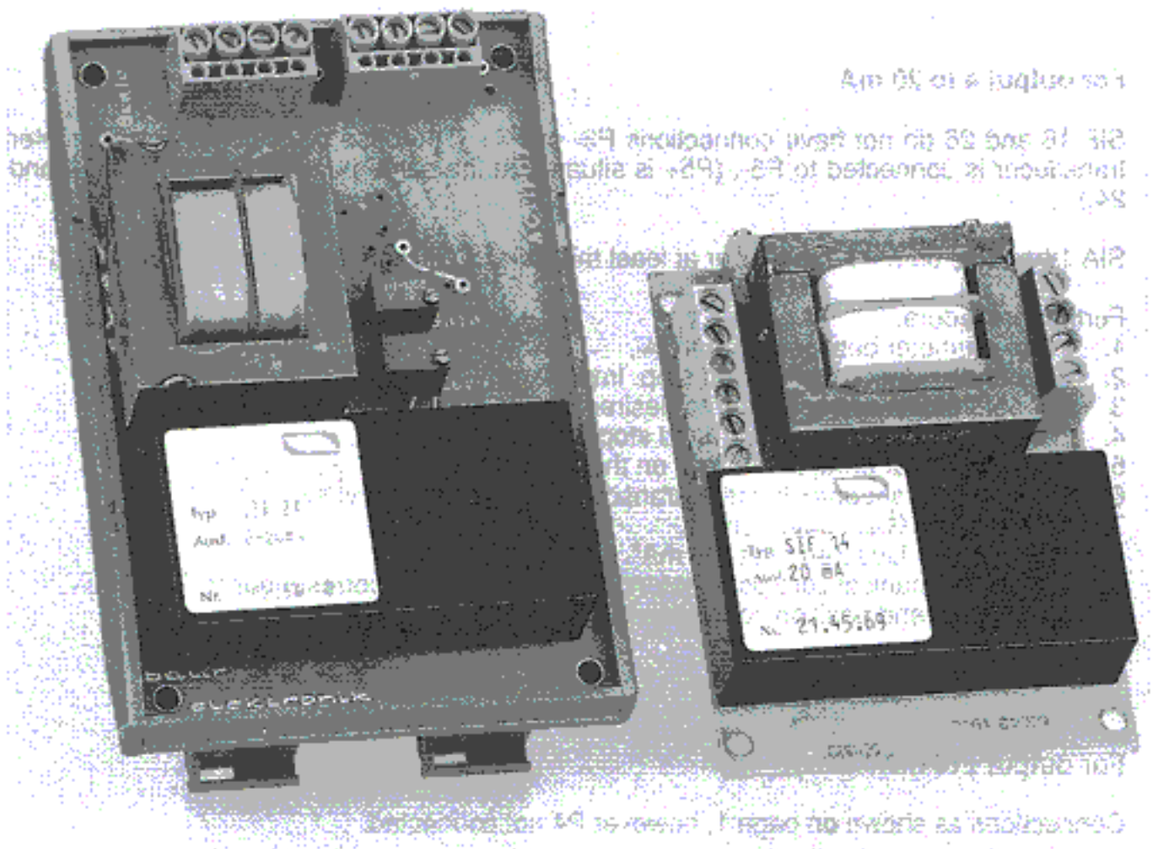


ACTIPOT modules SIA and SIF

- To power potentiometer transducer of various designs
- To transform the measuring signal into an injected current (e.g. 0 to 20 mA)
- For connection to a 220 V/50 Hz mains
- With zero point and range setting
- Load impendance 0 to 600 Ω
  Compliance voltage 0 to 12 V
- Bipolar field-effect transistor technology

Setup and Function

For models SIF 12 to 26 and SIA 12 to 24 a high-quality constant-current source is utilized to supply a potentiometer transducer (angle-of-rotation, pressure or displacement transducer) via the connections P_{2-} and P_{3+}. The voltage drop (corresponding to the measured variable) is tapped between P_{1-} and P_{4+}. The measurement does not include the contact resistant between the potentiometer wiper arm and the resistant element. An amplifier transforms the measured signal into a proportional injected current.

The sensitivity (measured range end) or zero point can be set within specific limits using the trimming potentiometers "Gain" and "Zero". For a transducer with a functional stroke of 100 mm, it is possible, for example, to set the end of the measuring range (≙ 20 mA) to 40 mm from the start or, in another case, to form an imaginary zero point and to begin at 0 stroke ≙ 2 mA. These options eliminate the mechanical adjustment of transducer, which is often difficult. Moreover, the measuring signals of various transducer can be set to a uniform sensitivity or the same full-scale deflection.

The output (I_{A+} and I_{A-}) is idling and short-circuit proof.

In the case of models SIF 92 and 94 and SIA 92 and 94, the potentiometer transducer are supplied with a constant voltage of 2.5 VDC. The same circuit is used for the connections.

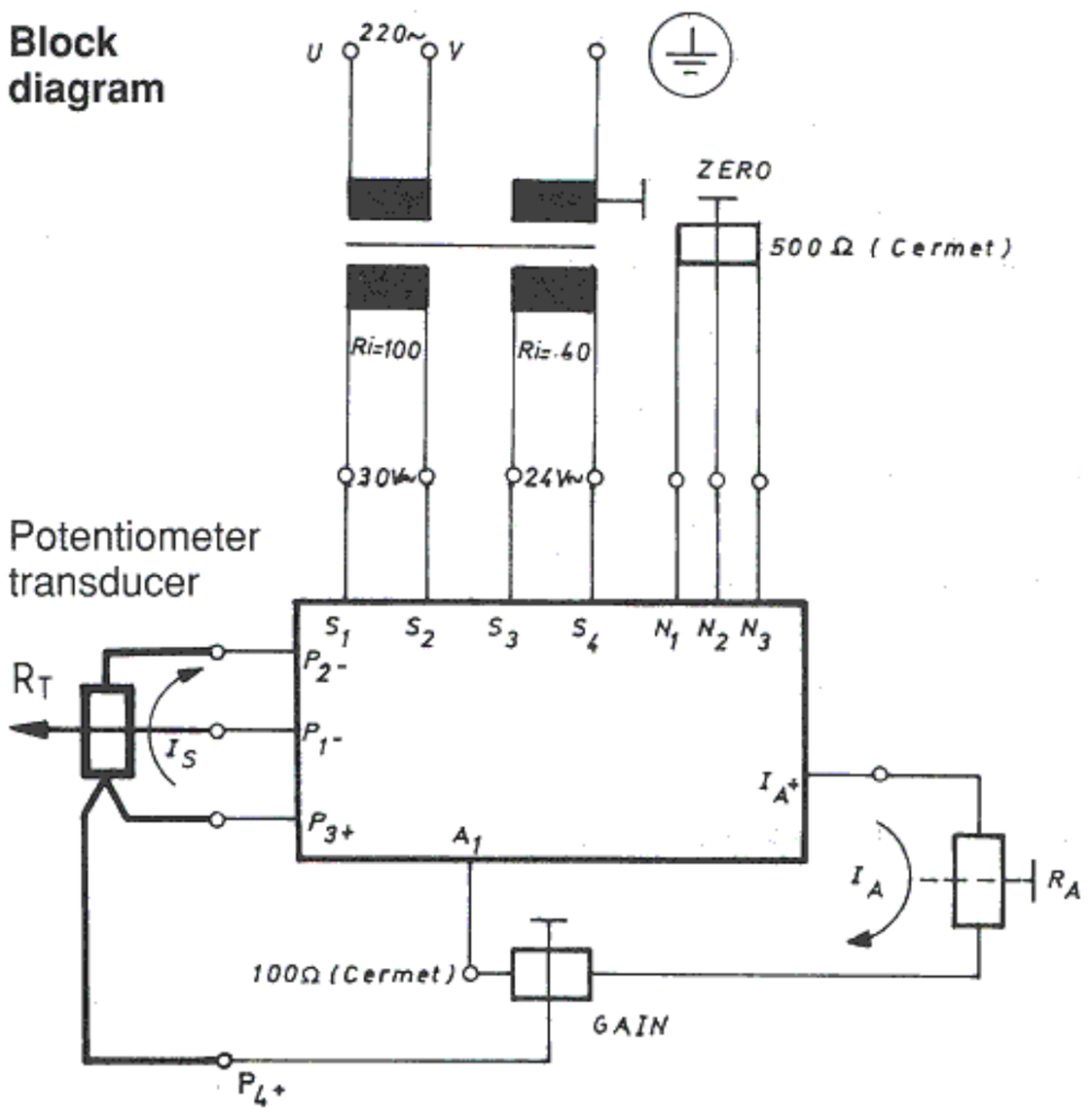
Types:

SIF: Contact wafer populated on one side
SIA: Type SIF mounted on standard busbar carrier to Data Sheet 6310

The exact type designation depends on the connection resistance RT of potentiometer transducer and desired output according to following table:

Type	Pot. supply current	For pot R_T	Output	Load impendance
SIA/SIF14	I constant 0.5 mA	5 kΩ	0 to 20 mA	0 to 12 V
SIA/SIF24	I constant 2.5 mA	1 kΩ	0 to 20 mA	0 to 12 V
SIA/SIF16	I constant 0.5 mA	5 kΩ	4 to 20 mA	0 to 12 V
SIA/SIF26	I constant 2.5 mA	1 kΩ	4 to 20 mA	0 to 12 V
SIA/SIF12	I constant 0.5 mA	5 kΩ	±10 mA	±10 V
SIA/SIF22	I constant 2.5 mA	1 kΩ	±10 mA	±10 V
SIA/SIF94	U constant 2.5 mA	0.5 to	0 to 20 mA	0 to 12 V
SIA/SIF92	U constant 2.5 mA	100 kΩ	±10 mA	±10 V

Block diagram



Technical specificatioins:

Supply voltage[1]:	220V 50/60 Hz –15/+10%
Power consumption:	2.8 VA
Operating temperature:	–20 to +60°C
Output currents:	see table
Compliance voltage:	see table
Load impendance:	0 to 600 Ω (SI 12 + 22: 0 to 1000 Ω)
Internal resistances:	- amplifier output > 4 MΩ - ampifier input > 20 MΩ SI 12 to 26 > 5 MΩ SI 92/94 > 0.1 Ω
Dielectric strength of the output:	±30 V
Regulation factor:	> 1000
Residual ripple [2]:	≤ 0.5%
Temp. coefficient:	≤5 x 10^{-5} / °C
Long term drift:	< 0.04% / year
Disturbance correction time[3]:	10^{-4} s
Setting range for Zero and Gain:	see reverse side
Cut-off frequency:	500 Hz
Linearity:	< 0.1%
Reproducibility:	<0.1%
Weight:	200 g (SIF) 270 g (SIA)

Footnotes: see reverse side

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Setting ranges:

- for Zero: –2 to +40% of the transducer potentiometer, referred to its starting point. The output current for the set zero point is 0 or 4 mA.

- for Gain: +40 to 110% of the transducer potentiometer based on its total range. The output current at the end position of the set range is 20 mA or ±10 mA,

Note: The set range for the full output current (0 to 20 or 4 to 20 or ±10 mA) has to be at least 40% of the total range of the transducer potentiometer, e.g. 0 to 100%, 40 to 100%, 0 to 40%, –2 to 40%, 30 to 80%, 40 to 110%.

Information about the circuit

When supplying the potentiometer trasducer with $I_{const.}$ (SI 14/24) and connecting with 4 leads (see block diagramm), the changes in the lead resistances and the contact resistance at the potentiometer wiper are not included in the measurement result.

When supplying with $E_{const.}$ (SI 92/94), the changes in the lead and contact resistances from P2- and P3+ are included in the measurement result but the temperature coefficient of the potentiometer remains insignificant.

In general, we recommend supplying with $I_{const.}$ Note the following when doing so:

Changes in the lead resistances are included in the measurement result when circuits with 3 leads are involved (P3 and P4 joined at the ACTIPOT).

In the case of circuits with 2 leads (P3 and P4 plus P1 and P2 joined at the ACTIPOT), changes in the lead resitances and the contact resistants at the potentiometer wiper and the temperature coefficient of the potentiometer transducer are apparent as errors.

For protection against voltage peaks which can affect the output from the outside, it is advisable to connect a suppressor diode ±15 VDC (e.g. Semikron CTZC 15).

Adjustment and connections for output 0 to 20 mA

Make connections as shown on page 1.
1. Connect adequately accurate ammeter between IA+ and IA-.
2. Set trimmer Zero to right-hand stop. Important!
3. Set potentiometer transducer to desired mechanical end position.
4. With trimmer Zero, set "0 mA"
5. Mechanically set potentiometer transducer to desired end value.
6. With trimmer Gain, set "20 mA".
7. Check: Mechanical zero point of potentiometer transducer corresponds to "0 mA"; mechanical end position corresponds to "20 mA".

For output 4 to 20 mA

SIF 16 and 26 do not have connections P3- or P4+. The base point of the potentiometer transducer is connected to P5-. (P5+ is situated at the same point as P4+ on SIF 14 and 24.)

SIA 16 and 26 do not have P3+ or at least this point is not connected. P4+ is connected

Further procedure:
1. Place ammeter between I_{A+} and I_{A-}.
2. Set trimmer Zero to right-hand stop. Important!
3. Set potentiometer transducer to desired mechanical end position.
4. Set trimmer Live Zero to left-hand stop (zero).
5. With trimmer at Zero, set "0 mA" on the instrument.
6. Mechanically set potentiometer transducer to desired end value.
7. With trimmer Gain, set "16 mA".
8. With trimmer Live Zero, set "20 mA".
9. Check: Mechanical zero point potentiometer transducer corresponds to "4 mA"; mechanical end position corresponds to "20 mA".

For output ±10 mA

Connections as shown on page 1, however P4 not connected.

1. Mechanically set potentiometer transducer to centre (desired zero point).
2. With trimmer at zero, set current IA = 0 mA.
3. Mechanically set potentiometer transducer to left-hand end position.
4. With trimmer at Gain, set current to -10 mA.
5. Mechanically set potentiometer transducer to right-hand end position.
6. Check that current is +10 mA on the indicator
7. Again mechanically approach the zero point on the potentiometer transducer. Reading must be "0 mA".

Notes regarding the technical specifications on page 1

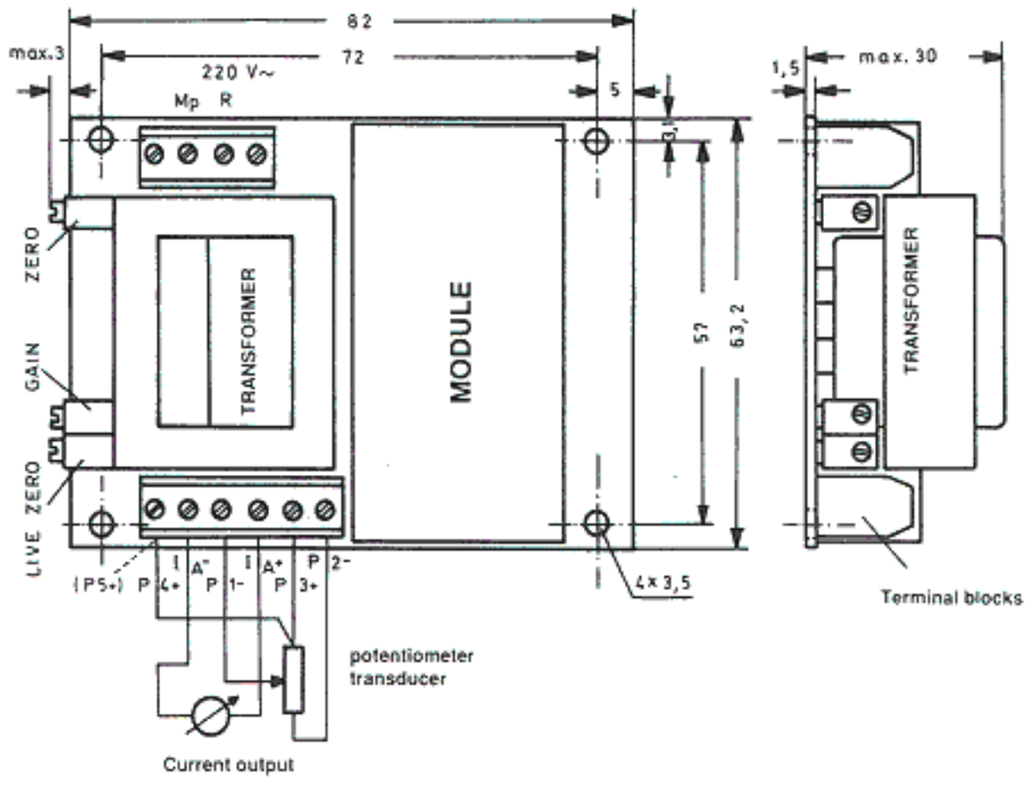
1) Other supply voltages such as 240, 120, 110, 42 or 24 VAC are possible. Devices which do not have 220 V line voltage are clearly marked.

2) The specified residual ripple is correct if potentiometer transducer and module SIF or SIA are side by side.

3) The disturbance correction time refers to abrupt changes in supply voltage or load.

Mounting dimensions in mm and connections

Type SIF



Type SIA