SCHREIBER MESSTECHNIK

Inductive Displacement Transducer

Series SM41 / SM43

Programmable Inductive Transducer

The analogue signal of an inductive sensor is digitised in a 16bit A/D converter and processed in a micro-controller. The signal is linearised using the sensor's eeprom-stored variance of accuracy. Through a 16bit D/A converter the digital information is transformed back into a scaled analogue output signal of 0(4) – 20mA or 0 – 5(10)V. The measuring stroke can be individually programmed by the user.

Standard dimensions:

type	measuring stroke mm (factory preset)	mid L1 mm	housing length L2 mm	programmable measuring stroke	
				maximum mm	minimum 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	130	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 (pole reversal protection)	signal ** (decreasing programmable)	mid
SM4x1	0 .. 20 mA *	9 .. 32 V	increasing	10 mA
SM4x3	4 .. 20 mA *	9 .. 32 V	increasing	12 mA
SM4x7	0 ..10 V	14 .. 32 V	increasing	5 V
SM4x9	0 .. 5 V	8,5 .. 32 V	increasing	2,5 V

* Load $R_L \leq (U_B - 7\ V) / 0{,}02\ A$
** Increasing signal by moving the plunger in the direction towards the plug (factory preset)

Technical data:

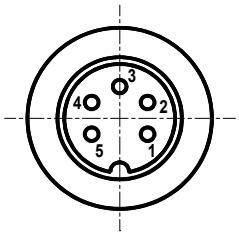
Accuracy (at 20°C)	0,25% (optional 0,1%) (reference: factory preset stroke)
Resolution	16 Bit
Output dependence on R_L	< 0,02% for $\Delta R_L = 100\Omega$
Output dependence on U_B	< 0,02% for $\Delta U_B = 1V$

For other data, dimensions and options, see datasheet SM40 / SM42

Electrical connections:

(view to the plug at the transducer)

5-pin plug Binder Bl723	PUR-cable (option .KPx) 5 x 0,34² shielded (x = cable-length in meter)
1: $+U_B$ (supply) 2: $-U_B$ 3: I_A / U_A (output) 4: START 5: END	brown $+U_B$ (supply) white $-U_B$ green I_A / U_A (output) yellow START grey END



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Programming an individual measuring stroke:

Notice:
Correct programming is only possible if the position of the plunger is within the maximum measuring stroke and the planned measuring stroke is not less than the specified minimum stroke (see table of “standard dimensions” on page 1).

With the sensor connected to the power supply and the output monitored, the sensor can be programmed by connecting START or/and END with $+U_B$ for a minimum of 2 seconds. Correct programming is indicated by a short jump (1 second) of the output signal to the mid-position signal.

Between every single programming step there has to be a minimum delay of 2 seconds (with START and END connected to $-U_B$ or open).

programming step	name	what to do	indicator output signal	error message
1	reprogramming the factory preset	connect START and (together) END to $+U_B$ (2 sec.)	mid-position (1 sec.) followed by correct measuring signal	**Warning, if plunger is not within the maximum stroke:** ¼-position signal (1 sec.) factory preset will be programmed
2	set start position	adjust plunger mechanically to the start position		
3	programming START position	connect START to $+U_B$ (2 sec.)	mid-position (1 sec.) followed by start output signal	**Two error possibilities if plunger is <u>not within the maximum measuring stroke:</u>** **Error message** **¼- position signal** (1 sec.) START position is set to the nearest limit of the maximum measuring stroke **Message mid-position** [1] (1 sec.) START position <u>not correct</u> programmed !
4	set end position	adjust plunger mechanically to the end position		
5	programming END position	connect END to $+U_B$ (2 sec.)	mid-position (1 sec.) followed by end output signal	**Less than the minimum measuring stroke:** ¾ - position signal (1 sec.) **No programming !**
				Two error possibilities if plunger is <u>not within the maximum measuring stroke:</u> **Error message** **¼- position signal** (1 sec.) END position is set to the nearest limit of the maximum measuring stroke **Message mid-position** [1] (1 sec.) END position <u>not correct</u> programmed !

[1] Please make sure that the plunger is mechanically within the maximum programmable measuring stroke during programming (see table of standard dimensions on page 1).

During normal measurement operation, we recommend to connect START and END to $-U_B$.

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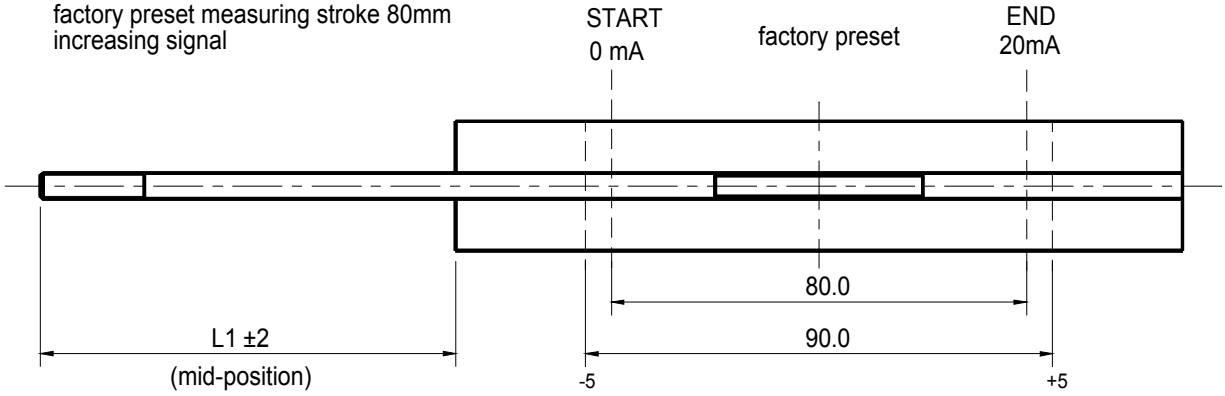
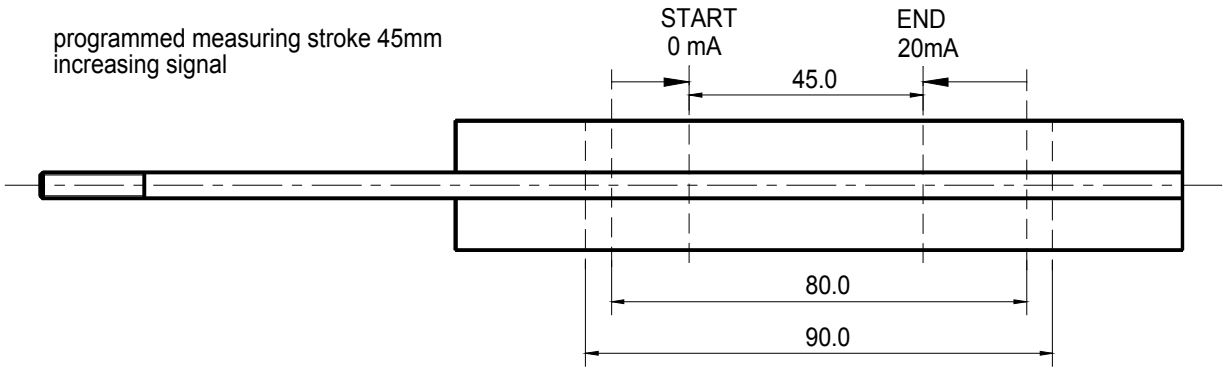
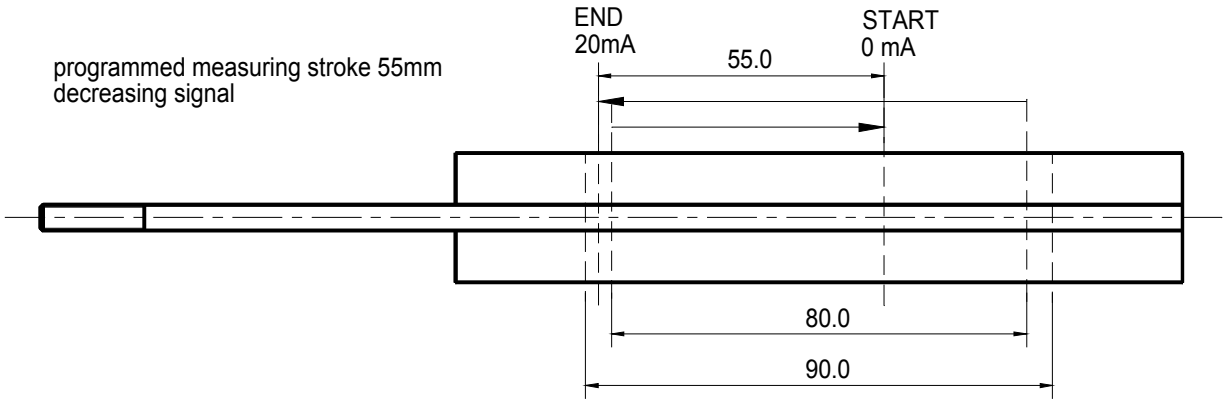
For example SM431.80 :







Order code

SM41 3 . 40 . 1 . T

- T — version
- 1 — accuracy 1: 0.25%, 0: 0.1%
- 40 — measuring stroke (factory preset)
- 3 — current or voltage output and sense
- SM41 — series

Order codes for customer specified versions will be named at plant.

For example: SM413.40.1.T
Gauge series 41, output 4-20 mA , 40mm measuring stroke (factory preset), accuracy 0.25%