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MESSTECHNIK

Inductive displacement sensors

Models SM41 / SM43

Scaleable inductive displacement sensors

The analogue measuring data of the inductive displacement sensor is digitized with a 16 bit D/A converter and processed in a microcontroller. The measuring data is corrected by the accuracy tolerances which are filed in the EEPROM. The digital information is processed by a 16bit D/A- converter in norm output signals 0(4) – 20mA or 0 – 5(10) V. The measuring stroke can be scaled by the user.

Standard measuring stroke:

Type	Measuring stroke mm (Default setting)	Central position L1 mm	Housing length L2 mm	Scaleable measuring stroke	
				Max. ca. mm	Min. mm ≤
SM41x.20	20	40	110	30	5
SM41x.40	40	50	140	50	8
SM41x.70	70	65	200	80	13
SM41x.100	100	80	250	110	18
SM41x.150	150	105	350	160	26
SM41x.200	200	120	500	210	34
SM43x.80	80	70	140	90	15
SM43x.170	170	115	250	180	29
SM43x.240	240	150	350	250	40
SM43x.360	360	210	500	370	60

Standard versions:

Type	Output	Supply voltage U_B (Reverse battery protected)	Signal ** (scaleable decreasing)	Central position
SM4x1	0 .. 20 mA *	10 .. 32 V	increasing	10 mA
SM4x3	4 .. 20 mA *	10 .. 32 V	increasing	12 mA
SM4x7	0..10 V	15 .. 32 V	increasing	5 V
SM4x9	0..5 V	10 .. 32 V	increasing	2,5 V

* working resistance $R_L \leq (U_B - 7\ V) / 0{,}02\ A$
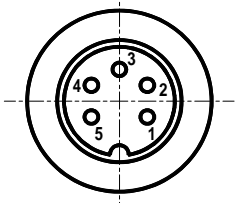** increasing signal by moving the plunger in the direction towards the plug (default setting)

Technical data:

Accuracy (at 20°C)	0,25% optional 0,1% (referring to measuring stroke of the default setting)
Resolution	16 Bit
Dependence on U_B	$\Delta I_A / \Delta U_B < 0{,}02\% / V$ $\Delta U_A / \Delta U_B < 0{,}02\% / V$

Further data according to data sheet SM40 (for SM41) and SM42 (for SM43)

Electrical connections on plug:

(View to the plug at transducer)

5-pol. connector Binder BI723		PUR-cable (Option .KPx) 5 x 0,34² screened (x = cable-length in metres)
1: $+U_B$ 2: $-U_B$ 3: I_A / U_A (Output) 4: ANF 5: END		Brown $+U_B$ White $-U_B$ Green I_A / U_A Yellow ANF Grey END

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Programming of the measuring stroke:

ATTENTION:
The programming of the measuring stroke is only possible, if the plunger is within the max. measuring stroke and the provided measuring stroke does not fall below the minimal measuring stroke.

The displacement sensor, which is connected to the supply voltage, is scaled by bringing the connections ANF bzw. END with $+U_B$ in contact for at least 2 seconds. A successful scaling is signalized by a short time change of the output signal to the central position (1 second).
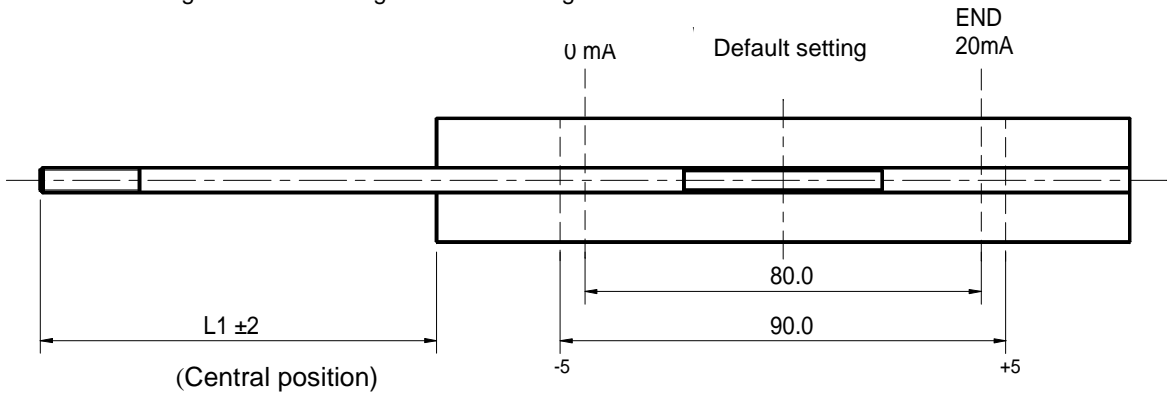
After each single programming step a break of at least 2 seconds is to be made ! (Connect ANF and END with $-U_B$ or leave open)

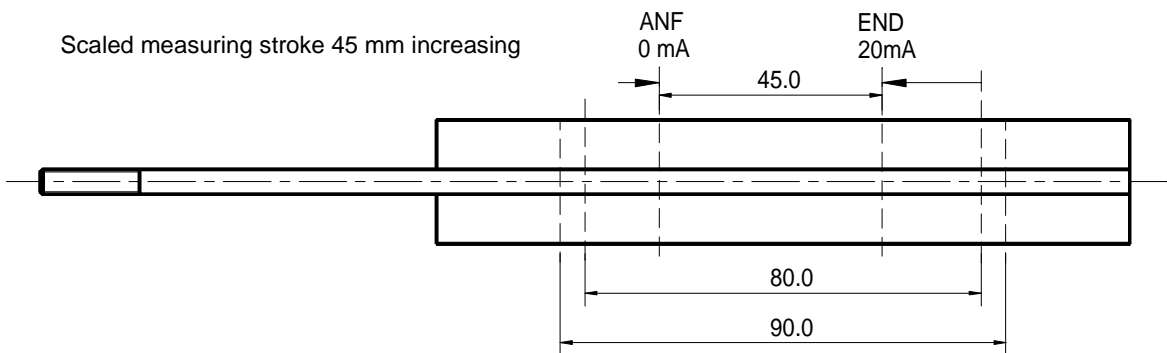| Programming step	Designation	What to do ?	Confirmation output signall	Error message
1	Programming of default setting	Connect ANF and END simultaneously with $+U_B$ (2 sec.)	Central position (1 sec.) then measuring value	**Warning, if plunger is outside the max. measuring stroke:** ¼-position (1 sec.) default setting is programmed nevertheless
2	Setting of the measuring stroke starting point	Adjust plunger mechanically to the measuring stroke starting point		
3	Programming of the measuring stroke starting point	Connect ANF with $+U_B$ (2 sec.)	Central position (1 sec.) then initial value	**If plunger is outside the max. measuring stroke:** ¼-position (1 sec.) measuring stroke starting point is set to the nearest edge of the max. measuring stroke
4	Setting of the measuring stroke end point	Adjust plunger mechanically to the measuring stroke end point		
5	Programming of the measuring stroke end point	Connect END with $+U_B$ (2 sec.)	Central position (1 sec.) then final value	**If remaining under the min. measuring stroke:** ¾ - position (1 sec.) No programming ! **If plunger is outside the max measuring stroke:** ¼-position (1 sec.) measuring stroke staring point is set to the nearest edge of the max. measuring stroke

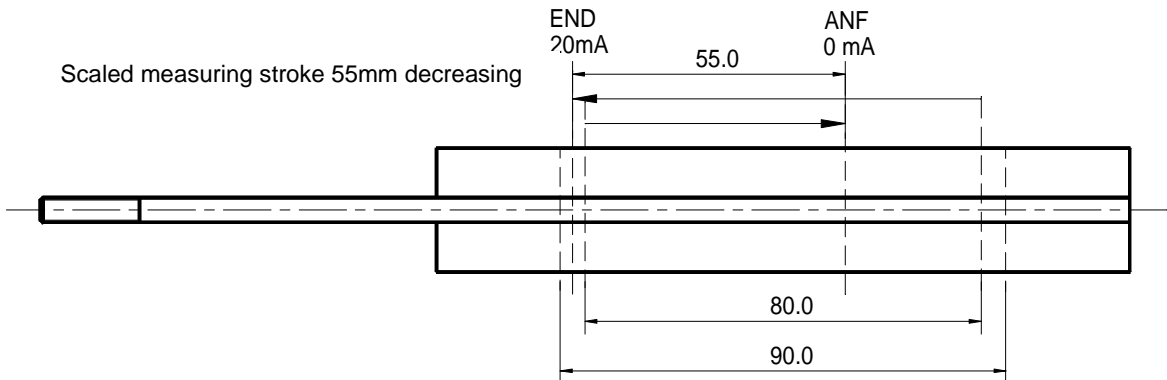During normal operation it is recommended to connect ANF and END with $-U_B$.

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Example SM431.80 :

Default setting 80mm measuring stroke increasing

0 mA   Default setting   END
20mA

80.0

L1 ±2   90.0

(Central position)   -5   +5

Scaled measuring stroke 45 mm increasing

ANF   END
0 mA   20mA

45.0

80.0

90.0

Scaled measuring stroke 55mm decreasing

END   ANF
20mA   0 mA

55.0

80.0

90.0

Order code

SM41 3 . 40 . 1 . T
 | | | | └── Version
 | | | └────── Accuracy 1: 0.25%, 0: 0.1%
 | | └─────────── Measuring stroke (default setting)
 | └──────────────── Current or voltage output
 └───────────────────── Series
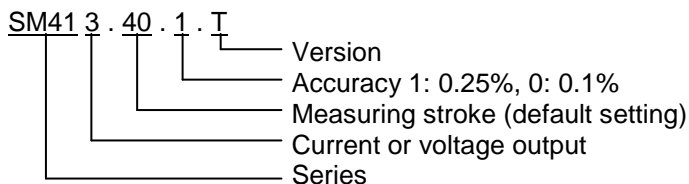
Order codes for customer specified versions will be named at plant.
e.g. SM413.40.1.T
Displacement sensor Serie 41, output 4-20 mA , 40mm
measuring stroke , accuracy 0,25%, gauge

Your Distributor

abj