



# Check valve

## NRV / NRVH

Version 2

## Description

NRV and NRVH piston type check valves are designed for installation in commercial refrigerating systems and in residential or industrial air conditioning plants. They are used to control the unidirectional flow of refrigerant so as to prevent backflow.

## Features & benefits

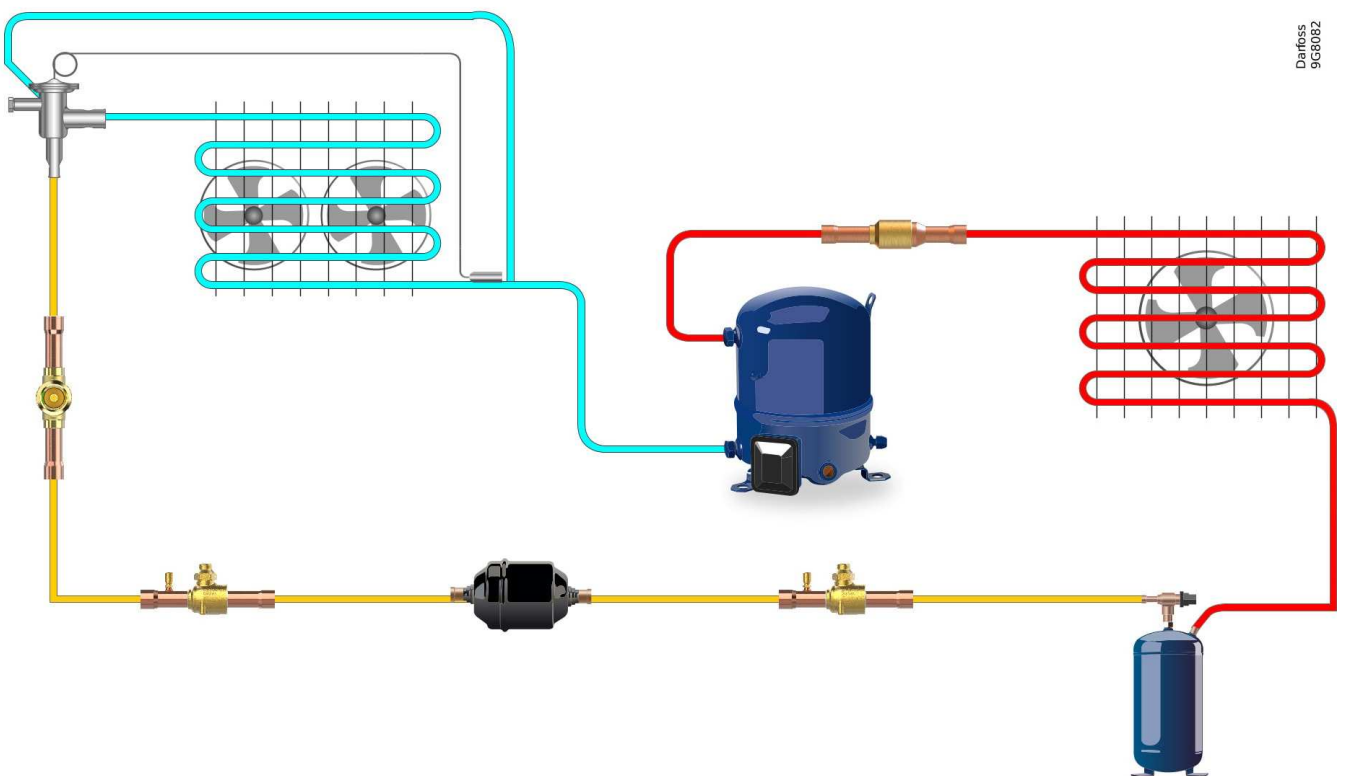
- Available in both straightway and angleway versions which is easy to connect
- Hermetic tight design for solder versions with low risk of external leakage
- Built-in damping piston that makes the valves suitable for installation in lines where pulsation can occur, e.g. in the discharge line from the compressor
- NRVH type check valve is with stronger spring and it's recommended to use for compressors in parallel (i.e. power packs) where higher level of pulsation and vibration are expected
- Low pressure drop during operation
- Oversize connections provide flexibility in use

## Applications

Typical applications for NRV and NRVH valves are:

- Cold room
- Heat pump
- VRF
- Chiller

**Figure: Application Diagram**



## Ordering

### Product code numbers

NRV/NRVH code numbers described in this data sheet are standard code numbers, i.e. made to stock. Besides code numbers made to stock NRV/NRVH is also made to order. Make to order options include:

- Mechanical connection type
- Mechanical connection size

Multipack contains several items, individually packed, so that customers can purchase 1 item and receive all relevant documentation.

Industrial pack contains several items that are not individually packed. Industrial packs cannot be broken down, and will only contain documentation on pack level, not on item level.

### Straightway flare version without flare nut



**Table: Straightway flare version without flare nut**

| Valve type | SAE flare ext. x ext. | Min. OPD $\Delta p$ <sup>(1)</sup> |       | $K_v$ <sup>(2)</sup> | $C_v$ <sup>(2)</sup> | Max. working pressure: PS/MWP | Media temperature range        | PED category [Fluid Group 1] | PED category [Fluid Group 2] | Multi pack |          | Industrial pack |          |
|------------|-----------------------|------------------------------------|-------|----------------------|----------------------|-------------------------------|--------------------------------|------------------------------|------------------------------|------------|----------|-----------------|----------|
|            | [in]                  | [bar]                              | [psi] | [m <sup>3</sup> /h]  | [gal/min]            |                               |                                |                              |                              | Code no.   | Qty/pack | Code no.        | Qty/pack |
| NRV 6      | ¼                     | 0.07                               | 1.01  | 0.56                 | 0.65                 | 46 bar /<br>667 psig          | -50 – 140 °C /<br>-58 – 285 °F | Art. 4.3                     | Art. 4.3                     | 0201040    | 25       | 0200138         | 140      |
| NRV 10     | ¾                     | 0.07                               | 1.01  | 1.2                  | 1.39                 |                               |                                |                              |                              | 0201041    | 25       | –               | –        |
| NRV 12     | ½                     | 0.05                               | 0.72  | 2.05                 | 2.37                 |                               |                                |                              |                              | 0201042    | 25       | –               | –        |
| NRV 16     | ¾                     | 0.05                               | 0.72  | 3.6                  | 4.16                 |                               |                                |                              |                              | 0201043    | 25       | –               | –        |
| NRV 19     | ¾                     | 0.05                               | 0.72  | 5.5                  | 6.36                 |                               |                                |                              |                              | 0201044    | 24       | –               | –        |

<sup>(1)</sup>  $\Delta p$  = Minimum Opening Pressure Differential

<sup>(2)</sup> The  $K_v/C_v$  is the flow of water in [m<sup>3</sup>/h – gal/min] at a pressure drop across valve of 1 bar / 14.5 psig,  $\rho = 1000 \text{ kg/m}^3 / 62.4 \text{ lb/ft}^3$

## Angleway solder ODF version, PS = 46 bar

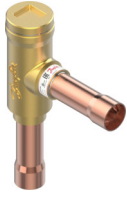


Table: Angleway solder ODF version, PS = 46 bar

| Valve type              | Connection solder ODF x ODF |      | Min. OPD $\Delta p$ <sup>(2)</sup> |       | $K_v$ <sup>(3)</sup><br>[m <sup>3</sup> /h] | $C_v$ <sup>(3)</sup><br>[gal/min] | Max. working pressure: PS/MWP | Media temperature range     | PED category [Fluid Group 1] | PED category [Fluid Group 2] | Multi pack |          | Industrial pack |          |   |         |    |
|-------------------------|-----------------------------|------|------------------------------------|-------|---|-----------------------------------|-------------------------------|-----------------------------|------------------------------|------------------------------|------------|----------|-----------------|----------|---|---------|----|
|                         | [in]                        | [mm] | [bar]                              | [psi] |   |                                   |                               |                             |                              |                              | Code no.   | Qty/pack | Code no.        | Qty/pack |   |         |    |
| NRV 22s                 | 3/8                         | 22   | 0.04                               | 0.58  | 8.5   | 9.83                              | 46 bar / 667 psig             | -50 – 140 °C / -58 – 285 °F | Art. 4.3                     | Art. 4.3                     | 0201020    | 18       | 0201152         | 12       |   |         |    |
| NRVH 22s                | 3/8                         | 22   | 0.30                               | 4.35  | 8.5   | 9.83                              |                               |                             |                              |                              | 0201032    | 18       | 0200129         | 12       |   |         |    |
| NRV 22s <sup>(1)</sup>  | 1 1/8                       | –    | 0.04                               | 0.58  | 8.5   | 9.83                              |                               |                             |                              |                              | 0201060    | 18       | –               | –        |   |         |    |
|                         | –                           | 28   | 0.04                               | 0.58  | 8.5   | 9.83                              |                               |                             |                              |                              | 0201055    | 18       | –               | –        |   |         |    |
| NRVH 22s <sup>(1)</sup> | 1 1/8                       | –    | 0.30                               | 4.35  | 8.5   | 9.83                              |                               |                             |                              |                              | 0201072    | 18       | –               | –        |   |         |    |
|                         | –                           | 28   | 0.30                               | 4.35  | 8.5   | 9.83                              |                               |                             |                              |                              | 0201067    | 18       | –               | –        |   |         |    |
| NRV 28s                 | 1 1/8                       | –    | 0.04                               | 0.58  | 16.5  | 19.07                             |                               |                             |                              |                              | 0201021    | 6        | 0200126         | 12       |   |         |    |
|                         | –                           | 28   | 0.04                               | 0.58  | 16.5  | 19.07                             |                               |                             |                              |                              | 0201025    | 6        | 0201153         | 12       |   |         |    |
| NRVH 28s                | 1 1/8                       | –    | 0.30                               | 4.35  | 16.5  | 19.07                             |                               |                             |                              |                              | 0201029    | 6        | –               | –        |   |         |    |
|                         | –                           | 28   | 0.30                               | 4.35  | 16.5  | 19.07                             |                               |                             |                              |                              | 0201033    | 6        | 0200131         | 12       |   |         |    |
| NRV 28s <sup>(1)</sup>  | 1 3/8                       | 35   | 0.04                               | 0.58  | 16.5  | 19.07                             |                               |                             |                              |                              | 0201056    | 6        | –               | –        |   |         |    |
| NRVH 28s <sup>(1)</sup> | 1 3/8                       | 35   | 0.30                               | 4.35  | 16.5  | 19.07                             |                               |                             |                              |                              | 0201068    | 6        | –               | –        |   |         |    |
| NRV 35s                 | 1 3/8                       | 35   | 0.04                               | 0.58  | 29  | 33.52                             |                               |                             |                              |                              | –          | –        | Cat. 1          | 0201026  | 6 | 0201154 | 12 |
| NRVH 35s                | 1 3/8                       | 35   | 0.30                               | 4.35  | 29  | 33.52                             |                               |                             |                              |                              |            |          |                 | 0201034  | 6 | 0200127 | 12 |
| NRV 35s <sup>(1)</sup>  | 1 3/8                       | –    | 0.04                               | 0.58  | 29  | 33.52                             |                               |                             |                              |                              |            |          |                 | 0201061  | 6 | –       | –  |
|                         | –                           | 42   | 0.04                               | 0.58  | 29  | 33.52                             |                               |                             |                              |                              |            |          |                 | 0201027  | 6 | –       | –  |
| NRVH 35s <sup>(1)</sup> | 1 3/8                       | –    | 0.30                               | 4.35  | 29  | 33.52                             | 0201073                       | 6                           | –                            | –                            |            |          |                 |          |   |         |    |
|                         | –                           | 42   | 0.30                               | 4.35  | 29  | 33.52                             | 0201035                       | 6                           | –                            | –                            |            |          |                 |          |   |         |    |

<sup>(1)</sup> Oversize connections<sup>(2)</sup>  $\Delta p$  = Minimum Opening Pressure Differential<sup>(3)</sup> The  $K_v/C_v$  is the flow of water in [m<sup>3</sup>/h – gal/min] at a pressure drop across valve of 1 bar / 14.5 psig,  $\rho = 1000 \text{ kg/m}^3 / 62.4 \text{ lb/ft}^3$

## Angleway solder ODF version, PS = 49 bar



**Table: Angleway solder ODF version, PS = 49 bar**

| Valve type                | Connection solder ODF x ODF |      | Min. OPD $\Delta p$ <sup>(2)</sup> |       | $K_v$ <sup>(3)</sup> | $C_v$ <sup>(3)</sup> | Max. working pressure: PS/MWP | Media temperature range     | PED category [Fluid Group 1] | PED category [Fluid Group 2] | Multi pack |           | Industrial pack |           |
|---------------------------|-----------------------------|------|------------------------------------|-------|----------------------|----------------------|-------------------------------|-----------------------------|------------------------------|------------------------------|------------|-----------|-----------------|-----------|
|                           | [in]                        | [mm] | [bar]                              | [psi] | [m <sup>3</sup> /h]  | [gal/ min]           |                               |                             |                              |                              | Code no.   | Qty/ pack | Code no.        | Qty/ pack |
| NRV 22s E                 | 7/8                         | 22   | 0.04                               | 0.58  | 8.5                  | 9.83                 | 49 bar / 710 psig             | -50 – 155 °C / -58 – 311 °F | Art. 4.3                     | -                            | 0203020    | 18        | -               | -         |
| NRVH 22s E                | 7/8                         | 22   | 0.30                               | 4.35  | 8.5                  | 9.83                 |                               |                             |                              |                              | 0203032    | 18        | -               | -         |
| NRV 22s E <sup>(1)</sup>  | 1 1/8                       | -    | 0.04                               | 0.58  | 8.5                  | 9.83                 |                               |                             |                              |                              | 0203060    | 18        | -               | -         |
|                           | -                           | 28   | 0.04                               | 0.58  | 8.5                  | 9.83                 |                               |                             |                              |                              | 0203055    | 18        | -               | -         |
| NRVH 22s E <sup>(1)</sup> | 1 1/8                       | -    | 0.30                               | 4.35  | 8.5                  | 9.83                 |                               |                             |                              |                              | 0203072    | 18        | -               | -         |
|                           | -                           | 28   | 0.30                               | 4.35  | 8.5                  | 9.83                 |                               |                             |                              |                              | 0203067    | 18        | -               | -         |
| NRV 28s E                 | 1 1/8                       | -    | 0.04                               | 0.58  | 16.5                 | 19.07                |                               |                             |                              |                              | 0203021    | 6         | -               | -         |
|                           | -                           | 28   | 0.04                               | 0.58  | 16.5                 | 19.07                |                               |                             |                              |                              | 0203025    | 6         | -               | -         |
| NRVH 28s E                | 1 1/8                       | -    | 0.30                               | 4.35  | 16.5                 | 19.07                |                               |                             |                              |                              | 0203029    | 6         | -               | -         |
|                           | -                           | 28   | 0.30                               | 4.35  | 16.5                 | 19.07                |                               |                             |                              |                              | 0203039    | 6         | -               | -         |
| NRV 28s E <sup>(1)</sup>  | 1 3/8                       | 35   | 0.04                               | 0.58  | 16.5                 | 19.07                |                               |                             | 0203056                      |                              | 6          | -         | -               |           |
| NRVH 28s E <sup>(1)</sup> | 1 3/8                       | 35   | 0.30                               | 4.35  | 16.5                 | 19.07                |                               |                             | 0203068                      |                              | 6          | -         | -               |           |
| NRV 35s E                 | 1 3/8                       | 35   | 0.04                               | 0.58  | 29                   | 33.52                |                               |                             | Cat. 2                       |                              | 0203026    | 6         | -               | -         |
| NRVH 35s E                | 1 3/8                       | 35   | 0.30                               | 4.35  | 29                   | 33.52                |                               |                             |                              |                              | 0203036    | 6         | -               | -         |
| NRV 35s E <sup>(1)</sup>  | 1 3/8                       | -    | 0.04                               | 0.58  | 29                   | 33.52                |                               |                             |                              |                              | 0203061    | 6         | -               | -         |
|                           | -                           | 42   | 0.04                               | 0.58  | 29                   | 33.52                |                               |                             |                              |                              | 0203027    | 6         | -               | -         |
| NRVH 35s E <sup>(1)</sup> | 1 3/8                       | -    | 0.30                               | 4.35  | 29                   | 33.52                |                               |                             |                              |                              | 0203073    | 6         | -               | -         |
|                           | -                           | 42   | 0.30                               | 4.35  | 29                   | 33.52                |                               |                             |                              |                              | 0203035    | 6         | -               | -         |

<sup>(1)</sup> Oversize connections

<sup>(2)</sup>  $\Delta p$  = Minimum Opening Pressure Differential

<sup>(3)</sup> The  $K_v/C_v$  is the flow of water in [m<sup>3</sup>/h – gal/min] at a pressure drop across valve of 1 bar / 14.5 psig,  $\rho = 1000 \text{ kg/m}^3 / 62.4 \text{ lb/ft}^3$

## Straightway solder ODF version



**Table: Straightway solder ODF version**

| Valve type              | Connection solder ODF × ODF |      | Min. OPD $\Delta p$ <sup>(2)</sup> |       | $K_v$ <sup>(3)</sup> | $C_v$ <sup>(3)</sup> | Max. working pressure: PS/MWP | Media temperature range        | PED category [Fluid Group 1] | PED category [Fluid Group 2] | Multi pack           |                                | Industrial pack |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |          |    |          |    |
|-------------------------|-----------------------------|------|------------------------------------|-------|----------------------|----------------------|-------------------------------|--------------------------------|------------------------------|------------------------------|----------------------|--------------------------------|-----------------|----------|----------------------|--------------------------------|----------|----------|----------------------|--------------------------------|----------|----------|----------------------|--------------------------------|----------|----------|----------------------|--------------------------------|----------|----------|----------------------|--------------------------------|----------|----------|----------------------|--------------------------------|----------|----------|----------------------|--------------------------------|----------|----------|----------------------|--------------------------------|----------|----------|----------|----|----------|----|
|                         | [in]                        | [mm] | [bar]                              | [psi] | [m <sup>3</sup> /h]  | [gal/min]            |                               |                                |                              |                              | Code no.             | Qty/pack                       | Code no.        | Qty/pack |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |          |    |          |    |
| NRV 6s                  | ¼                           | –    | 0.04                               | 0.58  | 0.67                 | 0.77                 | 49 bar /<br>710 psig          | -50 – 155 °C /<br>-58 – 311 °F | Art. 4.3                     | Art. 4.3                     | 020B1010             | 25                             | 020B0125        | 88       |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |          |    |          |    |
|                         | –                           | 6    | 0.04                               | 0.58  | 0.67                 | 0.77                 |                               |                                |                              |                              | 020B1014             | 25                             | 020B1156        | 88       |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |          |    |          |    |
| NRV 6s <sup>(1)</sup>   | ¾                           | –    | 0.04                               | 0.58  | 0.67                 | 0.77                 |                               |                                |                              |                              | 49 bar /<br>710 psig | -50 – 155 °C /<br>-58 – 311 °F | Art. 4.3        | Art. 4.3 | 020B1057             | 25                             | 020B1191 | 88       |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |          |    |          |    |
|                         | –                           | 10   | 0.04                               | 0.58  | 0.67                 | 0.77                 |                               |                                |                              |                              |                      |                                |                 |          | 020B1050             | 25                             | 020B1082 | 88       |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |          |    |          |    |
| NRVH 6s <sup>(1)</sup>  | ¾                           | –    | 0.20                               | 2.90  | 0.67                 | 0.77                 |                               |                                |                              |                              |                      |                                |                 |          | 49 bar /<br>710 psig | -50 – 155 °C /<br>-58 – 311 °F | Art. 4.3 | Art. 4.3 | 020B1069             | 25                             | –        | –        |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |          |    |          |    |
|                         | –                           | 10   | 0.20                               | 2.90  | 0.67                 | 0.77                 |                               |                                |                              |                              |                      |                                |                 |          |                      |                                |          |          | 020B1062             | 25                             | –        | –        |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |          |    |          |    |
| NRV 10s                 | ¾                           | –    | 0.04                               | 0.58  | 1.64                 | 1.90                 |                               |                                |                              |                              |                      |                                |                 |          |                      |                                |          |          | 49 bar /<br>710 psig | -50 – 155 °C /<br>-58 – 311 °F | Art. 4.3 | Art. 4.3 | 020B1011             | 25                             | 020B1168 | 40       |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |          |    |          |    |
|                         | –                           | 10   | 0.04                               | 0.58  | 1.64                 | 1.90                 |                               |                                |                              |                              |                      |                                |                 |          |                      |                                |          |          |                      |                                |          |          | 020B1015             | 25                             | 020B0136 | 88       |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |          |    |          |    |
| NRVH 10s                | ½                           | –    | 0.20                               | 2.90  | 1.64                 | 1.90                 |                               |                                |                              |                              |                      |                                |                 |          |                      |                                |          |          |                      |                                |          |          | 49 bar /<br>710 psig | -50 – 155 °C /<br>-58 – 311 °F | Art. 4.3 | Art. 4.3 | 020B1046             | 25                             | –        | –        |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |          |    |          |    |
|                         | –                           | 12   | 0.20                               | 2.90  | 1.64                 | 1.90                 |                               |                                |                              |                              |                      |                                |                 |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          | 020B1036             | 25                             | 020B0132 | 88       |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |          |    |          |    |
| NRV 10s <sup>(1)</sup>  | ½                           | –    | 0.04                               | 0.58  | 1.64                 | 1.90                 |                               |                                |                              |                              |                      |                                |                 |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          | 49 bar /<br>710 psig | -50 – 155 °C /<br>-58 – 311 °F | Art. 4.3 | Art. 4.3 | 020B1058             | 25                             | 020B0165 | 40       |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |          |    |          |    |
|                         | –                           | 12   | 0.04                               | 0.58  | 1.64                 | 1.90                 |                               |                                |                              |                              |                      |                                |                 |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          | 020B1051             | 25                             | 020B0161 | 40       |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |          |    |          |    |
| NRVH 10s <sup>(1)</sup> | ½                           | –    | 0.20                               | 2.90  | 1.64                 | 1.90                 |                               |                                |                              |                              |                      |                                |                 |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          | 49 bar /<br>710 psig | -50 – 155 °C /<br>-58 – 311 °F | Art. 4.3 | Art. 4.3 | 020B1070             | 25                             | –        | –        |                      |                                |          |          |                      |                                |          |          |          |    |          |    |
|                         | –                           | 12   | 0.20                               | 2.90  | 1.64                 | 1.90                 |                               |                                |                              |                              |                      |                                |                 |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          | 020B1063             | 25                             | –        | –        |                      |                                |          |          |                      |                                |          |          |          |    |          |    |
| NRV 12s                 | ½                           | –    | 0.02                               | 0.29  | 2.50                 | 2.89                 |                               |                                |                              |                              |                      |                                |                 |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          | 49 bar /<br>710 psig | -50 – 155 °C /<br>-58 – 311 °F | Art. 4.3 | Art. 4.3 | 020B1012             | 24                             | 020B1155 | 40       |                      |                                |          |          |          |    |          |    |
|                         | –                           | 12   | 0.02                               | 0.29  | 2.50                 | 2.89                 |                               |                                |                              |                              |                      |                                |                 |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          | 020B1016             | 24                             | 020B0137 | 40       |                      |                                |          |          |          |    |          |    |
| NRVH 12s                | ½                           | –    | 0.20                               | 2.90  | 2.50                 | 2.89                 |                               |                                |                              |                              |                      |                                |                 |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          | 49 bar /<br>710 psig | -50 – 155 °C /<br>-58 – 311 °F | Art. 4.3 | Art. 4.3 | 020B1039             | 24                             | 020B1239 | 40       |          |    |          |    |
|                         | –                           | 12   | 0.20                               | 2.90  | 2.50                 | 2.89                 |                               |                                |                              |                              |                      |                                |                 |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          | 020B1037             | 24                             | 020B0133 | 40       |          |    |          |    |
| NRV 12s <sup>(1)</sup>  | ¾                           | –    | 0.02                               | 0.29  | 2.50                 | 2.89                 |                               |                                |                              |                              |                      |                                |                 |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          | 49 bar /<br>710 psig | -50 – 155 °C /<br>-58 – 311 °F | Art. 4.3 | Art. 4.3 | 020B1052 | 24 | 020B0162 | 54 |
|                         | –                           | 16   | 0.02                               | 0.29  | 2.50                 | 2.89                 |                               |                                |                              |                              |                      |                                |                 |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          | 020B1064 | 24 | –        | –  |
| NRVH 12s <sup>(1)</sup> | ¾                           | –    | 0.20                               | 2.90  | 2.50                 | 2.89                 | 49 bar /<br>710 psig          | -50 – 155 °C /<br>-58 – 311 °F | Art. 4.3                     | Art. 4.3                     |                      |                                |                 |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          | 020B1064 | 24 | –        | –  |
|                         | –                           | 16   | 0.20                               | 2.90  | 2.50                 | 2.89                 |                               |                                |                              |                              |                      |                                |                 |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          |                      |                                |          |          | 020B1064 | 24 | –        | –  |

**Table: Straightway solder ODF version (Continued)**

| Valve type              | Connection solder<br>ODF × ODF |      | Min. OPD $\Delta p$ <sup>(2)</sup> |       | $K_v$ <sup>(3)</sup> | $C_v$ <sup>(3)</sup> | Max. working<br>pressure:<br>PS/MWP | Media<br>temperature<br>range  | PED<br>category<br>[Fluid<br>Group 1] | PED<br>category<br>[Fluid<br>Group 2] | Multi pack |              | Industrial pack |              |
|-------------------------|--------------------------------|------|------------------------------------|-------|----------------------|----------------------|-------------------------------------|--------------------------------|---------------------------------------|---------------------------------------|------------|--------------|-----------------|--------------|
|                         | [in]                           | [mm] | [bar]                              | [psi] | [m <sup>3</sup> /h]  | [gal/ min]           |                                     |                                |                                       |                                       | Code no.   | Qty/<br>pack | Code no.        | Qty/<br>pack |
| NRV 16s                 | 5/8                            | 16   | 0.02                               | 0.29  | 4.00                 | 4.62                 | 49 bar /<br>710 psig                | -50 – 155 °C /<br>-58 – 311 °F | Art. 4.3                              | Art. 4.3                              | 020B1018   | 24           | 020B1150        | 54           |
| NRVH 16s                | 5/8                            | 16   | 0.20                               | 2.90  | 4.00                 | 4.62                 |                                     |                                |                                       |                                       | 020B1038   | 24           | 020B0134        | 54           |
| NRV 16s <sup>(1)</sup>  | –                              | 18   | 0.02                               | 0.29  | 4.00                 | 4.62                 |                                     |                                |                                       |                                       | 020B1053   | 24           | –               | –            |
| NRVH 16s <sup>(1)</sup> | –                              | 18   | 0.20                               | 2.90  | 4.00                 | 4.62                 |                                     |                                |                                       |                                       | 020B1065   | 24           | –               | –            |
| NRV 16s <sup>(1)</sup>  | 3/4                            | 19   | 0.02                               | 0.29  | 4.00                 | 4.62                 |                                     |                                |                                       |                                       | 020B1059   | 24           | –               | –            |
| NRVH 16s <sup>(1)</sup> | 3/4                            | 19   | 0.20                               | 2.90  | 4.00                 | 4.62                 |                                     |                                |                                       |                                       | 020B1071   | 24           | –               | –            |
| NRV 19s                 | –                              | 18   | 0.02                               | 0.29  | 6.50                 | 7.51                 |                                     |                                |                                       |                                       | 020B1017   | 28           | –               | –            |
| NRVH 19s                | –                              | 18   | 0.14                               | 2.03  | 6.50                 | 7.51                 |                                     |                                |                                       |                                       | 020B1008   | 28           | –               | –            |
| NRV 19s                 | 3/4                            | 19   | 0.02                               | 0.29  | 6.50                 | 7.51                 |                                     |                                |                                       |                                       | 020B1019   | 28           | –               | –            |
| NRVH 19s                | 3/4                            | 19   | 0.14                               | 2.03  | 6.50                 | 7.51                 |                                     |                                |                                       |                                       | 020B1023   | 28           | –               | –            |
| NRV 19s <sup>(1)</sup>  | 7/8                            | 22   | 0.02                               | 0.29  | 6.50                 | 7.51                 |                                     |                                |                                       |                                       | 020B1054   | 28           | 020B1091        | 54           |
| NRVH 19s <sup>(1)</sup> | 7/8                            | 22   | 0.14                               | 2.03  | 6.50                 | 7.51                 |                                     |                                |                                       |                                       | 020B1066   | 28           | –               | –            |

<sup>(1)</sup> Oversize connections<sup>(2)</sup>  $\Delta p$  = Minimum Opening Pressure Differential<sup>(3)</sup> The  $K_v/C_v$  is the flow of water in [m<sup>3</sup>/h – gal/min] at a pressure drop across valve of 1 bar / 14.5 psig,  $\rho = 1000 \text{ kg/m}^3 / 62.4 \text{ lb/ft}^3$

## Functions

NRV/NRVH are used to control the unidirectional flow of refrigerant so as to prevent backflow. When selecting the right Danfoss check valve, it's recommended to use Coolselector which is a Danfoss calculation and selection software. When dimensioning and selecting Danfoss check valves for mounting into the compressor discharge line, it is important to be aware of the following:

The differential pressure across the valve must always be higher than the given minimum pressure drop at which the valve is open. This also applies to lowest capacities for compressor with capacity regulation. NRVH type check valve is with stronger spring, and it's recommended to use for compressors in parallel (i.e. power packs) where higher level of pulsation and vibration are expected.

## Media

### Refrigerants

Table: Media

| Valve type                          | Connection type    | Max. working pressure | Refrigerants  |
|-------------------------------------|--------------------|-----------------------|---|
|                                     |                    | (PS/MWP)              |   |
| NRV/NRVH 6-19                       | Straightway-flare  | 46 bar / 667 psig     | R134a, R22/R407C, R404A/R507, R407A, R407F, R407H, R410A, R448A, R449A, R449B, R450A, R452A, R452B, R454A, R454B, R454C, R455A, R513A, R515B, R516A, R1233zd(E), R1234ze(E), R1234yf  |
| NRV/NRVH 6s-19s <sup>(1)</sup>      | Straightway-solder | 49 bar / 710 psig     | R134a, R22/R407C, R290, R32, R404A/R507, R407A, R407F, R407H, R410A, R448A, R449A, R449B, R450A, R452A, R452B, R454A, R454B, R454C, R455A, R513A, R515B, R516A, R600, R600a, R1233zd(E), R1234ze(E), R1234yf, R1270   |
| NRV/NRVH 22s-35s <sup>(1)</sup>     | Angleway-solder    | 46 bar / 667 psig     | R134a, R22/R407C, R290 <sup>(2)</sup> , R404A/R507, R407A, R407F, R407H, R410A, R448A, R449A, R449B, R450A, R452A, R452B <sup>(2)</sup> , R454A <sup>(2)</sup> , R454B <sup>(2)</sup> , R454C <sup>(2)</sup> , R455A <sup>(2)</sup> , R513A, R515B, R516A <sup>(2)</sup> , R600 <sup>(2)</sup> , R600a <sup>(2)</sup> , R1233zd(E), R1234ze(E), R1234yf <sup>(2)</sup> , R1270 <sup>(2)</sup> |
| NRV/NRVH 22s E-35s E <sup>(1)</sup> | Angleway-solder    | 49 bar / 710 psig     | R290, R32, R452B, R454A, R454B, R454C, R455A, R516A, R600, R600a, R1234ze(E), R1234yf, R1270  |

<sup>(1)</sup> Oversize connections

<sup>(2)</sup> NRV/NRVH 28s<sup>(1)</sup>-35s<sup>(1)</sup> can be used with flammable refrigerants, without certificate of PED Fluid Group 1, category II

|                 |                     |
|-----------------|---------------------|
| Refrigerant oil | POE, PAG (PVE, PAO) |
|-----------------|---------------------|

#### Note:

- For a complete list of approved refrigerants, visit <http://store.danfoss.com/> and search for individual code numbers, where refrigerants are listed as part of product details.
- This product is approved for R290, R32, R452B, R454A, R454B, R454C, R455A, R516A, R600, R600a, R1234ze(E), R1234yf and R1270 by ignition source assessment in accordance to standard EN ISO 80079-36.
- NRV/NRVH is not suitable for oil line application. For detailed information please contact Danfoss.
- Flare/face seal connections are only approved for A1 and A2L refrigerants.
- R32 can only be used for 49 bar NRV/NRVH.
- R1234ze can be used for NRV size up to 35s according to the PED category I, Fluid II.

## Product details

### General data

**Table: Technical data**

| Technical data   | Values  |
|--|---|
| Maximum working pressure                                 | <a href="#">See ordering table</a>                |
| Media temperature range                                  | <a href="#">See ordering table</a>                |
| Environmental transport/storage temperature and humidity | -40 – 65 °C / -40 – 150 °F. Air humidity: RH ≤95% |
| Flow direction   | Single flow                                       |
| Serviceable  | No  |

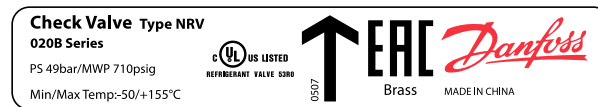
### Identification

Relevant product data is available on the product and box label. An example of a box label and product label are shown, including an explanation of the content.

**Figure: Box label**



**Figure: Product label**



**Table: Product and label text**

| Position                 | Inscription   | Explanation   |
|--------------------------|---|---|
| Box label; Product label | Check valve   | Product name  |
| Box label                | 020B1010  | Code number for ordering  |
| Box label                | NRV 6s  | Product type; no numeral on product label   |
| Box label                | Straightway   | Direction   |
| Box label                | ODF ¼ in  | Connection size and type  |
| Box label; Product label | PS 49 bar / MWP 710 psig                                  | Max. working pressure in bar and psig   |
| Box label                | BE4520C   | Code for production place and time (BE = Wuqing, week 45, year 2020, weekday C = Wednesday) |
| Box label; Product label | MADE IN CHINA   | Manufacturing site acc. to EN standards   |
| Box label                | EAN code  | Barcode for individual code no. identification according to EAN standard                    |
| Product label            | Min./max. temp: -50 / +155 °C                             | Media temperature range, min. and max.  |
| Product label            | Arrow   | Flow direction indicator  |
| Box label; Product label | Additional information: Relevant approval authority logos | –   |

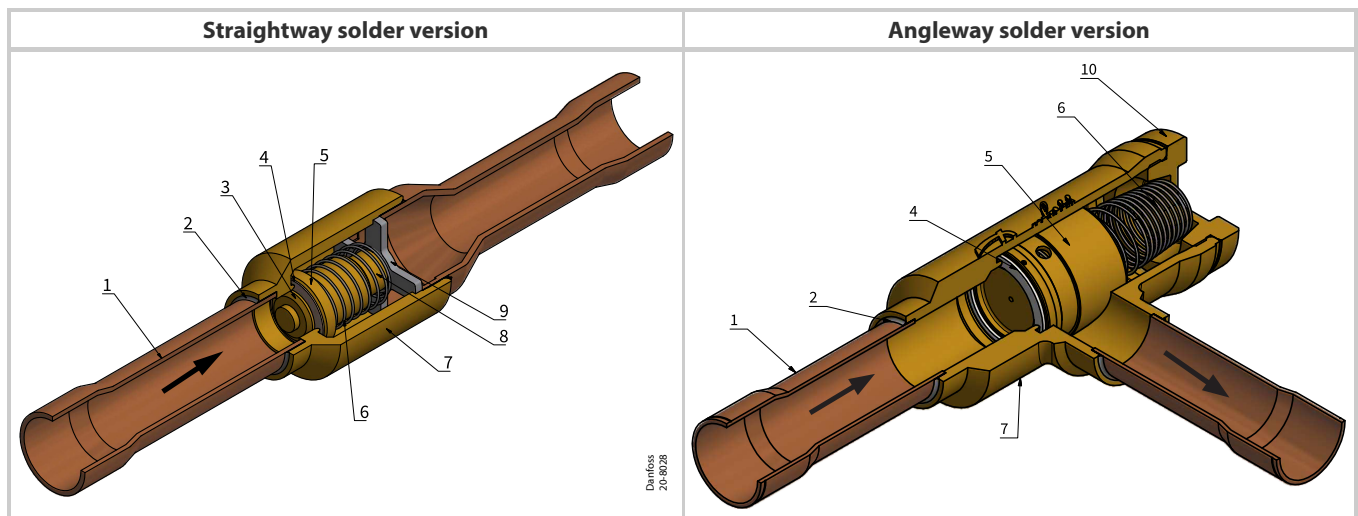
## Design

The pressure of the fluid passing through a refrigeration system opens the valve, while any reverse flow closes the valve.

In NRV/NRVH check valves a sealing disc is activated by the spring to close or open the valve, and the force of the spring determines the differential opening pressure. When the refrigerant flows through the valve and the differential pressure is more than min. opening pressure, the piston will move to stop face and compress the spring, then the valve will open.

NRV/NRVH valves are equipped with a damping piston for improved performance in lines where pulsations can occur, e.g. in the discharge line from a compressor.

## Materials



| Position | Description     | Material              |
|----------|-----------------|-----------------------|
| 1        | Connection tube | Copper                |
| 2        | Solder ring     | Ag alloy              |
| 3        | Washer          | Brass                 |
| 4        | Disk            | PTFE with glass fiber |
| 5        | Piston          | Brass                 |
| 6        | Spring          | Stainless steel       |
| 7        | Valve body      | Brass                 |
| 8        | Guide           | Brass                 |
| 9        | Stop face       | Stainless steel       |
| 10       | Cover           | Brass                 |

## Capacity

### Valve selection based on capacity calculation

As for extended capacity calculations and valve selection based on capacities and refrigerants, please refer to Coolselector®2. Rated and extended capacities are calculated with the Coolselector®2 calculation engine to ARI standards with the ASEREP equations based on laboratory measurements of selected valves.

## Dimensions

We have chosen to show dimensions of the major versions.

You will find downloadable dimension drawings for individual code numbers on Danfoss store as part of the visuals tab for individual code numbers.

Weights also differ depending on the design of the individual code numbers. Weights are available as part of the technical data for individual code numbers on Danfoss store.

### Flare straightway version

Figure: Flare straightway version

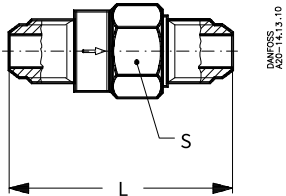


Table: Flare straightway version

| Type   | SAE flare | Flare           | L    | Spanner flats S | Net weight |
|--------|-----------|-----------------|------|-----------------|------------|
|        | [in]      | Thread          | [mm] | [mm]            | [kg]       |
| NRV 6  | ¼         | 7/16-20UNF-2A   | 55   | 19              | 0.072      |
| NRV 10 | 3/8       | 5/8-18UNF-2A    | 60   | 19              | 0.088      |
| NRV 12 | ½         | ¾-16UNF-2A      | 70   | 24              | 0.14       |
| NRV 16 | 5/8       | 7/8-14UNF-2A    | 81   | 28              | 0.206      |
| NRV 19 | ¾         | 1 1/16-14UNS-2A | 95   | 34              | 0.344      |

### Solder straightway version

Figure: Solder straightway version

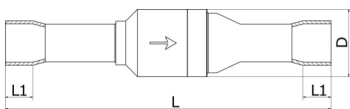


Table: Solder straightway version

| Type                        | Connection Size |      | Connection tolerance | L    | L1   | øD   | Net weight |
|-----------------------------|-----------------|------|----------------------|------|------|------|------------|
|                             | [in]            | [mm] | [mm]                 | [mm] | [mm] | [mm] | [kg]       |
| NRV/NRVH 6s                 | ¼               | 6    | 0.065/0.155          | 92   | 7    | 18   | 0.05       |
| NRV/NRVH 6s <sup>(1)</sup>  | 3/8             | 10   | 0.06/0.13            | 95   | 9    | 18   | 0.06       |
| NRV/NRVH 10s                | 3/8             | 10   | 0.065/0.155          | 109  | 9    | 18   | 0.05       |
| NRV/NRVH 10s <sup>(1)</sup> | ½               | 12   | 0.065/0.155          | 109  | 10   | 18   | 0.06       |
| NRV/NRVH 12s                | ½               | 12   | 0.065/0.155          | 131  | 10   | 22   | 0.09       |
| NRV/NRVH 12s <sup>(1)</sup> | 5/8             | 16   | 0.065/0.155          | 131  | 12   | 22   | 0.09       |
| NRV/NRVH 16s                | 5/8             | 16   | 0.065/0.155          | 139  | 12   | 28   | 0.16       |
| NRV/NRVH 16s <sup>(1)</sup> | –               | 18   | 0.065/0.155          | 139  | 14   | 28   | 0.17       |
| NRV/NRVH 16s <sup>(1)</sup> | ¾               | 19   | 0.065/0.155          | 139  | 14   | 28   | 0.17       |
| NRV/NRVH 19s                | –               | 18   | 0.065/0.155          | 165  | 14   | 34   | 0.27       |
| NRV/NRVH 19s                | ¾               | 19   | 0.065/0.155          | 165  | 14   | 34   | 0.28       |
| NRV/NRVH 19s <sup>(1)</sup> | 7/8             | 22   | 0.075/0.185          | 165  | 17   | 34   | 0.28       |

<sup>(1)</sup> Oversize connections

### Solder angleway connection

Figure: Solder angleway connection

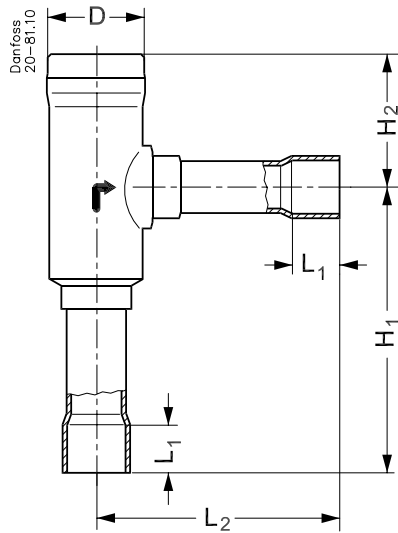


Table: Solder angleway connection

| Type                        | Connection size |      | Connection tolerance<br>[mm] | H <sub>1</sub> | H <sub>2</sub> | L <sub>1</sub> | L <sub>2</sub> | øD   | Net weight |
|-----------------------------|-----------------|------|------------------------------|----------------|----------------|----------------|----------------|------|------------|
|                             | [in]            | [mm] |                              | [mm]           | [mm]           | [mm]           | [mm]           | [mm] | [kg]       |
| NRV/NRVH 22s                | 7/8             | 22   | 0.075/0.185                  | 94             | 48             | 17             | 87             | 37   | 0.584      |
| NRV/NRVH 22s <sup>(1)</sup> | 1 1/8           | 28   | 0.075/0.185                  | 94             | 48             | 22             | 87             | 37   | 0.616      |
| NRV/NRVH 28s                | 1 1/8           | 28   | 0.075/0.185                  | 141            | 67             | 20             | 123            | 49   | 1.330      |
| NRV/NRVH 28s <sup>(1)</sup> | 1 3/8           | 35   | 0.09/0.23                    | 141            | 67             | 25             | 123            | 49   | 1.478      |
| NRV/NRVH 35s                | 1 3/8           | 35   | 0.09/0.23                    | 141            | 67             | 25             | 123            | 49   | 1.400      |
| NRV/NRVH 35s <sup>(1)</sup> | 1 5/8           | 42   | 0.09/0.23                    | 141            | 67             | 29             | 123            | 49   | 1.388      |

<sup>(1)</sup> Oversize connections

## Connections

Standard NRV/NRVH versions can be provided with straightway and angleway, connection types of flare or solder ODF in a wide variety of connection sizes. Solder versions are with extended ends copper connections, flare versions with brass connections.

**Table: Connections**

| Direction   | Inlet      | Outlet     | Connections [mm]  | Connections [in]   |
|-------------|------------|------------|---|--|
| Straightway | Flare      | Flare      | –   | $\frac{1}{4} \times \frac{1}{4}$<br>$\frac{3}{8} \times \frac{3}{8}$<br>$\frac{1}{2} \times \frac{1}{2}$<br>$\frac{5}{8} \times \frac{5}{8}$<br>$\frac{3}{4} \times \frac{3}{4}$                                     |
| Straightway | Solder ODF | Solder ODF | 6 x 6<br>10 x 10<br>12 x 12<br>16 x 16<br>18 x 18<br>19 x 19<br>22 x 22 | $\frac{1}{4} \times \frac{1}{4}$<br>$\frac{3}{8} \times \frac{3}{8}$<br>$\frac{1}{2} \times \frac{1}{2}$<br>$\frac{5}{8} \times \frac{5}{8}$<br>$\frac{3}{4} \times \frac{3}{4}$<br>$\frac{7}{8} \times \frac{7}{8}$ |
| Angleway    | Solder ODF | Solder ODF | 22 x 22<br>28 x 28<br>35 x 35<br>42 x 42                                | $\frac{7}{8} \times \frac{7}{8}$<br>$1 \frac{1}{8} \times 1 \frac{1}{8}$<br>$1 \frac{3}{8} \times 1 \frac{3}{8}$<br>$1 \frac{5}{8} \times 1 \frac{5}{8}$   |

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The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

| Approval type               | Title  | Certification body                        | Approval topic             |
|-----------------------------|--|---|----------------------------|
| Statement of Compliance     | <a href="#">Certificate UL-US-L7200-15-20114002-1</a>  | UL - Underwriters Laboratories inc.       | Compliance misc. Standards |
| Export Control Declaration  | <a href="#">Check valve, Shut-off diaphragm valve, shut-off ball valve and differential pressure valve</a> | Danfoss                                   |                            |
| Manufacturer's Declaration  | <a href="#">Danfoss MD 033F4017.AF</a>   | Danfoss                                   |                            |
| Manufacturer's Declaration  | <a href="#">Danfoss MD 033F4001.AL</a>   | Danfoss                                   | PED, Pressure              |
| Pressure Safety Certificate | <a href="#">LLC CDC EURO-TYSK UA.TR.089.1015.02-22</a>   | LLC CDC EURO TYSK - Ukraine               | PED, Pressure              |
| UA Declaration              | <a href="#">Danfoss UA 2023-01-10 Valves PL01 PL40</a>   | Danfoss                                   | PED, Pressure              |
| Manufacturer's Declaration  | <a href="#">Danfoss MD 033F4006.AC</a>   | Danfoss                                   | China RoHS                 |
| Manufacturer's Declaration  | <a href="#">Danfoss MD 033F4010</a>  | Danfoss                                   | EU RoHS                    |
| UK Declaration              | <a href="#">Danfoss UK 033F4025.AA</a>   | Danfoss                                   | Pressure                   |
| EU Declaration              | <a href="#">Danfoss EU-UK 033F4002.AM</a>  | Danfoss                                   | PED, Pressure              |
| Pressure Safety Certificate | <a href="#">TÜV 0045 202 9120 Z 00447 25 D 001(00)</a>   | TÜV NORD - Technischer Überwachungsverein | PED, Pressure              |

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