



VAT Vakuumventile AG  
CH-9469 Haag, Schweiz

## PRODUCT DATA SHEET

Series 613, DN 25 - 320 mm (I.D. 1" - 12")

Ordering No. 613..-.....-.....

### 1 Description

This product is a Butterfly control valve for conductance control in vacuum systems.

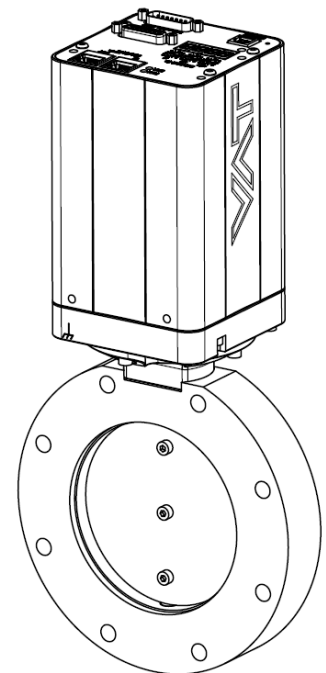
This Product Data Sheet is valid for the valve ordering number(s):

| DN  |      | Ordering numbers |     |          |     |                 |     |          |     |
|-----|------|------------------|-----|----------|-----|-----------------|-----|----------|-----|
| mm  | inch | aluminum         |     |          |     | stainless steel |     |          |     |
|     |      | ISO-KF           |     | ISO-F    |     | ISO-KF          |     | ISO-F    |     |
| 25  | 1    | 61328-KA         | x y |          |     | 61328-KE        | x y |          |     |
| 40  | 1 ½  | 61332-KA         | x y |          |     | 61332-KE        | x y |          |     |
| 50  | 2    | 61334-KA         | x y |          |     | 61334-KE        | x y |          |     |
| 63  | 2 ½  |                  |     | 61336-PA | x y |                 |     | 61336-PE | x y |
| 80  | 3    |                  |     | 61338-PA | x y |                 |     | 61338-PE | x y |
| 100 | 4    |                  |     | 61340-PA | x y |                 |     | 61340-PE | x y |
| 160 | 6    |                  |     | 61344-PA | x y |                 |     | 61344-PE | x y |
| 200 | 8    |                  |     | 61346-PA | x y |                 |     | 61346-PE | x y |
| 250 | 10   |                  |     | 61348-PA | x y |                 |     | 61348-PE | x y |
| 320 | 12   |                  |     | 61350-PA | x y |                 |     |          |     |

Controller configurations:

|   |  |  |
|---|--|--|
| <p> <span style="border-bottom: 1px solid black; display: inline-block; width: 150px;"></span> x         </p> <p> <span style="border-bottom: 1px solid black; display: inline-block; width: 150px;"></span> y         </p> | <p>Interface</p> <p>H = RS232</p> <p>E = Logic (A/D)</p> <p>Q = DeviceNet®</p> <p>F = Profibus</p> <p>K = RS485</p> <p>N = CC-Link</p> <p>X = EtherCAT</p> <p>F = Ethernet</p> | <p>Sensor inputs</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p> |
|---|--|--|

|  |
|--|
| SPS = Sensor Power Supply<br>(±15VDC power supply for sensor)                          |
| PFO = Power Failure Option<br>(valve closes / opens automatically<br>at power failure) |



Sample picture only. Specified product may differ in size, flange and options.

Example: 61340-PAGH = aluminum valve with ISO-F DN 100 flange, RS232 interface, 2 sensor inputs

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## 2 Technical data

### 2.1 Valve unit

|  |                     |   |      |   |      |      |       |       |       |        |        |
|--|---------------------|---|------|---|------|------|-------|-------|-------|--------|--------|
| Pressure range at 20°C (unheated on delivery)                    |                     |   |      |   |      |      |       |       |       |        |        |
| - Aluminum (613...A...)  |                     | 1 × 10E-8 mbar to 1.2 bar (abs)   |      |   |      |      |       |       |       |        |        |
| - Aluminum hard anodized (613...H...)                            |                     | 1 × 10E-6 mbar to 1.2 bar (abs)   |      |   |      |      |       |       |       |        |        |
| - Aluminum nickel coated (613...I...)                            |                     | 1 × 10E-8 mbar to 1.2 bar (abs)   |      |   |      |      |       |       |       |        |        |
| - Stainless steel (613...E...)                                   |                     | 1 × 10E-8 mbar to 1.2 bar (abs)   |      |   |      |      |       |       |       |        |        |
| Leak valve body, valve seat at 20°C (unheated on delivery)       |                     |   |      |   |      |      |       |       |       |        |        |
| - Aluminum (613...A...)  |                     | 1 × 10E-9 mbar ls <sup>-1</sup>   |      |   |      |      |       |       |       |        |        |
| - Aluminum hard anodized (613...H...)                            |                     | 1 × 10E-5 mbar ls <sup>-1</sup>   |      |   |      |      |       |       |       |        |        |
| - Aluminum nickel coated (613...I...)                            |                     | 1 × 10E-9 mbar ls <sup>-1</sup>   |      |   |      |      |       |       |       |        |        |
| - Stainless steel (613...E...)                                   |                     | 1 × 10E-9 mbar ls <sup>-1</sup>   |      |   |      |      |       |       |       |        |        |
| Cycles until first service (unheated and under clean conditions) |                     | 2'000'000   |      |   |      |      |       |       |       |        |        |
| Admissible operating temperature                                 |                     | while temperature of valve body and valve plate should be kept on about same level  |      |   |      |      |       |       |       |        |        |
| • Valve body   |                     | 10°C to 150°C   |      |   |      |      |       |       |       |        |        |
| • Ambient  |                     | ≤ 50°C  |      |   |      |      |       |       |       |        |        |
| Mounting position  |                     | any (DN63...250)<br>Control unit for ISO-KF version needs support when mounted on horizontal piping and control unit does not hang. (DN25...50) |      |   |      |      |       |       |       |        |        |
| Process side materials   |                     | body / plate  |      | Aluminum - EN AW-6082 (3.2315) (A, H, I)<br>Stainless steel: AISI 316L (1.4404 or 1.4435) (E) |      |      |       |       |       |        |        |
|  |                     | shaft / plate screws  |      | Stainless steel: AISI 316L (1.4404 or 1.4435)   |      |      |       |       |       |        |        |
|  |                     | shaft bearing   |      | Iglidur® X  |      |      |       |       |       |        |        |
| Seals  |                     | rotary feed through   |      | FKM (e.g. Viton®)   |      |      |       |       |       |        |        |
| DN (nominal I. D.)   | [mm]                | 25  | 40   | 50  | 63   | 80   | 100   | 160   | 200   | 250    | 320    |
|  | [inch]              | 1   | 1½"  | 2"  | 2½"  | 3"   | 4"    | 6"    | 8"    | 10"    | 12"    |
| Max. differential pressure on plate (close position)             | [mbar]              | 1000  | 1000 | 1000  | 1000 | 1000 | 800   | 300   | 150   | 100    | 75     |
| Typical closing or opening time                                  | Aluminum [ms]       | 90  | 90   | 90  | 90   | 90   | 90    | 110   | 140   | 180    | 290    |
|  | Steel [ms]          | 90  | 90   | 90  | 90   | 90   | 110   | 140   | 180   | 290    | na     |
| Min. controllable conductance (N <sub>2</sub> molecular flow)    | [ls <sup>-1</sup> ] | 0.15  | 0.25 | 0.3   | 0.45 | 0.65 | 0.85  | 1.70  | 2.80  | 5      | 6      |
| Max. conductance (N <sub>2</sub> molecular flow)                 | [ls <sup>-1</sup> ] | 22  | 80   | 150   | 360  | 850  | 1'400 | 3'800 | 7'800 | 15'000 | 27'000 |
| Weight (approx.) Aluminum valve                                  | Aluminum [kg]       | 2.2   | 2.3  | 2.6   | 2.8  | 3.0  | 3.2   | 4.4   | 4.9   | 5.9    | 10.6   |
|  | Aluminum [lbs]      | 4.9   | 5.1  | 5.8   | 6.2  | 6.7  | 7.1   | 9.8   | 10.9  | 13.0   | 23.5   |
| Weight (approx.) Stainless steel valve                           | Steel [kg]          | 2.7   | 2.8  | 3.2   | 4.3  | 4.9  | 5.2   | 7.4   | 10.2  | 12.5   | n.a    |
|  | Steel [lbs]         | 6.0   | 6.2  | 7.1   | 9.5  | 10.9 | 11.5  | 16.4  | 22.6  | 27.6   | n.a    |

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### 2.2 Control unit

|                           |                       |  |
|---------------------------|-----------------------|--|
| Power supply input        | connector             | D-Sub, DA-15, male   |
|                           | supply voltage        | +24 VDC ( $\pm 10\%$ ) @ 0.5 V pk-pk max.  |
| Power consumption         | (control / drive)     | 40 W (max.)<br>with optional SPS + 40 W<br>with optional PFO + 10 W<br>3 W max. (from DeviceNet <sup>®</sup> to DeviceNet <sup>®</sup> Interface board of valve) |
| Ambient                   | temperature           | 0 °C to +50 °C max. (<35 °C recommended)   |
|                           | humidity              | 0 to 95% RH, non-condensing  |
| Interface                 | remote                | Refer to chapter 2.3   |
|                           | service port          | USB-B (USB 2.0)  |
| Sensor                    | connector             | D-Sub, DA-15, female   |
|                           | number of inputs      | 2  |
|                           | signal voltage        | -10 ... +10 V  |
|                           | input resistance      | 100 k $\Omega$   |
|                           | ADC resolution        | 0.1 mV   |
|                           | sampling rate         | 2 ms   |
|                           | power supply (output) | +24 VDC / 1.5 A max. or<br>$\pm 15$ VDC / 1.2 A max. (with SPS option)   |
| Position resolution       |                       | 5000 (90° angle)   |
| Actuator type             |                       | servo control  |
| Actuator backlash         |                       | < 0.02°  |
| Pressure control accuracy |                       | 5 mV or 0.1% of setpoint, the higher value applies   |
| Ingress Protection        |                       | IP 40  |

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### 2.3 Interface

#### 2.3.1 Power Connector

|                 |                                    |   |
|-----------------|------------------------------------|---|
| Connector       |                                    | D-Sub, DA-15, male                        |
| Digital inputs  | input 1                            | interlock open (adjustable with CPA 4.0)  |
|                 | input 2                            | interlock close (adjustable with CPA 4.0) |
|                 | voltage control<br>contact control | 12 ... 24V / 4 ... 8 mA<br>24V / 8 mA     |
| Digital outputs | output 1                           | valve closed (adjustable with CPA 4.0)    |
|                 | output 2                           | valve opened (adjustable with CPA 4.0)    |
|                 | load                               | max. 70 V / 0.1 A                         |

#### 2.3.2 EtherCAT

|               |                |  |
|---------------|----------------|--|
| Connector     |                | 2 x RJ45, 8-pin (socket), IN and OUT                             |
| Communication | protocol       | Protocol specialized for EtherCAT                                |
|               | node address   | Explicit device identification or station alias, set by switches |
|               | physical layer | 100BASE-Tx (IEEE 802.3)  |
| Cable         |                | shielded Ethernet CAT5e or higher                                |

#### 2.3.3 DeviceNet

|                |  |  |
|----------------|--|--|
| Connector      |  | microstyle, 5-pin, male                                  |
| Communication  | protocol                               | DeviceNet, group 2 slave only                            |
|                | data rate                              | 125, 250, 500 kbaud<br>by switch or network programmable |
|                | MAC ID                                 | address 00 - 63<br>by switch or network programmable     |
|                | profiles                               | Generic "C" default,<br>Process Control Device (ODVA)    |
| Supply voltage | transceiver at microstyle<br>connector | 24 Vnom, 11 ... 25V; max. 0.5 W                          |

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### 2.3.4 RS232

|                        |   |   |
|------------------------|---|---|
| Connector              |   | D-Sub, DB-25, female  |
| Communication settings | baud rate<br>data bits<br>stop bits<br>parity bit | 1200,2400,4800,9600,19200,38400,57600,115200<br>7 or 8<br>1 or 2<br>even, odd, none |
| Digital inputs         | number of inputs                                  | 2   |
|                        | voltage control<br>contact control                | 5 ... 24V / 2 ... 10 mA<br>3.3V / 2 mA  |
| Digital outputs        | number of outputs                                 | 2   |
|                        | load  | max. 70 V / 0.1 A   |
| Analog outputs         | number of outputs                                 | 2   |
|                        | voltage range<br>load                             | 0 ... 10V<br>max. 1 mA  |

### 2.3.5 RS485

|                        |  |  |
|------------------------|--|--|
| Connector              |  | D-Sub, DB-25, female   |
| Communication settings | baud rate<br>data bits<br>stop bits<br>parity bit<br>topology<br>network<br>adress range | 1200,2400,4800,9600,19200,38400,57600,115200<br>7 or 8<br>1 or 2<br>even, odd, none<br>half duplex, full duplex<br>point to point, multiple devices<br>0 ... 255 |
| Digital inputs         | number of inputs   | 2  |
|                        | voltage control<br>contact control   | 5 ... 24V / 2 ... 10 mA<br>3.3V / 2 mA   |
| Digital outputs        | number of outputs  | 2  |
|                        | load   | max. 70 V / 0.1 A  |
| Analog outputs         | number of outputs  | 2  |
|                        | voltage range<br>load  | 0 ... 10V<br>max. 1 mA   |

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### 2.3.6 Logic

|                 |                                    |  |
|-----------------|------------------------------------|--|
| Connector       |                                    | D-Sub, DB-25, female                   |
| Digital inputs  | number of inputs                   | 8                                      |
|                 | voltage control<br>contact control | 5 ... 24V / 2 ... 10 mA<br>3.3V / 2 mA |
| Digital outputs | number of outputs                  | 4                                      |
|                 | load                               | max. 70 V / 0.1 A                      |
| Analog input    | number of inputs                   | 1                                      |
|                 | voltage range                      | 0 ... 10V                              |
|                 | input resistance                   | 100 kOhm                               |
| Analog outputs  | number of outputs                  | 2                                      |
|                 | voltage range                      | 0 ... 10V                              |
|                 | load                               | max. 1 mA                              |

### 2.3.7 Profibus

|               |              |  |
|---------------|--------------|--|
| Connector     |              | D-Sub, DE-9, female  |
| Communication | protocol     | Profibus DP-V1, DP-V0  |
|               | data rate    | 9.6, 19.2, 45.45, 93.75, 187.5, 500 kbps,<br>1.5, 3, 6, 12 Mbps<br>The baud rate is detected automatically or may be<br>configured |
|               | node address | SW configurable (0 – 125)  |

### 2.3.8 CC-Link

|               |                |   |
|---------------|----------------|---|
| Connector     |                | D-Sub, DE-9, female                                       |
| Communication | protocol       | CC-Link V2  |
|               | data rate      | 156, 625, 500 kbps,<br>2.5, 5, 10 Mbps<br>SW configurable |
|               | station number | SW configurable (1– 64)                                   |

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### 2.3.9 Ethernet

|               |                |                                      |
|---------------|----------------|--------------------------------------|
| Connector     |                | 2 x RJ45, 8-pin (socket), IN and OUT |
| Communication | protocol       | Telnet                               |
|               | node address   | IP Address (DHCP or static)          |
|               | physical layer | 100BASE-Tx (IEEE 802.3)              |
| Cable         |                | shielded Ethernet CAT5e or higher    |

### 2.4 General data

|                     |   |
|---------------------|---|
| Weight              | refer to chapter: 2.1   |
| Dimensional drawing | Refer to dimensional drawing of specific valve ordering number (available on request) |

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