User's Manual

ADMAG TI Series AXG, AXW Magnetic Flowmeter

Manual Change No. 23-120758-E

Please change the corresponding pages of the user's manuals to the contents below.

1. Applicable Users' Manuals

Document No. (Edition No.) Product Model, Document Name	Page	Chapter	Changed Description
IM 01E21A02-03EN(3) ADMAG TI Series AXG, AXW Magnetic Flowmeter FOUNDATION™ Fieldbus Communication Type	282	A5.4 PID Computation Details	Please change it with the content shown in this Manual Change.
	282	A5.4.1 Proportional Derivative Leading Type PID Control Algorithm(I-PD)	Please change it with the content shown in this Manual Change.

2. Contents of change

Before change	After change
A5.4 PID Computation Details As the PID calculation method, the I-PD method (PI-D method for some modes) is employed.	**A5.4 PID Computation Details** As the PID calculation method, the I-PD method is employed.
A5.4.1 Proportional Derivative Leading Type PID Control Algorithm(I-PD) The proportional derivative leading type PID control algorithm (I-PD) ensures control stability against sudden changes in the setpoint, such as when the user enters a new setpoint value. At the same time, the I-PD algorithm ensures excellent controllability by performing proportional, integral, and derivative control actions in response to changes of characteristics in the controlled process, changes in load, and occurrences of disturbances. If the mode of the PID block is Auto and RCas, calculation is done with this I-PD method. When the mode of the block is Cas, the proportional derivative leading type PID control algorithm is employed in order to obtain better performance against the changes in the setpoint. The control algorithm is automatically switched by the block in accordance with the mode. The basic form of each algorithm is expressed in the equation below. **比例微分先行形PID (I-PD方式)** $\Delta MVn=K\{\Delta PVn+\frac{\Delta T}{Ti}(PVn-SPn)+\frac{Td}{\Delta T}\Delta(\Delta PVn)\}$ **微分先行形PID (PI-D方式)** $\Delta MVn=K\{\Delta(PVn-SPn)+\frac{\Delta T}{Ti}(PVn-SPn)+\frac{Td}{\Delta T}\Delta(\Delta PVn)\}$ Δ MVn : change in control output Δ PVn : change in measured (controlled) value Δ PVn=PVn-PVn-1 Δ T : control period (Block Header.period_of_execution) K : proportional gain(GAIN) Ti : integral time(RESET) Td : derivative time(RATE) The subscripts, n and n-1, represent the time of sampling such that PVn and PVn-1 denote the PV value sampled most recently and the PV value sampled at the preceding control period, respectively.	**A5.4.1 Proportional Derivative Leading Type PID Control Algorithm(I-PD)** The proportional derivative leading type PID control algorithm (I-PD) ensures control stability against sudden changes in the setpoint, such as when the user enters a new setpoint value. At the same time, the I-PD algorithm ensures excellent controllability by performing proportional, integral, and derivative control actions in response to changes of characteristics in the controlled process, changes in load, and occurrences of disturbances. The basic form of the proportional derivative leading type PID control algorithm(I-PD) is expressed in the equation below. $\Delta MVn=K\{\Delta PVn+\frac{\Delta T}{Ti}(PVn-SPn)+\frac{Td}{\Delta T}\Delta(\Delta PVn)\}$ Δ MVn : change in control output Δ PVn : change in measured (controlled) value Δ PVn=PVn-PVn-1 Δ T : control period (Block Header.period_of_execution) K : proportional gain(GAIN) Ti : integral time(RESET) Td : derivative time(RATE) The subscripts, n and n-1, represent the time of sampling such that PVn and PVn-1 denote the PV value sampled most recently and the PV value sampled at the preceding control period, respectively.