bürkert
FLUID CONTROL SYSTEMS

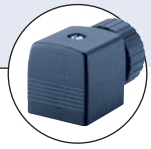
# 2/2-way Solenoid Control Valve

- Direct-acting, normally closed
- DN 3 ... 12 mm
- Port Connection 1/2" or 3/4"

Type 2836 can be combined with...

**Type 8605**
Control electronics
Cable plug version

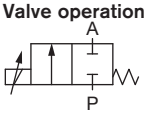
**Type 8605**
Digital control electronics
DIN-rail version



**Type 2508**
Cable plug

The direct-acting solenoid control valve, Type 2836, works as an electromagnetically actuated control valve in applications with relatively high flow rates. The valve is normally closed.

**Valve operation A**




Direct-acting, 2-way solenoid control valve, normally closed

Valve control takes place through the control electronics of Type 8605, which converts an analogue input signal into a PWM[2] (pulse-width modulation) signal.

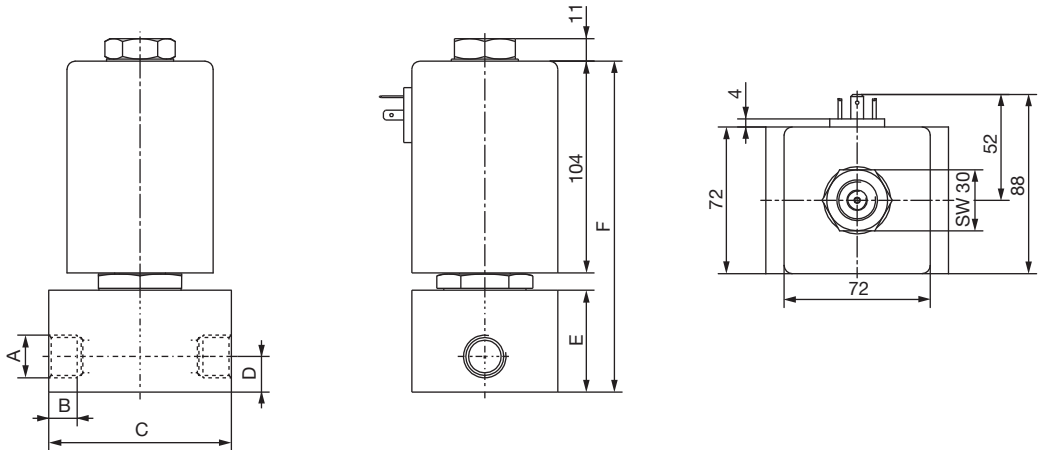
Further, functional features of the Type 8605 electronic control unit:

- Temperature compensation for coil heating by internal current regulation
- Simple zero and span settings
- Ramp function to dampen fast status changes

[1] Pressure data [bar]: Overpressure with respect to atmospheric pressure
[2] PWM pulse-width modulation
[3] Characteristic data of control behaviour depends on process conditions

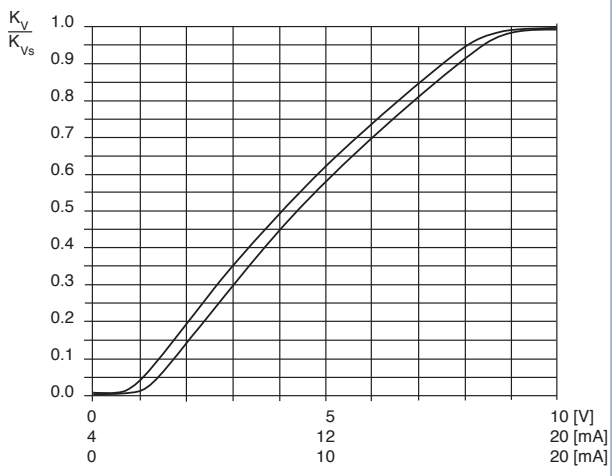
| Technical data - valve | |
|---|---|
| **Body material** | Brass, stainless steel |
| **Seal material** | FKM, others on request |
| **Fluids** | Neutral gases and liquids |
| **Pressure range** | 0 ... 25 bar [1] |
| **Fluid temperature** | -10 ... +90 °C (14 °F to 194 °F) |
| **Ambient temperature** | max. +55 °C (max. 131 °F) |
| **Viscosity** | max. 21 mm²/s (max. 21 cSt) |
| **Power supply** | 24 V DC |
| **PWM frequency** | 150-180 Hz |
| **Power consumption** | max. 30 W |
| **Max. coil current** | 1100 mA |
| **Duty cycle** | 100 % continuously rated |
| **Port connection** | G 1/2, G 3/4, NPT 1/2, NPT 3/4, others on request |
| **Electrical connection** | Cable plug Type 2508 acc. to DIN EN 175301-803 form A |
| **Installation** | As required, preferably with actuator in upright position |
| **Typical control data[3]** | |
| Hysteresis | < 5 % |
| Repeatability | < 1 % of F.S. |
| Sensitivity | < 0.5 % of F.S. |
| Span | 1:25 |
| **Protection class - valve** | IP65 |

## Dimensions [mm]




| Line connection A | B | C | D | E | F | Mass [g] |
|---|---|---|---|---|---|---|
| G 1/2; NPT 1/2 | 14 | 90 | 17.5 | 50 | 162.5 | 4000 (brass) |
| G 3/4; NPT 3/4 | 16 | 90 | 17.5 | 50 | 162.5 | 4600 (stainless steel) |

## Characteristics of a proportional valve




## Advice for valve sizing

In continuous flow applications, the choice of an appropriate valve size is much more important than with on/off valves. The optimum size should be selected such that the resulting flow in the system is not unnecessarily reduced by the valve. However, a sufficient part of the pressure drop should be taken across the valve even when it is fully opened.

**Recommended value: $\Delta p_{valve}$ > 25 % of total pressure drop within the system**

Otherwise, the ideal, linear valve curve characteristic is changed.

If the differential pressure (difference between inlet and outlet pressure) exceeds half the value of the nominal pressure, the characteristics may change.

**For that reason take advantage of Bürkert competent engineering services during the planning phase!**

## Determination of the $k_v$ value

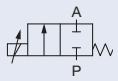
| Pressure drop | $k_v$ value for liquids [m³/h] | $k_v$ value for gases [m³/h] |
|---|---|---|
| Subcritical $p_2 > \frac{p_1}{2}$ | $= Q\sqrt{\frac{\rho}{1000\,\Delta p}}$ | $= \frac{Q_N}{514}\sqrt{\frac{T_1\,\rho_N}{p_2\,\Delta p}}$ |
| Supercritical $p_2 < \frac{p_1}{2}$ | $= Q\sqrt{\frac{\rho}{1000\,\Delta p}}$ | $= \frac{Q_N}{257\,p_1}\sqrt{T_1\,\rho_N}$ |

| | | |
|---|---|---|
| $k_V$ | Flow coefficient | [m³/h] [4] |
| $Q_N$ | Standard flow rate | [$m_N^3$/h] [5] |
| $p_1$ | Inlet pressure | [bar] [6] |
| $p_2$ | Outlet pressure | [bar] [6] |
| $\Delta p$ | Differential pressure $p_1$-$p_2$ | [bar] |
| $\rho$ | Density | [kg/m³] |
| $\rho_N$ | Standard density | [kg/m³] |
| $T_1$ | Temperature if fluid medium | [(273+t)K] |

[4] Measured with water, Δp =1 bar, differential pressure over the valve
[5] Standard conditions at 1,013 bar[3] and 0 °C (273K)
[6] Absolute pressure

## Characteristic values with ordering chart (other versions on request)

### All valves with FKM seal

| Valve operation | Orifice [mm] | Port connection | $k_{vs}$ value water [m³/h] [7] | $Q_{Nn}$ value [l/min] [8] | Maximum operating pressure [bar] [9] | Item no. brass body | Item no. stainless steel body |
|---|---|---|---|---|---|---|---|
| A   | 3 | G 1/2 | 0.25 | 270 | 25 | 154 541 | 154 542 |
| | | NPT 1/2 | 0.25 | 270 | 25 | 164 592 | - |
| | 4 | G 1/2 | 0.40 | 430 | 16 | 154 543 | 154 544 |
| | | NPT 1/2 | 0.40 | 430 | 16 | 164 593 | - |
| | 6 | G 1/2 | 0.90 | 970 | 8 | 145 654 | 154 545 |
| | | NPT 1/2 | 0.90 | 970 | 8 | 164 594 | - |
| | | G 3/4 | 0.90 | 970 | 8 | 154 546 | 154 547 |
| | | NPT 3/4 | 0.90 | 970 | 8 | 164 595 | - |
| | 8 | G 1/2 | 1.5 | 1615 | 5 | 154 548 | 154 549 |
| | | NPT 1/2 | 1.5 | 1615 | 5 | 164 596 | - |
| | | G 3/4 | 1.5 | 1615 | 5 | 154 550 | 154 551 |
| | | NPT 3/4 | 1.5 | 1615 | 5 | 164 597 | - |
| | 10 | G 3/4 | 2.0 | 2150 | 3 | 154 552 | 154 553 |
| | | NPT 3/4 | 2.0 | 2150 | 3 | 164 598 | - |
| | 12 | G 3/4 | 2.5 | 2700 | 2 | 154 554 | 154 555 |
| | | NPT 3/4 | 2.5 | 2700 | 2 | 164 599 | - |

[7] $k_{vs}$ value: Flow rate value for water, measured at +20 °C and 1 bar pressure differential over a fully opened valve.
[8] $Q_{Nn}$ value: Flow rate value for air with inlet pressure of 6 bar[1], 1 bar pressure differential and +20 °C.
[9] Pressure data [bar]: Overpressure with respect to atmospheric pressure

**Please note** that the valves are delivered without control electronics unit and cable plug (see accessories below).

## Ordering chart for accessories

### Cable plug Type 2508 according to DIN EN 175301-803 Form A

The delivery of a cable plug includes the flat seal and fixing screw

| Circuitry | Voltage / frequency | Item no. |
|---|---|---|
| None | 0 - 250 V AC/DC | 008 376 |
| None, with 3 m cable | 0 - 250 V AC/DC | 783 573 |

### Control Electronics, Type 8605 - please see datasheet

**For product inquiries, use the specification sheet for solenoid control valves!**

Note

You can fill out the fields directly in the PDF file before printing out the form.

# Design data for solenoid control valves

**Please fill out this form and send to your local Bürkert Sales Centre* with your inquiry or order**

| | |
|---|---|
| Company | Contact person |
| Customer no. | Dept. |
| Address | Tel./Fax |
| Town / Postcode | E-Mail |

**= Mandatory fields** | **Quantity** | **Requested delivery date**

## Process data

| | | | | |
|---|---|---|---|---|
| **Fluid** | | | | |
| **State of fluid** | | ☐ **liquid** | ☐ **gaseous** | |
| **Fluid temperature** | | | °C | |
| **Maximum flow rate** | $Q_{nom}$ = | | Unit: | |
| **Minimum flow rate** | $Q_{min}$ = | | Unit: | |
| **Inlet pressure at nominal operation** | $p_1$ = | | barg | |
| **Outlet pressure at nominal operation** | $p_2$ = | | barg | |
| **Maximum inlet pressure** | $p_{1max}$ = | | barg | |
| **Ambient temperature** | | | °C | |

## Additional specifications

| | | | | |
|---|---|---|---|---|
| **Body material** | ☐ Brass | ☐ Stainless steel | | |
| **Seal material** | ☐ FKM | ☐ other | | |

**Note** Please state all pressure values as **overpressures with** respect to atmospheric [barg].