

# PEES

## COMPONENTS

## Digital Module ADN 404



### Outline description: ADN 404

The **ADN 404** has been developed as a digital controller with a valve amplifier for actuation of a servo-valve. The output stage is suitable in four ranges for  $\pm 20\text{mA}$  to  $200\text{mA}$  valves.

The **ADN 404** is extremely suitable for use with high-speed servo-valves for control functions in the  $0\text{--}150\text{Hz}$  frequency range. The **ADN 404** has been equipped with a triple-controller cascade, in order to permit a large number of applications. A facility for limitation of servo-valve deflection has been implemented, in order to improve matching of valves to load conditions.

The input sensor system is equipped with interchangeable sensor modules, signifying that the module can be operated using widely-used input signals, such as  $4\text{--}20\text{mA}$  or  $\pm 10\text{V}$ , or other similar signals. A medium-frequency generator with a demodulator is available for operation with inductive position encoders. The sensor input modules are equipped with a second-order low-pass filter. Phase shift at  $150\text{Hz}$  is  $13^\circ$ , damping at  $10\text{kHz}$  is approx.  $45\text{dB}$ .

The line of action (sign) of the individual sensor modules can be selected using the **ADN configurator**. This permits rapid start-up of systems at rational cost.

The external sensors can be supplied with  $24\text{V DC}$  from the device. A PTC thermistor assures full thermistor-type protection against external short-circuit.

Alarms are issued via a separate output which can be loaded to  $24\text{V}/100\text{mA}$ .

The **ADN 404** is equipped with six opto-decoupled inputs. These are, in standard configuration, one Enable input, one 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  $0.01\text{s}$  to  $30\text{s}$  in increments of  $10\text{ms}$ . The module can, in addition, also be externally actuated by means of an analog input or via the CAN bus. The three controllers are P, I and DT1 controllers with a sample time of approx.  $0.1\text{ms}$ . An internal function generator, the frequency of which can be selected between  $0.1$  and  $50\text{Hz}$ , is provided for controller optimization. The generator supplies sinusoidal, triangular and square waves. Amplitude and offset can be selected up to  $\pm 10\text{V}$ .

All settings on the **ADN 404** are made using the **ADN configurator** via an **RS232** interface linked to a PC or laptop computer.

The input software **ADN configurator** is available free-of-charge on the Internet.

Further information:

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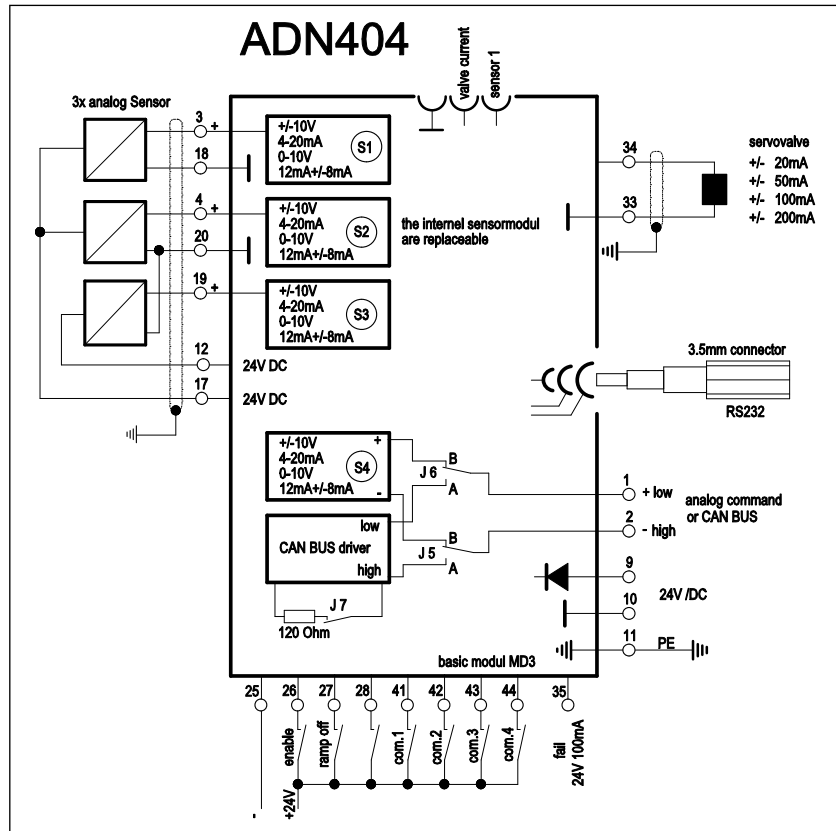
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#### Technical data:

Supply voltage	24V DC, nominal (22 to 28V) DC
Bias current (idling)	approx. 70mA
Auxiliary voltage	22 to 28V DC for supply of the sensors; short-circuit-proof via 0.5A resettable fuse
Valve current	selectable in four ranges, $\pm 20mA$ to $\pm 200mA$
Level matching	selectable from 0 to 100%
Inputs	6, opto-decoupled, of which 1 x Enable, 1 x Ramp OFF and 4 x Setpoint (internal)
Alarm output	1 x 24V/100mA
Dither generator	variable from 50 to 200Hz, amplitude 0 to 10%, referred to $\pm 10V$
Measuring sockets	The valve current can be measured at $\pm 20mA = \pm 10V$ $\pm 50mA = \pm 10V$ etc. on Measuring Socket M1. Sensor 1 can be measured on Measuring Socket M2.
Ambient temperature	-20 to +60°C
Microprocessor	16 bit signal processor with a processing speed of 40 MIPS
Program cycle time	9.7kHz for the entire computer program, approx. 0.1ms
Controller setting range	1 to 32000 for P, I, DT1
Function generator	Sinusoidal, triangular and square-wave generator, with offset and amplitude setting, $\pm 10V$
Sensor modules	$\pm 10V$ , 12mA $\pm 8mA$ , 4-20mA, 0-10V, 7.5V $\pm 4V$ Sign-changing for controller outputs, sensor outputs and setpoint-sensor output
Fault signalization	Wire breakage on modules 12mA $\pm 8mA$ 4-20mA 7.5V $\pm 4V$ in case of short-circuit in the sensor supply. Signalization via a 24V/100mA output, flashing red LED and display on the <b>ADN configurator</b>
Parametering	Parameters are entered on the <b>ADN configurator</b> . This input software is available via the Internet.

An USB-to-RS232 adapter is required for use with laptops with a USB interface.