Instruction Manual

Manufacturing Certificate
CMC Shanghai No.02220105

TYPE LWF-11A
LWF-11A/P
LWF-11B
LWF-11B/P

Explosion-Proof Amplifier

SHANGHAI NO.9 AUTOMATION INSTRUMENTATION CO., LTD.

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CONTENTS

1. General Description

This manual is for the installation, application and maintenance of Type LWF-11 Series Explosion-proof Amplifiers designed and made by SAIC No.9 .

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Type LWF-11A, LWF-11A/P, LWF-11B, LWF-11B/P Explosion-proof Amplifiers (hereinafter referred to as Amplifier) are to be used in combination with Type LWGY Turbine Body to form Turbine Flow Sensor that is suitable for the application in explosive environment.

The amplifier converts the flow passing through the Turbine body into electrical pulse signal which is transferred to remote flow calculating meters or computers for flow rate or total flow displaying and data processing; LWF-11A/P (B/P) possesses functions, not only as same as LWF-11A (B), but also generates output signal that is compatible to PLC;

Standard for this Amplifier: **Q/TDSM 17**

2. Technical Specifications

(1) Frequency Range: 20～5000Hz
(2) Output signal
  a. Wave Form: Square
  b. Amplitude (Load resistance 3kΩ): Low electric level≤ 1V;
    High level: (Power Supply Voltage minus 2) V
(3) Working condition:
  a. Ambient Temperature: -25～+55℃
  b. Relative Humidity: 35-85%
  c. Power Supply: LWF-11A (B): +12V or 24V DC±5%
    LWF-11A/P (B/P): +24V DC±5%
  d. Current Consumption: ≯ 30mA
(4) Working Temperature:
  a. LWF-11A (LWF-11A/P): -25～+80℃
  b. LWF-11B (LWF-11B/P): -20～+120℃
(5) Dimensions: see Fig.1
(6) Weight:
  a. LWF-11A (LWF-11A/P): approximately 1.2 kg
  b. LWF-11B (LWF-11B/P): approximately 1.8 kg
(7) Explosion-Proof:
  In accordance with GB3836.1-2010 « Explosive atmospheres – Part 1: Equipment – General requirement» and GB3836.2-2010 « Explosive atmospheres – Part 2: Equipment protetion by flameproof enclosures "d"»
  Explosion-Proof Mark: Exd Ⅱ BT4

3. Structure and Working Principle

1) Structure

Amplifier structure is as shown on Fig.1.

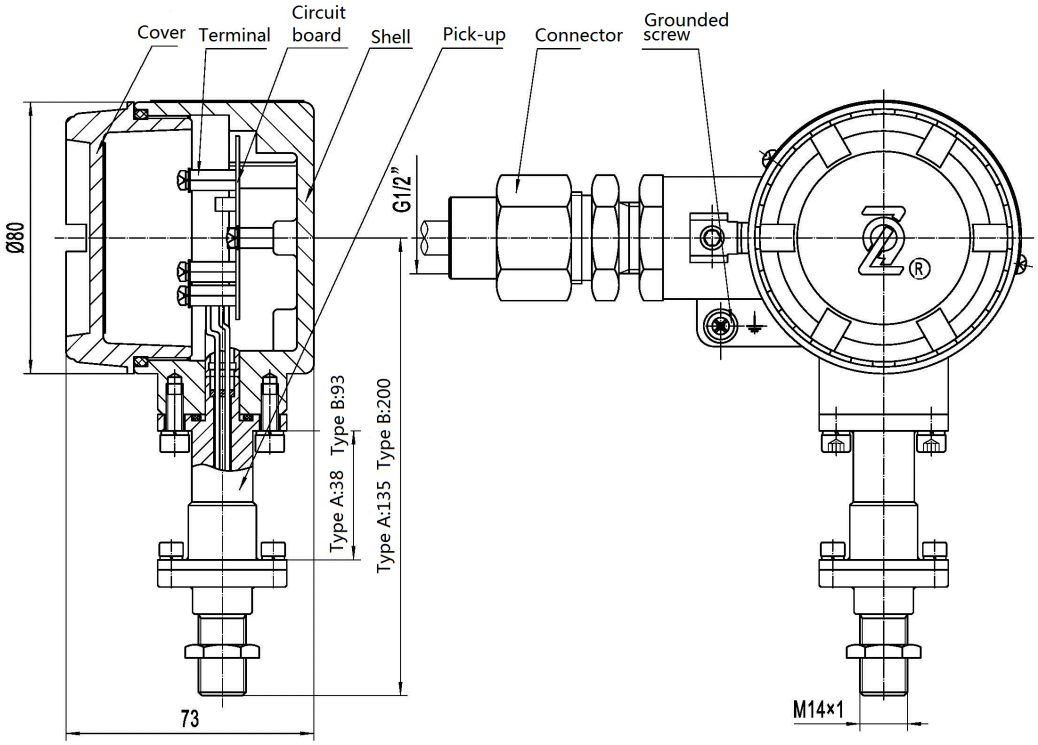


Fig.1 LWF-11A (B)/ P Structure

2) Working Principle

The Amplifier, consisting of transistor circuits, compares and amplifies weak output signal (approximately SINE wave) from the Sensor, then sends it to trimming circuit for an output which is proportional to the flow; disturbance-proof and high loading capability are its performance advantages.

4. Dimensions, Installation and Wiring

1) Dimensions (see Fig.1 and Table 1)
2) Installation
Refer to Fig.1, mounting it on the Turbine Body by Thread connecting of M14×1;
To position the Amplifier appropriately by loosing and fastening the Adjusting Nut at pipe connector;
3) Wiring
Refer to Fig.1, loosing the Lock; opening the Cover; penetrating the signal wire into the connector Wash-Seal-Ring; connecting the signal wire on terminals as per the wiring diagram attached to the cover; also connecting the cable shield to the GND terminal;Connecting the Housing "Grounded Screw" to the Ground (⊥) finally.
Terminal Diagram is as shown on Fig.2.

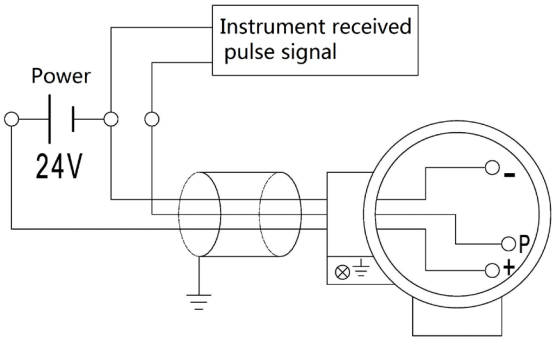


Fig 2 Type LWF-11A (B)/P Terminal Diagram

5. Key Points to the Installation of Explosion-Proof Product

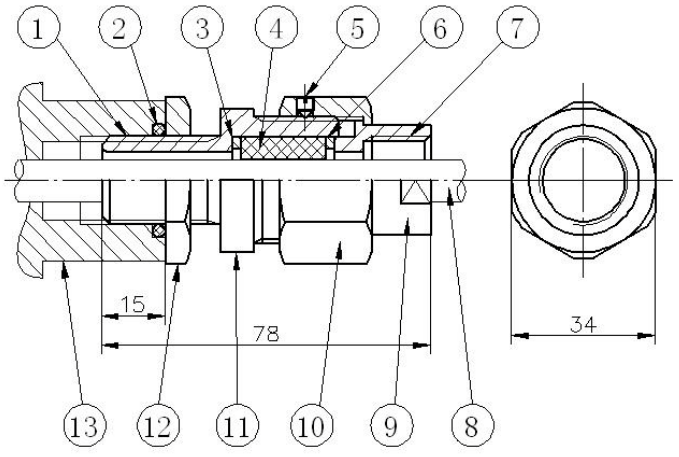
Products marked with "ExdIIBT4" can be used in the environment stipulated in the following standards:

GB3836.1-2010 《Explosive atmospheres – Part 1: Equipment – General requirement》 and GB3836.2-2010 « Explosive atmospheres – Part 2: Equipment protetion by flameproof enclosures "d"»

for Explosion Class not higher than Explosion Class Ⅱ, Grade B, Natural Temperature T1-T6 Group, Zone I or Zone II hazardous areas;

To secure SAFETY, user must be very careful in installation with bolts, cables and pipes and should pay high attention to safety regulations during maintenance;

1) Installation of Explosion-Proof Seal Connector: (see Fig.3)



1. G½ External Thread
2. O Ring
3. Washer
4. Seal Sleeve
5. M4 Set Screw
6. Washer
7. G½ Inner Thread
8. Cable
9. Pipe Connector
10. Nut
11. Connector
12. Lock Nut
13. Converter Housing

Fig. 3 Explosion-Proof Seal Connector

(1)Ground terminal is available; well- “grounded” is necessary in use
(2)During operation or maintenance on site, strictly observe the WARNING “Open the cover only when power is off”
(3)The out-diameter of leading cable is approximately φ9-10(mm); 3-core-shielded-cable is recommended;
(4) Maintenance must be carried out in the safe area, where no combustible gas exists.

2) Ambient Conditions for Installation:
(1) Ambient atmosphere pressure 80kPa ～110kPa; temperature -20℃～+60℃, maximum relative air humidity 90%
(2) If there are combustible gases or vapors of flammable liquids working around, their explosion class must not be higher than Class II /Grade B; Natural Temperature within T4 Group; and Installation of the product is within Zone I or Zone II hazardous area.
(3) Listed below is a Table that stipulates the temperature limitations; within the Temperature Grade, the maximum out-exposed-surface temperature between explosion-proof product and equipment as well as the medium temperature are not allowed to exceed the limitations;

Temperature Group Grade	T1	T2	T3	T4	T5	T6
Maximum Medium Temperature (°C)	450	300	200	135	100	85

3) Usage:
(1) If housing corrosion happens, replace it promptly;
(2) Both internal and external ground terminals must be “grounded” properly; During maintenance, taking off the Terminal Box cover must be under power -off condition;
(3) The seal ring within the cable-leading connector and the O ring within the cover must be replaced in time, as soon as they are ageing;
(4) The connecting between wires and wiring-strips must be in firm and reliable way, meanwhile using insulation sleeve is also necessary, which shall be bent into right angle, to ensue the electrical gap bigger than 4mm
(5) Leading cable should be suitable to the corrosive and high temperature enduring conditions on site;
(6) During Terminal Box mounting, please to be sure, do not damage the thread and explosion-proof linkage surface;
(7)On-site installation, application and maintenance of the product shall also abide by stipulations related to« GB50058-92 Design Requisition for the Electrical Equipment on Explosion & Fire Hazardous Site » and «GB3836 .15-2000».

6. Operations and Cares

To avoid strong vibration and impact during operation; keep it clean without dust entering when cover is opened for wiring; wiring correctly per Diagram.

Note: Correct Power Supply polarity

For long distance signal transmission, if signal voltage drop via signal wire is too high, replacing it by a bigger cable is necessary.

7. Transportation & Storage

1) The Amplifier packing condition should be kept, like original ex-works packing, for transportation and moving (prior to job-site or return it for repair) in order to prevent it from being damaged.

2) The Amplifier should be stored indoor with temperature ranging from 5 to 40ºC, relative humidity not exceeding 85%, in good ventilation and non-corrosive atmosphere;

8. Notice to Order

1) Output Signal Wire is user's responsibility; this company optionally supplies Type RVVP Metal-shielded, PVC insulating Cable that is compatible to Seal Ring with 3 specifications of 3×23/0.15; 3×28/0.15; 3×32/0.15; if purchase needed, please specify cable specifications and length in Order;

2) Please specify Amplifier type in Order; (A for Normal Temperature; B for High Temperature; P special for PLC)

9. Accessories

1) Instruction Manual one copy
2) Quality Certificate one original
3) Seal Ring 2 pieces
4) Wash 2 pieces
5) Wiring Strip 5 pieces
6) Connector 1 piece
7) Inner-Hex Wrench 1 piece

Introduction of Products for Combination with Amplifier

1) Function Briefing

Type & Name	Main Function
XSJ-39A (I) Digital Flow Totalizer	Display on the same screen: Flow, total flow, with up/low limit alarm; power failure data protection of 5 Years; XSJ-39A (I) with additional 4-20mA output;

2) Wiring example:

LWF-11A (B)/P with XSF-39A (I) wiring