

Data sheet

# Proportional solenoid valves 2-way servo-operated Type EV260B

Features



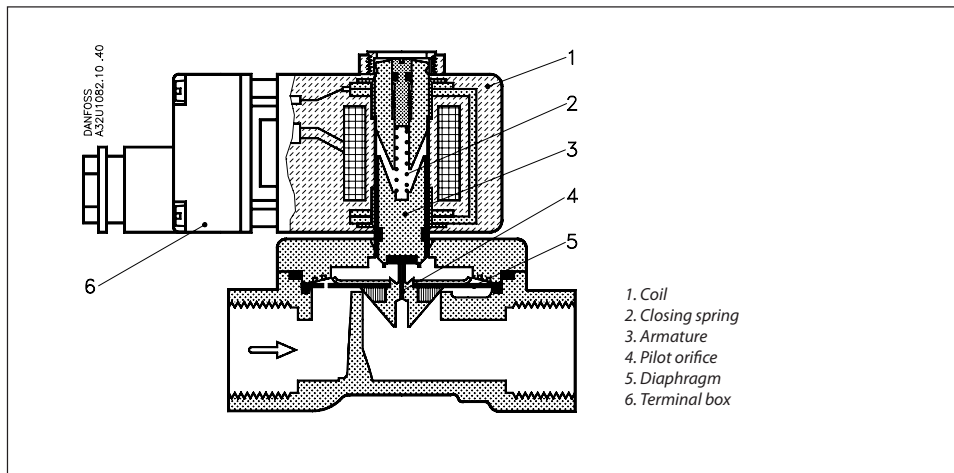
**EV260B**

- For stepless flow regulation in industrial plants
- Short reaction time
- Linear characteristic throughout the regulation range
- Closes on power failure (fail-safe function)
- 24 V dc supply voltage
- Standard 4-20 mA or 0-10 V dc pilot signal
- For water, oil and similar neutral liquids
- Flow range for water: 0.5-12.7 m<sup>3</sup>/h
- Coil enclosure: IP 67
- Also available with NPT thread. Please contact Danfoss.

Technical data

|                     |                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Installation        | Vertical solenoid system is recommended                                                                                                                                                                                                                                                                                                                                                                 |
| Pressure range      | 0.5 to 10 bar                                                                                                                                                                                                                                                                                                                                                                                           |
| Test pressure       | 15 bar                                                                                                                                                                                                                                                                                                                                                                                                  |
| Rangeability        | Better than 1:20 ( 5 - 100%)                                                                                                                                                                                                                                                                                                                                                                            |
| Ambient temperature | -25 to +50°C                                                                                                                                                                                                                                                                                                                                                                                            |
| Medium temperature  | -10 to +80°C                                                                                                                                                                                                                                                                                                                                                                                            |
| Viscosity           | max. 50cSt                                                                                                                                                                                                                                                                                                                                                                                              |
| Materials           | Valve body: Brass,..... W.no. 2.0402<br>Armature: Stainless Steel, W.no. 1.4105 / AISI 430 FR<br>Armature tube: Stainless Steel, W.no. 1.4306 / AISI 304 L<br>Spring: Stainless Steel, W.no. 1.4568<br>Orifice: Stainless Steel, W.no. 1.4305 / AISI 303<br>Spindle: Stainless Steel, W.no. 1.4105 / AISI 430 FR<br>Valve plate: FKM<br>Seat & guide ring: PTFE<br>Diaphragm: PTFE<br>O-rings: NBR / CR |

## Function



Proportional regulation of the opening and closing of the EV260B valves is achieved through stepless regulation of the coil current and thus of the pulling force of the solenoid coil.

When the coil current is increased, the pulling force of the coil (1) will at a certain point exceed the counteracting spring force of the closing spring (2). The armature (3) moves up, opening the pilot orifice (4) in the diaphragm (5), which due to the servo effect follows the armature's movement.

The valve is fully open when the coil current has reached its maximum value.

Through stepless regulation of the coil current the armature can be placed in any position in the armature tube, and the valve thus set to any position between completely closed and completely open.

The effective coil current range for EV260B proportional valves without signal converter is approx. 300-600 mA.

The EV260B valves are also available with a signal converter built in the coil's terminal box (6). The signal converter's output terminals are connected to the solenoid coil.

The signal converter regulates the coil current so that it is proportional to the input signal (pilot signal).

The pilot signal may be a  
- 0 - 10 V dc voltage signal  
or a  
- 4 - 20 mA current signal

## Ordering

### Valve

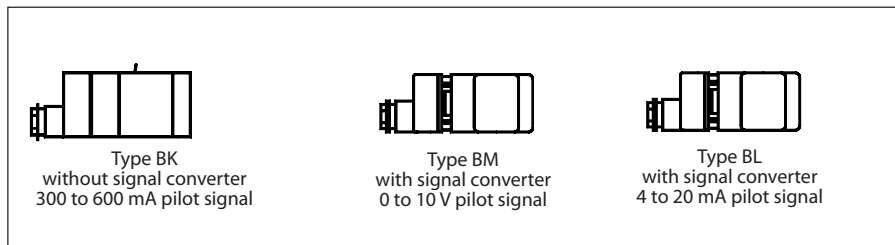
| Con-<br>nection<br>ISO<br>228/1 | Seal<br>material | k <sub>v</sub><br>value<br>[m <sup>3</sup> /h] | Media<br>temp. |              | Type designation |               | Permissible diff.<br>pressure(bar) / Coil type |      |    | Code no.<br>without<br>coil |                 |
|---------------------------------|------------------|------------------------------------------------|----------------|--------------|------------------|---------------|------------------------------------------------|------|----|-----------------------------|-----------------|
|                                 |                  |                                                | Min.<br>[°C]   | Max.<br>[°C] | Main type        | Specification | Min.                                           | Max. |    |                             |                 |
|                                 |                  |                                                | BK             | BM           | BL               | Standard      |                                                |      |    |                             |                 |
| G ¼                             | PTFE             | 0.8                                            | -10            | +80          | EV260B 6B        | G 14T NC000   | 0.5                                            | 10   | 10 | 10                          | <b>032U8052</b> |
| G ⅜                             | PTFE             | 0.8                                            | -10            | +80          | EV260B 6B        | G 38T NC000   | 0.5                                            | 10   | 10 | 10                          | <b>032U8053</b> |
| G ⅜                             | PTFE             | 1.3                                            | -10            | +80          | EV260B 10B       | G 38T NC000   | 0.5                                            | 10   | 10 | 10                          | <b>032U8054</b> |
| G ½                             | PTFE             | 1.3                                            | -10            | +80          | EV260B 10B       | G 12T NC000   | 0.5                                            | 10   | 10 | 10                          | <b>032U8055</b> |
| G ½                             | PTFE             | 2.1                                            | -10            | +80          | EV260B 15B       | G 12T NC000   | 0.5                                            | 10   | 10 | 10                          | <b>032U8056</b> |
| G ¾                             | PTFE             | 5.0                                            | -10            | +80          | EV260B 20B       | C 34T NC000   | 0.5                                            | 10   | 10 | 10                          | <b>032U8057</b> |

## Ordering

### Coil

| Description              | Supply voltage           | Pilot signal | Specification | Code no.        |
|--------------------------|--------------------------|--------------|---------------|-----------------|
| Without signal converter | 24 V full wave rectified | 300 - 600 mA | BK024D        | <b>018Z6987</b> |
| With signal converter    | 21 to 30 V dc            | 0 - 10 V     | BM024D        | <b>018Z0290</b> |
|                          |                          | 4 - 20 mA    | BL024D        | <b>018Z0291</b> |

### Coil options



### Technical data, coil

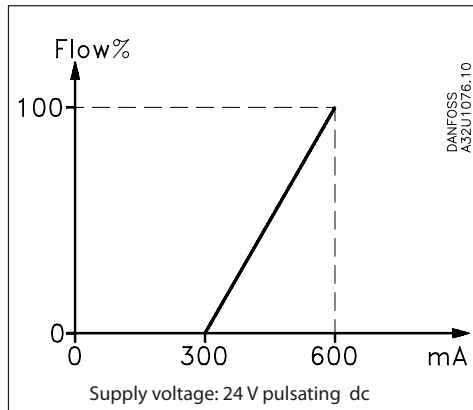
|                             |                                                                                                                  |
|-----------------------------|------------------------------------------------------------------------------------------------------------------|
| Supply voltage              | Without signal converter: 24 V $\pm$ 10%, full-wave rectified ac voltage<br>With signal converter: 21 to 30 V dc |
| Pilot signal                | Without signal converter: 300 to 600 mA<br>With signal converter: 4 to 20 mA or 0 - 10 V                         |
| Coil power                  | max. 20 W                                                                                                        |
| Insulation of coil windings | 400 k $\Omega$ for 0 - 10 V pilot signal. 250 $\Omega$ for 4 to 20 mA pilot signal                               |
| Coil resistance             | 23.5 $\Omega$ at an ambient temperature of 20°C                                                                  |
| Insulation of coil windings | Class H according to IEC 85                                                                                      |
| Connection                  | Without signal converter: Terminal box Pg 13.5<br>With signal converter: 2 m 3-core cable, Pg 13.5               |
| Coil enclosure, IEC 529     | IP 67                                                                                                            |
| Ambient temperature         | -25°C to +50°C                                                                                                   |
| Duty rating                 | Continuous                                                                                                       |

**Signal flow characteristics**

*Coil type BK*

*Without signal converter*

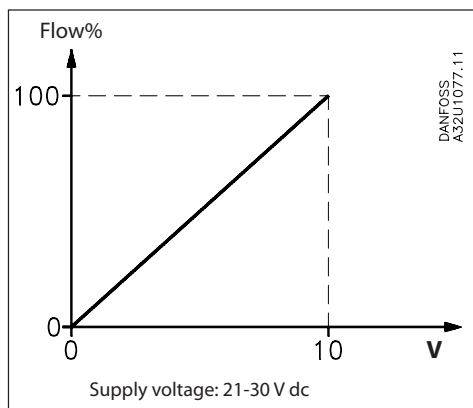
The basic version consists of a valve with a coil for pulsating direct current. The supply voltage of 24 V DC can be established with full-wave rectified alternating current. The valve begins to open at a coil current of approx. 300 mA and is fully open at a coil current of approx. 600 mA. The ratio between coil current and flow between the two outer points is directly proportional.



*Coil type BM*

*With signal converter and 0-10 V pilot signal*

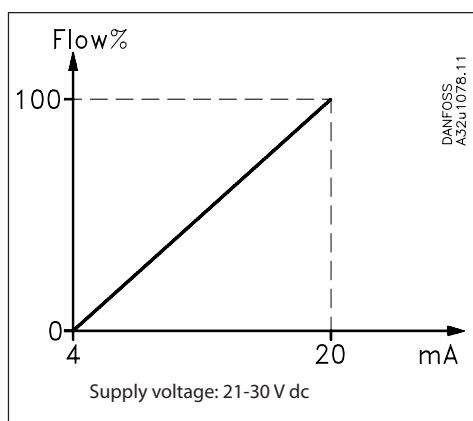
The ratio between pilot signal and flow is directly proportional throughout the regulation range.



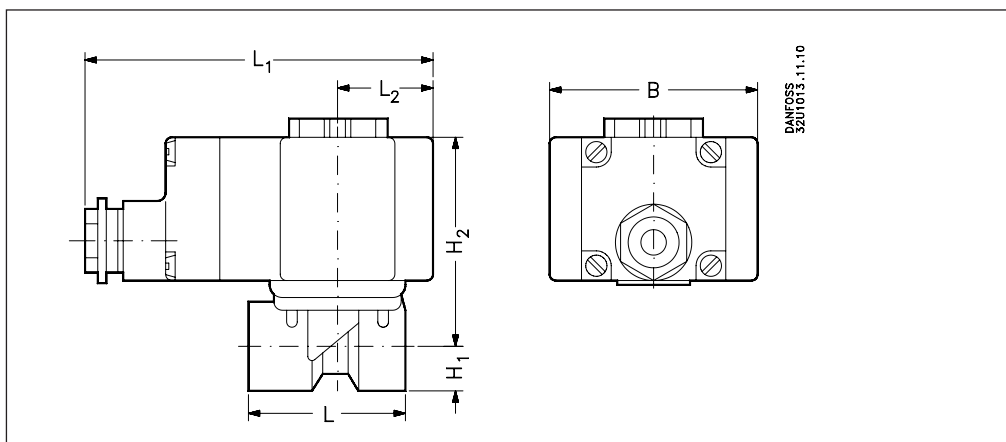
*Coil type BL*

*With signal converter and 4-20 mA pilot signal*

The ratio between pilot signal and flow is directly proportional throughout the regulation range.



### Dimensions and weight

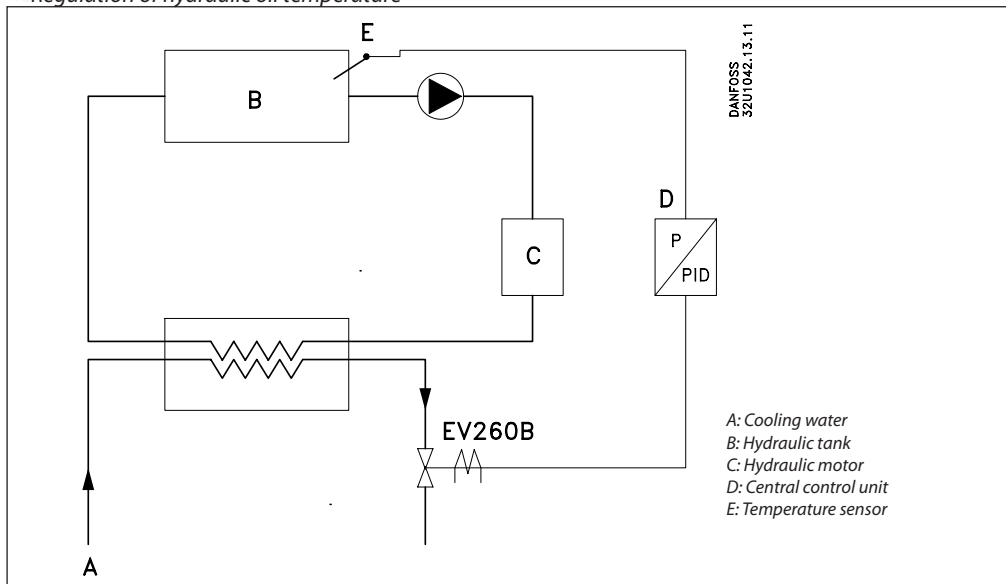


| Type       | L [mm] | L <sub>1</sub> [mm] | L <sub>2</sub> [mm] | H <sub>1</sub> [mm] | H <sub>2</sub> [mm] | B [mm] | Weight without signal converter [kg] | Weight with signal converter [kg] |
|------------|--------|---------------------|---------------------|---------------------|---------------------|--------|--------------------------------------|-----------------------------------|
| EV260B 6B  | 62     | 112 <sup>1)</sup>   | 30                  | 13                  | 71                  | 68     | 1.02                                 | 1.22                              |
| EV260B 10B | 62     | 112 <sup>1)</sup>   | 30                  | 13                  | 71                  | 68     | 1.02                                 | 1.22                              |
| EV260B 15B | 81     | 112 <sup>1)</sup>   | 30                  | 15                  | 74                  | 68     | 1.17                                 | 1.37                              |
| EV260B 20B | 98     | 112 <sup>1)</sup>   | 30                  | 18                  | 79                  | 68     | 1.71                                 | 1.91                              |

1) With signal converter the L<sub>1</sub> measurement is 128 mm

### Example of application

#### Regulation of hydraulic oil temperature



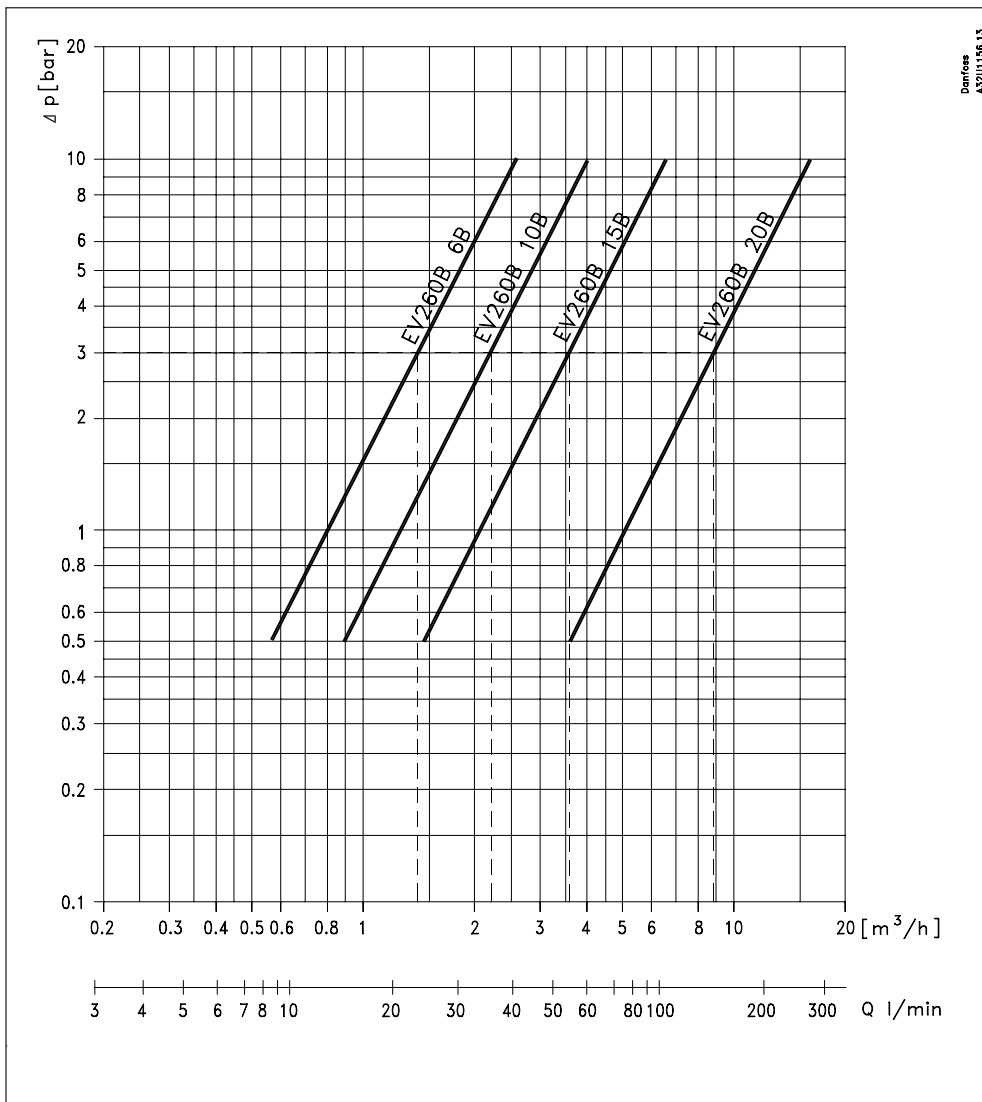
To control viscosity and thus friction, it is important to keep a constant oil temperature in hydraulic motor (C). Cooling is therefore often required.

The temperature in the oil tank (B) is measured by the electronic sensor (E). The signal from the sensor is processed by the P/PID regulator (D). The regulator emits an analogue output signal from 4-20 mA or 0-10 V dc.

The signal from the regulator is converted to a specific coil current by the EV260B valve's signal converter. The valve will then let in a specific quantity of cooling water (A) equivalent to the temperature in the oil tank and the load of the machine.

This system has the advantage that the valve closes immediately when the voltage is disconnected, shutting off the water supply without delay and thus saving water.

Capacity diagram Water at fully opened valve



**Example**

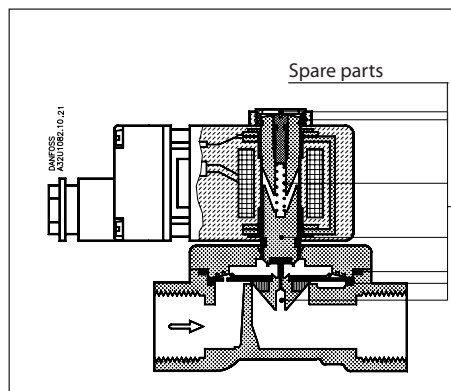
*Problem:*

What capacity is obtainable from EV260B at a differential pressure of 3 bar?

*Results:*

|            |                   |
|------------|-------------------|
| EV260B 6B  | appr. 1.4 $m^3/h$ |
| EV260B 10B | appr. 2.2 $m^3/h$ |
| EV260B 15B | appr. 3.6 $m^3/h$ |
| EV260B 20B | appr. 8.7 $m^3/h$ |

**Spare parts kit**



The spare parts kit comprises e.g. a locking button and nut for the coil, armature with valve plate, spring, O-rings and diaphragm.

| Type       | Code no.        |
|------------|-----------------|
| EV260B 6B  | <b>032U8039</b> |
| EV260B 10B | <b>032U8040</b> |
| EV260B 15B | <b>032U8041</b> |
| EV260B 20B | <b>032U8042</b> |