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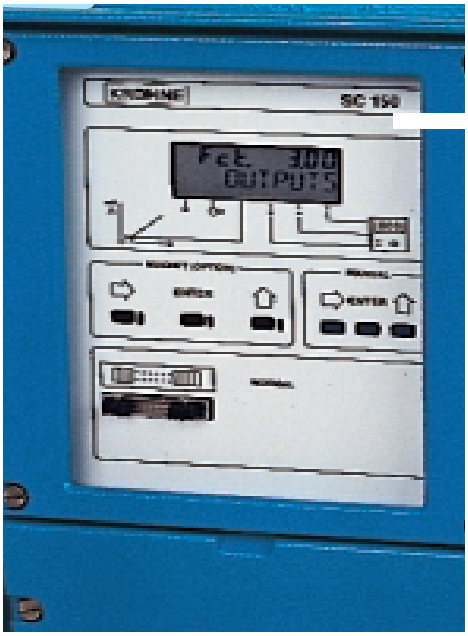
ПРЕОБРАЗОВАТЕЛИ СИГНАЛОВ

SC 150



SC 150
Signal Converter

for electromagnetic flowmeter

The modular Krohne system will have the right electromagnetic flowmeter for your specific application – right from both the flowmetering and the economic viewpoint.

Available versions

SC 150 Standard
with display /control elements,
active current,
pulse and status outputs.

SC 150 MP
with magnetic sensors, allowing operation (setting) by means of a bar magnet without having to open the housing.

SC 150..
with additional input, output and/or functions on request.

Calibrated on **EN 45 001**
certified calibration rigs,
accuracy of calibration better
than 99.97% of the measured value.

Technologie to rave about

- The extremely wide dynamic range of the new, patented A/D converter for the electrode signals also allows continuous evaluation of noisy electrode signals with stable output signals.
- The new high-power field current driver supplies very high currents at high field frequencies.
- The new periodic phase shift method ensures accuracy, zero, long-term and temperature stability even at high field frequencies, in the same way as the electromagnetic flowmeter with low-frequency pulsed DC field.
- The adjustable, non-linear filter allows accommodation to the most difficult applications.
- Included as standard features
  Scaled frequency outputs, low flow cutoff, automatic range change, measurement in both directions of flow, also with different ranges (forward/reverse operation), status indication output
  (e.g. adjustable as limit value), bootstrap circuit.
- Adaptable to the most varied metering tasks
  through adjustable parameters such as meter size, full-scale range $Q_{100\%}$ in metric or US units, magnetic field frequency, primary constant (GK), time constant down to 0.2 second, adjustable response for overflow of full scale range, etc.
- Large high-contrast LC display
  (max. 7-digit) for actual flowrate, volume, counts in physical units
- Easy to operate
  No special setting knowledge required to commission or reset the SC 150. Plain text operator prompting available in various languages.
- Data retention for a minimum of 10 years
  without auxiliary power (mains or battery).
- Self diagnostics
  indicates during commissioning and subsequent operation.
- Automatic data checking
  checks essential data during operation.
- Galvanic isolation
  between all output circuits and between these and the input circuit (electrodes).

Highlights

Excellent measuring accuracy, high zero stability and long-time stability, no maintenance requirement

Applications: ore extraction and ore dressing, mining, paper and woodpulp production, measurement of water / sand mixes on dredger vessels, etc.

Complete standard equipment, such as scaled pulse, current and status outputs, bootstrapping, limit switches, etc.

Safety First!
Shock-hazard-protected terminals and fuses in separate connection compart-ments, operator control via keys on the front panel, optionally via magnetic sensors without opening the housing

Largely self-monitoring feature to rule out errors

Pulsed d.c. field excitation, dynamic and powerful, in place of the normally used a.c. field technique

Compatible with ALTOFLUX primary heads IFS 2005 and IFS 4005

Technical data

Full-scale range	
Flowrate Q = 100%	adjustable from 2.1 to 305 000 m³/hr **or** 2.9 to 1 342 800 US gallons per minute, corresponding to flow velocity v = 0.3 to 12 m/s or 1 to 40 ft/s
Unit	m³, liters or US gallons per second, minute or hour, and 1 user-defined unit e.g. liters per hour or US million gallons per day
Forward/reverse measurements (F/R)	$Q_{100\%}$ separately adjustable for both directions
Current output (term. 5/6)	galvanically isolated, operating data adjustable
Current $I_{0\%}$ for Q = 0% $I_{100\%}$ for Q = 100%	0 to 16 mA 4 to 20 mA } adjustable in increments of 1 mA
Low-flow cutoff (SMU) cutoff "on" value cutoff "off" value	1 to 19% 2 to 20% } of $Q_{100\%}$, adjustable in 1% increments, independent of frequency output
Forward/reverse measurements (F/R)	selectable performance, direction identified via status indication or frequency output
Automatic range change (BA)	adjustable in 1% increments from 1:20 to 1:1.25 (equivalent to 5 to 80% of $Q_{100\%}$)
Time constant	0.2 to 3600 seconds, adjustable in increments of 1 or 0.1
Max. load at $I_{100\%}$	$\frac{20\text{ V}}{I_{100\%}[\text{mA}]}$ in kΩ (e.g. 1 kΩ at 20 mA, 4 kΩ at 5 mA)
Frequency outputs	galvanically isolated, operating data adjustable
Pulse rate (at Q = 100%)	10 to 36 000 000 pulses per hour 0.167 to 600 000 pulses per minute 0.0028 to 10 000 pulses per second (= Hz) optionally in pulses per m³, liters or US gallons
12-V output Terminals Amplitude Load (totalizer resistance)	for electronic totalizers (EC) 4 + 42 12 V, changeable to 5 V min. 1 kΩ
24-V output Terminals Amplitude Load	for electromechanical (EMC) or electronic (EC) totalizers 4 + 41 24 V see "pulse width" table below

Pulse width	Frequency f = $F_{100\%}$	Max. load current (24 V)	Min. load (24 V)
30 ms	0.0028 Hz < f ≤ 10 Hz	≤ 200 mA	≥ 120 Ω
100 ms	0.0028 Hz < f ≤ 5 Hz	≤ 200 mA	≥ 120 Ω
200 ms	0.0028 Hz < f ≤ 2.5 Hz	≤ 200 mA	≥ 120 Ω
500 ms	0.0028 Hz < f ≤ 1 Hz	≤ 200 mA	≥ 120 Ω
Pulse duty factor 1:1	10 Hz < f ≤ 1000 Hz	≤ 50 mA	≥ 500 Ω
160 µs	1000 Hz < f ≤ 2547 Hz	≤ 50 mA	≥ 500 Ω
50 µs	2547 Hz < f ≤ 10 000 Hz	≤ 50 mA	≥ 500 Ω

Low-flow cutoff (SMU) cutoff "on" value cutoff "off" value	1 to 19% 2 to 20% } of $Q_{100\%}$, adjustable in 1% increments, independent of current output
Forward/reverse measurements (F/R)	selectable performance, direction identified via status or current output
Time constant	0.2 second or same as current output (see above)

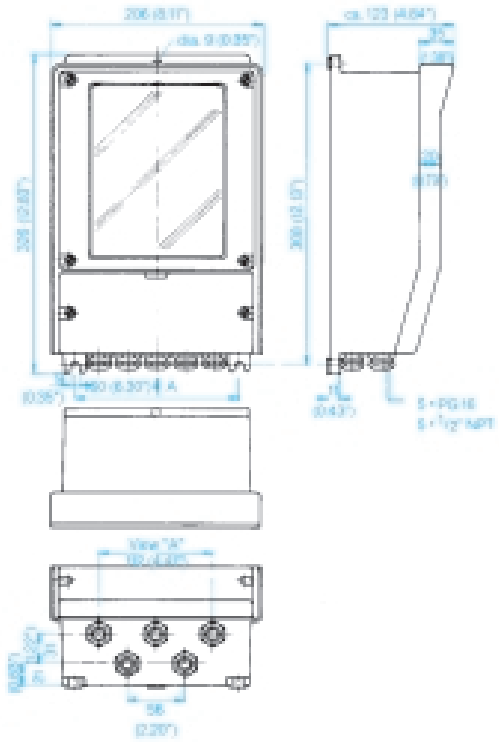
Indication outputs	Current output	Frequency output	Indication output
	I	**F**	**S**
Terminals	5 + 6	4 + 4.1	4 + 4.3
Voltage	U ≤ 35 Volt DC	U = 24 Volt DC	U = 24 Volt DC
Current	I_{load} ≤ 22 mA adjustable	I_{load} ≤ 200 mA	I_{load} ≤ 30 mA
Load (relay)	$R_{coil} = U/I_{max}$	R_{coil} ≥ 150 Ω	R_{coil} ≥ 1 Ω
Galvanically isolated from ... Current output I	–	yes	yes
Frequency output F	yes	–	no
Indication output S	yes	no	–
Function	only indication of flow direction for F (F/R operation) or operation indicator	only indication of flow direction for I (F/R operation)	indication of flow direction for I and/or F, trip point for I or F, self diagnostics (error indication), low-flow cutoff SMU counter overflow, operation indicator or automatic range change BA

Other functions and versions	
Standard	- Hold last alue of outputs during settings or set to “zero” - Coding for ent y into setting mode (can be deactivated)
Option	
Magnet programming MP	SC 150 MP, adjustable by means of bar magnet from outside without opening the housing
Local display	3-line back-lit LCD
Display functions	actual flowrate, forward, reverse and sum totalizers (7 digits), each adjustable for continuous or sequential display, and output of error messages
Display Units	
Actual flowrate	m^3, liters or US gallons per second, minute or hour, 1 user-defined unit (e.g. hectoliters per hour or US million gallons per day) and percent of full-scale range
Totalizers	m^3, liters or US gallons and 1 user-defined unit (e.g. hectoliters), min. 1 year overflow time
Language of plain texts	German, English, French, Finnish, others pending
Display:	
1st line	8-digit, 7-segment numeral and sign display, symbols for key acknowledgement
2nd line	10-character, 14-segment text display
3rd line	6 markers ▼ to identify actual display functions and status for indication output and low-flow cutoff (SMU)
Field power supply	
Terminals 7/8	for primary heads IFS 2005 and IFS 4005, others on request
Current/voltage	0.75 A_{pp}/max. 250 V
Field exitation frequency	1/2, 1/6 or 1/16 of line frequency, adjustable according to calibration data of primary head
Power supply	
Voltage	100 – 240 V AC, 50/60
Power consumption	Hz approx. 50 VA
Field housing	
Material	die-cast aluminium with electrostatic powder coating
Protection category (IEC 529 / EN 60 529)	IP 65 equivalent to NEMA 4X
Ambient temperature	
in operation	-25 to +50°C or – 13 to +122°F
in storage	-40 to +60°C or – 40 to +140°F

Dimensions and weights

SC 150 signal converter

Weight approx. 4 kg or 8.8 lb

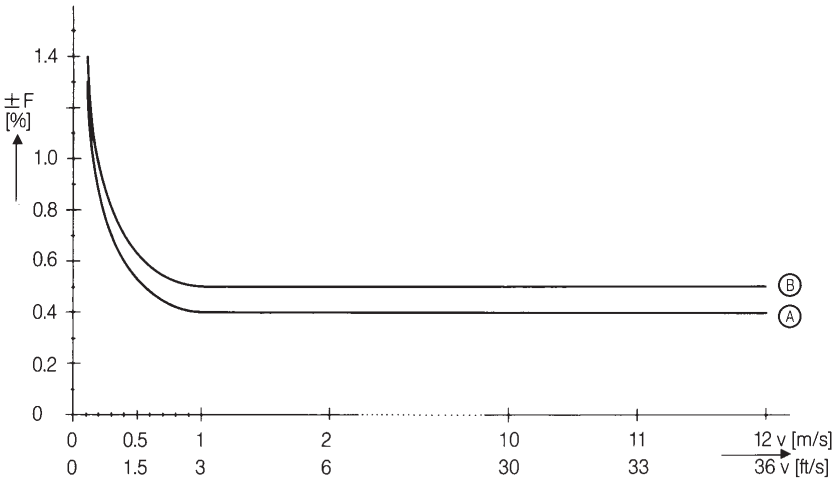


Accuracies

for complete system at reference conditions

Frequency output

F Error (±) as % of flowrate (measured value) v Flow velocity in m/s (ft/s)



Reference conditions

Product	Water at 10 to 30°C (50 to 86°F) and > 300 µS/cm (µmho/cm)
Power supply (line voltage)	U_N (± 2%)
Ambient temperature	20 to 22°C (68 to 71.6°F)
Warm-up time	60 min.
Maximum error of calibration	10 x smaller than F
system Inlet/outlet runs	5DN/2DN (DN = meter size)
Primary head	properly grounded and centered

Primary head

	Meter size DN mm	inch	Error Limits v ≥ 1 m/s or ≥ 3 ft/s % of MV	v < 1 m/s or < 3 ft/s % of MV + mm/s or % of MV + inch/s	Curve
IFS 2005	150 – 2000	6 – 80	± 0.4%	± (0.3% + 1 mm/s) or ± (0.3% + 0.04 inch/s)	A
IFS 4005	50 – 200	2 – 8	± 0.4%	± (0.3% + 1 mm/s) or ± (0.3% + 0.04 inch/s)	A
	> 200	> 8	± 0.5%	± (0.4% + 1 mm/s) or ± (0.4% + 0.04 inch/s)	B

Current output	same as above accuracies for frequency output			
	plus...			
	general:	± 0.05% x $\frac{20}{I_{100\%} - I_{0\%}}$ mA	}	of full-scale range
	0 to 20 mA:	± 0.05%		
	4 to 20 mA:	± 0.062%		
External influences				
Ambient temperature	± 0.01%	} of measured value per 1K temperature variation	**or** ±	} of measured value per 1°F temperature variation
Frequency output	± 0.025%			
Current ouput	± 0.05% of measured value at 10% variation			
Power supply	± 0.02% of measured value at max. load (see under “current output”)			
Load				

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