azbil

Machining ▪ Metalworking

Gas cutting machine flame control

Better gas flow rate control stabilizes the flame, improving the quality of the cut

Gas flow rate control

Product	**Process sensor** Digital Mass Flow Controller
Model No.	F4Q____

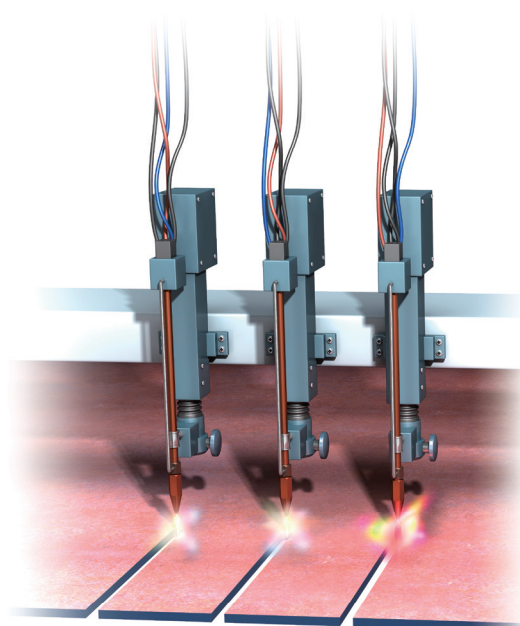|	
Process/ equipment	Gas cutting machine

Current Situation

- ◾ Gas cutting machines have many torches. The torch's gas valve regulates the flow rate.
- ◾ Ambient temperature around the cutting machine is not controled, so temperature varies considerably.
- ◾ We want to use a mass flow controller to improve the quality of the cutting, but we want to minimize the cost.

Current Problems

- ◾ Starting/stopping another torch changes the gas supply pressure, causing the flow rate and flame to vary.
- ◾ The typical mass flow controller has a small operating temperature range that does not cover the range at the manufacturing site.
- ◾ Because we use many MFCs, the cost for analog I/O on the PLC side and wiring would increase.

Azbil Corporation

Solutions

Solution 1

Auto-control keeps flow rate steady even when gas supply pressure changes

Model F4Q has a 0.3 second high-speed response, acting almost instantaneously to keep the flow rate steady when the pressure changes. With a stable flame, the cutting quality improves.

Solution 2

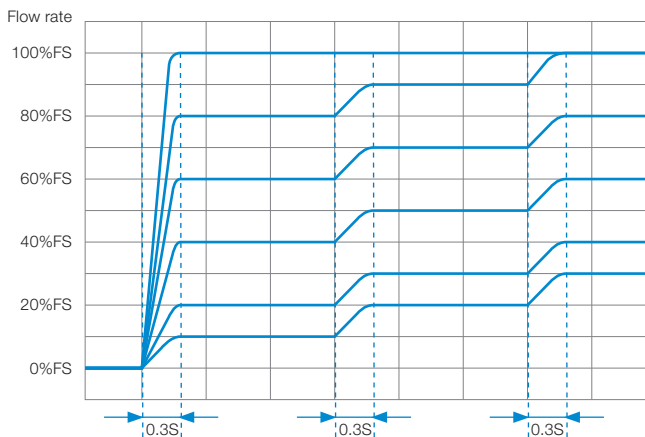## Operating temperature range is –10 to +60 °C

The service temperature range of typical mass flow controllers is limited, so errors due to a change in ambient temperature are significant. The operating temperature range of the F4Q is from –10 to +60 °C, and changes in the surrounding temperature have only a minimal effect on the flow rate. The flow rate remains stable even in an environment with greatly changing temperature, so the cutting quality stabilizes.

Solution 3

Use of communications can reduce PLC analog I/O, and also wiring costs

Using communications for data exchange with PLCs can reduce the cost of expensive analog I/O and the cost of wiring.
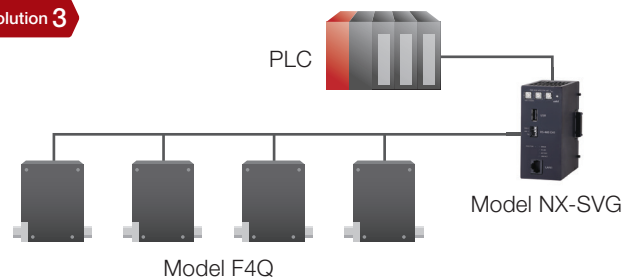
Solution 1

Flow rate

100%FS
80%FS
60%FS
40%FS
20%FS
0%FS

0.3S   0.3S   0.3S

Solution 2

-10 °C   +60 °C

Unheated room in winter, etc.

Clean room and Air conditioned room

Near an industrial furnace, etc.

Solution 3

PLC

Model NX-SVG

Model F4Q

Related products

Network Instrumentation Module
Smart Device Gateway* Model NX-SVG

Program-less communication can markedly reduce development time.

* A communication gateway that allows the interchange of information between various kinds of control device without programming, enabling smarter development work.

Please read "Terms and Conditions" from the following URL before ordering and use.

https://www.azbil.com/products/factory/order.html

Other product names, model numbers and company names may be trademarks of the respective company.

[Notice] Specifications are subject to change without notice. No part of this publication may be reproduced or duplicated without the prior written permission of Azbil Corporation.

Azbil Corporation
Advanced Automation Company

1-12-2 Kawana, Fujisawa
Kanagawa 251-8522 Japan

URL: https://www.azbil.com

1st Edition : Jul. 2021-SO

CP-PC-9070-001E