

# NE107 Troubleshooting Manual

## Smart Valve Positioner

### ASD-5 & ASD-7 Series



**A-T Controls**

**Ver 1.0**

## 1. Position of Error Symbols on LCD Types

### 1.1. Display with advanced diagnostic option

1 → INPUT CURRENT 12.00mA

2 → TARGET VALUE 50.0 %

3 → PRESENT VALUE 50.0 %

4 → [Bar Graph]

5 → [NAMUR NE107 symbol]

6 → [Heart symbol]

7 → [Limit switch symbols]

8 → [Stability symbols]

1. Input signal (current)
2. Input signal (%)
3. Current valve position (%)
4. Current valve positioner (bar)
5. **NAMUR NE107 diagnostics**
6. Communication status
7. Activation status of software limit switches
8. Stability or instability status of control

This display is available only when the advanced diagnostics option is included.  
NE107 ERROR is displayed in the upper right corner.

### 1.2. Standard display

HART Communication

EQ/Quick/User set mode

Control Status

Sensitivity: Low or High

Set Friction mode

NE 107 Alarm

MAN MON RUN AUTO PARM TEST LOCK

Temp Dev Rev

PV °C

mA

Display Status

PV & Temperature display

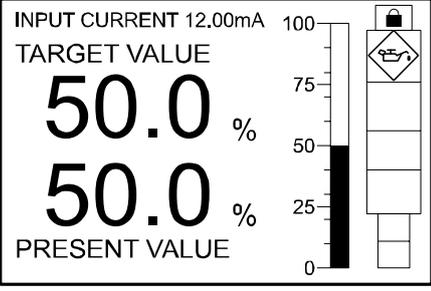
Main menu

SV & Parameter display

NE107 ERROR is displayed in the upper right corner.

## 2. Error Symbols of NAMUR NE107

If a problem is detected during a self-diagnostic process of the ASD positioner, the error symbol will be displayed depending on the importance of the NAMUR NE107.

	Failure (F)	Out of Specification (S)	Maintenance Required (M)	Check Function (C)
				

### 2.1. Failure

	Bit Code	Error
F	NE107-F : 0	Loop current low
F	NE107-F : 1	Compliance voltage high
F	NE107-F : 2	Compliance voltage low

### 2.2. Out of Specification

	Bit Code	Error
S	NE107-S : 0	Loop current high
S	NE107-S : 1	Position sensor high limit
S	NE107-S : 2	Position sensor low limit
S	NE107-S : 3	Temperature sensor high limit
S	NE107-S : 4	Temperature sensor low limit
S	NE107-S : 5	Supply pressure high limit (When the advanced diagnostic option is included)
S	NE107-S : 6	Supply pressure low limit (When the advanced diagnostic option is included)

### 2.3. Maintenance Required

	Hex Code	Error
M	NE107-M : 0	Not calibrated 1
M	NE107-M : 1	Not calibrated 2
M	NE107-M : 2	Center position error
M	NE107-M : 3	Tuning fail
M	NE107-M : 4	Angle of use is too small
M	NE107-M : 5	Deviation error
M	NE107-M : 6	Tune point adjust high
M	NE107-M : 7	Tune point adjust low
M	NE107-M : 8	Supply pressure error (When the advanced diagnostics and fail-freeze options are included)

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## 2.4. Check Function

	Bit Code	Error
C	NE107-C : 0	PST fail
C	NE107-C : 1	Tune point high
C	NE107-C : 2	Tune point low
C	NE107-C : 3	Shape
C	NE107-C : 4	CINC
C	NE107-C : 5	GINC
C	NE107-C : 6	Friction
C	NE107-C : 7	-
C	NE107-C : 8	HART loop fixed mode

## 3. Cause of Error and Action

### 3.1. Cause of Failure and Action

	Bit Code	Error
F	NE107-F : 0	Loop current low
F	NE107-F : 1	Compliance voltage high
F	NE107-F : 2	Compliance voltage low

HEX CODE	Compliance Voltage Low	Compliance Voltage High	Loop current low
01			●
02		●	
04	●		
05	●		●

#### 3.1.1. Loop Current Low (HEX CODE : 01, 05)

- Cause: If the input signal is measured as lowered than 3.7mA, 'Failure' will be activated.
- Action: It's required to check the DCS / PLC.

If the actual current is different from the current detected by the positioner, it can be adjusted in '[Input cal.] - Input Signal Correction'.

#### 3.1.2. Compliance Voltage High (HEX CODE : 02)

- Cause: If the supply voltage is measured as higher than 8.06V, 'Failure' will be activated.
- Action: It's required to check the DCS / PLC.

#### 3.1.3. Compliance Voltage Low (HEX CODE : 04, 05)

- Cause: If the supply voltage is measured as lower than 7.26V, 'Failure' will be activated.
- Action: It's required to check the DCS / PLC.

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## 3.2. Cause and Action of Out of Specification

	Bit Code	Error
S	NE107-S : 0	Loop current high
S	NE107-S : 1	Position sensor high limit
S	NE107-S : 2	Position sensor low limit
S	NE107-S : 3	Temperature sensor high limit
S	NE107-S : 4	Temperature sensor low limit
S	NE107-S : 5	Supply pressure high limit (When the advanced diagnostics option is included)
S	NE107-S : 6	Supply pressure low limit (When the advanced diagnostics option is included)

HEX CODE	Supply pressure low limit	Supply pressure high limit	Temp. sensor low limit	Temp. sensor high limit	Position sensor low limit	Position sensor high limit	Loop current high
01							●
02						●	
04					●		
08				●			
10			●				
20		●					
40	●						
03						●	●
05					●		●
0A				●		●	
0B				●		●	●
0C				●	●		
0D				●	●		●
12			●			●	
13			●			●	●
14			●		●		
15			●		●		●

## 3.2.1. Loop current high(HEX CODE : 01, 03, 05, 0B, 0D, 13, 15)

- Cause: If the input signal is measured as higher than 20.5 mA, 'Out of Specification' will be activated.
- Action: It's required to check the DCS / PLC.

If the actual current is different from the current detected by the positioner are different, it can be adjusted in '[Input cal.] - Input Signal Correction'.

## 3.2.2. Position sensor low limit(HEX CODE : 02, 03, 0A, 0B, 12, 13)

- Cause: If the sensor reaches near the lower limit, 'Out of Specification' will be activated.
- Action: If the sensor reaches near the lower limit of the sensor, the error will be activated and the installation position must be adjusted for safety because the sensor may deviate from the sensor value.

## 3.2.3. Position sensor high limit(HEX CODE : 04, 05, 0C, 0D)

- Cause: If the sensor reaches near the higher limit, 'Out of Specification' will be activated.
- Action: If the sensor reaches near the higher limit of the sensor, the error will be activated and the installation position must be adjusted for safety because the sensor may deviate from the sensor value.

## 3.2.4. Temperature sensor low limit(HEX CODE : 08, 0A, 0B, 0C, 0D)

- Cause: If the temperature sensor measures as lower than -20°C, 'Out of Specification' will be activated.
- Action: This error is displayed in case that more attention is required apart from the operating temperature of the positioner. The operating low temperature of the positioner is -30°C as standard and -40°C with a low temperature option.

## 3.2.5. Temperature sensor high limit(HEX CODE : 10, 12, 13, 14, 15)

- Cause: If the temperature sensor measures as higher than +70°C, 'Out of Specification' will be activated.
- Action: This error is displayed in case that more attention is required apart from the operating temperature of the positioner. The operating high temperature of the positioner is +80°C as standard.

## 3.2.6. Supply pressure low limit(HEX CODE : 20)

- Cause: If the supply pressure is measured as lower than 1.2 bar, 'Out of Specification' will be activated.
- Action: It's required to check a supply air pressure and supply air at higher than 1.2 bar.

(Only when the advanced diagnostics option is included)

## 3.2.7. Supply pressure high limit(HEX CODE : 40)

- Cause: If the supply pressure is measured as higher than 7 bar, 'Out of Specification' will be activated.
- Action: It's required to check a supply air pressure and supply air at higher than 7 bar.

(Only when the advanced diagnostics option is included)

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## 3.3. Cause and Action of Maintenance Required

	Bit Code	Error
M	NE107-M : 0	Not calibrated 1
M	NE107-M : 1	Not calibrated 2
M	NE107-M : 2	Center position error
M	NE107-M : 3	Tuning fail
M	NE107-M : 4	Angle of use is too small
M	NE107-M : 5	Deviation error
M	NE107-M : 6	Tune Point Adjust High
M	NE107-M : 7	Tune Point Adjust Min
M	NE107-M : 8	Supply pressure error (When the advanced diagnostics option is included)

HEX CODE	Supply pressure error	Tune Point Adjust Min	Tune Point Adjust High	Deviation error	Angle of use is too small	Tuning fail	Center position error	Not calibrated 2	Not calibrated 1
01									●
02								●	
04							●		
08						●			
10					●				
20				●					
40			●						
80		●							
100	●								
14					●		●		
60			●	●					
68			●	●	●				
6B			●	●	●		●		
A0		●		●					
B0		●		●	●				
B4		●		●	●		●		

### 3.3.1. Not calibrated 1(HEX CODE : 01)

- Cause: If auto-calibration is not carried out after re-set, 'Maintenance Required' will be activated.
- Action: It's required to perform auto-calibration.

### 3.3.2. Not calibrated 2(HEX CODE : 02)

- Cause: If auto-calibration is not carried out, 'Maintenance Required' will be activated.
- Action: It's required to perform auto-calibration.

### 3.3.3. Center position error(HEX CODE : 04, 14, 6B, B4)

- Cause: If the intermediate operating angle exceeds 45 - 55%, 'Maintenance Required' will be activated.
- Action: Linearity is good when the intermediate angle is 50% in case of a linear type valve. It's required to get the intermediate operating angle stayed at 45 - 55% by checking an installation status.

### 3.3.4. Tuning fail(HEX CODE : 08)

- Cause: If the positioner is installed wrongly, 'Maintenance Required' will be activated.
- Action: It's required to check an installation status and an operating angle of the sensor. This error can be displayed when air is not supplied.

### 3.3.5. Angle of use is too small(HEX CODE : 10, 14, 68, 6B, B0, B4)

- Cause: If the operating angle is lower than 10%, 'Maintenance Required' will be activated.
- Action: The small operating angle may cause a poor accuracy. It's required to check an installation status and increase an operating angle.

### 3.3.6. Deviation error(HEX CODE : 20, 60, 68, 6B, A0, B0, B4)

- Cause: If a deviation of 5.0% of the current position relative to the input signal happens for 1 minute, 'Maintenance Required' will be activated.
- Action: It's required to perform auto-calibration and re-set the value. It may be required to replace the coil drive or the pilot valve if this deviation continuously happens.

### 3.3.7. Tune point adjust high(HEX CODE : 40, 60, 68, 6B)

- Cause: If the compensation of tune point reaches the upper limit, 'Maintenance Required' will be activated.
- Action: It may be required to replace the coil drive or the pilot valve if a normal control is not achieved even though the compensation reaches its maximum. Also, this error can be displayed when air is not supplied.

### 3.3.8. Tune point adjust min(HEX CODE : 80, A0, B0, B4)

- Cause: If the compensation of tune point reaches the lower limit, 'Maintenance Required' will be activated.
- Action: It may be required to replace the coil drive or the pilot valve if a normal control is not achieved even though the compensation reaches its maximum. This error can be displayed when air is not supplied.

### 3.3.9. Supply pressure error (HEX CODE : 100)

(When the advanced diagnostics and fail-freeze options are included)

- Cause: If the set pressure decreases lower than 60% after auto-calibration, 'Maintenance Required' will be activated.
- Action: The fail-freeze function will work and the positioner will help the valve stay at the last position. If a supply air pressure is returned to higher than 60%, the fail-freeze function will not work and the error will be de-activated.

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## 3.4. Cause of Check Function and Action

	Bit Code	Error
C	NE107-C : 0	PST fail
C	NE107-C : 1	Tune point high
C	NE107-C : 2	Tune point low
C	NE107-C : 3	Use shape mode
C	NE107-C : 4	1st damping low
C	NE107-C : 5	2nd damping low
C	NE107-C : 6	Use friction mode
C	NE107-C : 7	-
C	NE107-C : 8	HART loop fixed mode

HEX CODE	HART Loop Fixed mode		Use friction mode	2ed damping low	1st damping low	Use shape mode	Tune point low	Tune point high	PST fail
01									●
02								●	
04							●		
08						●			
10					●				
20				●					
40			●						
80									
100	●								
0A						●		●	
0C						●	●		
12					●			●	
14					●		●		
1A					●	●		●	
1C					●	●	●		
50			●		●				
58			●		●	●			
5A			●		●	●		●	
5C			●		●	●	●		

## 3.4.1. PST fail(HEX CODE : 01)

- Cause: If the result of PST Test is BAD, 'Check' will be activated.
- Action: It's required the status of the valve. Also, it's required to set properly because the result of PST Test can be BAD when the PST is set wrongly.

## 3.4.2. Tune point too high(HEX CODE : 02, 0A, 12, 1A, 5A)

- Cause: If the tune point becomes higher than 7% during auto-calibration, 'Check' will be activated.
- Action: This may affect a normal control of the positioner. So it's required to replace the coil drive or the pilot valve.

## 3.4.3. Tune point too low(HEX CODE : 04, 0C, 12, 1C, 5C)

- Cause: If the tune point becomes lower than 25% during auto-calibration, 'Check' will be activated.
- Action: This may affect a normal control of the positioner. So it's required to replace the coil drive or the pilot valve.

## 3.4.4. Use shape mode(HEX CODE : 08, 0A, 0C, 1A, 1C, 58, 5A, 5C)

- Cause: If Shade mode is activated among Lin/Shape/user, 'Check' will be activated.

## 3.4.5. 1st damping low(HEX CODE : 10, 12,14, 1A, 1C, 50, 58, 5A, 5C)

- Cause: If 1st damping is lower than 220, 'Check' will be activated.

## 3.4.6. 2nd damping low(HEX CODE : 20)

- Cause: If 2nd damping is lower than 150, 'Check' will be activated.

## 3.4.7. Use friction mode(HEX CODE : 40, 50, 58, 5A, 5C)

- Cause: If Friction mode in Control mode is activated, 'Check' will be activated.

## 3.4.8. Loop fixed mood(HEX CODE : 100)

- Cause: If Fixed mode of HART Communication is activated, 'Check' will be activated.