FUJI ELECTRIC

IN-SITU ZIRCONIA OXYGEN ANALYZER < ZIRCOMAT-C >

DATA SHEET

ZFK, ZRY

This oxygen analyzer is used to continuously measure oxygen concentration in combustion exhaust gas of industrial boilers or furnaces, and is ideally suited for combustion monitoring and control.

The detector (ZFK) used with the analyzer is directly inserted into the objects measured, eliminating the need for a sampling device and provides quick response.

The converter (ZRY) features 3 measuring ranges, one touch calibration and NEMA4 housing.

Comparing to the current converter (ZRM) , this ZRY is recognized as economical type with simple functions.

General-use detector

Converter

FEATURES

1. Sampling device is unnecessary
   Gas sampling devices such as a gas aspirator, a dehumidifier, etc. are unnecessary because of use of direct-insertion type detector.
2. High speed response
   The adoption of a flow guide tube utilizing the flow of the measured gas assures quick response (less than 7sec).
3. Dust-tight and water-proof housing
   Aluminum die casting housing of converter satisfies NEMA4 and IP65 standard.
4. 3-measuring ranges and one touch calibration
   The converter has 0-5, 10, 25 vol% 3 ranges easily changed by pin connection and zero and span are simply calibrated by key operation.

SPECIFICATIONS

General

Measuring object: Oxygen contained in noncombustible gas

Measuring principle: Direct-insertion zirconia system

Measuring range: 0 to 5, 10 or 25 vol% O_2 (Changed by internal set pin)

Repeatability: Within ±1.0% of full scale

Linearity: ±2% of full scale

Response time: Within 7sec for 90% response (from calibration gas inlet)

Power supply: 100, 115, 220 or 230V AC, 50/60Hz

Power consumption: (approx.) 15 + 50VA (at steady state)
15 + 200VA (at start)

Warmup time: Approx. 15min

Oxygen detector (ZFK2, 5)

Measuring detector:
For general-use: ZFK2
For corrosive gas: ZFK5

Measured gas temperature:
Flow guide tube system; –20 to +600°C

Measured gas pressure:
–3 to +3kPa

Flow guide tube: Flange; JIS5K 65A FF
(JIS5K-80AFF for high particulate gas)
Insertion length; 0.3, 0.5, 0.75, 1m
(0.8m for high particulate gas)

Ambient temperature:
–20 to +60°C for cable section
125°C or less at detector flange surface with power applied

Structure: Dust/rain-proof structure(IEC IP55 equivalent)

Filter: Alumina(filtering accuracy 50μm) and quartz paper

Main materials of gas-contacting parts:
General-use detector(ZFK 2); Zirconia, SUS316, platinum, SUS304
Anticorrosive detector(ZFK 5); Zirconia, tita-nium, platinum, SUS316
Flow guide tube; SUS304 or SUS316

Calibration gas inlet:
Brass joint for ϕ1/4 inch tube.
Reference air inlet (option):
Rc1/8 or NPT1/8
Detector mounting:
Horizontal plane ±45°, ambient surrounding air should be clean.
Outer dimensions: (L x max. dia.) 210mm x 100mm (detector)
Mass (approx.) {weight}:
Detector; 1.6kg
Flow guide tube (general-use, 1m); 5kg
Finish color: Silver and SUS metallic color

Oxygen converter (ZRY)

Measuring range: 0-5, 10, 25 vol% O_2
Changeable by internal set pin.
Repeatability: ±1.0% of full scale
Lineality: ±2.0% of full scale
Indication: Oxygen concentration; 3-digit LED
Oxygen concentration output signal:
4 to 20mA DC (allowable load resistance: 500Ω or less)
Isolated output, linear
Fault contact output:
250V AC, 2A rating (close contact or open contact for fault should be specified when you place an order.)
Self-diagnoses:
Fault of sensor temperature, zero calibration error, span calibration error
Calibration method:
Manual calibration with key operation
Calibration gas: • Recommended calibration gas concentration
Zero gas; 1.0 to 2.0% O_2
Span gas; 20.6 to 21.0% O_2
(oxygen concentration in the air)
Ambient temperature:
–10 to +50°C
Ambient humidity: 90% RH or less
Power supply: 90 to 220 or 230 V AC, 50/60Hz
Construction: Dust-tight, waterproof construction, NEMA4 (corresponding to IP65 of IEC)
Material: Aluminum die casting
Outer dimensions (H x W x D):
220 X 230 X 95mm
Mass {weight}: Approx. 4.5kg (excluding cable and detector)
Finish color: Munsell 6PB 3.5/10.5 (blue): cover, silver; case
Mounting method: Mounted flush on panel

The product conforms to the requirements of the Electromagnetic compatibility Directive 89/336/EEC as detailed within the technical construction file number TZ737041. The applicable standards used to demonstrate compliance are :

EN 55011 : 1992 CLASSA Conducted and Radiated emissions

EN 50082-1 : 1992 Radiated immunity, ESD and FBT

Exclusine cable (ZRZP)

Cable: 4-cores sealed wire (O_2 signal and R-themo couple signal) and 2-cores cable (power)
Cable conduit: Flexible type
Length: Refer to code symbols

SCOPE OF DELIVERY

Detector: Detector main unit x 1, Viton O ring x 1, mounting screw (M5mm x 12) x 6, thermal sticker x 1, flow guide tube (as specified) x 1, ceramic filter x 1, cover (as specified) x 1, reference air inlet (as specified) x 1
Converter: Converter main unit x 1
Accessories (AC250V 500mA T fuse x 1, AC250V 3.15A T fuse x 1)

Items to be prepared separately:
(1) Standard gas for calibration
Type ZBM□NSK4-01
(2) Reduction valve for standard gas (type ZBD61003)
(3) Flowmeter
Type; ZBD52203, 0.2 to 2L/min (for calibrating gas)

CAUTIONS

- If combustible gas (CO, H_2 etc.) exists in the measured gas, error will occur due to burning at the sensor section. The inclusion of corrosive gas (Si vapor, alkaline metal, P, Pb etc.) will shorten the life of the sensor.
- When the measured gas temperature is high (+300°C or higher), the flange should be separated from the furnace wall in order to bring the detector flange surface temperature below the specified value +125°C). The flow guide should be attached in the direction in which the gas flow to the detector decreases.
- When dust more than 1g/Nm^3 is included in the gas, manual blow down is necessary.

DEVICE CONFIGURATION

The device to be combined differ according to the conditions of the gas to be measured. Please select the devices to be combined with reference to the following table.

Measured gas						Device configuration		
Application	Temperature	Gas Flow	DUST	Protection cover	Note	Detector type	Converter type	Ejector type
General-use (boiler) Anti-corrosive use (incinerator)	600°C or less	5 to 20m/s	Less than 0.2g/m³[nor]	—	Fuel; gas, oil	ZFK□R□□4-5□□□□	ZRY	—
			Less than 10g/m³[nor]	no	Fuel: coal with manual blow down	ZFK□R□□4-6D8□□	ZRY	—
			Less than 25g/m³[nor]	yes	Included high moisture with manual blow down	ZFK□R□□4-6E8□□	ZRY	—

Note (1) Dust volume is approximate value.

(2) Instrument quality air or bottled air is available as reference air by selecting detector with reference air inlet, when oxygen concentration in air around sensor changes.

CODE SYMBOLS

(Detector)

ZFK R 2 4 | 9 10 11 12 13

Description
Application 2 General use. 5 For corrosive gas (refuse incinerator)
Cal. gas inlet 2 For ϕ1/4 inch tube
Power supply 1 100/115VAC 50/60Hz 3 200/220VAC 50/60Hz 5 230VAC 50/60Hz (CE-marking approved)
Flow guide tube flange / application / length 0 Y 0 None 5 A 3 SUS304 general use 300mm 5 A 5 SUS304 general use 500mm 5 A 7 SUS304 general use 750mm 5 A 1 SUS304 general use 1000mm 5 B 3 SUS316 for corrosive gas 300mm 5 B 5 SUS316 for corrosive gas 500mm 5 B 7 SUS316 for corrosive gas 750mm 5 B 1 SUS316 for corrosive gas 1000mm 6 D 8 SUS316 for high particulate 800mm 6 E 8 SUS316 for high particulate with cover 800mm
Protection cover Y Without A With
Reference air inlet Y Non A Rc1/8 B NPT1/8

(Replacement Detector element)

ZFK R 2 4 | 9 10 11 12 13

Description
Application 2 General use. 5 For corrosive gas (refuse in cinerator)
Cal. gas inlet 2 For ϕ1/4 inch tube
Power supply 1 100/115VAC 50/60Hz 3 200/220VAC 50/60Hz 5 230VAC 50/60Hz

(Converter)

Z R Y 1 | Y 1 1 - 1 R | 0

Description
Output signal and fault output B 4 to 20mA DC, close contact C 4 to 20mA DC, open contact
Power supply 1 90 to 230V AC 50/60Hz (CE marking approved)
Mounting method 1 Panel mounting
Instruction manual Y NO E YES (English)

(Exclusive-special cable)

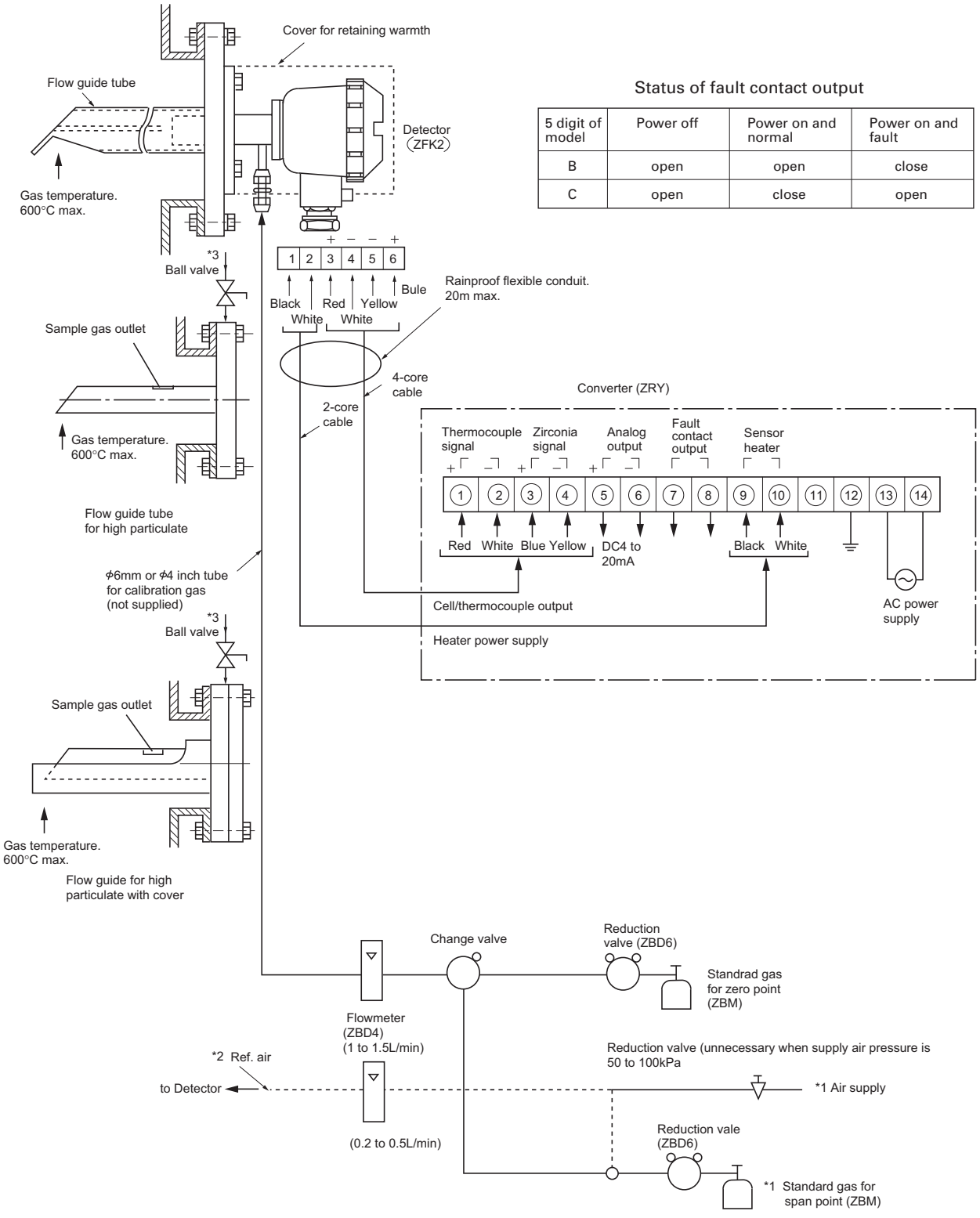
Z R Z P R | 1 - | 9

Description
Connectable devices P For ZRY
Types R For R thermocouple
Conduit length / Cable length YA None 6m YB None 10m YC None 15m YD None 20m YE None 30m YF None 40m YG None 50m YH None 60m YJ None 70m YK None 80m YL None 90m YM None 100m AA 6m 6m BB 10m 10m CC 15m 15m DD 20m 20m
Cable end treatment 0 None 1 One side (detector side) 2 Both sides

Note: For connection between detector and converter, the conduit to be used should be rainproof flexible type.

CONFIGURATION

Flow guide tube system



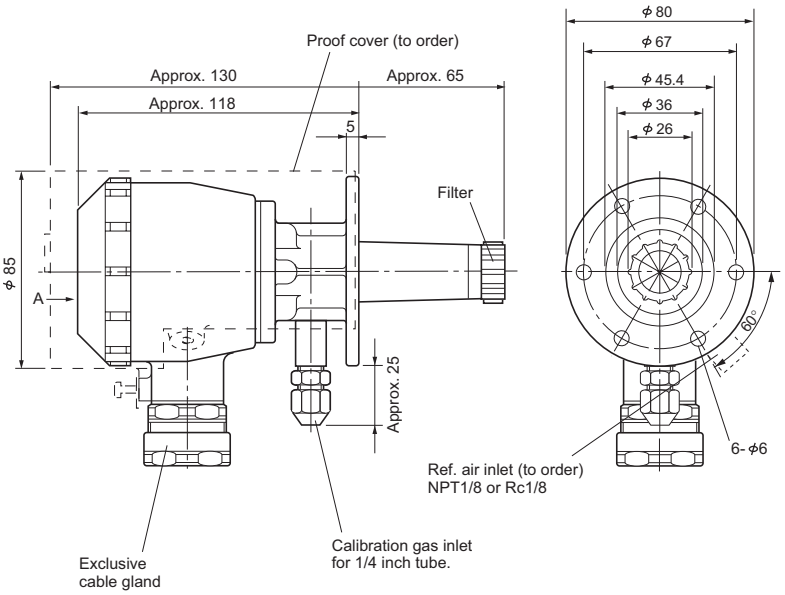
Status of fault contact output

5 digit of model	Power off	Power on and normal	Power on and fault
B	open	open	close
C	open	close	open

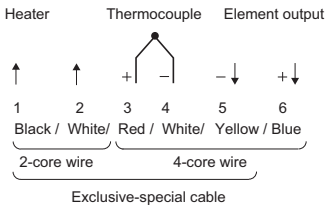
Note
*1 Sandard gas or instrumentation air can be used in place of span gas.
*2 Instrument quality air or bottled air is available as reference air instead of ambient air, when oxygen concentration in air around sensor changes.
*3 Blow down air inlet pressure in 200 to 300kpa.

OUTLINE DIAGRAM (Unit:mm)

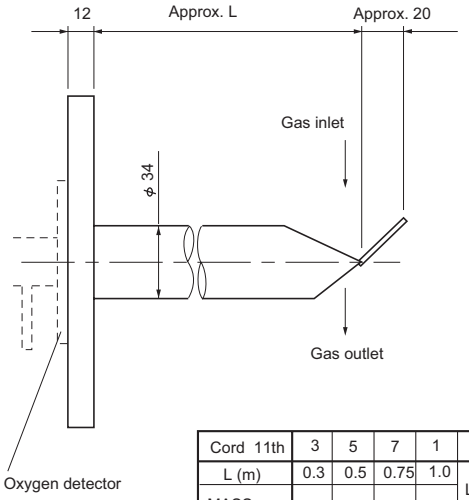
Detector (ZFK2)



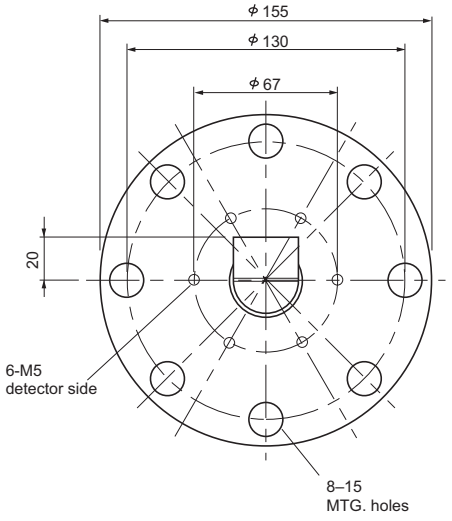
EXTERNAL CONNECTION DIAGRAM



Flow guide tube

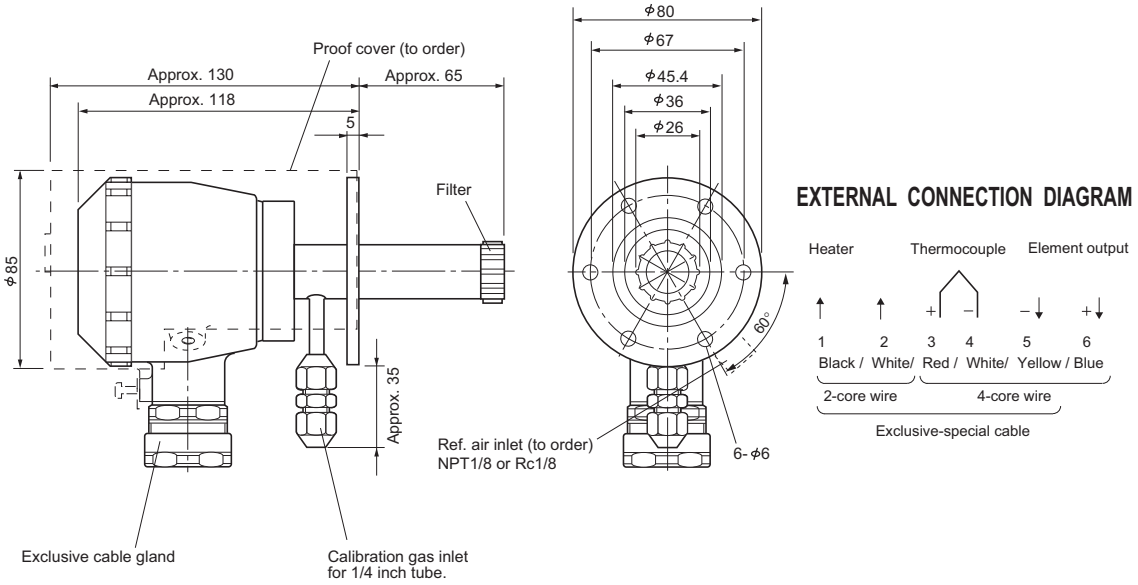


Cord 11th	3	5	7	1	Z
L (m)	0.3	0.5	0.75	1.0	L= (to order)
MASS Approx (kg)	2.7	3.3	4.1	4.8	



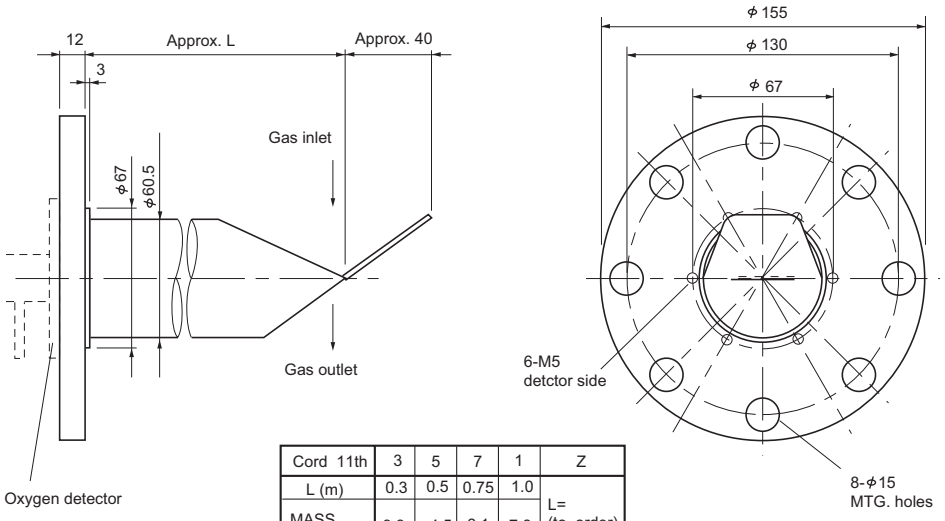
Z F K 2 R□□4 - 5 A 3 □
5
7
1

Detector (ZFK5)



EXTERNAL CONNECTION DIAGRAM

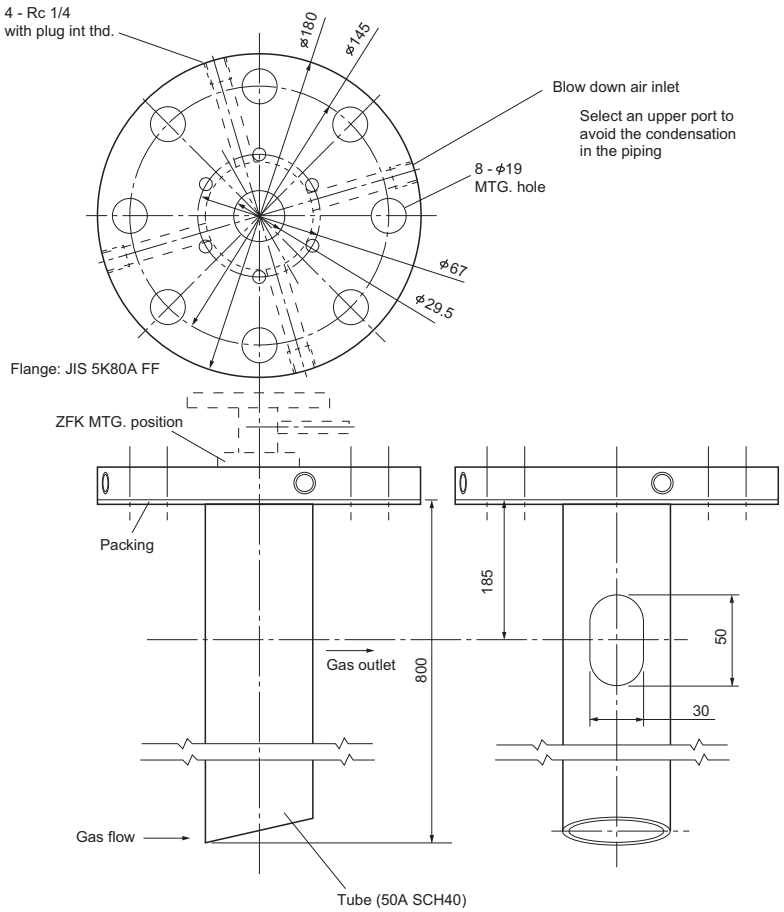
Flow guide tube



Cord 11th	3	5	7	1	Z
L (m)	0.3	0.5	0.75	1.0	L= (to order)
MASS Approx (kg)	3.3	4.5	6.1	7.6	

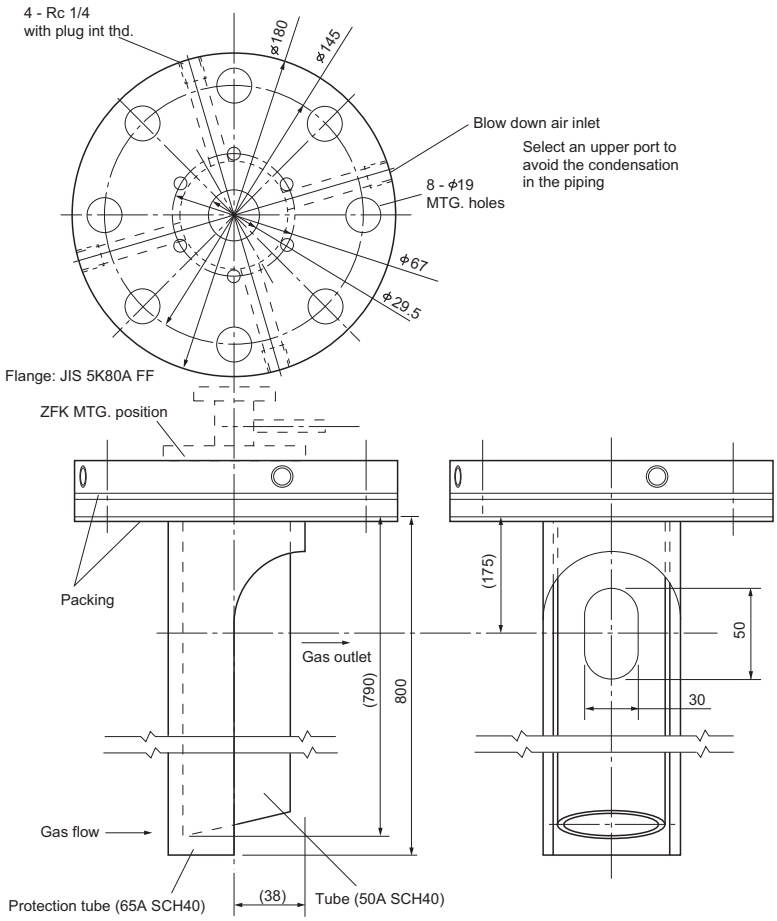
ZFK5R□□4-5B3□
5
7
1

Flow guide tube (for high particulate)



Z F K □ R □ □ 4 - 6 D8 □ □

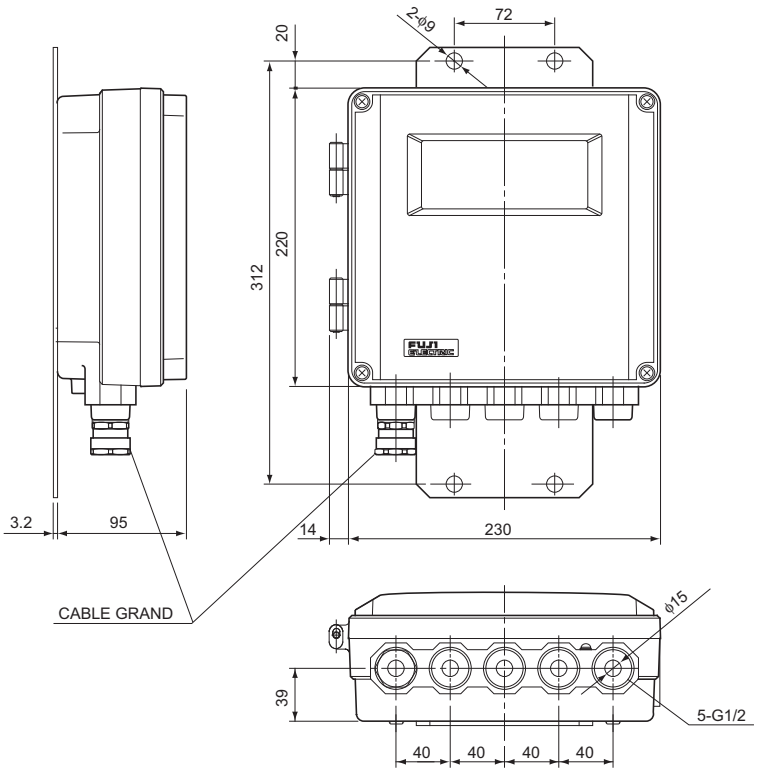
Flow guide tube (for high particulate with cover)



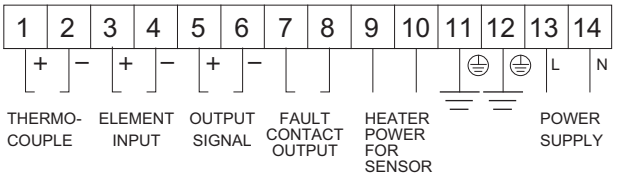
Z F K □ R □ □ 4 - 6 E8 □ □

Converter (ZRY)

Panel flush mounted



CONNECTION DIAGRAM



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