

Linear Transducers

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Linear Transducers

- Definition
- Technologies overview
- Effective application



Definition

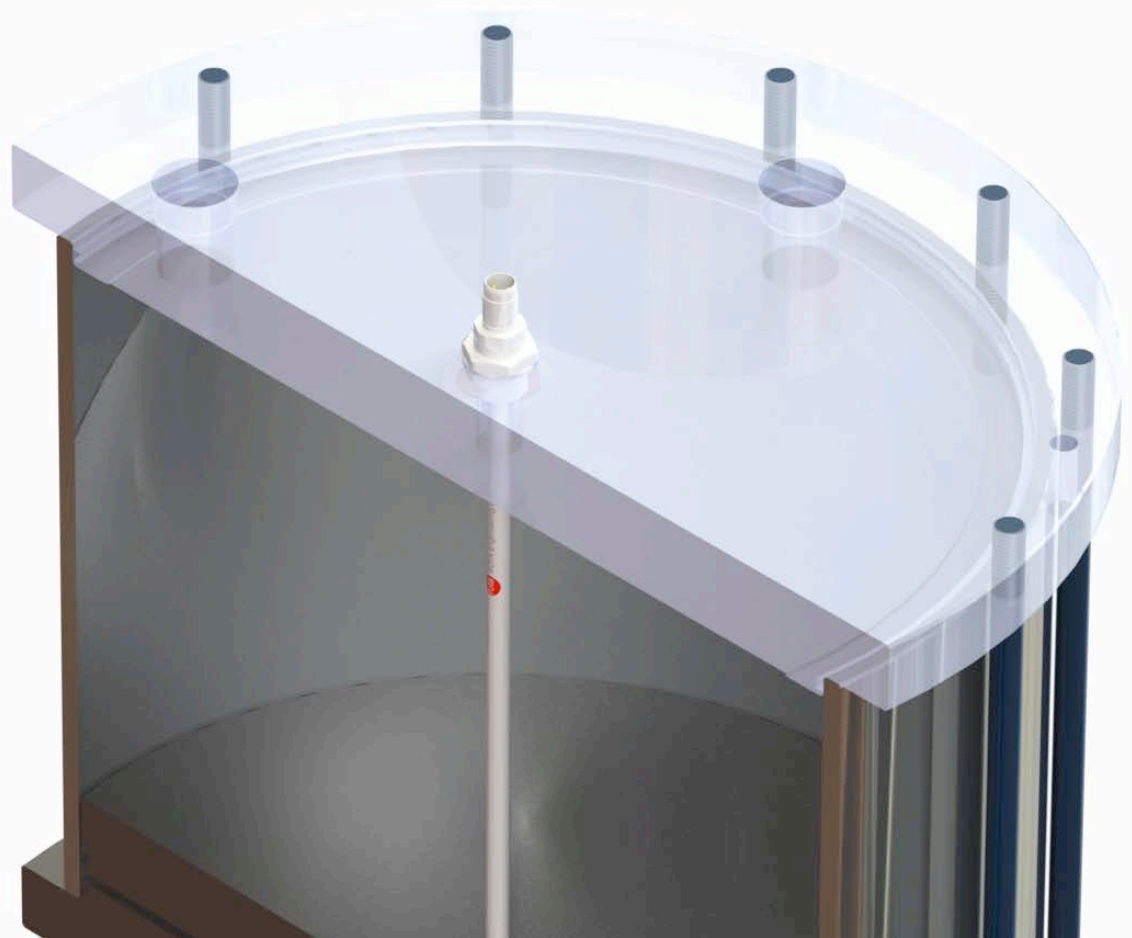
- Transducers are devices that convert one form of energy to another.

- Electrical
- Mechanical
- Electromagnetic
- Light
- Chemical
- Thermal



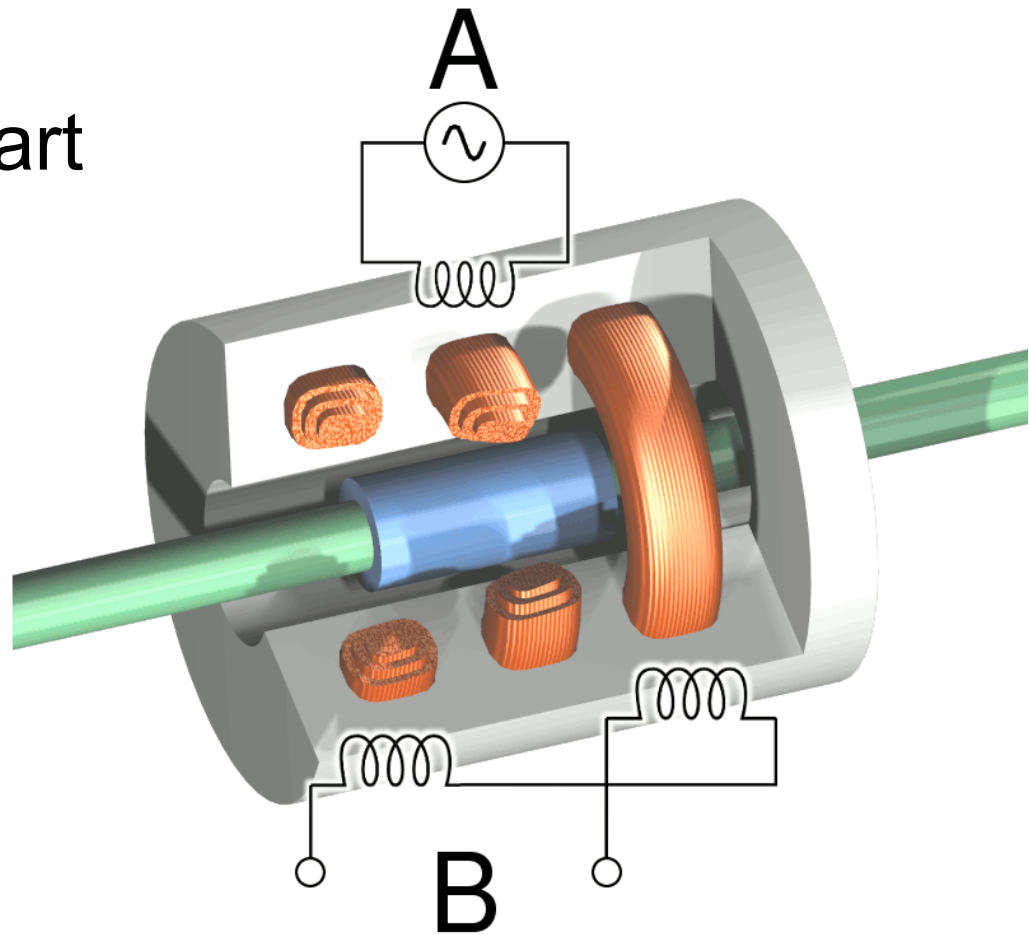
Technology Overview - Linear Transducers

- Inductive
- Reed Switch
- Hall Sensor



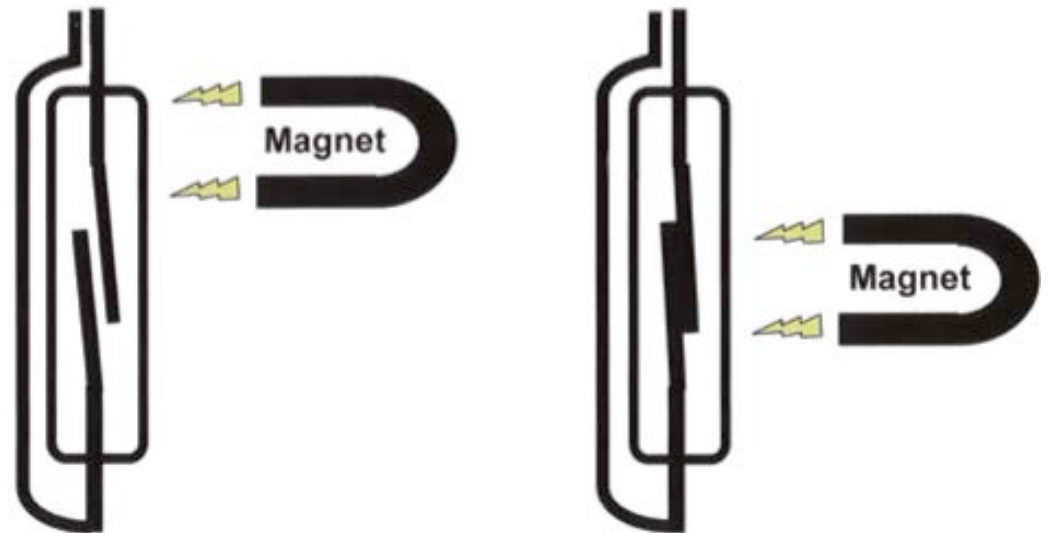
Technology Overview - Inductive

- One moving part
- Three coils
- Early 1940s



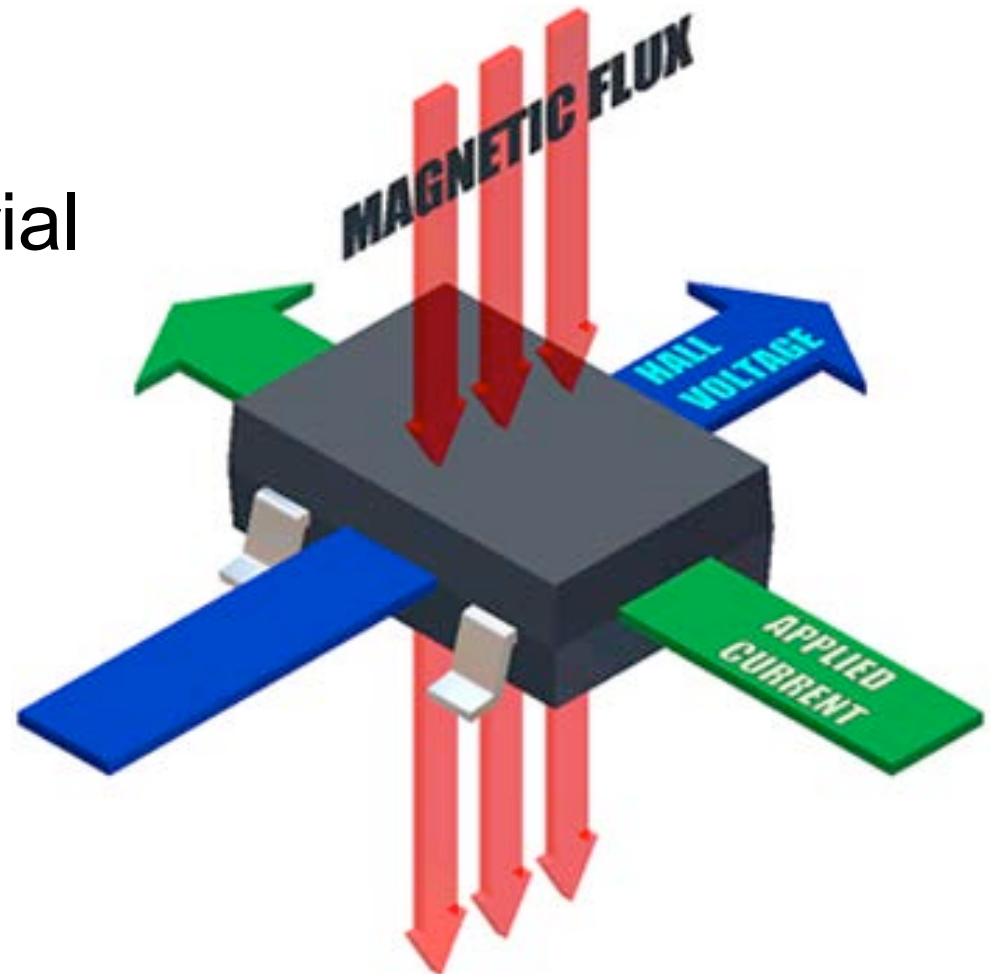
Technology Overview - Reed Switch

- Two lead wires
- Physical contact
- Early 1990s



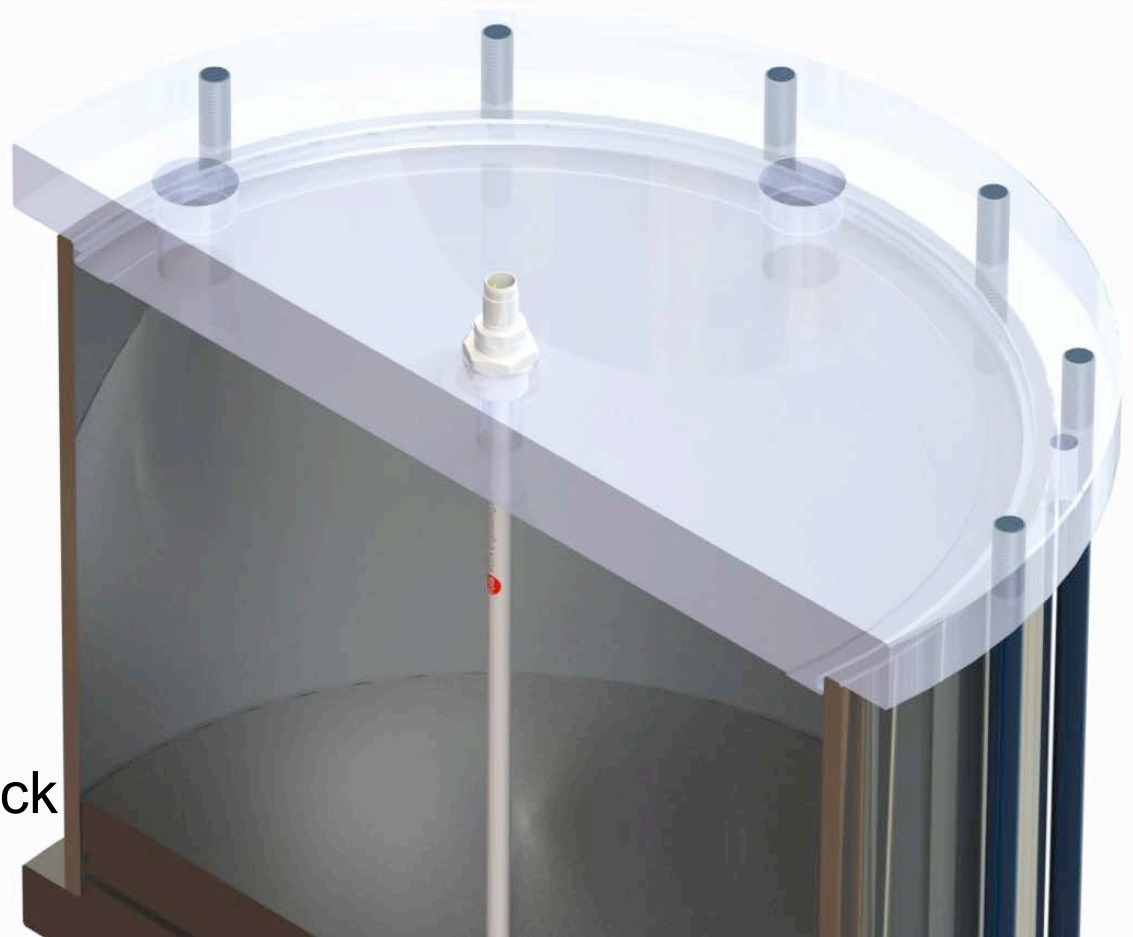
Technology Overview - Hall Sensor

- Solid state
- Conductive material
- Early 2000s



Technology Overview - Linear Transducers

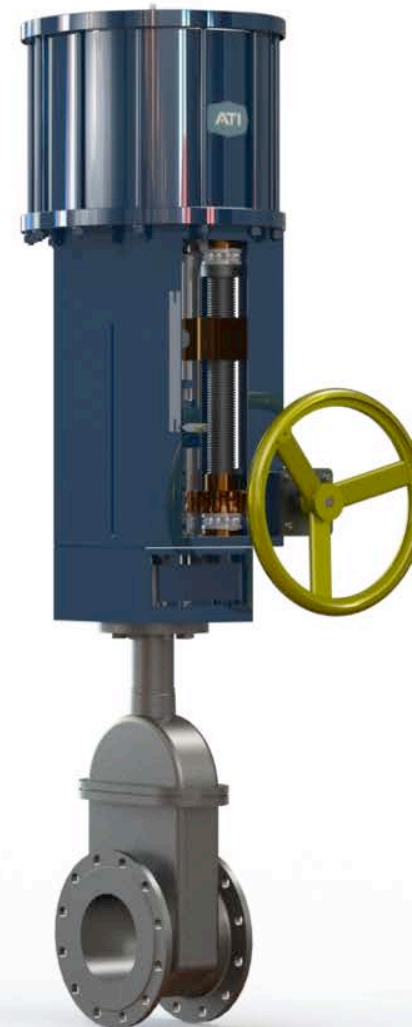
- Frictionless
- Magnet
- Supplementary
- Internal
- External
- Rising Stem
- Quarter-Turn
- Excellent Repeat
- Consistent Feedback
- Resolution



Technology Overview - Resolution/Output

INDUCTIVE	REED SWITCH	HALL SENSOR
0.005mm	1.5mm	0.2mm
0.0002"	0.06"	0.01"

4-20mA, Voltage, Current, PWM, Digital



Effective Application for Ultimate Valve Control

- Positioner
- Instrumentation
- Actuator
 - o Low-friction bubble tight seals
 - o Low-friction lubricants
 - o Robust actuator construction
 - o Smooth travel



Conclusion

- Valve type
- Process conditions
- Operating environment
- Contribution to system integrity

Thank You!

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Works Cited

- Thermometer: <http://medtree.co.uk/image/cache/data/Product%20Images/Diagnostics/DI063-700x700.jpg>
- Audio Speaker: <http://cdn.shopify.com/s/files/1/0303/7725/t/2/assets/clio-emt-speaker.png?14668558529570346452>
- Microphone: http://fc09.deviantart.net/fs14/f/2007/004/2/3/Microphone_by_gregVent.jpg
- LED: <http://www.in.all.biz/img/in/catalog/111074.jpeg>
- LVDT: http://www.sensorwiki.org/doku.php/sensors/linear_variable_differential_transformer
- Reed Switches: <http://www.chicagosensor.com/HowFloatSwitchesWork.html>
- Hall Sensors: <http://www.element14.com/community/docs/DOC-16976/l/hall-effect-sensors-measure-up>
- http://www.sensorwiki.org/doku.php/sensors/linear_variable_differential_transformer
- <https://www.google.pl/patents/US2264746> (Electromagnetic Switch)
- <http://www.google.com.tr/patents/US7250754> (Linear and Rotational)
- <http://www.google.com.ar/patents/US7449878> (Inductive Trasducer)
- http://rota-eng.com/public_docs/mobile-brochure.pdf