HYDAC INTERNATIONAL

Digital Display Unit
HDA 5001

Application:

The digital display unit HDA 5001 is designed to display 4 ... 20 mA or 0 ... 10 V standard output signals from pressure, temperature or flow rate sensors.

The display unit supplies the necessary voltage for the sensors and displays the measurement value via a 3–digit LED display. Simultaneously to the input signal, the HDA 5001 provides an analogue output signal (0 ... 10 V) for further use in control and measurement techniques.

As a critical value switch, the HDA 5001 can switch loads directly via two internal relays. The versatility of the HDA 5001 makes it ideal for remote monitoring, on test rigs and many other applications.

Special Features:

- Digital display for pressure, temperature or flow rate
- Accuracy class 0.25
- 14 mm, 3–digit LED display
- Instantaneous analogue output 0 ...10V
- Incorporates suitable supply for pressure, temperature or flow rate sensors
- Cable break detector
- Standard panel mounting 96 x 48 x 125 mm
- 110/220 V AC supply
- Option for 24 V DC supply
- Option for 2 critical value contacts, either normally open or normally closed
- Standard input signal 4 ... 20 mA or 0 ... 10V.

Construction and Mode of Operation:

The digital display unit HDA 5001 is built into a standard panel mounting module with the front panel measuring 96 x 48 mm.

The supply can be provided directly from the mains, i.e. 220 V AC, 110 V AC or from a control power supply of 24 V DC. The stabilising unit produces, in addition to the internal voltages, a ± 12 V supply for the sensors or connected modules.

The 4 . . . 20 mA sensor signal is converted, via a measurement amplifier, to a 0 . . . 10 V voltage signal, which is fed internally to the display unit and to the critical value switch and externally is available for further use.

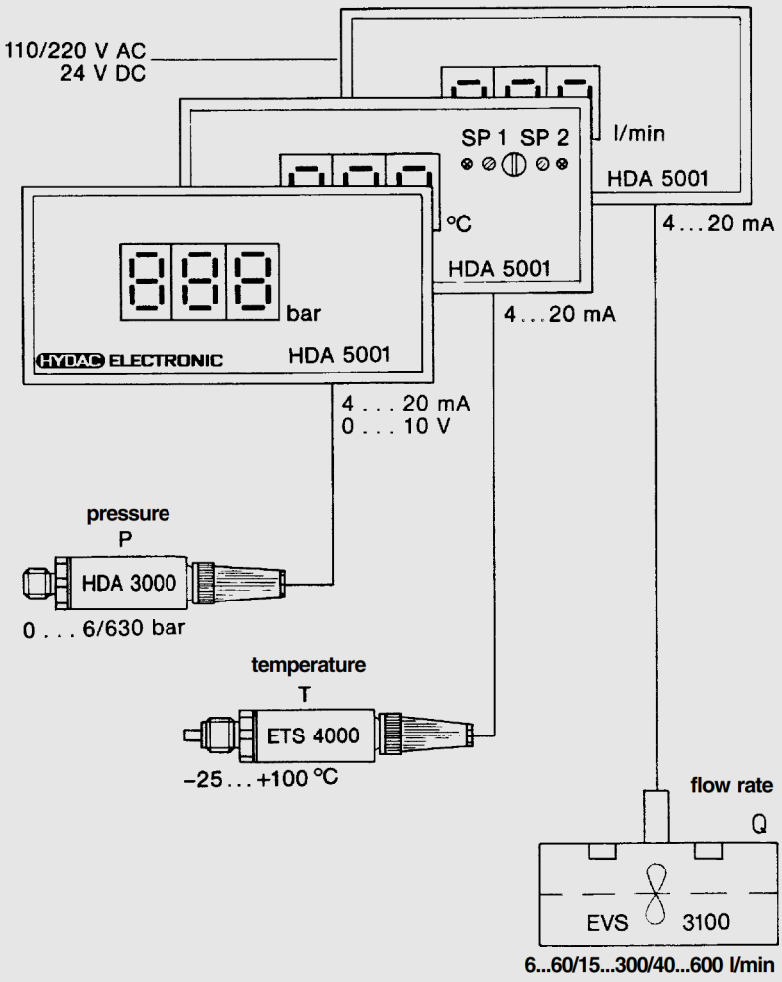
The measurement amplifier signal is translated into the 3–digit 7–segment display via a high quality A/D converter. The brightly lit display is clearly legible even from a long distance.

A cable break monitor checks the sensor signal and any fault is indicated by a flashing display.

Option for dual critical value indication: The available option for dual critical value indication compares the measurement value with the critical values which are adjustable via the potentiometer on the front panel, and activates the relays if they are exceeded. The switch–back hysteresis is approx. 1 % relative to the display final value.

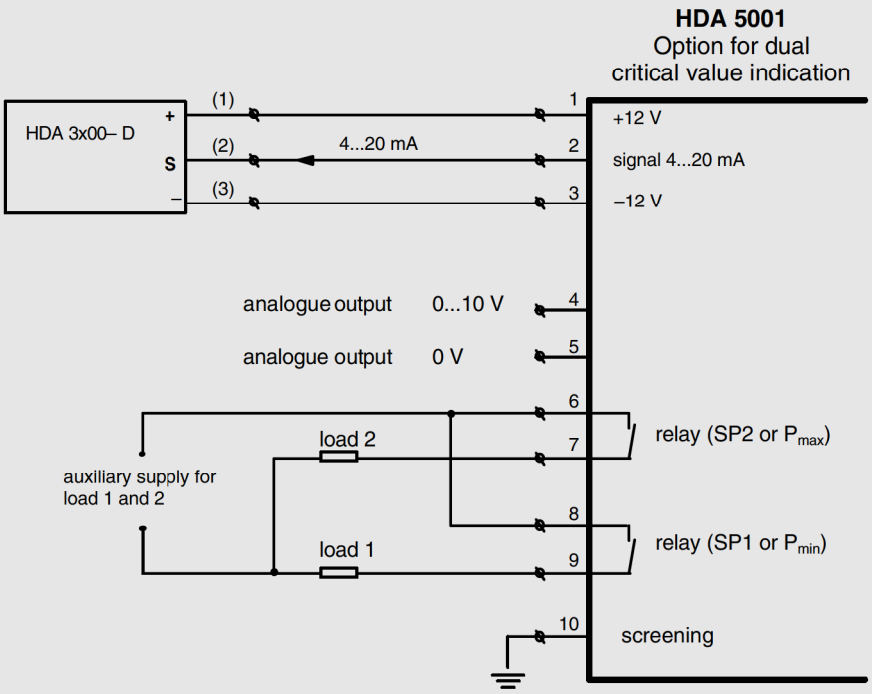
The prevailing critical value can be switched to the display via a selector switch on the front panel. The display then indicates the threshold value of the critical contact each time, i.e. when the relays are inactive the switching point, and when the relays are active, the switch–back point.

Application Examples:



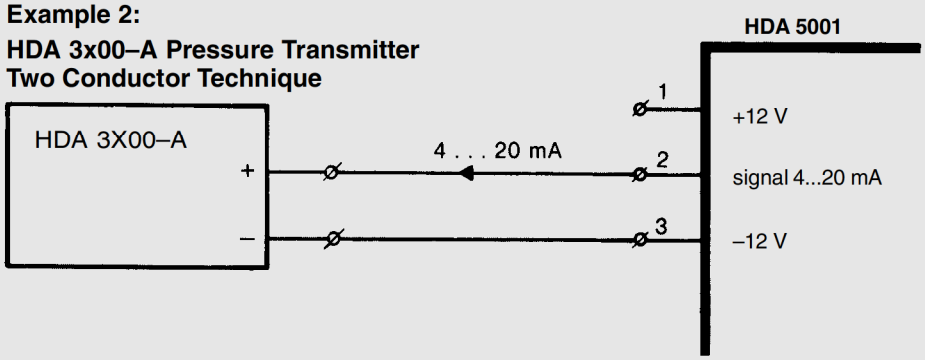
Wiring Examples:

Example 1:
HDA 3x00–D Pressure Transmitter
Three Conductor Technique

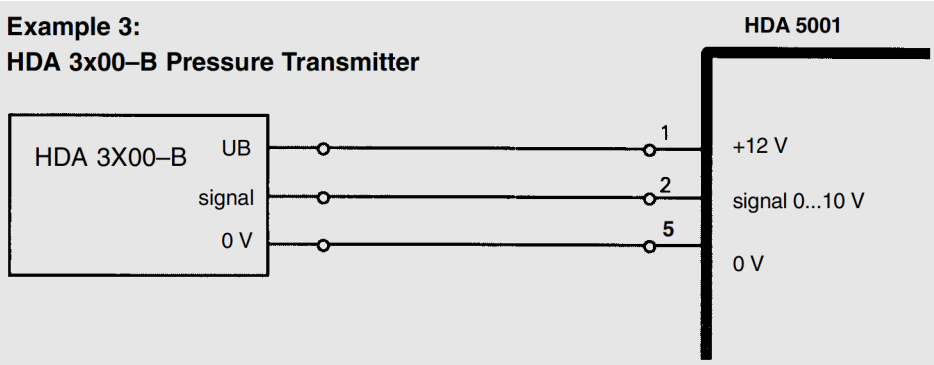


Wiring Examples:

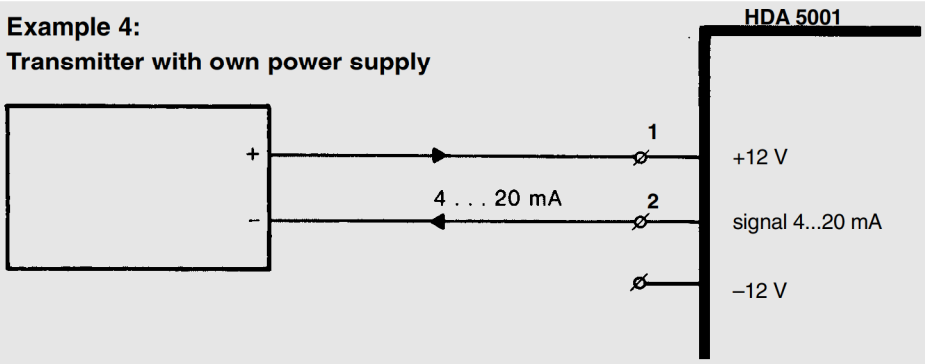
Example 2:
HDA 3x00–A Pressure Transmitter
Two Conductor Technique



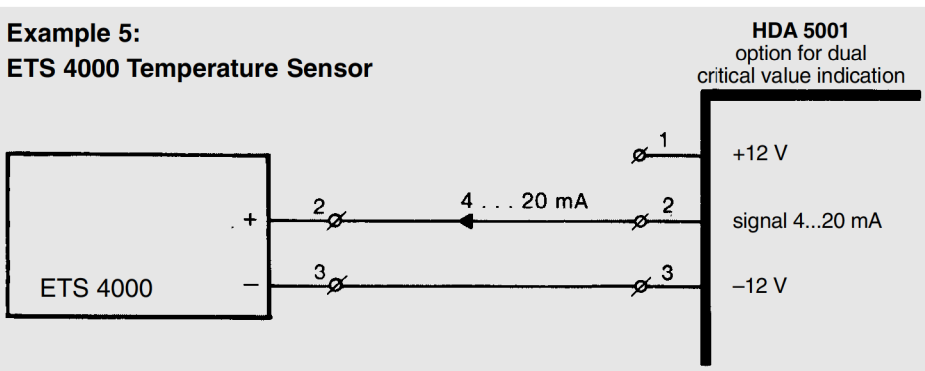
Example 3:
HDA 3x00–B Pressure Transmitter



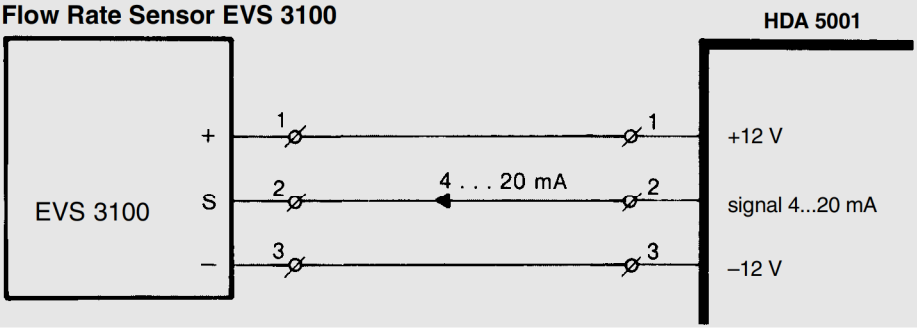
Example 4:
Transmitter with own power supply



Example 5:
ETS 4000 Temperature Sensor



Example 6:
Flow Rate Sensor EVS 3100



Digital Display Unit HDA 5001:

HDA 5001 Technical Specifications:

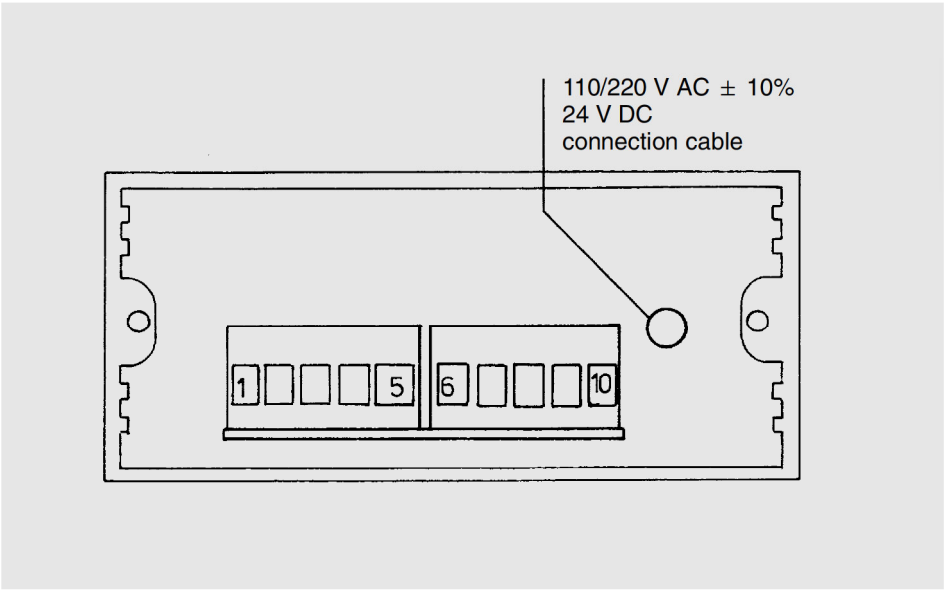
Housing:	control panel module housing 96 x 48 mm control panel cutout 91 x 45 mm max. front panel thickness 13 mm min. depth 150 mm
Supply voltage:	110/220 V AC ±10%, 50 ... 60 Hz , Option 24 V DC
Voltage supply for sensors:	24 V or ±12 V, max. 40 mA
Input sensor signal:	4 ... 20 mA (input resistance 300 Ω) or 0 ... 10 V (input resistance 100 kΩ)
Analogue output:	0 ...10 V
Min. load resistance:	≥ 2 kOhm
Frequency limit:	2 kHz; –3 dB
Display:	3 digits, 7 segment, digits 14 mm high
Contrast filter:	red
Cable break detection:	when sensor current is < 2.5 mA display flashes
Display ranges:	
Pressure in bar:	0...6.0; 0...9.99; 0...16.0; 0...35.0 0...50.0; 0...60.0; 0...99.9; 0...140 0...200; 0...250; 0...315; 0...350; 0...400; 0...450; 0...500; 0...600; 0...630
Temperature in °C:	–25.0...99.9
Flow rate in l/min:	0...60.0; 0...300; 0...600
Display accuracy:	better than 0.25% relative to the final value
Temperature effect:	
Permiss. ambient temperature:	0...50 °C (273...323 K)
Temperature drift:	typically 0.01 % / K
Connections:	
Supply:	110/220 V AC via cable (length 1.5 m) with main plugs to Euro standard. 24 V DC via cable (length 1.5 m) with flying leads
Signal connections:	two 5–pole plug connectors with screw–type terminal connections max. cross section 1.5 mm^2
Option for dual critical value indication:	
Relay outputs:	mechanical life expectancy of contacts: 10^6 cycles switching capacity AC 200 VA: 0.1 ... 250 V AC 0.025 ... 2 A DC voltage 50 W; 400 VA

Note: To prevent high switch–off surges, inductive loads over 100 VA should be fitted with varistors to eliminate faulty switching.

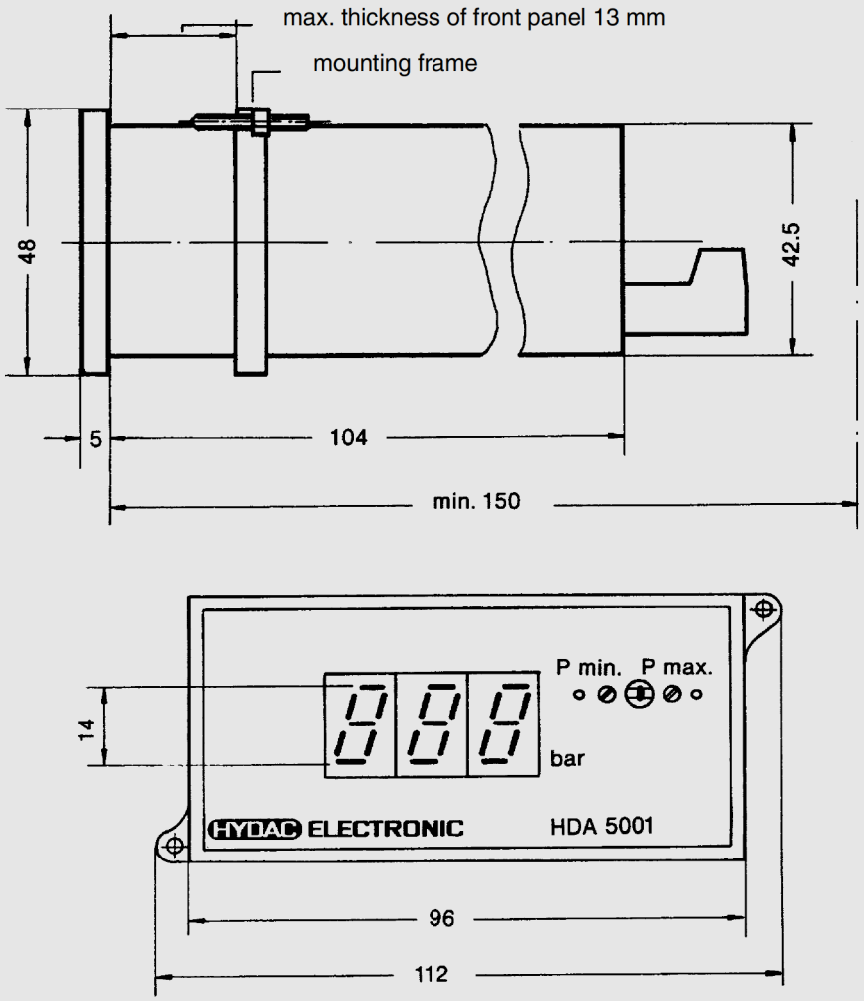
Terminal Connections:

Terminal	Signal
1	+12 V output, supply sensor
2	sensor – input
3	–12 V output, supply sensor
4	analogue output 0...10 V
5	0 V analogue output
6	relay SP 2
7	relay SP 2
8	relay SP 1
9	relay SP 1
10	screening

HDA 5001 Rear View:



HDA 5001 Dimensions:



HDA 5001 Model / Order Code:

HDA 5001 – XXX – X – X – XXX – 000

Series No.
(determined by the manufacturer)

Measuring range

Pressure in bar	006, 010, 016, 035, 050, 060, 100, 140, 200, 250, 315, 350, 400, 450, 500, 600, 630
Temperature in °C	025 (only in conjunction with option for critical value indication)
Flow rate in l/min	060, 300, 600

Signal Input

0	4...20 mA
1	0...10 V

Option

0	display unit only
1	with dual critical value indication, relays normally open
2	with dual critical value indication, relays normally closed

Voltage supply

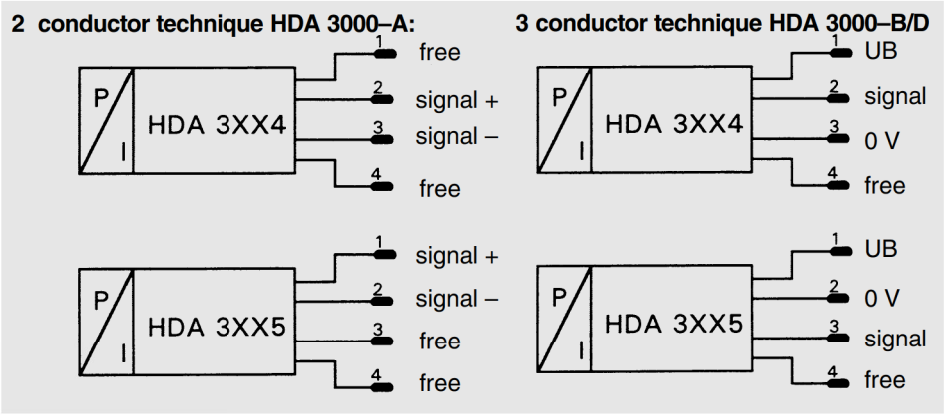
220	220 V AC
110	110 V AC
024	24 V DC

Modification number
(determined by manufacturer)
000 standard

Sensors suitable for use with HDA 5001:

Pressure Transmitter Series HDA 3000:

Connection Diagram HDA 3000:

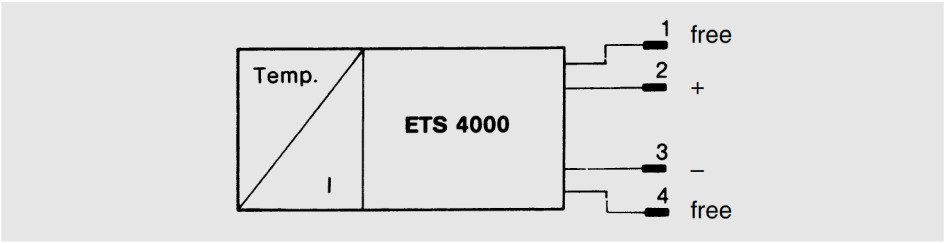


Technical Data HDA 3000:

Supply voltage:	10 ... 30 V DC, residual ripple ≦5%
Accuracy:	1%, 0.5% or 0.3%
Pressure ranges:	0 ... 6 bar, 0 ... 630 bar
Signal output:	4 ... 20 mA / 0 ... 10 V
Mechanical connection:	G 1/4 A male thread
Electrical connection:	4–pole Binder plug connector / 4–pole appliance plug to DIN 43650
Measuring principle:	DMS on stainless steel membrane

Temperature Sensor ETS 4000:

Connection Diagram ETS 4000:

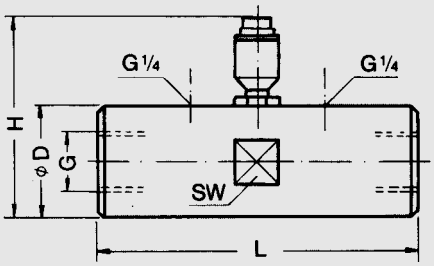


Technical Data ETS 4000:

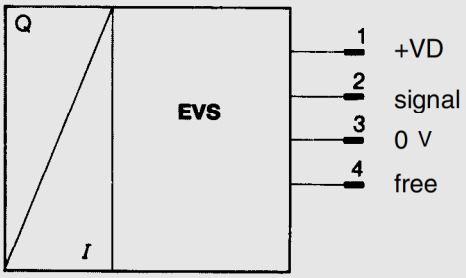
1. Mechanical data:	
Threaded connection:	G 1/4 A male thread, spanner width 27 torque rating 17...20 Nm
Pressure resistance:	600 bar
Overload:	up to 900 bar
Electrical connection:	Binder plug connector type 714 M 18 safety type IP 65 to DIN 40050
2. Electrical data:	
Measuring principle:	PT 100 resistance type thermometer
Measuring range:	–25 °C...+100 °C
Technique:	2 conductor principle
Output signal:	4 ... 20 mA
Accuracy:	0.8% of the range, typically 0.5%
Supply voltage:	10 ... 30 V DC permiss. residual ripple ≦5%
Safety type to DIN 40050:	IP 65
Safety measures:	reverse polarity protected, excess voltage protected, electronic current limit
3. Ambient effects:	
Temperature range of measuring material:	–30 °C ... +100 °C
Ambient temperature range:	–30 ° C ... + 80 ° C
Temperature drift:	0.1% / 10 K max., typically 0.05% / 10 K
Application class to DIN 40040:	glass reinforced plastic

Flow Rate Sensor EVS 3100:

Dimensions EVS 3100:



Wiring Diagram EVS 3100:



Technical Data EVS 3100:

Supply voltage:	10 ... 30 V DC
Signal output:	4 ... 20 mA (sinking)
Temperature of medium:	max. 90 °C
Ambient temperature:	max. 70 °C
Permissible viscosity range:	1....100 cSt
Calibrated at:	30 cSt
Class accuracy:	≦ 2 % of the instantaneous value
Measuring ranges/operating pressure:	
EVS 3100–1 EVS 3100–3 EVS 3100–2	6 ... 60 l/min / 400 bar 15 ... 300 l/min / 400 bar 40 ... 600 l/min / 315 bar
Electrical connection:	4–pole Binder plug, series 714 M 18
Mechanical connection/torque rating:	
EVS 3100–1 EVS 3100–3 EVS 3100–2	G 1/2" female thread / approx. 200...250 Nm G 1 1/4" female thread / approx. 300 Nm G 1 1/2" female thread / approx. 350 Nm
Additional connection possibilities:	2 x G 1/4 female thread for pressure or temperature sensors
Dimensions: (SW = spanner width)	
EVS 3100–1	approx.: L: 145 mm, H: 130 mm, D: 50 mm, SW: 46 mm
EVS 3100–3	approx.: L: 155 mm, H: 145 mm, D: 65 mm, SW: 60 mm
EVS 3100–2	approx.: L: 181 mm, H: 145 mm, D: 65 mm, SW: 60 mm

Assembly:

In order to avoid mechanical destruction in critical applications (e.g. strong vibrations or knocks), we recommend that the flow rate sensors are decoupled by means of flexible hose pieces.

Note:

All details in this brochure are subject to technical modifications.