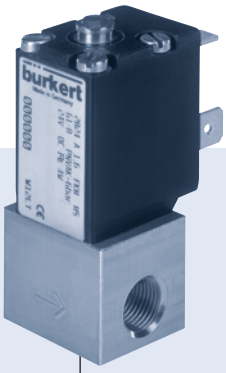
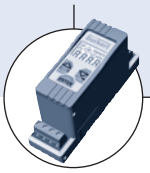
burkert
FLUID CONTROL SYSTEMS

# 2/2-way proportional valve

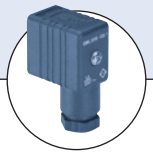


- General purpose
- 0 ... 12 bar[1)]
- DN 0.8 ... 2.0 mm
- 1/8” or sub-base version

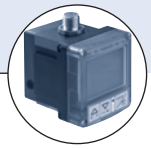
Type 2824 can be combined with…



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



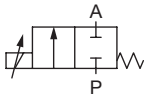
**Type 2507**
Cable plug



**Typ 8611**
Universal Controller

The direct-acting proportional valve Type 2824 can be used as a control valve for process control and is suitable for technical vacuum. Low hysteresis, high repeatability and high sensitivity ensure superior regulation behaviour. Thanks to an elastomeric sealing, the valve closes tightly and securely.

**Circuit function A**




Direct acting 2-way proportional valve, normally closed

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

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

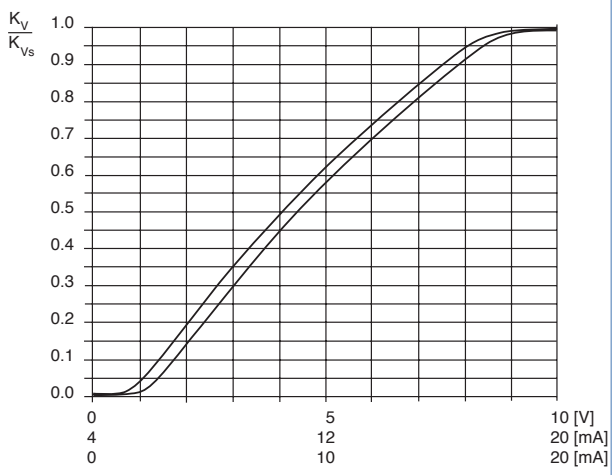
[1)] Pressure data [bar]: Overpressure with respect to atmospheric pressure
[2)] PWM pulse-width modulation
[3)] Characteristic data of control behaviour depends on process conditions

| Technical data - valve | |
|---|---|
| **Body material** | Brass, Stainless steel |
| **Seal material** | FKM, EPDM on request |
| **Media** | Neutral gases, liquids |
| **Medium temperature** | -10 ... +90 °C |
| **Ambient temperature** | max. +55 °C |
| **Viscosity** | max. 21 mm²/s |
| **Operating voltage** | 24 V DC |
| **Power consumption** | 5 W |
| **Duty cycle** | 100% continuously rated |
| **Port connection** | Sub-base , G 1/8, NPT 1/8, others on request |
| **Electric connection** | Cable plug Type 2507, Form B Industrial standard |
| **Installation** | As required, preferably with actuator in upright position |
| **Typical control data [3)]** | |
| Hysteresis | < 5% |
| Repeatability | < 0.25% FS |
| Sensitivity | < 0.25% FS |
| Turn-down ratio | 1:100 |
| **Protection class - valve** | IP65 |

**Technical data - control electronics Type 8605 (see separate datasheet)**

DTS 1000083869 EN Version: A Status: RL (released I freigegeben I validé) printed: 29.03.2007

## Characteristic of a proportional valve




## Advice for valve sizing

In continuous flow applications, the choice of 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: $\Delta p_{valve}$ > 30% of total pressure drop within the system**

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

## Determination of the kv value

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

| | | |
|---|---|---|
| $k_V$ | Flow coefficient | [m³/h] [1] |
| $Q_N$ | Standard flow rate | [$m_N^3$/h] [2] |
| $p_1$ | Inlet pressure | [bar][3] |
| $p_2$ | Outlet pressure | [bar][3] |
| $\Delta p$ | 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] |

[1] measured for water, Δp = 1 bar, via the device

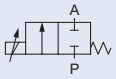
[2] Standard conditions at 1.013 bar[3] and 0 °C (273K)

[3] Absolute pressure

DTS 1000083869 EN Version: A Status: RL (released I freigegeben I validé) printed: 29.03.2007

## Ordering chart (other versions on request)

**All valves with FKM sealing**

| Control function | Orifice [mm] | Port connection | kvs value water [m³/h] [1] | QNn value [l/min] [2] | Maximum pressure [bar] [3] | Coil power consumption [W] | Maximum coil current [mA] | Item no. Brass body | Item no. Stainless steel body |
|---|---|---|---|---|---|---|---|---|---|
| A  | 0.8 | sub-base FK01 | 0.018 | 19 | 12 | 5 | 210 | 175 660 | 175 677 |
| | | G 1/8 | 0.018 | 19 | 12 | 5 | 210 | 175 950 | 175 951 |
| | | NPT 1/8 | 0.018 | 19 | 12 | 5 | 210 | 175 952 | 175 953 |
| | 1.0 | sub-base FK01 | 0.027 | 29 | 10 | 5 | 210 | 175 954 | 175 955 |
| | | G 1/8 | 0.027 | 29 | 10 | 5 | 210 | 175 956 | 175 957 |
| | | NPT 1/8 | 0.027 | 29 | 10 | 5 | 210 | 175 958 | 175 959 |
| | 1.2 | sub-base FK01 | 0.038 | 41 | 8 | 5 | 210 | 175 960 | 175 961 |
| | | G 1/8 | 0.038 | 41 | 8 | 5 | 210 | 175 962 | 175 963 |
| | | NPT 1/8 | 0.038 | 41 | 8 | 5 | 210 | 175 964 | 175 965 |
| | 1.6 | sub-base FK01 | 0.055 | 59 | 6 | 5 | 210 | 175 685 | 175 686 |
| | | G 1/8 | 0.055 | 59 | 6 | 5 | 210 | 175 687 | 175 688 |
| | | NPT 1/8 | 0.055 | 59 | 6 | 5 | 210 | 175 966 | 175 967 |
| | 2.0 | sub-base FK01 | 0.090 | 97 | 3 | 5 | 210 | 175 968 | 175 969 |
| | | G 1/8 | 0.090 | 97 | 3 | 5 | 210 | 175 970 | 175 971 |
| | | NPT 1/8 | 0.090 | 97 | 3 | 5 | 210 | 175 972 | 175 973 |

[1] kVs value: Flow rate value for water, measured at +20 °C and 1 bar pressure differential over a fully opened valve.
[2] QNn value: Flow rate value for air with inlet pressure of 6 bar1), 1 bar pressure differential and +20 °C.
[3] Pressure data [bar]: Overpressure with respect to atmospheric pressure

Please note that the valves are delivered without control electronics unit and cable plug (see Accessory Ordering Information below).

### Further versions on request

**Materials**
Seal material FFKM - Resistant to aggressive media
Seal material EPDM

**Analytical**
Oxygen version
Part oil-, fat- and silicon free

**Electrical connection**
12 V Coil
Cable coil 300mm

**Approvals**
UR
CSA

## Ordering chart for accessories

### Cable plug Type 2507, Form B Industrial standard

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

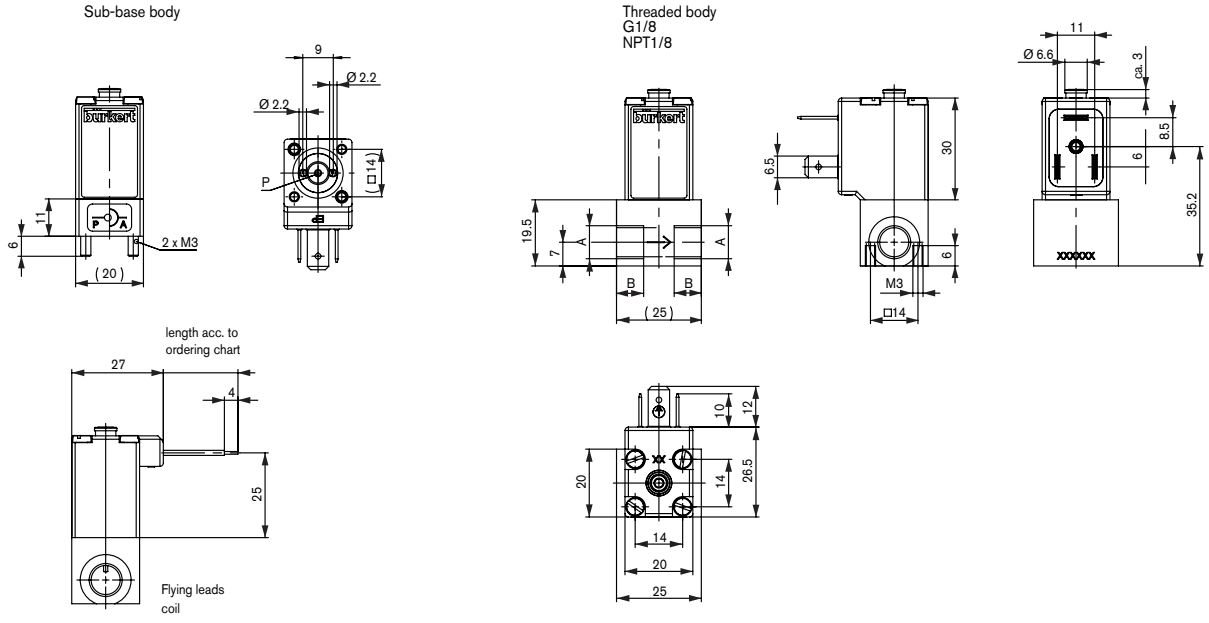
| Voltage | Current rating | Item no. |
|---|---|---|
| Without circuitry | | |
| 0 ... 250 V AC/DC | max. 6 A | 423 845 |

**Elecronic Control Type 8605** - please see datasheet 8605



DTS 1000083869 EN Version: A Status: RL (released | freigegeben | validé) printed: 29.03.2007

## Dimensions [mm]




| A | B |
|---|---|
| NPT 1/8 | 7 |
| G1/8 | 8 |

DTS 1000083869 EN Version: A Status: RL (released I freigegeben I validé) printed: 29.03.2007

bürkert

Note

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

## Design data for proportional 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** | **Desired delivery date**

### Process data

| | | | |
|---|---|---|---|
| **Medium** | | | |
| **State of medium** | ☐ **liquid** ☐ **gaseous** ☐ **vaporous** | | |
| **Medium 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].

DTS 1000083869 EN Version: A Status: RL (released | freigegeben | validé) printed: 29.03.2007

**To find your nearest Bürkert facility, click on the orange box →** www.burkert.com

Reset form



0703/2_EU-en_00891983