| DPF(TS1)2.2C-24  | 10130392702               | n           | 2,2              | 0,2                    |                         |                                 |                               |
| DPF(TS1)2.2C-38  | 10130425202               | L           | 2,2              | 0,2                    |                         |                                 |                               |
| DPF(TS1)2.4C-40  | 10130392602               | n           | 2,4              | 0,23                   |                         |                                 |                               |
| DPF(TS1)2.4C-41  | 10130404802               | L           | 2,4              | 0,23                   |                         |                                 |                               |
| DPF(TS1)3.0C-29  | 10130389902               | L           | 3                | 0,39                   |                         |                                 | $\geq 15$                     |
| DPF(TS1)3.2C-30  | 10130389502               | L           | 3,2              | 0,43                   |                         |                                 |                               |
| DPF(S03)4.0C-01  | 10130355702               | L           | 4                | 0,5                    |                         | 30                              | $\geq 7$                      |
| DPF(S03)4.5C-01  | 10130035502               | L           | 4,5              | 0,7                    |                         |                                 |                               |
| DPF(S03)5.5C-01  | 10130355802               | L           | 5,5              | 0,9                    |                         |                                 |                               |
| DPF(S03)6.5C-02  | 10130355902               | L           | 6,5              | 1,1                    |                         |                                 |                               |

- Note:**
- 1) Coil is separated
  - 2) MOP = Maximum Operating Pressure
  - 3) MOPD Direct = Maximum Operating Pressure Difference in Direct flow direction
  - 4) MOPD Rev = Maximum Operating Pressure Difference in Reversible flow direction



| Valve Model                          | Max Cooling Capacity<br>@ 5°C/38°C/5K/5K<br>[kW] |       |       |                |       |       |       |       |         |         |       |       |       |
|--------------------------------------|--------------------------------------------------|-------|-------|----------------|-------|-------|-------|-------|---------|---------|-------|-------|-------|
|                                      | R134a                                            | R513A | R407C | R404A<br>R507A | R410A | R452A | R32   | R290  | R1234yf | R1234ze | R454B | R454C | R455A |
| DPF(TS1)1.0C-15<br>DPF(TS1)1.0C-16   | 3.1                                              | 2.7   | 4.3   | 2.9            | 4.8   | 3.1   | 7.0   | 4.2   | 2.3     | 2.5     | 5.5   | 3.6   | 4.0   |
| DPF(TS1)1.3C-21<br>DPF(TS1)1.3C-22   | 4,5                                              | 3.8   | 6.2   | 4.2            | 6,9   | 4.5   | 9.9   | 5.8   | 3.2     | 3.4     | 7.6   | 5.0   | 5.5   |
| DPF(TS1)1.65C-36<br>DPF(TS1)1.65C-38 | 7.6                                              | 6.4   | 10.4  | 7.1            | 11.6  | 7.6   | 16.7  | 10.0  | 5.6     | 5.9     | 13.1  | 8.6   | 9.5   |
| DPF(TS1)1.8C-69<br>DPF(TS1)1.8C-68   | 9                                                | 7.7   | 12.4  | 8.5            | 13.8  | 9.1   | 19.9  | 12.0  | 6.6     | 7.1     | 15.7  | 10.3  | 11.4  |
| DPF(TS1)2.0C-33<br>DPF(TS1)2.0C-40   | 11.1                                             | 9.5   | 15.3  | 10.5           | 17.1  | 11.2  | 24.6  | 14.9  | 8.2     | 8.8     | 19.5  | 12.8  | 14.1  |
| DPF(TS1)2.2C-24<br>DPF(TS1)2.2C-38   | 12                                               | 10.2  | 16.4  | 11.3           | 18.3  | 12    | 26.4  | 16.0  | 8.9     | 9.4     | 21.0  | 13.8  | 15.2  |
| DPF(TS1)2.4C-40<br>DPF(TS1)2.4C-41   | 14.1                                             | 12    | 19.4  | 13.3           | 21.6  | 14.2  | 31.1  | 18.8  | 10.4    | 11.1    | 24.6  | 16.2  | 17.8  |
| DPF(TS1)3.0C-29                      | 23.3                                             | 19.8  | 32.1  | 22             | 35.8  | 23.5  | 51.5  | 31.4  | 17.4    | 18.5    | 41.1  | 27.0  | 29.8  |
| DPF(TS1)3.2C-30                      | 25,7                                             | 21.8  | 35,3  | 24.2           | 39.4  | 25.9  | 56.8  | 34.4  | 19.0    | 20.2    | 45.0  | 29.5  | 32.5  |
| DPF(S03)4.0C-01                      | 42.8                                             | 36.3  | 58.8  | 40.3           | 65.5  | 43.1  | 94.4  | 57.2  | 31.6    | 33.7    | 74.9  | 49.2  | 54.2  |
| DPF(S03)4.5C-01                      | 57.2                                             | 48.6  | 78.7  | 63.9           | 67.7  | 57.6  | 126.3 | 77.1  | 42.6    | 45.4    | 100.9 | 66.3  | 73.1  |
| DPF(S03)5.5C-01                      | 66.2                                             | 56.3  | 91    | 62.4           | 101.5 | 66.7  | 146.2 | 88.6  | 49.0    | 52.2    | 116.0 | 76.2  | 84.0  |
| DPF(S03)6.5C-02                      | 80,5                                             | 68.5  | 110.7 | 75,9           | 123.4 | 81.1  | 177.9 | 108.4 | 59.9    | 63.8    | 141.9 | 93.2  | 102.7 |

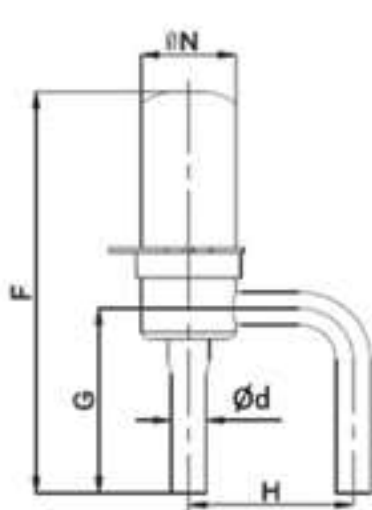
For others running points or others refrigerants, please contact your local support or download our selection software – Quick Finder with the link : <http://www.SanhuaSelector.com>

## FLOW CHARACTERISTIC

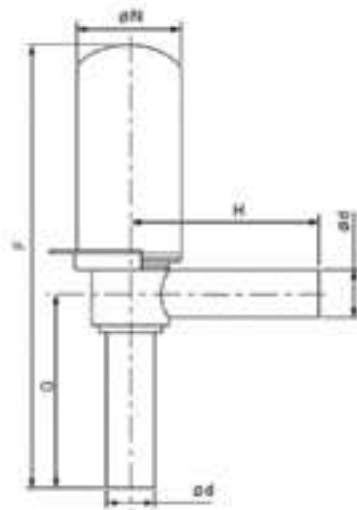




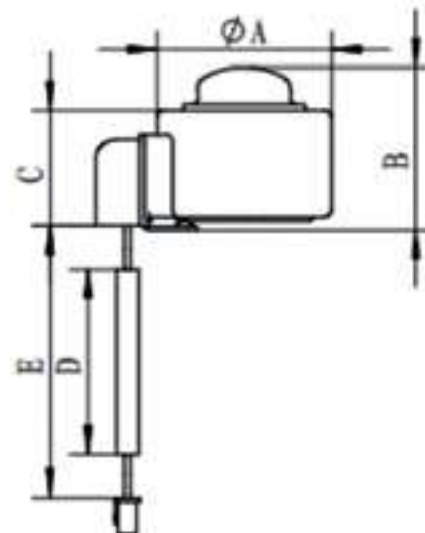
**DIMENSIONS**



DPF 1.0 ~ 2.4 n Design



DPF 3.0 ~ 6.5 L Design



| Valve Model          | Dimensions [mm] |      |      |       |       | Weight [kg] |
|----------------------|-----------------|------|------|-------|-------|-------------|
|                      | F               | G    | H    | Ød    | ØN    |             |
| DPF 1.0~2.4 n Design | 77              | 36   | 30   | 6.35  | 17.35 | 0.04        |
| DPF 1.0~2.4 L Design | 77              | 36   | 36   | 6.35  | 17.35 | 0.04        |
| DPF 3.0~3.2          | 85              | 43   | 53   | 7.94  | 17.35 | 0.05        |
| DPF 4.0~6.5          | 148             | 64.7 | 63.4 | 15.88 | 35.3  | 0.26        |

| Coil Model       | Product Number | Valve Model | Dimensions [mm] |      |      |      |      | Terminal | Weight [kg] |
|------------------|----------------|-------------|-----------------|------|------|------|------|----------|-------------|
|                  |                |             | ØA              | B    | C    | E    | D    |          |             |
| PQ-M10012-001059 | 10810138802    | DPF 1.0~3.2 | 38.5            | 35.8 | 25.6 | 700  | 600  | XHP-5    | 0.12        |
| PQ-M10012-001016 | 10810134602    |             | 38.5            | 35.8 | 25.6 | 1500 | 1400 | XHP-5    |             |
| PQ-M10012-001002 | 10810130702    |             | 38.5            | 35.8 | 25.6 | 2000 | 1800 | XHP-5    |             |
| PQ-M10012-001268 | 10810160602    |             | 38.5            | 35.8 | 25.6 | 5000 | 4500 | XHP-5    |             |
| PQ-M03012-001004 | 10810141302    | DPF 4.0~6.5 | 67.5            | 74.4 | 33.3 | 2000 | 1900 | XHP-5    | 0.5         |
| PQ-M03012-001041 | 10810171302    |             | 67.5            | 74.4 | 33.3 | 5000 | 4500 | XHP-5    | 0.6         |