

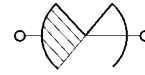


DIGITAL-COMPENSATOR

DK710 series

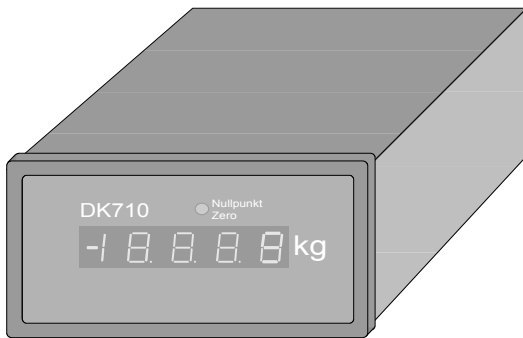
M E S O M A T I C

Automation und Meßtechnik GmbH



Application

The device can be used for digitising and displaying small analogue voltages from load cells, temperature sensors and similar signals. It's main field of use in weighing, where the device is used as a digital display or for controlling printers, dosing systems.



Function

The incoming measurement voltage is initially amplified at low drift and then fed into a calibrating unit which permits the zero-point and the endpoint of the measurement range to be set individually. The calibrated voltage is now passed on into an A/D converter which drives the display. There is a comparator for monitoring maximum values and one for minimum values.

Technical data

a) Measurement amplifier

The measurement amplification unit is needed for pre-amplifying small transmitter voltages such as those from load cells, temperature sensors, etc. It was designed as a low-drift, high-ohm electrometer-amplifier. The input operation amplifier are artificially aged and paired.

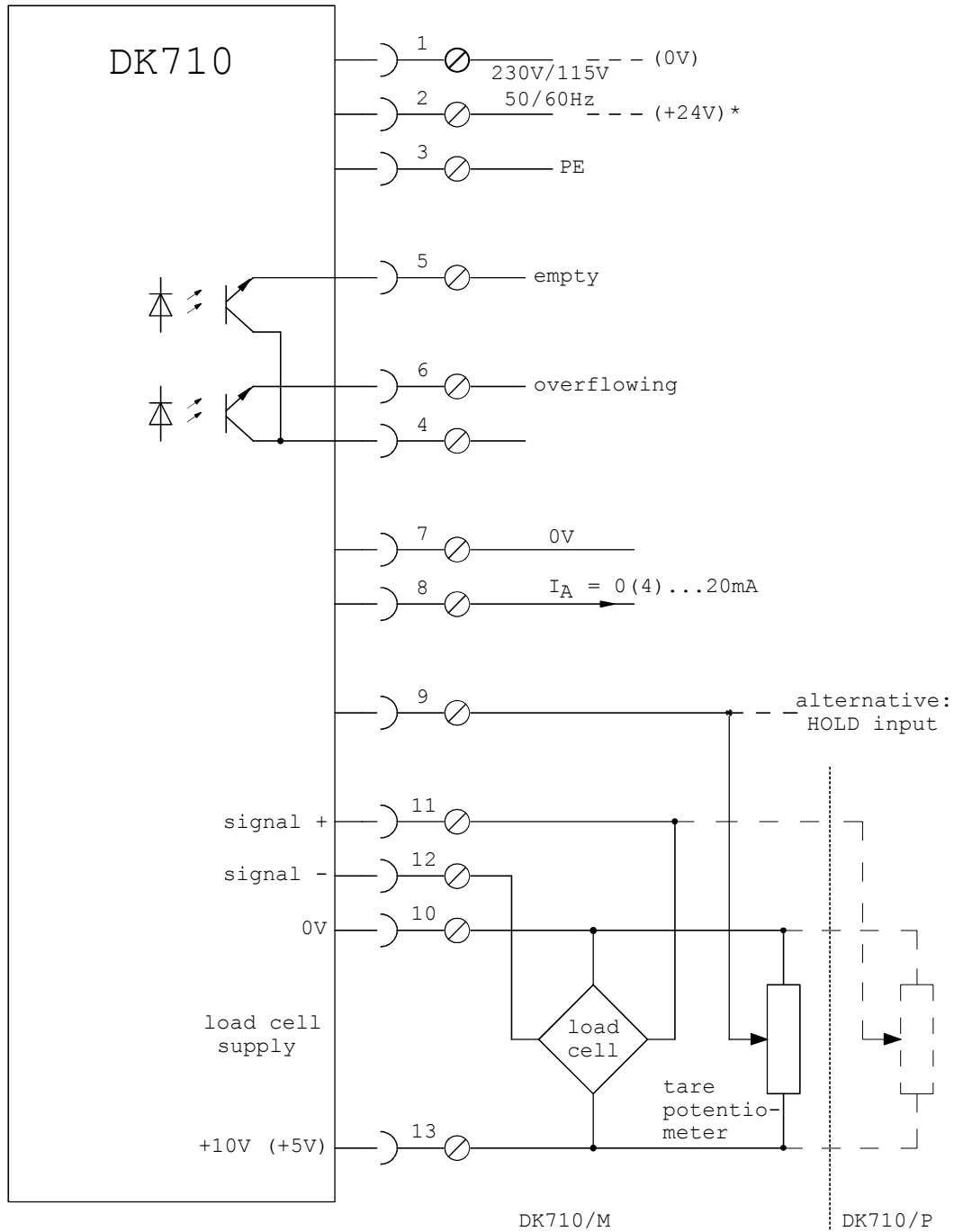
Type of input	Diff.-input
Static input resistance	> 1 G Ω
Common-mode rejection	> 110 dB
Temp. drift, related to input	< 0,5 μ V/ $^{\circ}$ C
Linearity of amplifier characteristic	< 0,01 %
Amplification rate	450 (basic amplification of pre-stage)
Output	0 (4) ... 20 mA impressed current
Ohmic load	\leq 500 Ω

b) Bridge voltage

A highly stable bridge voltage is available for feeding the transmitters, the value of which can be set at 10 V or 5 V by means of a switch. If up to 3 load cells are connected, this should be set at 10 V, with 4 up to the maximum of 6 load cells at 5 V.

Bridge voltage	10 Volt / 5 Volt \pm 20mV
Temp. drift of bridge voltage	0,1 mV/ $^{\circ}$ C
Change at \pm 10 % power supply voltage	1 mV
Capacity	10 Volt: > 100 Ω / 5 Volt: > 60 Ω

c) Wiring diagram of connections



* version with 24V DC supply

Fig. 1

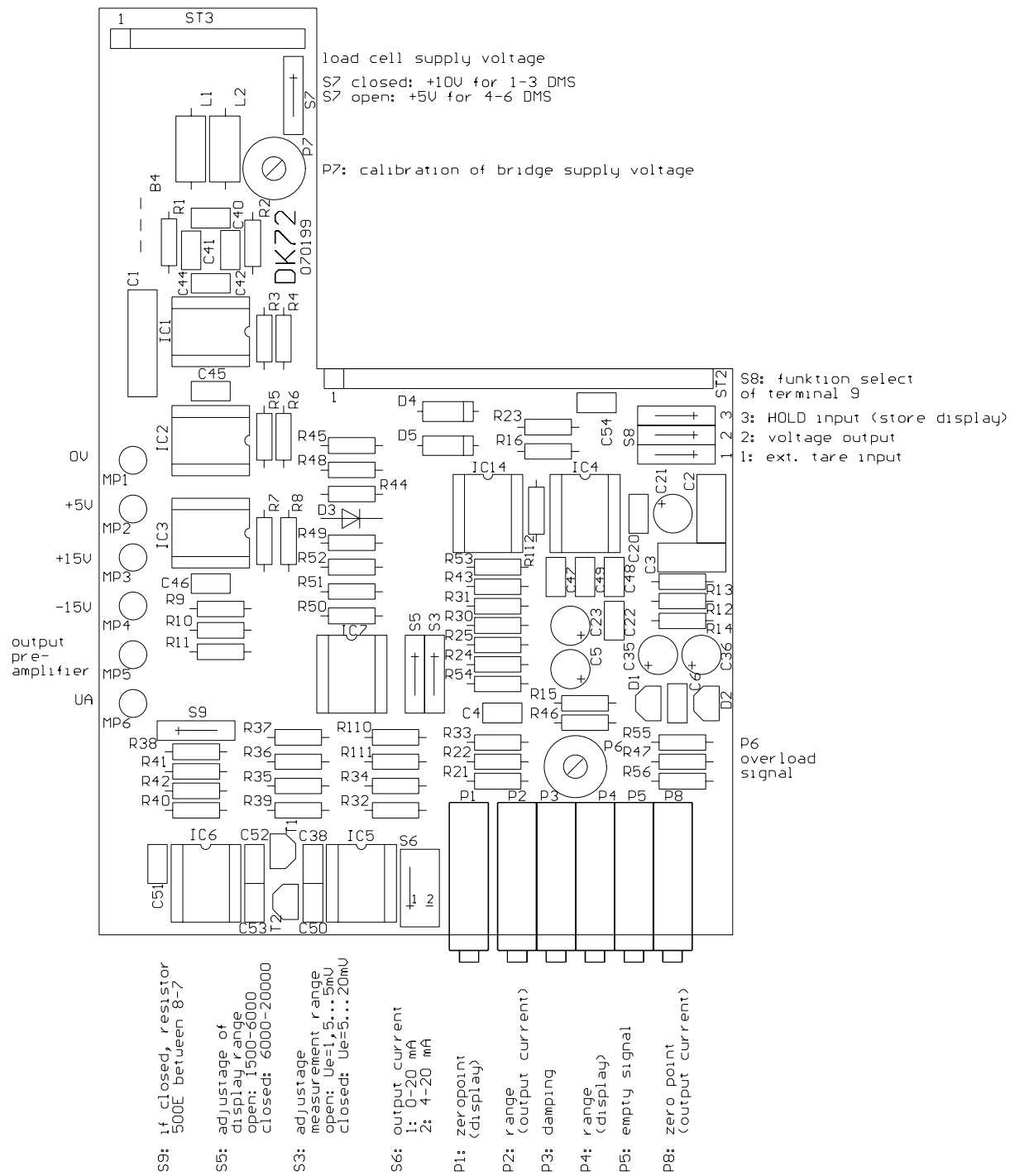


Fig 2: Analogue board

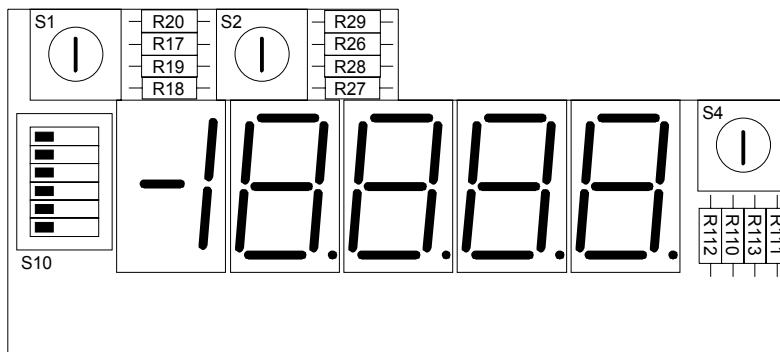


Fig. 3: Display board

d) Operation

Before the Zero-/range-calibration is carried out in connection with the weigher, a number of values have to be pre-set. For this purpose the housing is to be removed (remove front frame and front panel, pull counter-plug out at the back, and push the board out forwards by pressing in the plug). The upper board is now accessible, and various switches are arranged on it with the following layout (see Fig. 2):

S3: Adjustment to input voltage range

S3 must be open if the output voltage lift to the weigher lies on the load cell between 1,5 ... 5 mV.
If it lies between 5 ... 20 mV, S3 should be closed.

S5: This switch is used for pre calibrating the final display value.

S5 should be open if the required final display value lies in the range from 1500 ... 6000.
For values > 6000 up to 20000 (max. final value), this switch should be closed.

S6: This switch element is used for pre-selecting the output current range.

Setting 1: range 0 ... 20 mA
Setting 2: range 4 ... 20 mA

S7: Adjustment to the number of load cells connected in parallel.

When S7 is closed, the load cell's feed voltage is 10 Volt. In this operating mode a maximum of 3 load cells can be fed in parallel.

If the number of load cells is > 3, S7 must be opened so that 4 to 6 load cells can be operated in parallel, with the feed voltage still at only 5 Volt.

Caution: This means that the input voltage ranged is halved!

Fine-tuning of the bridge voltage with P7

S8: This contact group consists of 3 switches, designated S8.1, S8.2 and S8.3

The configuration of these contacts determines the function of I/O-terminal 9

Attention: Only one of these 3 contacts has to be closed simultaneously!

S8.1 closed: Terminal 9 works like a tare input. A voltage given on this input can be used to bring the display and the current output on zero.

S8.2 closed: Terminal 9 can be used as an additional voltage output 0 ... 10 Volt (see chapter *calibration*)

S8.3 closed: If this contact is closed and terminal 9 is connected to ground, the digital display is disactivated (Hold function).

Calibration:

Further switching elements are located on the display board at the front, with which calibration can be carried out as described below.

Zero-point / tare

- 1.) Remove any load from weigher
- 2.) switch current meter (pre-selected the mA-range !) in between terminals 7 and 8.
- 3.) Set switch S1 so that the value indicated (current and digital display) lies as close as possible to 0.
- 4.) Bring the digital display to exactly 0 by using the trimmer P1.
- 5.) Bring the output current on 0 mA (4 mA) by using the trimmer P8.

Final value (range)

- 6.) Load the weigher with the maximum weight or some other known weight not far from the maximum weight.
- 7.) Set switch S2 so that the value read off the current meter corresponds to the weight imposed as closely as possible (maximum weight \approx 20 mA).
- 8.) Fine-tune the final current value using trimmer P2.
- 9.) Set switch S4 so that the digital display shows the weight imposed on the weigher as exactly as possible.
- 10.) Fine-tune the weight displayed using trimmer P4.

Note:

If instead of the current output a voltage output is needed, switch S9 has to be closed. The current output is now loaded with a resistor 500 E to ground. A voltage 0 ... 10 Volt is resulting between the terminals 8 and 7.

Alternately the voltage output on terminal 9 can be used (switch 8.2 closed). Note that the zero point of this output cannot be calibrated independently from the zero point of the digital display.

e) Additional facilities

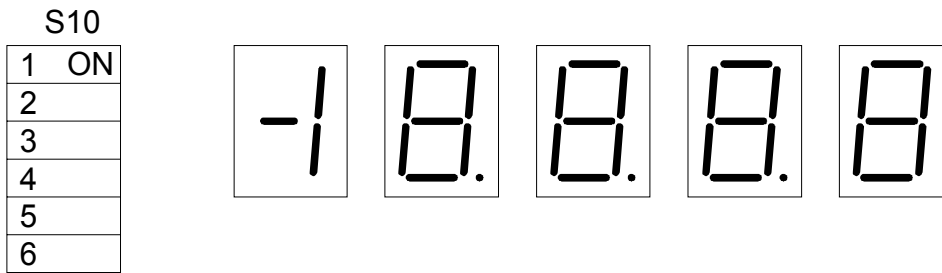
- 1.) Switch point for "weigher empty"
Setting on trimmer P5 / output opto-coupler I_{max} approx. 25 mA.
- 2.) Switch point for "weigher overflowing"
Setting on trimmer P6 / output opto-coupler I_{max} approx. 25 mA.

f) Type description

The device is available in following versions:

Load cell input DK710/M
 Potentiometer or input voltage 0 ... 10V DK710/P

Following types of voltage supply are available: 230/115 V AC or 24 V DC



S10						Description
1	2	3	4	5	6	
On	Off	Off				DP 1
Off		On	Off			DP 2
Off	Off		On			DP 3
			On			Last digit deleted
				Off	Off	Digit interval 1
				On	Off	Digit interval 2
				Off	On	Digit interval 5
				On	On	Digit interval 10

Fig. 4

g) General data

Supply voltage
Current consumption
Weight
Dimensions

230 V / 115 V 50 / 60 Hz or 24 V DC
approx. 35 mA with 230 V feed
ca. 0,6 kp
see Fig. 5

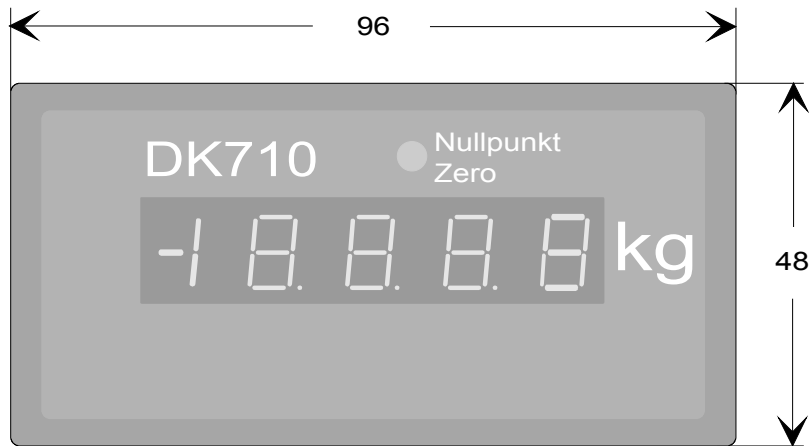
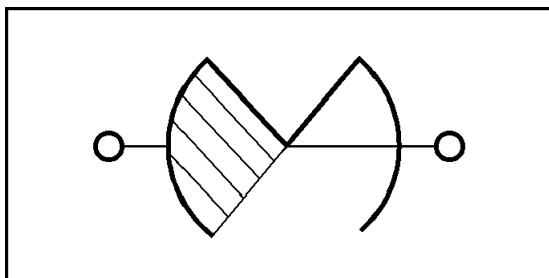


Fig. 5

Front cut-out required:
Installation depth:
Connecting plug:

43 x 91 mm
170 mm including plug
Combicon MVSTBW 1,5/13-ST



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