

## Series 65.0

### Main applications

Downstream pressure control and isolation valve for SEMI and FPD processes

Optimal for corrosive etching and cleaning processes



### Ordering information

Valve with stepper motor and integrated pressure controller

DN		Ordering numbers											
mm	inch	aluminum				aluminum, hard anodized							
		ISO-F		JIS		ISO-F		JIS					
100	4	65040-PA	x	y	65040-JA	x	y	65040-PH	x	y	65040-JH	x	y
160	6	65044-PA	x	y	65044-JA	x	y	65044-PH	x	y	65044-JH	x	y
200	8	65046-PA	x	y	65046-JA	x	y	65046-PH	x	y	65046-JH	x	y
250	10	65048-PA	x	y	65048-JA	x	y	65048-PH	x	y	65048-JH	x	y
320	12	65050-PA	x	y	65050-JA	x	y	65050-PH	x	y	65050-JH	x	y
350	14	–			65051-JA	x	y	–			65051-JH	x	y
400	16	65052-PA	x	y	65052-JA	x	y	65052-PH	x	y	65052-JH	x	y

Controller configurations:

- G = basic version
- A = with SPS
- H = with PFO
- C = with SPS and PFO
- T = basic version with VC master
- V = with SPS and VC master
- U = with PFO and VC master
- W = with SPS, PFO and VC master

SPS = Sensor Power Supply  
(±15VDC power supply for sensor)

PFO = Power Failure Option  
(valve closes/opens automatically at power failure)

VC = Valve Cluster  
(for operating several valves synchronously)

Interface

- G = RS232 1
- H = RS232 2
- C = Logic 1
- E = Logic 2
- P = DeviceNet® 1
- Q = DeviceNet® 2
- D = Profibus 1
- F = Profibus 2
- J = RS485 1
- K = RS485 2
- Y = Ethernet 1
- Z = Ethernet 2
- L = CC-Link 1
- N = CC-Link 2
- I = EtherCAT 1
- X = EtherCAT 2
- S = VC slave (without interface)

Number of sensors

Example: 65040-PAGG  
= Aluminum valve  
with ISO-F DN 100 flanges,  
RS232 interface, for 1 sensor

Pressure controller: see pages 146 – 149

## Features

Body material:

aluminum or  
aluminum, hard anodized

Compact design

Fast, virtually particle-free and shock-free operation

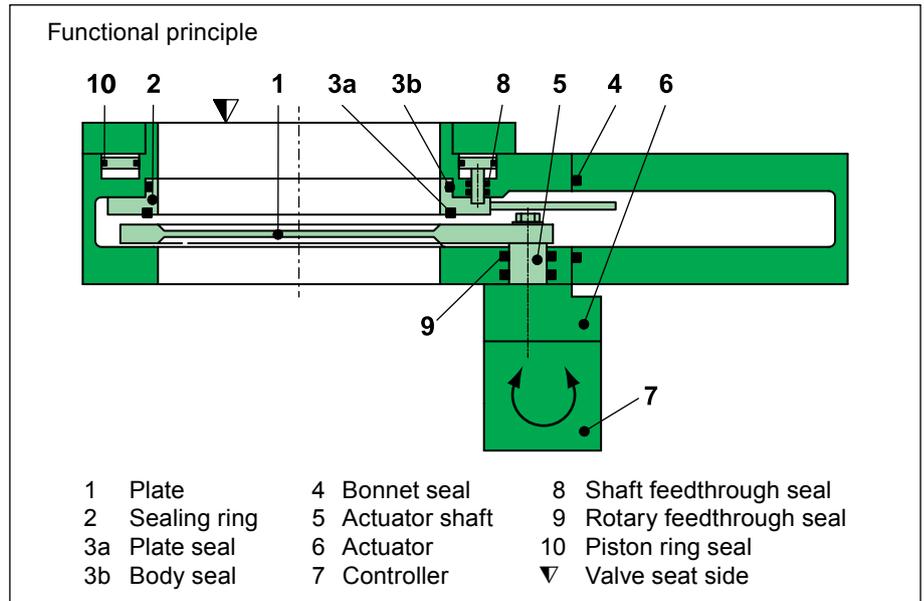
Integrated or external pressure controller

Extremely short control response times

Position indication

Service port for connecting a computer or a service box 2

Easy maintenance

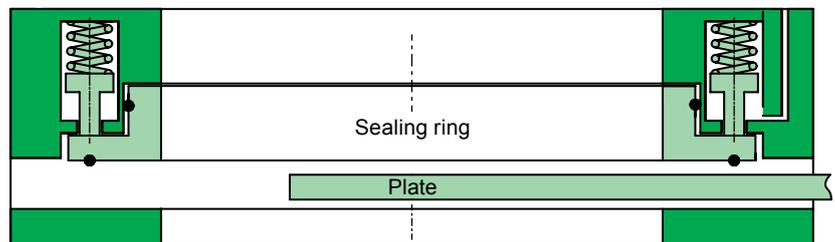


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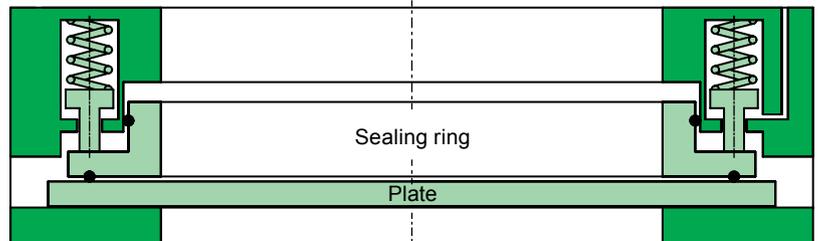
The plate acts as a throttling element and varies the conductance of the valve opening. The pressure controller calculates the required plate position to achieve the setpoint pressure. See also principle drawing on page 280. Actuation is performed by a stepper motor. An encoder monitors the position. This principle ensures fast and accurate process pressure control.

For leaktight closing the sealing ring is pressed downwards by a spring. For opening the sealing ring is lifted pneumatically.

Pressure control



Isolation



## Technical data

Leak rate <sup>1)</sup> : valve body	
– Aluminum	1 · 10 <sup>-9</sup> mbar ls <sup>-1</sup>
– Aluminum, hard anodized	1 · 10 <sup>-5</sup> mbar ls <sup>-1</sup>
Leak rate <sup>1)</sup> : valve seat	
– Aluminum	1 · 10 <sup>-9</sup> mbar ls <sup>-1</sup>
– Aluminum, hard anodized	1 · 10 <sup>-4</sup> mbar ls <sup>-1</sup>
Pressure range <sup>1)</sup>	
– Aluminum	1 · 10 <sup>-8</sup> mbar to 1.2 bar (abs)
– Aluminum, hard anodized	1 · 10 <sup>-6</sup> mbar to 1.2 bar (abs)
Cycles until first service <sup>2)</sup>	
– Pressure control	1 million
– Closing/opening	200 000
Temperature <sup>2)</sup>	
– Valve body	≤ 120 °C
– Ambient	≤ 50 °C
Material	
– Valve body, plate	EN AW-6082 (3.2315)
– Sealing ring	EN AW-6082 (3.2315), AISI 305 (1.4303), AISI 420C (1.3541), AISI 631 (1.4568)
– Other parts	AISI 316L (1.4404, 1.4435), AISI 440 (1.4122), AISI 301 (1.4310), AISI 316 Ti (1.4571), AISI 304 (1.4301)
Seal: bonnet, plate, body, feedthrough	FKM (Viton®)
Feedthrough	
– Actuator	rotary feedthrough
– Sealing ring	shaft feedthrough
Mounting position	
– DN 100–250	any <sup>3)</sup>
– DN 320–400	horizontal <b>only</b> <sup>3)</sup>

<sup>1)</sup> Unheated on delivery

<sup>2)</sup> Maximum values: depending on operating conditions and sealing materials

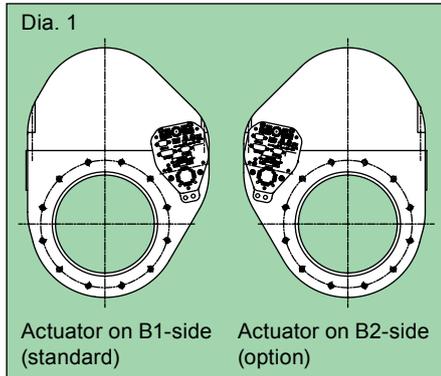
<sup>3)</sup> Valve seat on chamber side recommended

DN (nominal I.D.)		Conductance (molecular flow)	Minimum controllable conductance (molecular flow)	Max. differential pressure on the plate	Max. differential pressure during operation	Compressed air min. – max. overpressure		Operating time for throttling	Typical closing/ opening time		Weight	
mm	inch					bar	psi		Open → closed	Closed → open	kg	lbs
100	4	1 700	3	1 200	30	4–7	58–102	0.7	3	4	12	27
160	6	5 000	5	1 200	10	4–7	58–102	0.8	3	4	18	40
200	8	12 000	10	1 200	5	4–7	58–102	0.9	3	4	22	49
250	10	22 000	15	1 200	5	4–7	58–102	0.9	3	4	29	64
320	12	30 000	22	1 200	5	4–7	58–102	1.1	5	6	48	106
350	14	43 000	25	1 200	5	4–7	58–102	1.3	5	6	59	130
400	16	61 000	30	1 200	5	4–7	58–102	1.5	5	6	68	150

Technical data for pressure controller: see pages 146–149

## Options

Certain options are not available for some nominal diameters or cannot be combined. Moreover, options can affect the general technical data.



### Actuator

- Actuator on B2-side (Dia. 1)
- Controller with configurable PID parameters (adaptive, upstream, downstream, soft-pump)
- RS232 interface with 2 analog outputs

### Valve

- Other sizes, e.g. DN 80
- Other flanges, e.g. ASA-LP
- Customer specified flanges, e.g. rectangular flange for direct mounting to chamber
- Surface treatment, e.g. nickel-plated
- Other sealing materials
- KF ports in body
- Heater with insulation (Pic. 2) for valve temperatures up to 120 °C (for valve temperatures up to 200 °C on request)
- Valve with detached pressure controller (Pic. 3)
- Valve for pressure control only (no leaktight closing)
- Wedge-shaped plate for smaller controllable conductances
  - DN 320: 16 ls<sup>-1</sup> (standard 22 ls<sup>-1</sup>)
  - DN 350: 19 ls<sup>-1</sup> (standard 25 ls<sup>-1</sup>)
  - DN 400: 22 ls<sup>-1</sup> (standard 30 ls<sup>-1</sup>)

### Ordering information for options:

Ordering No. of valve-X (e. g. 65046-PAGH-X, X = valve with heater for 120 °C)

## Spare parts

- **Seals**  
on request (specify fabrication number of valve)

## Accessories

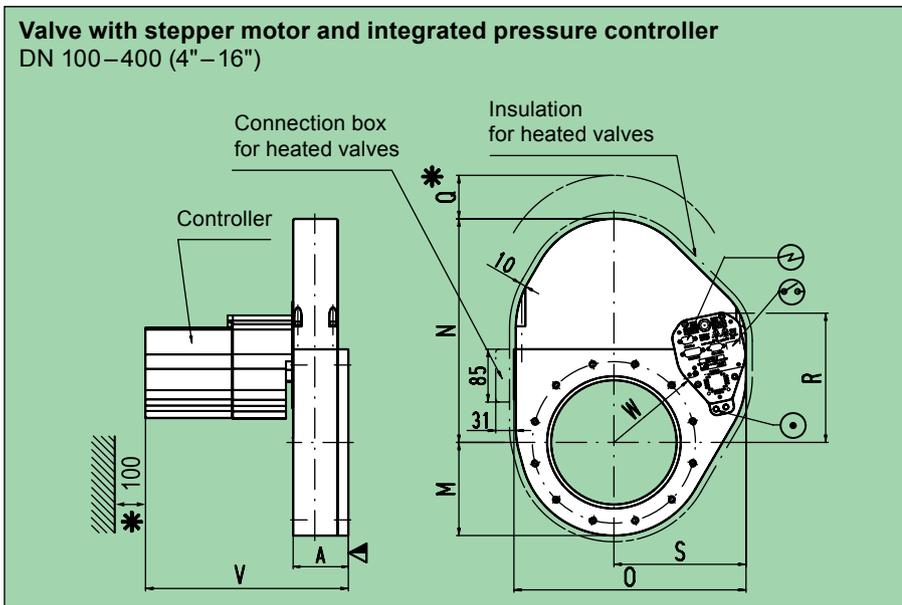
- **Flange connections**  
for installation of the valve: see series 32

## Easy maintenance



- Valve need not be removed from the system
- Fast removal and reinstallation of plate and sealing ring
- Only 2 standard tools required

## Main dimensions

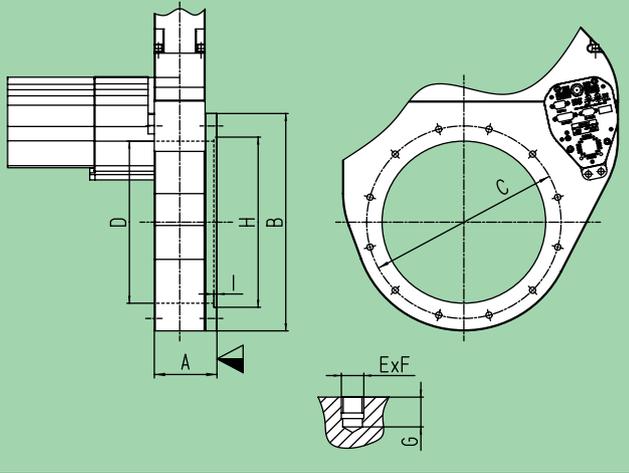


- ▽ Valve seat side
- \* Required for dismantling
- ⊙ Compressed air connection
- ⊕ Electrical connection
- ⊖ Position indicator

DN	mm inch	100 4	160 6	200 8	250 10	320 12	350 14	400 16
A	mm inch	70 2.76	88 3.46	88 3.46	100 3.94	120 4.72	126 4.96	128 5.04
M	mm inch	95 3.74	121.50 4.78	150 5.91	175 6.89	214 8.43	235 9.25	260 10.24
N	mm inch	200 7.87	302 11.88	360 14.17	438 17.24	538 21.18	590 23.23	655 25.79
O	mm inch	260.90 10.27	321 12.64	370.15 14.57	442.70 17.43	536.40 21.12	582 22.91	633 24.92
Q	mm inch	50 1.97	50 1.97	50 1.97	50 1.97	50 1.97	50 1.97	50 1.97
R	mm inch	176 6.93	192 7.56	208.50 8.21	233.50 9.19	277 10.91	290 11.42	313 12.32
S	mm inch	162.90 6.41	184.70 7.27	210.80 8.30	246.40 9.70	274.50 10.81	300 11.81	320 12.60
V	mm inch	308 12.13	326 12.83	326 12.83	331 13.03	351 13.82	358 14.09	360 14.17
W	mm inch	94 3.70	121 4.76	151 5.94	194 7.64	236 9.29	257 10.12	292 11.50

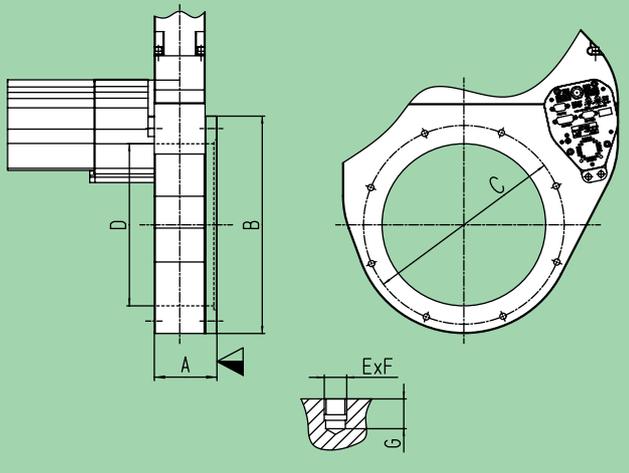
## Flange dimensions

### ISO-F DN 100–400 (4"–16")

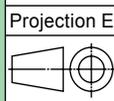


DN	mm inch	100 4	160 6	200 8	250 10	320 12	–	400 16
A	mm inch	70 2.76	88 3.46	88 3.46	100 3.94	120 4.72	–	128 5.04
B	mm inch	190 7.48	243 9.57	300 11.81	350 13.78	425 16.73	–	520 20.47
C	mm inch	145 5.71	200 7.87	260 10.24	310 12.20	395 15.55	–	480 18.90
D	mm inch	100 3.94	150 5.91	200 7.87	261 10.28	318 12.52	–	400 15.75
E x F		8 x M8	8 x M10	12 x M10	12 x M10	12 x M12	–	16 x M12
G	mm inch	12 0.47	14 0.55	15 0.59	16 0.63	18 0.71	–	20 0.79
H	mm inch	–	153 6.02	213.20 8.39	–	–	–	–
I	mm inch	–	5 0.20	5 0.20	–	–	–	–

### JIS B 2290: 1998 / ISO 1609 DN 100–400 (4"–16")



DN	mm inch	100 4	150 6	200 8	250 10	300 12	350 14	400 16
A	mm inch	70 2.76	88 3.46	88 3.46	100 3.94	120 4.72	126 4.96	128 5.04
B	mm inch	190 7.48	243 9.57	300 11.81	350 13.78	425 16.73	470 18.50	520 20.47
C	mm inch	160 6.30	210 8.27	270 10.63	320 12.60	370 14.57	420 16.54	480 18.90
D	mm inch	100 3.94	150 5.91	200 7.87	261 10.28	318 12.52	350 13.78	400 15.75
E x F		8 x M10	8 x M10	8 x M12	12 x M12	12 x M12	12 x M12	12 x M16
G	mm inch	12 0.47	14 0.55	15 0.59	16 0.63	18 0.71	18 0.71	25 0.98

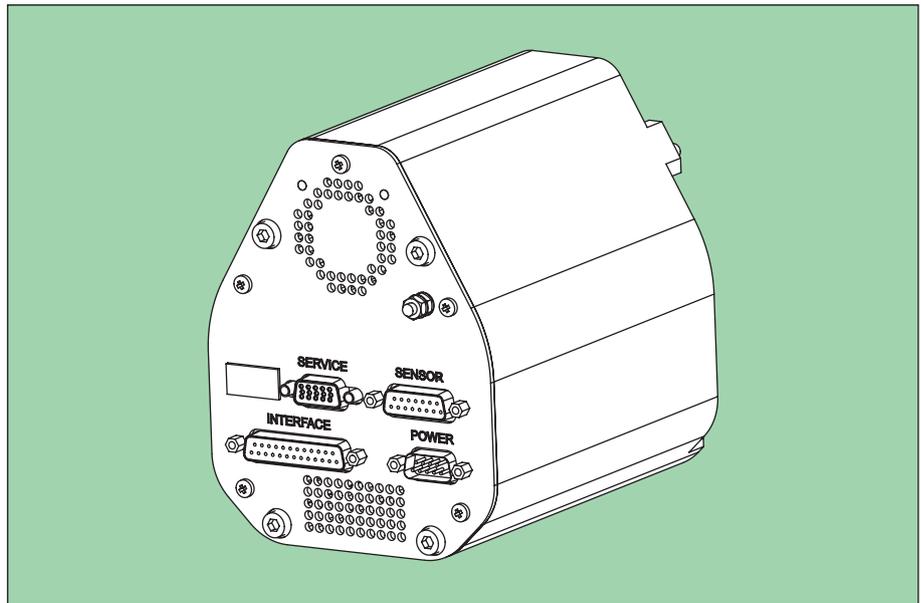


▽ Valve seat side

## Series 65.0

### Features

- Integrated or external pressure controller, depending on valve type
- Automatic learning of system parameters
- Extremely short control response times
- Fast and accurate pressure control
- Valve position control
- Remote control or local operation
- Input for pressure sensor
- Information display



### Function

By operating the LEARN function – needs to be done only once at start-up – the system parameters are automatically determined. Due to the adaptive algorithm the controller continuously adapts to the process conditions (species of gas, gas flow) and thus ensures optimum pressure control at any time.

In position control mode the valve plate can be moved to any position. Status and position are displayed by means of 4 digits.

The valve can be controlled by a computer via Logic, RS232, RS485, DeviceNet®, Ethernet, Profibus, CC-Link or EtherCAT interface.

The RS232 interface and the field busses also have digital inputs to close and open the valve. In addition, digital outputs are available for «open» and/or «closed».

Control via Logic interface performs via digital and analog inputs and outputs.

### Electrical connections

	Connection	Type
POWER	Power input	DB-9 male or Weidmüller SL 3.50 male
SENSOR	Sensor input Sensor power supply	DB-15 female
INTERFACE	Logic, RS232, RS485	DB-25 female
	Ethernet	RJ 45
	DeviceNet® with Logic I/O	Micro-style M12 male
	Profibus with Logic I/O	DB-9 female
	CC-Link with Logic I/O	5-pole terminal screw
	EtherCAT with Logic I/O	2 × RJ 45
	Logic I/O	Binder M8 female

### Accessories

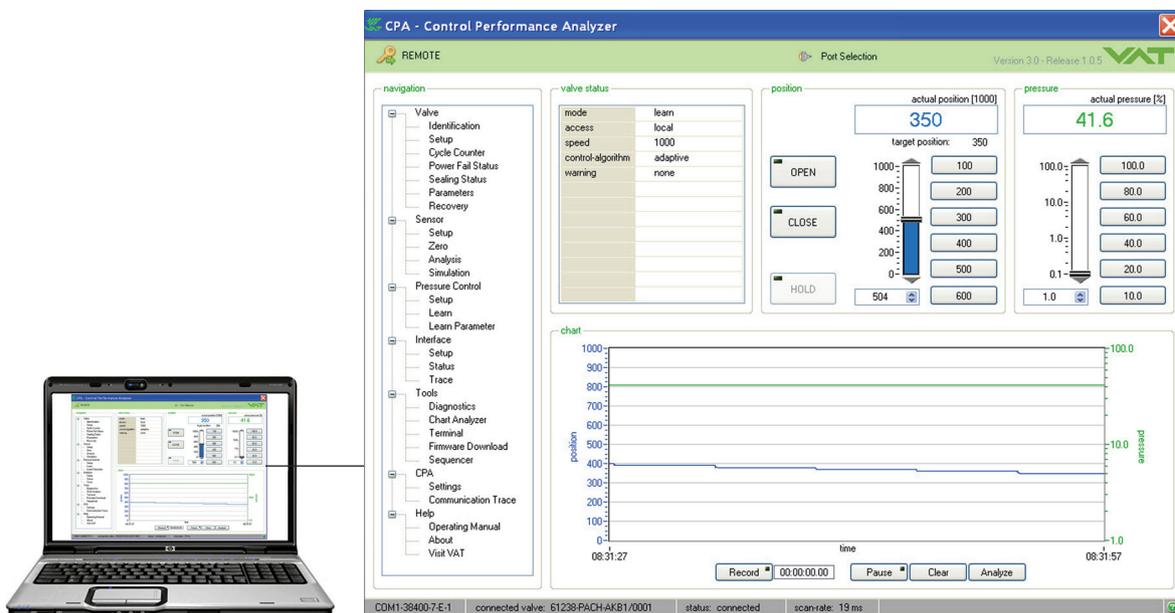
- CPA software (see «Operation»)
- Service box, control panel (see «Operation»)
- Connector kits for the various interfaces
- AC power supply unit (input: 100–240 VAC, output: 24 VDC/4A)

## Operation

### Remote control via computer

Control via computer by using the CPA software developed by VAT offers comfortable functions such as

- Setup
- Operation
- Monitoring
- Diagnostics
- Graphical illustration of the pressure behavior
- Programming and recording of sequences
- Several possibilities for data analysis and process optimization



The software –Control Performance Analyzer (CPA)– may be downloaded for free from our website: [www.vatvalve.com/Customer Service/Information and downloads/Control Performance Analyzer](http://www.vatvalve.com/Customer_Service/Information_and_downloads/Control_Performance_Analyzer).

For connecting the computer to the valve, a special cable designed by VAT is required. The diagram for the cable is available on our website: [www.vatvalve.com/Customer Service/Information and downloads/Cable description](http://www.vatvalve.com/Customer_Service/Information_and_downloads/Cable_description). The cable and the software «Control Performance Analyzer (CPA)» can also be ordered from VAT.

### Local operation by means of a service box or control panel



Standard service box 2 with cable



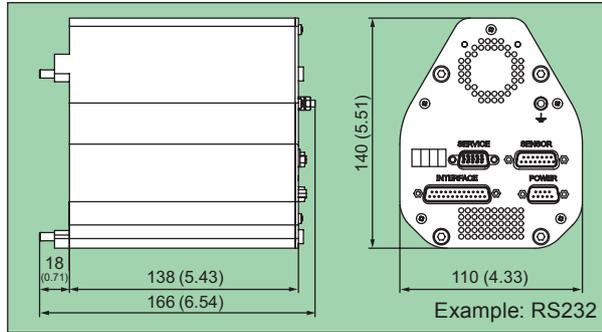
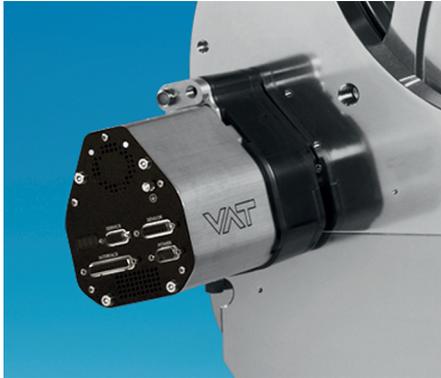
Control panel with cable for integration into a 19" rack

## Options

- **Sensor Power Supply (SPS)**  
±15VDC power supply for the sensor/sensors
- **Power Failure Option (PFO)**  
Valve closes/opens automatically at power failure
- **Valve Cluster (VC)**  
For operating several valves synchronously by means of a master valve and one or more slave valves.

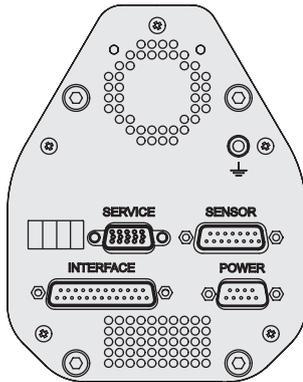


## Integrated controller: Series 65.0 (external controller available as an option)



Available interfaces:

- Logic
- RS232
- RS485
- DeviceNet®
- Ethernet
- Profibus
- CC-Link
- EtherCAT



Power consumption	max. +24 VDC (±10%) @ 0.5 V pk-pk
- Controller + motor	max. 50 W
- Power failure option (PFO)	max. 10 W
- Sensor power supply (SPS)	max. 36 W
Sensor supply	24 VDC or ±15 VDC
Sensor input	0–10 VDC linear with pressure
- Signal voltage	Ri = 100 kΩ
- Input resistance	0.23 mV
- Resolution	10 ms
- Sampling rate	
Control accuracy	5 mV or 0.1% of setpoint <sup>1)</sup>
Position resolution	≥9155 (depending on nominal diameter)
Protective system	IP 20

<sup>1)</sup> The higher value applies