



## Instruction Manual

# EJECTOR FOR DIRECT INSERTION TYPE ZIRCONIA OXYGEN ANALYZER

INZ-TN1ZTA-B-E

**Fuji Electric Co., Ltd.**

**International Sales Div  
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## Foreword

Thank you for purchasing Fuji Ejector for Direct Insertion Type Zirconia Oxygen Analyzer (Type ZTA).

- Before attempting to use the ejector, read this instruction manual carefully to understand installation, operation and maintenance procedures for the ejector. Improper handling may result in an accident or a failure.
- The specifications of the ejector are subject to change without prior notice for improvement.
- It is strictly forbidden to remodel the ejector without our permission. We will not be responsible at all for any accidents caused by such remodeling.
- The instruction manual must be kept by a person in charge of the ejector.
- After reading the manual, it must be kept at a place ready to be accessed by operators.
- Arrange so that the instruction manual will be handed over to the final user.

Manufacturer : Fuji Electric Co., Ltd.  
Type : Described in nameplate on main frame  
Date of manufacture : Described in nameplate on main frame  
Country of manufacture : Japan

<Related document>

- Instruction manual for direct insertion zirconia oxygen analyzer

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- It is forbidden to transfer a part or all of contents of the manual without permission.
- Contents of the manual are subject to change without prior notice.

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## Precautions in safety

**Use the instrument correctly upon carefully reading the "Precautions in safety".**

- The precautions given here concern important points regarding the safety. Be sure to observe them.  
The safety precautions are shown according to their ranks "DANGER", "CAUTION" and "INHIBITION".

|                                                                                                       |                                                                                                         |
|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
|  <b>DANGER</b>     | If handled wrongly, a dangerous situation may occur, and death or serious injury may be caused.         |
|  <b>CAUTION</b>    | If handled wrongly, a dangerous situation may occur, and medium trouble or slight injury may be caused. |
|  <b>INHIBITION</b> | Indicates an inhibition (thing that must not be done).                                                  |

| Precautions in mounting and wiring                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <b>DANGER</b>      | <ul style="list-style-type: none"> <li>The instrument is not an explosion proof type. Do not use it in explosive gases. Otherwise, explosion, fire or other serious accidents may occur.</li> <li>Mount or maintain the ejector carefully at an elevated place upon providing a stable scaffold. Otherwise, an accidental fall may occur.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|  <b>CAUTION</b>     | <ul style="list-style-type: none"> <li>Entrust mounting, wiring and piping to specialist or agent you purchased the instrument from. Poor mounting may cause drop of the instrument, electric shock or injury.</li> <li>Install the instrument where the conditions mentioned in the "Instruction manual" are met. A use where the installation conditions are not cleared may cause electric shock, fire or erratic operation.</li> <li>Before wiring, maintenance or others, be sure to turn off the ejector. Otherwise, there may be a fear of electric shock or injury.</li> <li>Use appropriate wiring materials conforming to the instrument's rated values. Use of non-conforming wiring materials may cause a fire.</li> <li>When mounting the instrument, do not leave any waste wires nor other foreign matters in the instrument. Otherwise, fire, fault or erratic operation may occur.</li> <li>Be sure to carry out class D ground work. Otherwise, electric shock or erratic operation may be caused.</li> <li>Connect a power source matching the rated values. Otherwise, a fire may be caused.</li> <li>Do not introduce metallic bar, finger or others in the power terminal section. Otherwise, electric shock or injury may occur.</li> <li>Before the work, remove watch and other metallic objects. Otherwise, there is a fear of electric shock.</li> <li>For piping, use pipes and couplings specified in the instruction manual. Otherwise, a gas leakage may occur.</li> <li>Opening the flange may cause hot gas to blow out when the stack or flue is under a positive pressure. Getting near it may cause a burn.</li> <li>Use spare parts specified by us. Otherwise, the instrument could not exhibit its performance fully and, furthermore, accidents or faults may be caused.</li> <li>If any trouble cannot be located upon referring to the instruction manual, be sure to ask the sales agent or our serviceman to correct it. Disassembling the instrument carelessly may cause an injury.</li> <li>Dispose of eliminated faulty parts and the like as incombustible objects.</li> </ul> |
|  <b>INHIBITION</b> | <ul style="list-style-type: none"> <li>It is forbidden to carry out a work at a place exposed to direct rainfall or dripping. Otherwise, electric shock, failure or dropping may be caused.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## 1. General

The instruction manual concerns an ejector used for a direct insertion oxygen analyzer that serves for oxygen measurement in a heating furnace or others where the internal temperature will be over 600°C (ejector type). For detector and converter, refer to relevant instruction manuals.

## 2. Specifications and type code

### 2.1 Specifications

- Measuring gas temperature
  - : -20 to +800°C (for general purpose)
  - : -20 to +1590°C (for high temperature)
  - If alkali metal is contained in measuring gas, the heat resisting temperature may drop
- Measuring gas pressure
  - : -3 to +3 kPa
- Dust in measuring gas
  - : 1 g/Nm<sup>3</sup> or less
- Ambient temperature
  - : -20 to +60°C (cable section)
  - : -20 to +100°C (ejector section)
- Structure
  - : Drip proof design (ZFK, rainproof cover mounted)
- Main materials of sections in contact with gas
  - : SUS304, SUS316 (for general purpose)
  - : SiC, SUS304, SUS316 (for high temperature)
- Mass
  - : Approx. 15 kg (insertion length 1 m)
- Finish color
  - : SUS natural color and silver
- Ejector air flow rate
  - : 5 to 10 L/min
- Blow-down air pressure
  - : 200 to 300 kPa
- Ejector exhausting
  - : Return to furnace interior and flue
- Flange
  - : JIS 10K, 65A RF
- Insertion length
  - : 0.5, 0.75, 1 or 1.5 (as specified)
- Heater power source
  - : 100/115 V AC or 200/220 V AC, 50/60 Hz
- Heater temperature drop alarm
  - : Alarm output below 100°C, mechanical thermostat with one NO contact, 200 V AC, 2 A

### 2.2 Type code

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Z | T | A |   | 1 |   |   | 1 |
|   |   |   |   | 1 |   |   |   |
|   |   |   |   | 2 |   |   |   |
|   |   |   |   |   |   |   |   |
|   |   |   |   | B |   |   |   |
|   |   |   |   | C |   |   |   |
|   |   |   |   | D |   |   |   |
|   |   |   |   | E |   |   |   |
|   |   |   |   |   |   |   |   |
|   |   |   |   | 1 |   |   |   |
|   |   |   |   | 3 |   |   |   |

| Description                         |
|-------------------------------------|
| Measuring gas temperature           |
| For high temperature (+1590°C max.) |
| For general purpose (+800°C max.)   |
| Insertion length [mm]               |
| 500                                 |
| 750                                 |
| 1000                                |
| 1500                                |
| Power source                        |
| AC100/115V 50/60Hz                  |
| AC200/220V 50/60Hz                  |

## 3. Configuration and dimension diagrams

### 3.1 Configuration

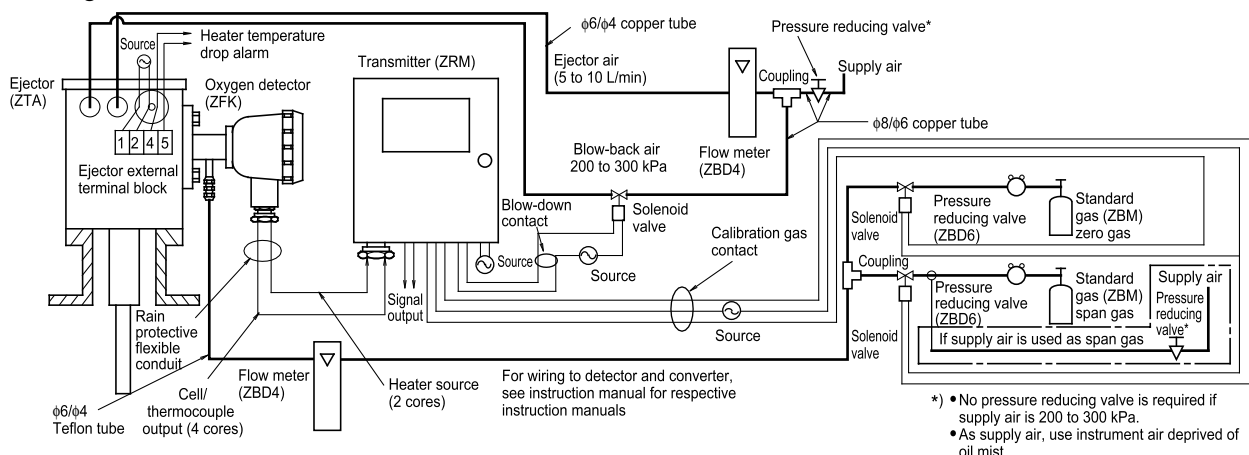


Fig. 3-1 Configuration

### 3.2 Dimensions

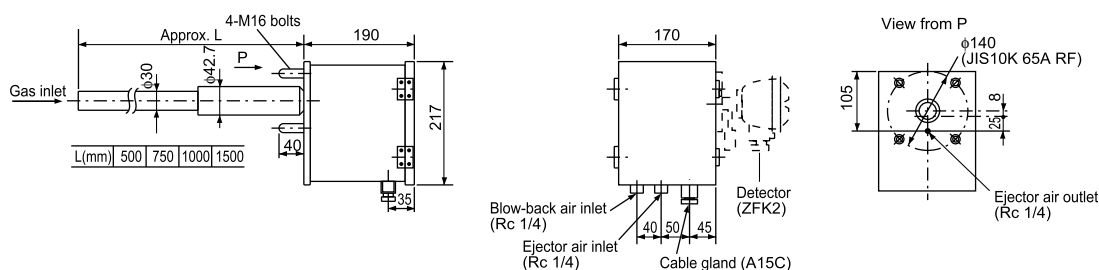


Fig. 3-2 Dimensions (in mm)

## 4. Mounting



**DANGER**

- The instrument is not of explosion-proof specifications. Do not use it in an atmosphere of explosive gas. Otherwise serious accidents such as explosion or fire may result.
- When mounting the ejector at an elevated place or perform maintenance, be sure to secure a stable footing and carry out the work, assuring safety. Carelessness may result in accidents such as falling.

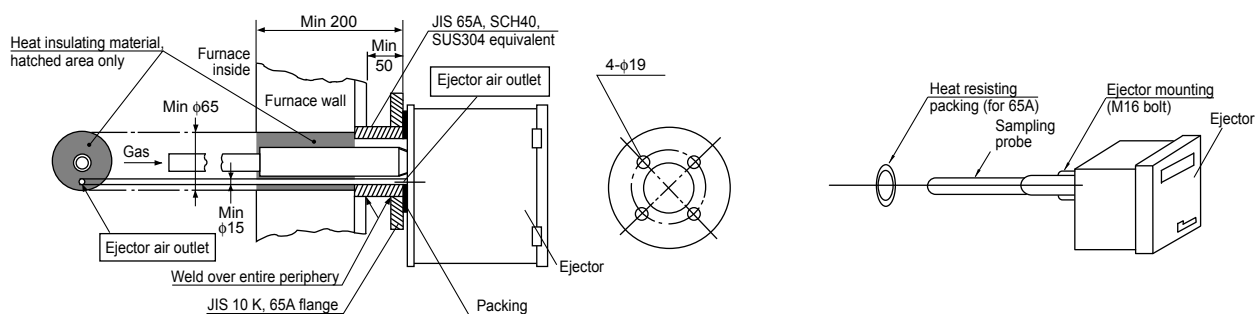


Fig. 4-1 Ejector mounting (unit: mm)

Note) Mount the detector only after warm-up in atmosphere (see "6.1 Start").

- (1) The sampling probe comes in general purpose version (temperature: 800°C or lower, material: SUS316) and high temperature version (temperature: 1590°C or lower, material: SiC). Pay utmost attention to mechanical and thermal impacts to a probe for high temperature because it is easy to break (see Fig. 4-2).
- (2) The sampling probe and ejector will be shipped separately from each other. When mounting, wind airtight tape on the probe, and screw it into the ejector body.
- (3) Install the furnished heat resisting packing into the probe, and fasten it with M16 nut (on bolt welded on body).

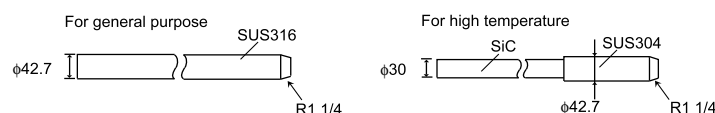


Fig. 4-2 Shape of sampling probe (unit: mm)

- (4) Do not completely close the route between the ejector air outlet (see Fig. 4-1) and furnace inside with thermal insulating material or others. Provide at least  $\phi 15$  of hole straight from the ejector air outlet. A pipe of about 15 mm of inner diameter together with heat insulating material may be wound on the probe by means of stainless steel wire.

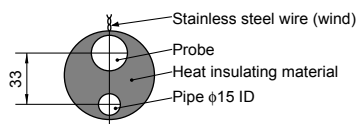


Fig. 4-3 Outlet pipe winding (unit: mm)

## 5. Wiring and piping

- (1) Use  $\phi 8/\phi 6$  copper pipe for piping of the blow-back air inlet, and  $\phi 6/\phi 4$  copper pipe for piping of the ejector air inlet.
- (2) For power wiring and heater temperature drop alarm output wiring, use 600V silicon rubber insulated wires (KGB) or equivalent (heat resisting wires).
- (3) Limit the output wiring within 100 m. Do not put the signal output wires and power source wires in the same conduit.

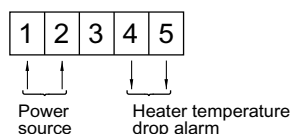


Fig. 5-1 Ejector external terminal block

## 6. Start and stop

### 6.1 Start

- (1) Double check if the wiring and piping to each device are as specified.
- (2) Supply each device with power (upon removing the detector from ejector).
  - About 1 hour after supplying the ejector with power, supply the ejector with air.
- (3) Operate the detector for a short time (about 20 min) in atmosphere, and then mount it on the ejector.  
For details, respect the instruction manual for the detector.

### 6.2 Stop

- (1) If furnace (boiler) or the like is left unused for short time
  - Stop the ejector air (instrument air). Leave the oxygen analyzer ON.
- (2) Before long time stoppage for furnace repair (boiler periodic inspection)
  - Turn off the oxygen analyzer after the furnace inside is vented to atmosphere.

## 7. Checkup and maintenance

### 7.1 Regular checkup

Visually make sure the ejector air flow rate and blow-down air pressure are as set initially.

### 7.2 Periodic checkup (every year)

- (1) Sampling probe
  - Pull out the ejector from the furnace wall, and check if it is cracked, clogged or corroded. If faulty, clean or replace it.
- (2) Ejector air outlet
  - Clean the ejector air outlet so that ejector air will flow smoothly.

## 8. Attached diagrams

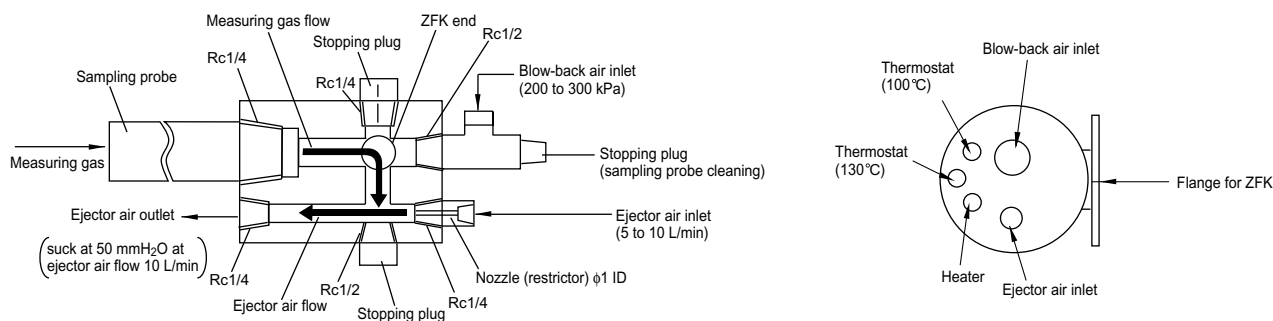


Fig. 8-1 Cross sectional view of ZTA block