Intelligent Proximity Positioner with HART® Communicator Capability and Online Diagnostics

ICoT™ 5300
Intelligent Positioner w/ Hart® Capability

Intelligent Calibration
HART® Protocol
The ICoT™ 5300 provides intelligence for the control valve through a microprocessor-based system utilizing the HART® protocol. Accurate measurement of valve stem position, input signal, and actuator pressure can be recorded during normal operation, thereby providing information for control valve signature generation.

Diagnostic Capability
A preventive maintenance and data logging system, in parallel with the 4-20 mA loops, performs online diagnostics of control valves with automatic record keeping for documentation purposes. The HART® communications capability of the ICoT™ positioner, coupled with the HPORT™ multiplexer and Cornerstone™ control valve specific software, provides operating personnel the opportunity of implementing customized preventive maintenance programs. It additionally simplifies adherence to occupational health and safety requirements mandated by government regulations.

Intelligent Control
ICoT, with HART® protocol, opens up an endless array of new possibilities for improving efficiency and preventive maintenance procedures in all areas pertaining to control valve usage.

ICoT™ 5300
Vendor:
Model:
Tag:
ID#:
Date:
Cal Scheme:
Range:
Description:
ICoT
5300
VP300
8176
21 June
Standard
4020H

A standard hand-held terminal (the HART® Communicator) may be utilized for field operations in conjunction with a remote PC for maintenance information and documentation.

ICoT™ 5300
Local LCD Display
Local Position Display
Local Diagnostics
Auto Cal, PID Control
Autotuning
Keypad Calibration
Hand-Held Communicator
Online Diagnostics
Fugitive Emissions Monitoring
End Limit Position Sensing
4-20 mA Position Transmitter
Early-Warning Diagnostic Software
Multiplex Capability
Remote Position Control

HPORT is a trademark of ARCOM Control Systems, Inc.
CORNERSTONE is a trademark of Applied System Technologies, Inc.
**Communication**

The Model 375 communicates with iCoT™ Smart Positioners via HART® protocol. Communication is accomplished by superimposing a high frequency signal on top of the 4-20 mA output signal. This allows simultaneous communication and output without comprising loop integrity.

**Hazardous Locations Certifications**

- **CENELEC**
  Intrinsic Safety Certification
  Certificate No. Ex9C2279

- **Factory Mutual (FM)**
  Intrinsic Safety and Nonincendive Approval
  Intrinsically Safe for Class I, Division 1, Groups A, B, C and D; Nonincendive for Class I, Division 2, Groups A, B, C and D.

- **Canadian Standards Association (CSA)**
  Intrinsic Safety Approval.
  Intrinsically Safe for Class I, Division 1, Groups A, B, C and D.

**HART® Hand-Held Terminal**

A single 4-20 mA iCoT® positioner with up to two master devices may be connected to each HART® loop. The primary master is generally a management system or a PC while the secondary unit can be a hand-held terminal or laptop computer.

A standard hand-held HART® Communicator is available for making field operations as uniform as possible. Manufactured by Rosemount, the Model 375 functions as a common tool for HART® microprocessor-based field instruments. From any wiring termination point in the loop, the battery-powered Model 375 can perform diagnostic, configuration, and interrogation functions. Additionally, while the 375 is offline, configuration data can be stored for later downloading to one or more positioners. Simultaneous communication capabilities allow the hand-held terminal to receive data from and send data to the positioner without disrupting the positioner’s signal from the control room.
ICoT™ 5300

Intelligent Positioner w/ Hart® Capability

Diagnostic and Configuration Software

ICoT™ has developed a Smart Positioner possessing the capability to predict rather than react to valve maintenance needs. With the ICoT™ positioner, operating personnel gain a real-time perspective on the state of control at the valve, including a view of operating integrity and emerging alert conditions. Timely information about each control valve condition is quickly made available to the plant’s production and maintenance engineers.

THE PRINCIPLE ADVANTAGE OF ONLINE DIAGNOSTICS IS THE ABILITY TO DETECT DEVIATIONS FROM ESTABLISHED PATTERNS OF BEHAVIOR AS THEY OCCUR UNDER ACTUAL OPERATING CONDITIONS.

Control valves are the most maintenance intensive components commonly used in instrumentation and control systems. By inclusion of internal parameter sensing within the valve positioner, forewarning of the need for maintenance is made available with a comfortable degree of lead time.

The ICoT™ positioner’s diagnostic compatibility is based upon observations of the following operating parameters:

- Valve position vs. input signal.
- Actuator pressure vs. valve position.
- Airset filter outlet pressure.
- Confirmation of principal operating pressures within positioner.
- Pressure generation within packing gland area.

Online Diagnostics via HART® Link

- “Stick-slip” detection.
- Excessive static position error.
- Fugitive emissions monitoring.
- Low air supply pressure.
- Clogged air supply filter.
- Restricted transducer nozzle.
- Transducer diaphragm air leak.
- Non-functioning spool valve.
- Calibration error.

For additional information utilizing Hart compatible software such as Cornerstone or Fisher Rosemounts’ AMS, please consult factory.
### AGENCY APPROVALS

<table>
<thead>
<tr>
<th>Intrinsically Safe:</th>
<th>Nonincendive:</th>
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<tr>
<td>Class I, II &amp; III</td>
<td>Class I, Groups A-D, Groups F-G, Div. 2</td>
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<tr>
<td>Class II &amp; III</td>
<td>Class II &amp; III, Groups E-G, Div. 1 Exia IIC T4, Class I, Zone D</td>
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Nonincendive:  
Class I, Groups A-D, Class II & III, Groups E-G, Div. 1 Exia IIC T4, Class I, Zone D

### OPERATING SPECIFICATIONS

<table>
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<tr>
<th>MODEL 5300</th>
<th>LINEAR</th>
<th>ROTARY</th>
</tr>
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<tbody>
<tr>
<td><strong>Input Current</strong></td>
<td>4 mA (Digital HART)</td>
<td>4 mA (Digital HART)</td>
</tr>
<tr>
<td><strong>Voltage Drop</strong></td>
<td>12.3 Volts</td>
<td>12.3 Volts</td>
</tr>
<tr>
<td><strong>Supply Air Pressure</strong></td>
<td>(low) 15 to 45 PSI</td>
<td>(low) 15 to 45 PSI</td>
</tr>
<tr>
<td></td>
<td>(high) 40 to 120 PSI</td>
<td>(high) 40 to 120 PSI</td>
</tr>
<tr>
<td><strong>Standard Stroke</strong></td>
<td>0 to 90 Degrees</td>
<td>0 to 90 Degrees</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>0.2% of span</td>
<td>0.2% of span</td>
</tr>
<tr>
<td><strong>Linearity</strong></td>
<td>1% of span (0.4” to 1.25”</td>
<td>0.5% of span</td>
</tr>
<tr>
<td><strong>Hysteresis</strong></td>
<td>0.2% of span</td>
<td>0.2% of span</td>
</tr>
<tr>
<td><strong>Repeatability</strong></td>
<td>0.2% of span</td>
<td>0.2% of span</td>
</tr>
<tr>
<td><strong>Thermal Coefficient</strong></td>
<td>2% / 100°C</td>
<td>2% / 100°C</td>
</tr>
<tr>
<td><strong>Output Flow Rates</strong></td>
<td>(low) 0.0 scfm @ 25 PSI</td>
<td>(low) 0.003 scfm @ 20 PSI</td>
</tr>
<tr>
<td></td>
<td>(high) 16.2 scfm @ 90 PSI</td>
<td>(high) 0.008 scfm @ 90 PSI</td>
</tr>
<tr>
<td><strong>Air Consumption</strong></td>
<td>-40°C to 85°C (-40°F to 185°F)</td>
<td>-40°C to 85°C (-40°F to 185°F)</td>
</tr>
<tr>
<td><strong>Gain</strong></td>
<td>Electronically Adjustable w/ Autotuning</td>
<td>Electronically Adjustable</td>
</tr>
<tr>
<td><strong>Speed Response</strong></td>
<td>Electronically Adjustable</td>
<td>Electronically Adjustable</td>
</tr>
<tr>
<td><strong>Feedback</strong></td>
<td>Magnetic (Non-contact)</td>
<td>Magnetic (Non-contact)</td>
</tr>
<tr>
<td><strong>Diagnostics</strong></td>
<td>HART Protocol</td>
<td>HART Protocol</td>
</tr>
<tr>
<td><strong>Air Connection Ports</strong></td>
<td>1/4” NPT</td>
<td>1/4” NPT</td>
</tr>
<tr>
<td><strong>Calibration Method</strong></td>
<td>HART® or HART® &amp; Keypad</td>
<td>HART® or HART® &amp; Keypad</td>
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*NOTE: For linear graphs displaying deviation from straight line (0.4” to 20”)
see technical manual #374.

### ORDERING GUIDE

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<td>Engineered Resin E</td>
<td>High Pressure (40 to 120 PSI) HART &amp; Keypad</td>
<td>1/2” NPT A</td>
<td>(Rotary Only) No Sensors 0</td>
<td>Without Transmitter A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Low Pressure (15 to 45 PSI) HART &amp; Keypad LB</td>
<td>M20 B</td>
<td>Magnum One SPST 1</td>
<td>4-20 mA B</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>High Flow (40-120 psi) HART &amp; Keypad VB</td>
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Westlock reserves the right to change product designs and specifications without notice, and is not responsible for errors and omissions.