Product data sheet

Control butterfly with isolation function
Series 616, DN 40 - 100; gear box actuator (1:25)
Ordering No. 616..-….-…. **“Pressure control”**

1 Description

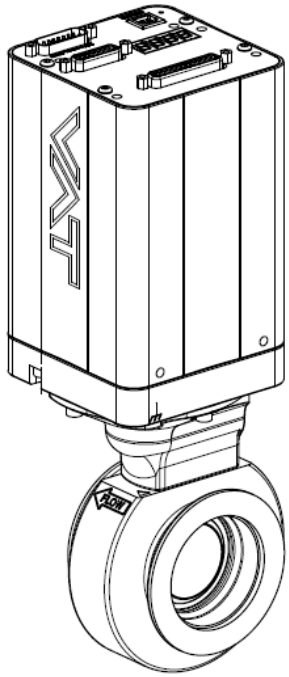
This product is a Butterfly control valve with extended control range and isolation functionality for downstream pressure control in vacuum systems.

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

DN		aluminum, hard anodized						stainless steel					
mm	inch	ISO-KF			ISO-F			ISO-KF			ISO-F		
40	1 ½	61632-KH	X	Y				61632-KE	X	Y			
50	2	61634-KH	X	Y				61634-KE	X	Y			
63	2 ½				61636-PH	X	Y				61636-PE	X	Y
80	3				61638-PH	X	Y				61638-PE	X	Y
100	4				61640-PH	X	Y				61640-PE	X	Y

X	Y	Sensor Inputs
Controller configurations	**Interface**	
G = Basic version	H = RS232 + AO	2
A = With SPS	K = RS485 + AO	2
H = With PFO	E = Logic (A/D)	2
C = With SPS and PFO	Q = DeviceNet®	2
	F = Profibus	2
SPS = Sensor Power Supply	N = CC-Link	2
(+/-15 VDC power for external pressure sensor)	X = EtherCAT	2
PFO = Power Failure Option	Z = Ethernet	2
(Valve opens/closes automatically at power failure)		

Example: 61638-PEGH = stainless steel valve, ISO-F DN80; RS232, 2 sensors



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

2 Technical data

2.1 Valve unit

Pressure range at 20°C (unheated on delivery) - Stainless steel (616 . . - . **E**. . - . . . .) - Aluminum hard anodized (616 . . - . **H**. . - . . . .)			1 × 10E-8 mbar to 1.2 bar (abs) 1 × 10E-6 mbar to 1.2 bar (abs)				
Leak valve seat at 20°C (unheated on delivery) - Stainless steel (616 . . - . **E**. . - . . . .) - Aluminum hard anodized (616 . . - . **H**. . - . . . .)			1 × 10E-9 mbar ls^{-1} 1 × 10E-4 mbar ls^{-1}				
Leak valve body at 20°C (unheated on delivery) - Stainless steel (616 . . - . **E**. . - . . . .) - Aluminum hard anodized (616 . . - . **H**. . - . . . .)			1 × 10E-9 mbar ls^{-1} 1 × 10E-5 mbar ls^{-1}				
Cycles until first service (unheated and under clean conditions) • Pressure control • Closing / opening o DN 40…50 o DN 63…100			2'000'000 250'000 100'000				
Admissible operating temperature • Valve body • Ambient			10°C to 120°C 10°C ... ≤ 50°C; (<35 °C recommended)				
Mounting position (valve seat towards chamber) support recommended			any DN40…100 (if actuator is not vertically oriented)				
Process side materials	body / plate		Stainless steel: AISI 316L (1.4404 or 1.4435) Aluminum - EN AW-6082 (3.2315) hard anodized				
	shaft / plate screws / ..		Stainless steel: AISI 316L (1.4404 or 1.4435)				
	shaft bearing		Iglidur® X				
Seals • Standard*)	Plate		FKM (e.g. Viton®)				
	rotary feed through atmosphere side		FKM (e.g. Viton®)				
	rotary feed through vacuum side		FKM (e.g. Viton®)				
DN (nominal I. D.)		[mm] [inch]	**40** **1½"**	**50** **2"**	**63** **2½**	**80** **3"**	**100** **4"**
Max. differential pressure on plate (close position)		[mbar]	1000	1000	1000	1000	1000
Operating time:	Open to close / Close to open	[s]	0.6	0.6	0.6	0.6	0.6
	Pressure control (throttling)	[s]	0.5	0.5	0.5	0.5	0.5
Min. controllable conductance (N_2 molecular flow)		[ls^{-1}]	0.05	0.1	0.15	0.2	0.25
Max. conductance (N_2 molecular flow) [ls^{-1}]			60	120	220	360	600
Weight (approx.) Aluminum valve		Aluminum [kg]	2.5	2.7	3.8	4.8	5.2
		Aluminum lbs]	5.5	6	8.4	10.6	11.5
Weight (approx.) Stainless steel valve		Steel [kg]	3.3	3.6	5.9	8.8	9.7
		Steel [lbs]	7.3	7.9	13	19.4	21.4

Behavior in case of power failure: Depending on configuration
(with or without PFO (Power Fail Option))

2.2 Control unit

Power supply input	connector	D-Sub, DA-15, male
	supply voltage	+24 VDC (±10%) @ 0.5 V pk-pk max.
Power consumption[1)]	(control / drive)	40 W (max.) with optional SPS: +40 W with optional PFO: +10 W +3 W max. (from DeviceNet® to DeviceNet® Interface board of valve)
Ambient	temperature	10 °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	0 … 10V DC linear with pressure
	input voltage range	-10 … +10 V
	input resistance	100 kΩ
	ADC resolution	0.1 mV
	sampling rate	2 ms; moving median (10 mSec)
	power supply (output)	+24 VDC / 1.5 A max. or ±15 VDC / 1.2 A max. (with SPS option)
Actuator		Motor: Stepper, field oriented control (foc) Encoder: Incremental, 20'000 puls per rotation Gearbox: Ratio 1:25, backlash <0.4°
Movement range	CLOSE - OPEN	158°
Valve mechanics		Deflection lever transfers 158° gearbox output to ≈90° gate movement; nonlinear transfer
Pressure control performance[2)]		5 mV or 0.1% of set point, the higher value applies.
Ingress Protection		IP 40

[1)] Rush in current not considered
[2)] Documented on model process chamber

Actual dimensions and special configuration: dimensional drawing & optional 3D model

2.3 Interface

2.3.1 Power Connector – all interfaces

Connector		D-Sub, DA-15, male
Digital inputs	input 1 input 2	interlock OPEN (adjustable with CPA 4) interlock CLOSE (adjustable with CPA 4)
	voltage control contact control	12 … 24V / 4 … 8 mA 24V / 8 mA
Digital outputs	output 1 output 2	valve OPEN (adjustable with CPA 4) valve CLOSE (adjustable with CPA 4)
	load	max. 70 V / 0.1 A

2.3.2 Logic

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

2.3.3 RS232

Connector		D-Sub, DB-25, female
Communication settings	baud rate data bits stop bits parity bit	1200,2400,4800,9600,19200,38400,57600,**115200**[1)] 7 or **8**[1)] **1**[1)] or 2 even, odd, **none**[1)]
Digital inputs	number of inputs	2
	voltage control contact control	5 … 24V / 2 … 10 mA 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 load	0 … 10V max. 1 mA

[1)] Default setting by firmware; Configuration-File (or CPA) can be used to change

2.3.4 RS485

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

[1)] Default setting by firmware; Configuration-File (or CPA) can be used to change

2.3.5 DeviceNet

Connector		microstyle, 5-pin, male
Communication	protocol	DeviceNet, group 2 slave only
	data rate	125, 250, 500 kbaud by switch or network programmable
	MAC ID	address 00 - 63 by switch or network programmable
	profile	**Generic "C"** 1) Process Control Device (ODVA)
Supply voltage	transceiver at microstyle connector	24 Vnom, 11 … 25V; max. 0.5 W

1) Default setting by firmware; Configuration-File can be used to change (or CPA)

2.3.6 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, 1.5, 3, 6, 12 Mbps The baud rate is detected **automatically**1) or may be configured
	node address	SW configurable (0,**1 1)** – 125)

1) Default setting by firmware; Configuration-File (or CPA) can be used to change

2.3.7 CC-Link

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

2) Default setting by firmware; Configuration-File can be used to change (or CPA)

2.3.8 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 **Default: 0-0-0**
	physical layer	100BASE-Tx (IEEE 802.3)
Cable		shielded Ethernet CAT5e or higher

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)