SI-02

Electromagnetic Flowmeter for General Applications

Features

/ Universally applicable
/ Separate or compact measuring transmitter
/ Variety of lining material
/ DN15 to DN2000
/ DIN- or ANSI flanges
/ High-temperature version
/ Pressure level up to PN100

Description:

The SI-02 series of electromagnetic flowmeters is always a combination of measuring pick-up and measuring transmitter MU-5000 which can be either directly mounted on the pick-up or separately mounted on the wall by means of a fixing metal plate. The measuring pick-up consists of a magnetically non-conductive measuring tube with plastic lining, magnetic coils fastened diametrically on the tube and at least two electrodes which are inserted through the tube's wall and establish contact with the measuring medium. As current passes through the magnetic coils, a clocked magnetic field is generated which penetrates the magnetically non-conductive measuring tube and induces in the electrically conductive medium a voltage proportional to the flow velocity. The electrodes inside the tube tap this voltage and pass it on to the measuring transmitter MU-5000. Now the transmitter generates a current signal in the range of 0(4). . .20mA which is linearly connected to the mean velocity of flow. The measuring pick-up has a SENSORPROM memory module in which its individual data is stored. The result is that nearly every measuring pick-up of the SI-02 series can be operate along with every MU-5000 measuring transmitter without the need for prior parameterization.

Application:

Electromagnetic flowmeters are suited for measuring nearly all electrically conductive fluids, pulp and slurry that have a conductivity of at least 5 micro-Siemens. Temperature, pressure, density and viscosity are of no consequence for the method of measurement so long as the measurement is performed within the velocity range of 0.25. . .10 m/s and the permissible material specifications do not fall short or are not exceeded. Applications for the SI-02 series are found in a wide range of industrial segments since the material combinations ensure resistance to nearly all media in respect of different electrodes and lining materials.

Technical Specifications:

Measuring principle / electromagnetic induction

Exciter frequency / 12.5/15 Hz for DN15. . .DN65
6.25/7.5 Hz for DN80. . .DN150
3.125/3.75 Hz for DN200. . .DN1200
1.5625/1.875 Hz for DN1400. . .DN2000

Conductivity / at least 5 µS/cm (mikro Siemens)

Operating range / 0.25. . .10 m/s at specified accuracy, below and above this greater deviations

Accuracy / ± 0.4% ± 1mm/s (optional ± 0.2% ± 1mm/s)

Ambient temp. / -40. . .+100°C standard
-20. . .+60°C for directly mounted measuring transmitter

Media temperature / 0. . .+70°C for Neopren lining
-10. . .+70°C for EPDM lining
-40. . .+70°C for Linatex (rubber) lining
(for temperatures below -20°C stainless steel flanges must be used)
0. . .+95°C for Ebonite lining
-20. . .+100°C for standard PTFE lining
-20. . .+180°C for high-temp. PTFE lining
Attention: For stainless steel flanges note the pressure-temperature curve!

Operating pressure / 0.01 to 100 bar abs. for Neopren lining

0.01 to 40 bar abs. for EPDM lining

0.01 to 40 bar abs. for Linatex lining

0.01 to 100 bar abs. for Ebonite lining

0.3 to 50 bar abs. for standard PTFE lining **(DN15 to DN300 only)**

0.3 to 40 bar abs. for standard PTFE lining **(DN350 to DN600 only)**

0.6 to 50 bar abs.for high-temp. PTFE lining **(DN15 to DN300 only)**

Testing pressure / 1,5 x PN (where applicable)

Vibration-proof / 18. . .1000 Hz random in x, y, z, directions for 2 hours as per EN 60068-2-36, Sensor 3.17 grms

Lining / Neoprene, EPDM, Linatex, Ebonit, PTFE or PTFE for high temperature

Materials /

Flange and housing: **Standard:** carbon steel with anti-corrosive 2-component coating (min 150 micrometer)

Option 1: flanges made of st. steel AISI 304 (1.4301), housing carbon steel

Option 2 (on request): flanges and housing made of st. steel AISI 316L (1.4404), polished

Measuring tube: AISI 304 (stainless steel 1.4301) (if flanges and housing are from AISI 316 L, the measuring tube is also from 316 L)

Electrodes: AISI 316 Ti (1.4571)
Option: Hastelloy C-276, Platin/Iridium, Titan, Tantal

Grounding electrodes: similar to measuring electrodes excepting for PTFE lining or electrode material Platinum and Tantalum as well PN100 (use grounding rings)

Process connection / **DIN flanges**
DN15. . .DN2000:

PN40 at DN15. . .DN600
PN16 at DN65. . .DN2000
PN10 at DN200. . .DN2000
PN6 at DN65. . .DN2000
(Options see Ordering codes)

ANSI flanges B16.5
for nominal diameters 1/2". . .24"

pressure level 150 lbs. or 300 lbs.

AWWA flanges C-207
for nominal diameters 28" to 78"

Class D (10 bar)

Weight / see drawings

Ordering Codes:

Order no.	SI-02.	[0][0][1][5].	4.	1.	1.	1.	1.	2

SI-02 Electromagn.Flowmeter for Gen. Applications

Nominal diameter DN15. . .DN2000 /
[ ][ ][ ][ ] e.g. 0040 for DN40

Flange design and pressure level /
0 = as per EN 1092-1 (DIN flange)
PN6 for nominal diameters DN65 to DN2000
1 = as per EN 1092-1 (DIN flange)
PN10 for nominal diameters DN200 to DN2000
2 = as per EN 1092-1 (DIN flange)
PN16 for nominal diameters DN65 to DN2000**
3 = as per EN 1092-1 (DIN flange)
PN25 for nominal diameters DN200 to DN600
4 = as per EN 1092-1 (DIN flange)
PN40 for nominal diameters DN15 to DN600
5 = as per EN 1092-1 (DIN flange)
PN63 for nominal diameters DN50 to DN300, not for PTFE lining
6 = as per EN 1092-1 (DIN flange)
PN100 for nominal diameters DN25 to DN300, not for PTFE lining
7 = as per ANSI B16.5 Class 150
for nominal diameters 1/2" to 24"
8 = as per ANSI B16.5 Class 300
for nominal diameters 1/2" to 24"
9 = as per AWWA C207 Class D
for nominal diameters 28" to 78"

Flange material /
1 = flanges made of plain carbon steel ASTM A 105
2 = flanges made of stainless steel AISI 304 (1.4301)
3 = flanges and sensor made of stainless steel AISI 316L (1.4404), polished (on request)

Electrode material / ***
1 = AISI 316Ti (stainless steel 1.4571)
2 = Hastelloy C276 (2.4819)
3 = Platinum (no grounding electrodes) (DN ≤ 300/12")*
4 = Titanium (DN ≤ 600/24")
5 = Tantalum (no grounding electrodes) (DN ≤ 600/24")*

Lining /
1 = Neopren for media temperatures 0. . .+70°C, 0.01. . .100 bar
2 = EPDM for media temperatures -10. . .+70°C, 0.01. . .40 bar
3 = Linatex for media temperatures -40. . .+70°C, 0.01. . .40 bar
4 = Ebonite for media temperatures 0. . .+95°C, 0.01. . .100 bar
5 = PTFE for media temperatures -20. . .+100°C, 0.3. . .40 bar, DN15. . .DN600 only (max. 50 bar below DN300)
6 = PTFE for media temperatures -20. . .+180°C, 0.6. . .50 bar, DN15. . .DN300 only

Measuring transmitter /
0 = none
1 = with MU-5000, accuracy ± 0.4% ± 1 mm/s

Cable gland /
2 = M20 x 1.5 (not for ANSI flanges)
3 = 1/2"-NPT (for ANSI flanges only)

* not for Ebonite lining
** PN16, non PED (DN700 to DN1200) (pending)
*** Grounding electrodes not for PTFE liner or pressure PN100

Electrical Spec. Transmitter:

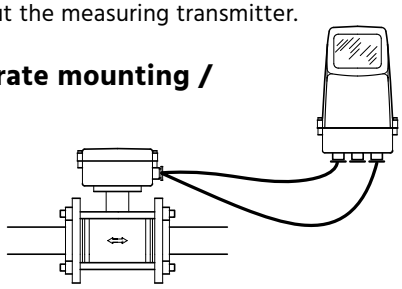
Cable insertion /	M20 x 1.5 or 1/2"-NPT
Protection class /	IP67 (IP68 on request)
EMC /	2014/30/EU

(see also Measuring transmitter MU-5000)

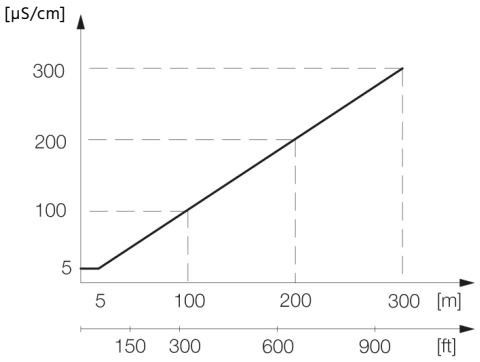
Measuring transmitter /

In principle, the SI-02 is suited for operations with a directly mounted measuring transmitter or for separate mounting. The MU-5000 measuring transmitter can be used universally (see data sheet MU-5000), hence it can be mounted directly on the measurement pick-up or positioned away from it by means of a wall fixture. If the SI-02 is required as a spare, since the MU-5000 measuring transmitter is already available, only the measurement pick-up can be ordered without the measuring transmitter.

Separate mounting /

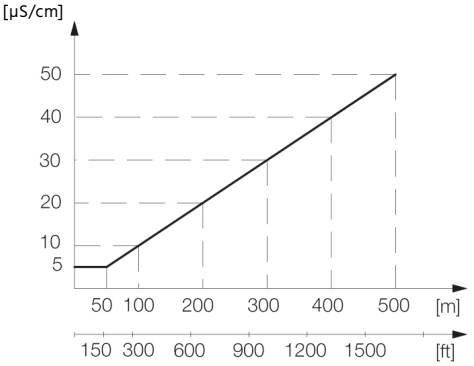


Connector length standard cable:



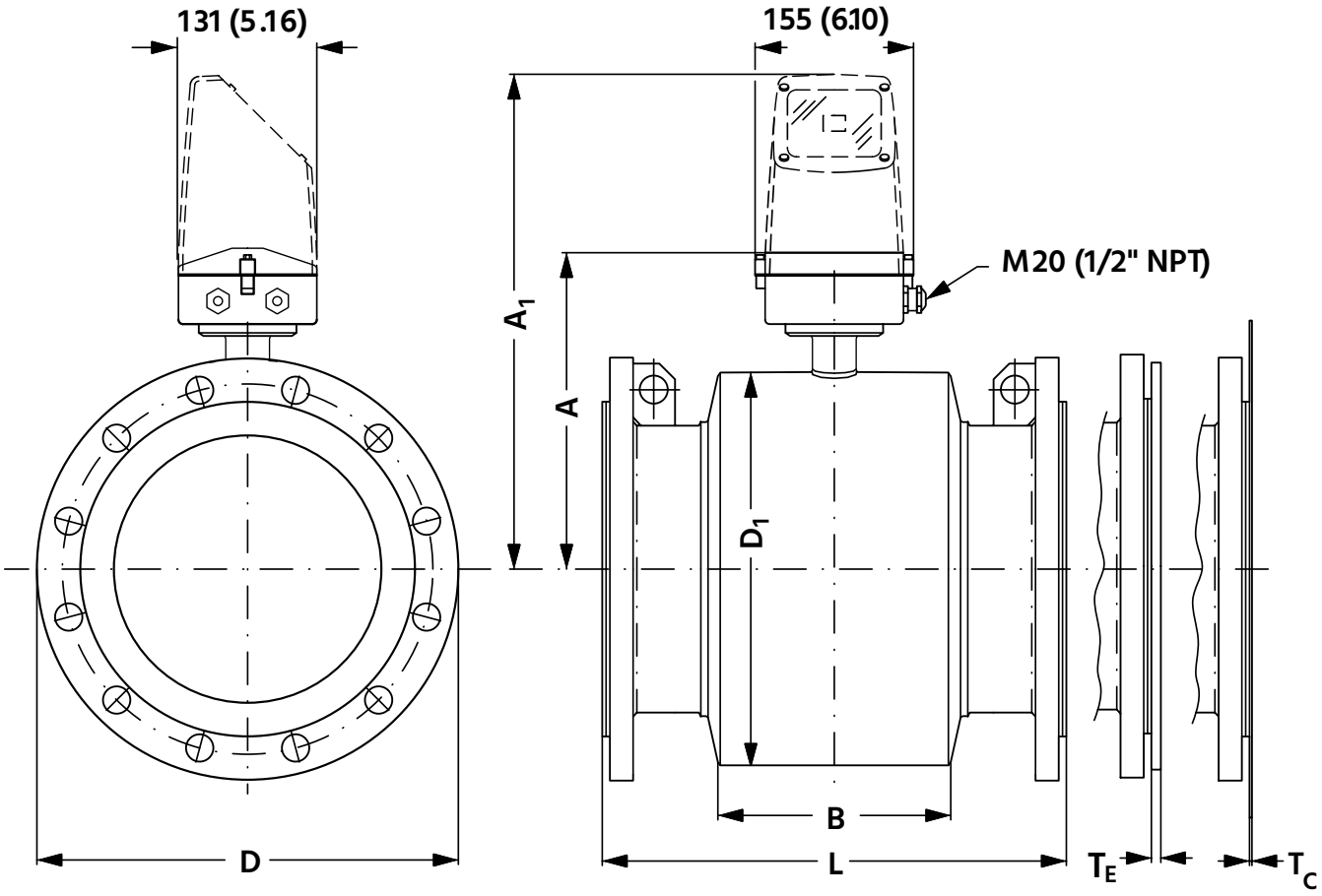
cable length

Connector length special cable:



cable length

Dimensions SI-02:



Dimensions SI-02:

DN	A[1)]	A[1]	B	D[1]	L[2)]								T_C[3)]	T_E[3)]	Weight[4)]
					EN1092-1-201					ANSI 16.5		AWWA C-207 Class D			
					PN6. 10. 16	PN25	PN40	PN64	PN100	Class 150	Class 300				
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
15	187	341	59	104	-	-	200	-	-	200	200	-	-	6	4
25	187	341	59	104	-	-	200	-	260	200	200	-	1.2	6	5
40	197	351	82	124	-	-	200	-	280	200	200	-	1.2	6	8
50	205	359	72	139	-	-	200	276	300	200	200	-	1.2	6	9
65	212	366	72	154	200	-	200	320	350	200	272	-	1.2	6	11
80	222	376	72	174	200	-	272*	323	340	272*	272*	-	1.2	6	12
100	242	396	85	214	250	-	250	380	400	250	310	-	1.2	6	16
125	255	409	85	239	250	-	250	420	450	250	335	-	1.2	6	19
150	276	430	85	282	300	-	300	415	450	300	300	-	1.2	6	27
200	304	458	137	338	350	350	350	480	530	350	350	-	1.2	8	40
250	332	486	157	393	450	450	450	550	620	450	450	-	1.2	8	60
300	357	511	157	444	500	500	500	600	680	500	500	-	1.6	8	80
350	362	516	270	451	550	550	550	-	-	550	550	-	1.6	8	110
400	387	541	270	502	600	600	600	-	-	600	600	-	1.6	10	125
450	418	572	310	563	600	600	600	-	-	600	640	-	1.6	10	175
500	443	597	350	614	600	625	680	-	-	600	730	-	1.6	10	200
600	494	648	320	715	600	750	800	-	-	600	860	-	1.6	10	287
700	544	698	450	816	700	-	-	-	-	-	-	700	2.0	-	330
750	571	725	556	869	-	-	-	-	-	-	-	750	2.0	-	360
800	606	760	560	927	800	-	-	-	-	-	-	800	2.0	-	450
900	653	807	630	1032	900	-	-	-	-	-	-	900	2.0	-	530
1000	704	858	670	1136	1000	-	-	-	-	-	-	1000	2.0	-	660
1100	755	904	770	1238	-	-	-	-	-	-	-	1100	2.0	-	1140
1200	810	964	792	1348	1200	-	-	-	-	-	-	1200	2.0	-	1180
1400	925	1079	1000	1675	1400	-	-	-	-	-	-	1400	2.0	-	1600
1500	972	1126	1020	1672	1500	-	-	-	-	-	-	1500	3.0	-	2460
1600	1025	1179	1130	1915	1600	-	-	-	-	-	-	1600	3.0	-	2525
1800	1123	1277	1250	1974	1800	-	-	-	-	-	-	1800	3.0	-	2930
2000	1223	1377	1375	2174	2000	-	-	-	-	-	-	2000	3.0	-	3665

1) 14.5mm shorter for AISI terminal boxes (Ex- and high-temperature version)

2) When using earth rings the flange thickness must be added to mounting length

3) TC = earth ring Type C,
TE = earth ring Type E
(included for PTFE measuring transmitter in high-temperature version and pre-mounted)

4) Weights are approximate values (for PN16) and applicable without measuring transmitter

5) PN35 = 272 mm (not according to ISO 13359)

D = flange diameter see flange tables

\- not available

* Size is out to ISO 13359

Flow-Nomogramm SI-01 / SI-02: