DX274

## Description

The **DX274** 6-way zone valve enables to control supply to a single usage point from two different thermal energy sources, that is to control 4-pipe systems (typically heating and cooling) in a very simple manner.

The integrated electronic flow rate controller of DX274 valves combines the functions of two pressure independent control valves (R206AM "PICV"), thus offering remarkable money saving and the use of a single electronic control component.

DX274 valves are generally used with radiant ceiling systems, especially in the commercial sector, where change-over from heating to cooling and vice versa can be easily handled, even during the same day and in an independent way for each zone.

The DX274 series by Giacomini satisfies various installation needs; it is available with or without Bluetooth connection, ModBus or BacNet protocol communication, and with or without temperature probes to monitor thermal energy consumptions.

| N°1 DX274 valve with N°1 actuator<br>= 1 control signal | N°1 R274N 6-way zone valve with N°1 K274-1 actuator<br>+ N°2 PICV R206AM valves with N°2 K281 actuators<br>= 3 control signals | N°2 R297 diverting valves with N°2 K275-1 actuators<br>+ N°2 PICV R206AM valves with N°2 actuators K281<br>= 4 control signals |
|---|---|---|

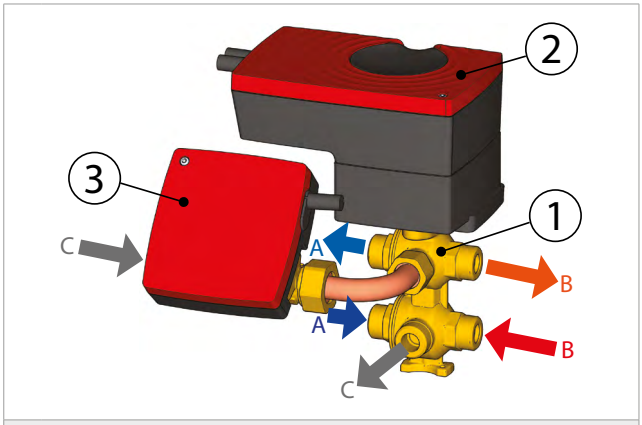
## Versions and product codes

| Product code | Valve connec-tions | Fitting connection with electronic controller | 6-way zone valve actuator (0÷10 V) | Bluetooth | ModBus | BacNet | N°2 temperature probes | Optional | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Fittings | Insulation |
| DX274Y003 | G1/2"M ISO 228 | G3/4"M ISO 228 | ✓ | - | ✓ | - | - | RM179Y053 (1/2"F x 16x2)<br>RM179Y056 (1/2"F x 20x2)<br>RM179Y063 (3/4"F x 16X2)<br>RM179Y066 (3/4"F x 20X2)<br>RM179Y069 (3/4"F x 26X3) | R274W012 |
| DX274Y013 | | | ✓ | - | - | ✓ | - | | |
| DX274Y053 | | | ✓ | - | ✓ | - | ✓ | | |
| DX274Y063 | | | ✓ | - | - | ✓ | ✓ | P15FY013 (1/2"F x 1/2"F) | |
| DX274Y103 | | | ✓ | ✓ | ✓ | - | - | P15Y018 (1/2"F x 1/2"M) | |
| DX274Y113 | | | ✓ | ✓ | - | ✓ | - | | |
| DX274Y153 | | | ✓ | ✓ | ✓ | - | ✓ | R254PY102 (1/2"F x 1/2"M) - red<br>R254PY112 (1/2"F x 1/2"M) - blue | |
| DX274Y163 | | | ✓ | ✓ | - | ✓ | ✓ | | |
| DX274Y005 | G1"M ISO 228 | G1"M ISO 228 | ✓ | - | ✓ | - | - | RM179Y073 (1"F x 26x3)<br>RM179Y074 (1"F x 32x3) | R274W011 |
| DX274Y015 | | | ✓ | - | - | ✓ | - | | |
| DX274Y055 | | | ✓ | - | ✓ | - | ✓ | RM252Y003 (1"F x RM16x2)<br>RM252Y004 (1"F x RM20x2) | |
| DX274Y065 | | | ✓ | - | - | ✓ | ✓ | | |
| DX274Y105 | | | ✓ | ✓ | ✓ | - | - | R252Y023 (1"F x 1/2"M)<br>R252Y025 (1"F x 18) | |
| DX274Y115 | | | ✓ | ✓ | - | ✓ | - | | |
| DX274Y155 | | | ✓ | ✓ | ✓ | - | ✓ | P15Y015 (1"F x 1/2"M)<br>P15Y016 (1"F x 3/4"M)<br>P15Y017 (1"F x 1"M) | |
| DX274Y165 | | | ✓ | ✓ | - | ✓ | ✓ | | |

## Main characteristics and advantage

- One single product combining multiple functions:
  - Flow rate control independent from pressure
  - Shut-off function
  - Change-over function
  - Thermal energy metering (versions with temperature probes only): display of kWh consumed; this data however cannot be used for MID-based metering
- Optional remote control through ModBus and BacNet protocols
- Easy integration with BMSs (Building Management System)
- Greater accuracy compared to mechanical control thanks to electronic control
- Better operation conditions thanks to real-time flow rate metering
- Actuator and electronic controller preassembled on valve
- Actuator with possible manual command to change valve position even when power is down
- Operation with wide range of differential pressures (no minimum Δp required)
- Overpressure protection system
- Possibility to fit the valve on brackets using the female-thread hole on lower part:
  - n° 2 M4 holes for 1/2" DX274
  - n° 1 M6 hole for 1" DX274

## Components




| Legend | |
|---|---|
| 1 | 6-way zone valve |
| 2 | Actuator for 6-way zone valve with integrated electronic controller |
| 3 | Flow rate metering |
| A | Cold source delivery/return (chiller) |
| B | Hot source delivery/return (boiler) |
| C | Usage point delivery/return |

## Technical data

- Fluid: water (NO glycol-based solutions), as provided by VDI 2035
- Fluid working temperature range: 5÷90 °C
- Working room temperature range: 10÷45 °C
- Stock room temperature range: -20÷50 °C
- Max. working humidity: 90 % HR, condensation-free
- Nominal pressure (PN): 16 bar
- Max. differential pressure: 2 bar
- Max. flow rate set point (Qmax): may be set separately for heating and cooling
- Min. setting flow rate: 3 l/h
- Leakage class (EN12266-1): A

### Flow rate range

| DX274 size | DN [mm] | Min. setting flow rate $Q_{min}$ [l/h] | Flow rate range with Δp 5 kPa $Q_5$ [l/h] | Flow rate range with Δp 10 kPa $Q_{10}$ [l/h] | Flow rate range with Δp 20 kPa $Q_{20}$ [l/h] | Max. setting flow rate $Q_{max}$ [l/h] |
|---|---|---|---|---|---|---|
| 1/2" | 15 | 3 | 310 | 440 | 625 | 1400 |
| 1" | 25 | 3 | 555 | 790 | 1115 | 2500 |

### Materials

- Valve body: CW617N brass
- Gaskets: low-friction PTFE / EPDM
- Actuator and flow rate meter: ABS

### Electric characteristics

- Control signal: 0÷10 Vdc (0,17 mA) / ModBus / BacNet
- Power: 24 Vdc (± 10 %) or 24 Vac (± 20 %) / 50 Hz
- Electric absorption: 1,5 W (2 VA) in Stand-By
  3 W (4 VA) with moving actuator
- Flow rate sensor: ultrasounds (TTM, no moving parts)
- Measuring unit: $m^3/h$ (default), l/s, l/min, gpm (UK), gpm (US)
- Temperature probes: Pt500 (MID 2014/32/EU, EN1434-4:2007)
- Electric connections: PVC wire, 6 x 0,5 $mm^2$ (length 1 m)
- Protection class: IP43

### ModBus/BacNet interface

Depending on the versions, the DX274 valve may include a ModBus or BacNet communication interface for easy integration with BMSs (Building Management System).
The ModBus communication technology is open, requires no licence and is available for every BMS on the market.

- ModBus protocol: RTU/MSTP, slave
- BacNet protocol: MSTP, slave
- Physical connection: RS485, 2 twisted pair cables
- Bus ends: 120 Ω resistance to be added at the end of the bus between RT+ and RT-
- Communication setting: 9600, 19200 or 38400 Baud, 1 start bit, even/odd/no parity, 8 data bits, 1 stop bit
- Type: multi-drop bus (MDP), max. length 1000 m
- Length between valve and bus: max. 1 m, daisy chain
- Type of cable: twisted pair with STP or FTP screening

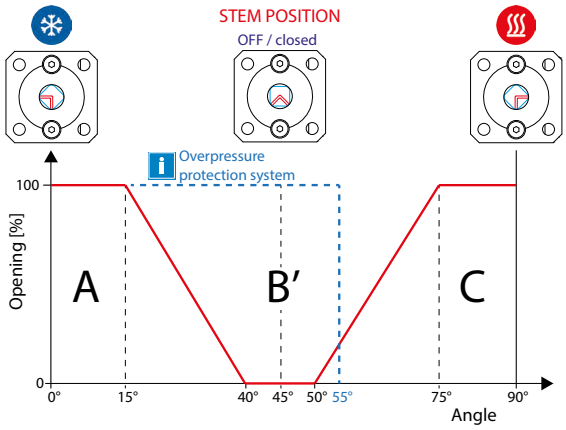
**Note.**
The installer shall be responsible for compliance with local EMC regulations when installing, connecting and starting up the DX274 valve on a communication bus.

Communication settings may be entered via Bluetooth (if available) or using the dxLink™ start-up device on ModBus communication.

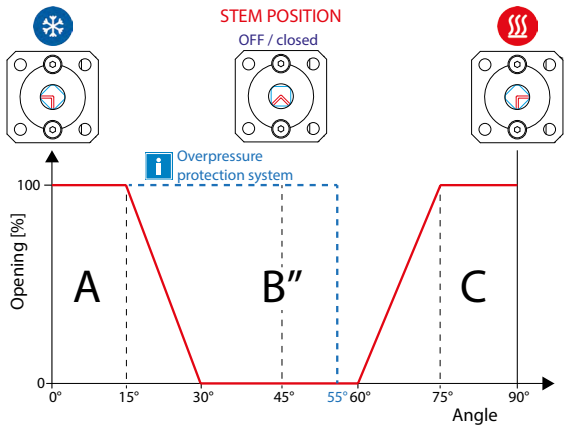
## Operation

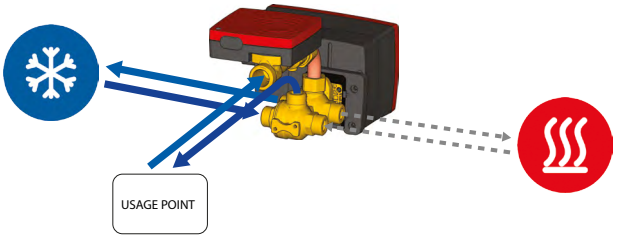
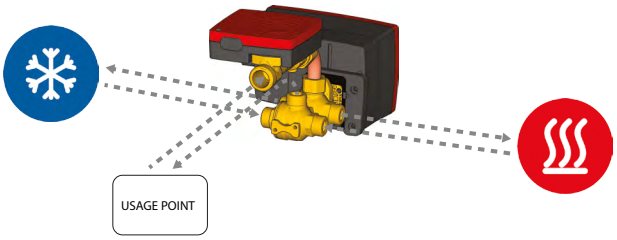
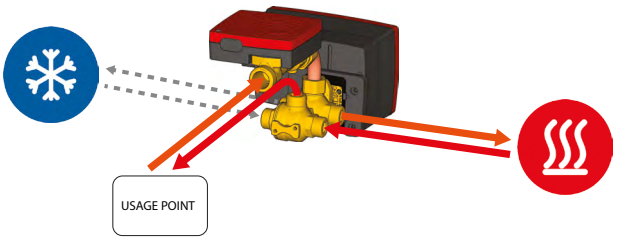
**Hydraulic operation: valve opening diagram**

DX274 (1")




DX274 (1/2")

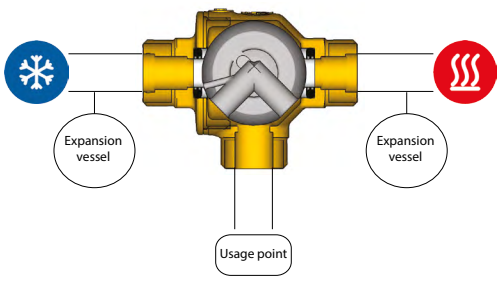


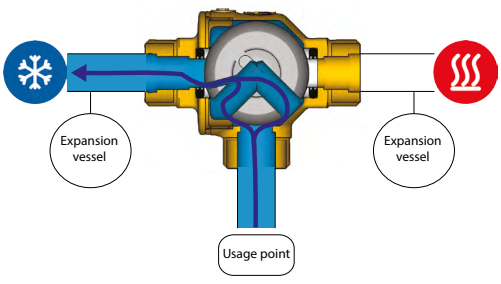

| Graphic reference | Stem angle | Opening percentage | Action |
|---|---|---|---|
| A | 0°÷15° | 100 % |  |
| B′ | 40°÷50° | 0 % |  |
| B″ | 30°÷60° | | |
| C | 75°÷90° | 100 % |  |



Overpressure protection system **PATENTED**

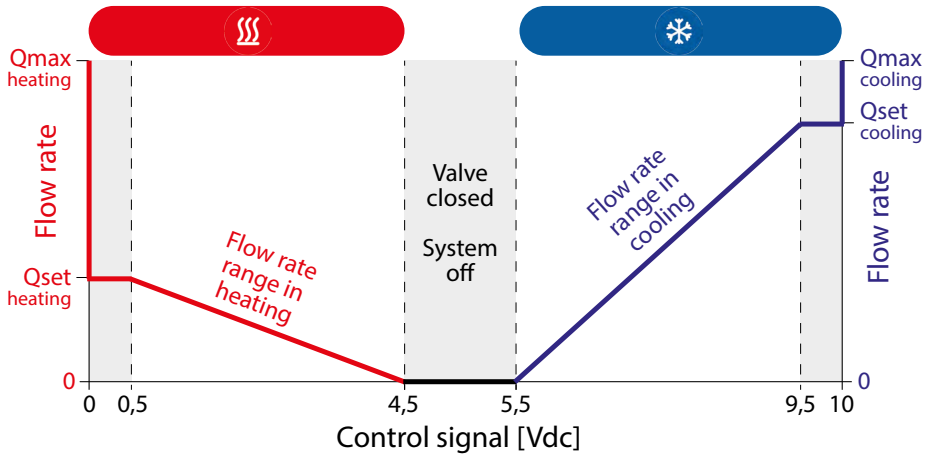
When using the 6-way valve with combined heating/cooling usage points (radiant ceilings, fan coils), the fluid inside the usage circuit would be completely insulated when the valve is closed (with no heating or cooling). The pressure of the fluid inside the usage circuit may then increase or decrease for the fluid temperature changes caused by room temperature.
The 6-way valve is equipped with an integrated overpressure protection system to compensate such pressure variations.
The upper ball of the valve has a small hole on the inside which always maintains the "usage point" connected with the "cold source", even when the valve is closed (stem at 45°). However the combined action of the two balls (upper and lower) prevents the fluid from circulating when the valve is closed. The overpressure protection system does not compromise the hydraulic separation between the two circuits (cold and hot sources): the two circuits are always kept separated.



**Electric operation: control signal**

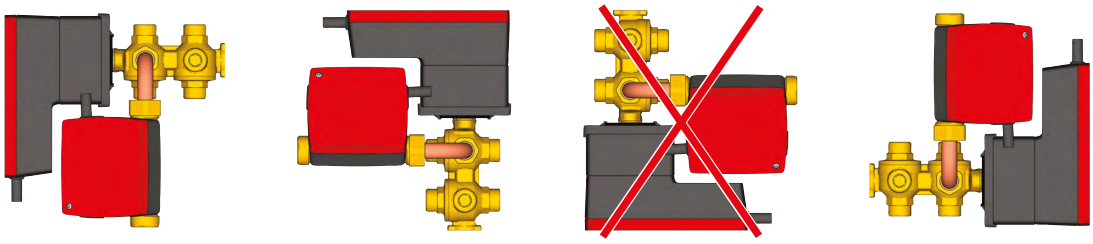
- The max. flow rate is defined by a Set Point which can be entered separately for heating and cooling
- The Set Point is entered through an external control signal (0÷10 V, ModBus, BacNet, Bluetooth)
- The external control signal acts on the valve according to the diagram shown below:
  - Heating max. flow rate (Qset heating), with no control: 0 Vdc
  - Heating control signal: 0,5÷4,5 Vdc
  - System OFF: control signal 4,5÷5,5 Vdc
  - Cooling control signal: 5,5÷9,5 Vdc
  - Cooling max. flow rate (Qset cooling), with no control: 10 Vdc

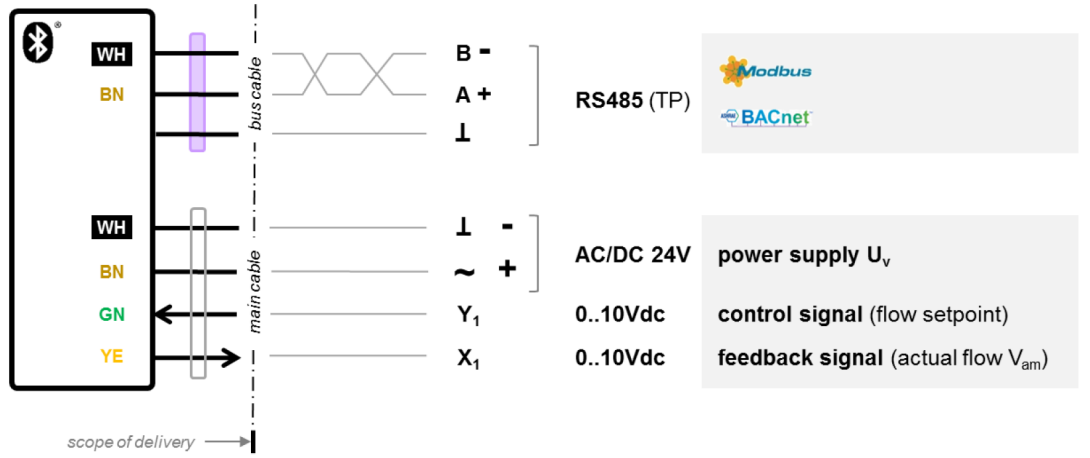


## Installazione

**Warning.**
The DX274 valve includes a fitting equipped with a flow rate meter on the upper side of the valve (return).
For proper operation of the valve, do no invert delivery with return.

**Allowed positions**





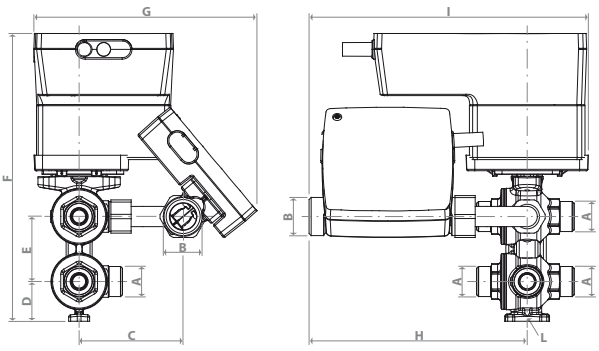

**Note.**
Use a low-voltage safety transformer complying with local provisions.
Complying with 2014/30/UE electromagnetic compatibility directive applying provisions: EN 61000-6-3 (2007); EN 61000-3-2 (2006); EN 61000-3-3 (1995) + am1(2001); EN 61000-6-1 (2005)

**Signal LED**

The LEDs integrated in the flow-rate meter provide useful data for easy start up.
n.1 LED for power supply
n.1 LED for status communication

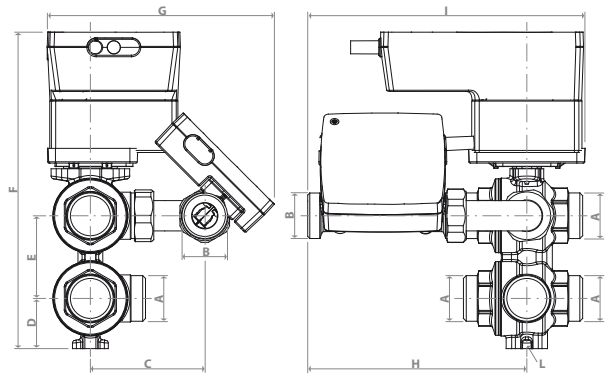
## Dimensions

**DX274 1/2" connections**




| Product code | A | B | C [mm] | D [mm] | E [mm] | F [mm] | G [mm] | H [mm] | I [mm] | L |
|---|---|---|---|---|---|---|---|---|---|---|
| DX274Y003<br>DX274Y013<br>DX274Y053<br>DX274Y063<br>DX274Y103<br>DX274Y113<br>DX274Y153<br>DX274Y163 | 1/2"M ISO 228 | 3/4"M ISO 228 | 72 | 28 | 45 | 199 | 154 | 151 | 193 | 2 M4 holes |

**DX274 1" connections**




| Product code | A | B | C [mm] | D [mm] | E [mm] | F [mm] | G [mm] | H [mm] | I [mm] | L |
|---|---|---|---|---|---|---|---|---|---|---|
| DX274Y005<br>DX274Y015<br>DX274Y055<br>DX274Y065<br>DX274Y105<br>DX274Y115<br>DX274Y155<br>DX274Y165 | 1"M ISO 228 | 1"M ISO 228 | 83 | 36 | 60 | 230 | 165 | 159 | 201 | 1 M6 hole |

## Product specifications

**DX274**

6-way zone valve to control supply to a single usage point from two different thermal energy sources, that is to control 4-pipe systems (typically heating and cooling) in a very simple manner. Integrated flow rate electronic control and actuator. Fluid: water (NO glycol-based solutions), as provided by VDI 2035. Fluid working temperature range: 5÷90 °C. Working room temperature range: 10÷45 °C. Stock room temperature range: -20÷50 °C. Max. working humidity: 90 % HR, condensation-free. Nominal pressure (PN): 16 bar. Max. differential pressure: 2 bar. Max. flow rate set point (Qmax): may be entered separately for heating and cooling. Min. setting flow rate: 3 l/h. Leakage class (EN12266-1): A. Valve body: CW617N brass. Gaskets: low-friction PTFE / EPDM. Actuator and flow rate meter: ABS. Available in 1/2" or 1" version; electronic controller with or without Bluetooth connection, ModBus or BacNet protocol connection available and with or without temperature probes to monitor thermal energy consumptions.