DENSO

# Understanding the operating conditions of an Air Cylinder

## Challenge

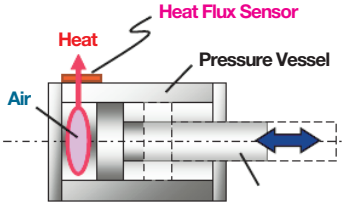
We want to find out the operating conditions of an Air Cylinder

Troublesome tomeasure air pressure, etc.

It would be great to know the conditions only through a surface measurement

## The Heat flux sensor Solution!

### The method of finding out the operating conditions of an Air Cylinder




Air Cylinder Example Diagram

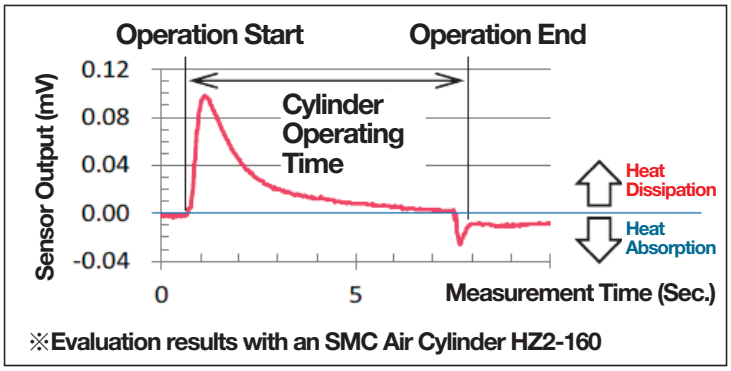
Air inside the Pressure Vessel

Compression = Heat Dissipation / Expansion = Heat Absorption

Piston (etc) Machine Friction = Heat Dissipation

Detection on pressure vessel surface

State of Operation made Visible!




※Evaluation results with an SMC Air Cylinder HZ2-160

## Evaluation Results

Air Cylinder Visualization
- Operation Start/End Timing
- Operation Time/Direction, etc

Note: A case where an amplifier may be separately required might arise

**We could understand the operating condition of the air cylinder only by measuring on the pressure vessel surface**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