

Digital Module ADN 402



Outline description: ADN 402

The **ADN 402** has been developed as a digital controller incorporating a valve amplifier for proportional valves with two magnets. The valve output stages function with fast de-excitation, with the result that the magnet current is adjusted to 0 in approx. 3–4 ms.

Thanks to its high-speed output stages, the **ADN 402** is extremely suitable for control tasks in the 0–30 Hz frequency range, and the module has therefore been equipped with a triple-controller cascade.

The input sensor system is equipped with interchangeable sensor modules, signifying that the module can be operated using widely used input signals, such as 4–20 mA or ± 10 V, or other similar signals. The sensor input modules are equipped with a second-order low-pass filter. Phase shift at 30 Hz is approx. 3° , and damping approx. 45 dB at 10 kHz. The setpoint can be specified either analog or digital using the CAN bus.

The direction line of action (sign) of the individual sensor modules can be set via the **ADN configurator**. This permits start-up of the complete system at rational cost.

The external sensors can be supplied with 24 V/0.5 A DC from the unit. A PTC thermistor assures full (thermistor-type) protection against external short-circuits. Alarm signalization is effected via a separate output, which can be loaded to 24 V/100 mA.

The **ADN 402** is equipped with six opto-decoupled inputs. These are, in standard configuration, an Enable input, a Ramp OFF input, and four setpoint inputs. Other input configurations are also possible in special cases. The ramps are assigned to the four internal setpoints and can be set from 0.01 s to 30 s in increments of 10 ms. The module can, in addition, also be externally actuated by means of an analog input. The three controllers are P, I and DT1 controllers, with a sample time of approx. 0.1 ms. An internal function generator, the frequency of which can be selected between 0.1 and 50 Hz, is available for controller optimization. The generator supplies sinusoidal, triangular and square waves. Amplitude and offset can be entered at ± 10 V.

All settings on the **ADN 402** can be effected using the **ADN configurator** via an **RS232** interface connected to a PC or laptop computer.

The input software **ADN configurator** is available via the Internet.

The **ADN 402** can, of course, also be used for applications with a single magnet in which a choke or a pressure adjustment valve is used. Only the values for the B magnet must then be set to 0 in the **ADN configurator**.

Further information:

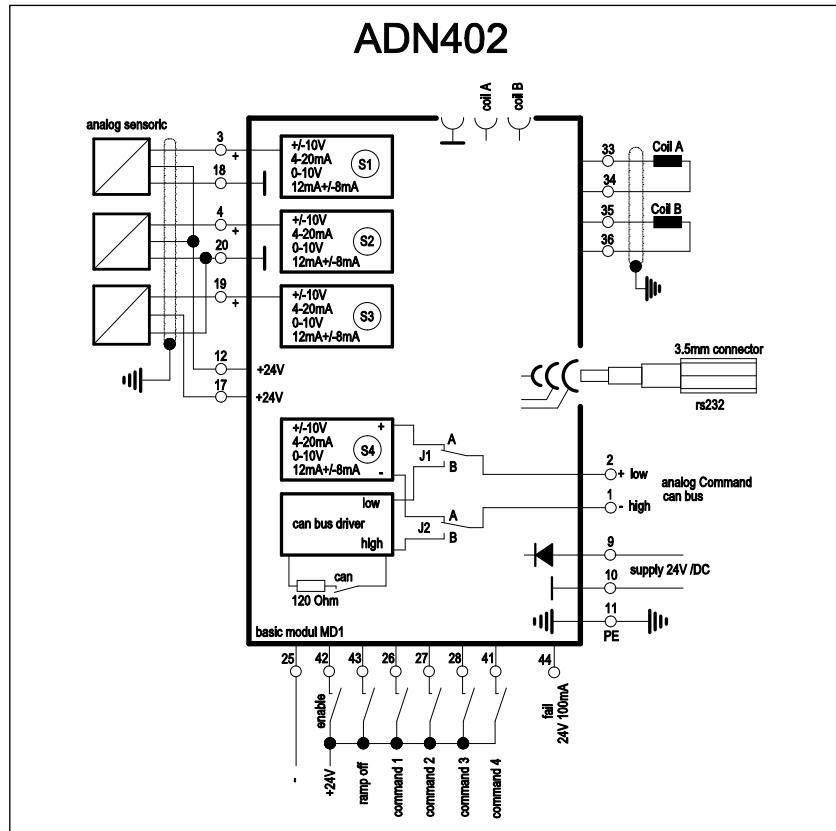
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COMPONENTS

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Technical data:

Supply voltage	24V DC, nominal (22 to 28V) DC
Bias current (idling)	approx. 70 mA
Auxiliary voltage	22 to 28V DC for supply of sensors; short-circuit-proof via 0.5A resettable fuse
Valve current	can be entered in 6 ranges, 0.85A to 3A
PWM (valve current)	9.7kHz with fast de-excitation and short-circuit monitoring
Inputs	6, opto-decoupled, of which 1 x Enable, 1 x Ramp OFF and 4 x Setpoint (internal)
Output	1 x 24V/100mA
Dither generator	selectable 50 to 150Hz, amplitude 0 to 10%, referred to the current selected
Imin	Imin can be selected as a jump or constant; "constant" should be selected for closed-loop control
Measuring sockets	The valve current for the A and B magnets can be measured at 1V/A on the two measuring sockets
Ambient temperature	-20 to +60°C
Microprocessor	16 bit signal processor with a computing capacity of 40 MIPS
Program cycle time	9.7kHz for the entire computer program, approx. 0.1 ms
Controller setting range	1 to 32000 for P, I, DT1
Function generator	Sinusoidal, triangular and square-wave generator, with setting of offset and amplitude +/- 10V. Frequency range from 0.1 to 50Hz
Sensor modules	+/- 10V, 12mA +/- 8mA, 4-20mA 0-10V, 7.5V +/- 4V Change of sign for the controller outputs, the sensor inputs and the setpoint-sensor output
Fault signalization	Wire breakage in 12mA +/- 8mA, 4-20mA, 7.5V +/- 4V modules, in case of short-circuit at valve, in case of short-circuit in sensor supply. Alarm via a 24V/100mA output, flashing red LED and display on the ADN configurator
Parametering	Parameters are entered on the ADN configurator . This input software is available via the Internet. An USB-to-RS232 adapter is required for use with laptops with a USB interface.