

## Diaphragm Breakage Detector DMS-24TN

# Instruction Manual

For using this product safely, please read this Instruction Manual thoroughly to have a good understanding of its contents before operating the product. After reading the Instruction Manual, keep it ready to your hand for use at all times.

### Introduction

This document describes the correct operating method and precautions on use about this product so that the product may be used for your purpose without causing any failure. Do not handle this equipment before reading this Instruction Manual. In particular, read the precautions carefully and keep the Instruction Manual ready to your hand for use at all times. If you find any unclear point or fault while using it, please inform the distributor or our business office mentioned in the end of the manual of it.

\* If you stain or lose the Instruction Manual, we want you to purchase a new manual at the distributor at once and keep it carefully.

### 1. Purpose of Use

This product is a floatless type diaphragm breakage detector that is used in combination with a diaphragm pump. The sensor installed on the air chamber of the pump detects a status filled with liquid due to breakage of the diaphragm.

### 2. Meanings of Warning and Caution

**WARNING** : This indicates the existence of potential hazard which, if not avoided, will result in death or serious injury.

**CAUTION** : This indicates the existence of potential hazard which, if not avoided, may result in bodily injury or in physical damage.

### 3. Precautions on Use

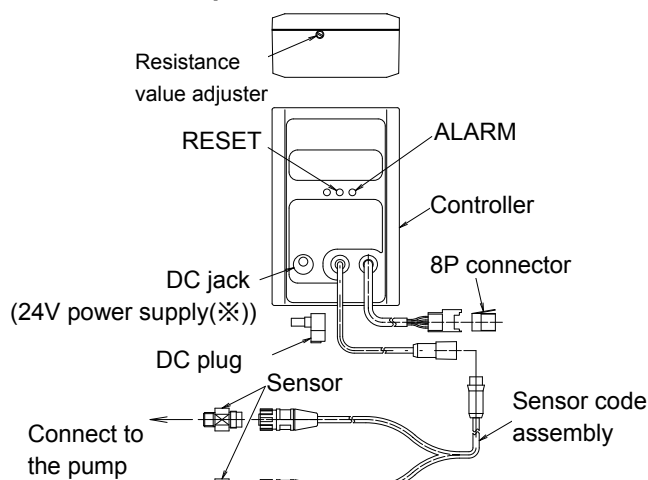
#### CAUTION

- This equipment cannot be used for any other purpose than the detection of diaphragm breakage. Otherwise, an unexpected accident may occur.
- Do not touch this unit when the equipment is powered on, otherwise an electric shock may occur.
- For a use in which a great effect on the human life or property is predicted or special safety is required, take a safety measure such as Fail Safe into consideration and consult our sales department.

### 4. Checking the Contents of the Package

After unpacking, check whether the product is free from damage and its accessories are all contained. Controller (1 unit), Sensor code assembly (1 piece), Sensor (2 units), DC plug (1 piece), 8P connector (1 piece), Liquid leakage sensor amplifier Manual (1 document) and Instruction Manual (this document)

### 5. Names of Component Parts



※When the AC adapter (product No.685968: separately available) is used, 100 V AC can be used as a power supply.

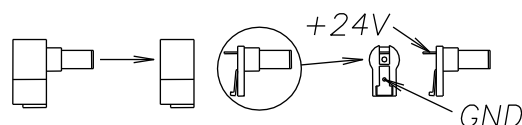
### 6. Installation and Adjustment

#### CAUTION

- Before starting installing operations, check whether the power supply is stopped and the pump air source to be installed is stopped. Otherwise, an unexpected accident may occur.
- To determine an installation place, select a place on which water or oil is not splashed. Otherwise, an electric shock or fire may occur.

#### 6.1 DC Plug Wiring

Disassemble the DC plug as shown below and perform cable wiring.



#### 6.2 Sensitivity Adjustment for the Sensor

- Perform wiring by referring to the figure of Item 5, and connect the specified power supply.
  - Dip the end of the sensor into the handling liquid (transfer liquid). If the ALARM (red) LED in the controller lights after 2-5 seconds, the liquid is detected. Take the end of the sensor from the handling liquid (transfer liquid) and make sure the handling liquid (transfer liquid) is not on the sensor. Press the [RESET] to make the ALARM (red) LED off. After the ALARM (red) LED is off, install the sensor in the pump.
  - If the ALARM (red) LED in the controller does not light though the end of the sensor is dipped in the handling liquid (transfer liquid), the sensitivity must be adjusted. Adjust the sensitivity within the stable LED ON range by operating the resistance value adjuster (\*1).
  - To set the resistance value in detail, remove the cover of the controller by using a cross-slot screwdriver. Then, adjust the range by the DIP switch referring to the label on the side of the liquid detector as shown below. After completed the adjustment, put the cover of the controller back.
  - After completion of the sensitivity adjustment, press [RESET] when the ALARM (red) LED is OFF.
- \*1: Do not apply excessive force to the resistance value adjuster. Rotation torque: 9.81mN·m max. Rotation stop strength: 29.4mN·m min.



NOTE: The variable sensitivity range is 0 to 50 MΩ. A liquid having a higher specific resistance than this range cannot be detected.

#### 6.3 Installing the Controller Main Unit

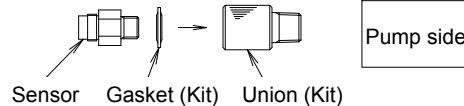
Install the controller by using DIN rails (35 mm).

#### 6.4 Installing the Sensor

For installing the sensor, the following two methods are available depending on the pump type. Select one of them according to your pump.

##### 1) For connecting to the DP-F series

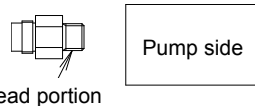
Purchase the sensor installation kit (product No.804042) separately and install this sensor installation kit on the pump according to the following procedure.



Install the gasket on the sensor and screw it into the union. Next, install the union in the breakage detector mounting hole of the pump.

##### 2) For connecting a pump other than the above

NOTE: For the pumps of NDP-5 series and NDP-15 series, the breakage detector cannot be used.



We recommend installing the sensor by applying an adhesive onto the sensor thread portion (M10 screw). (Equivalent to Adhesive TB1530 manufactured by Three Bond Co., Ltd.)

For installing the sensor by using a seal tape without any adhesive, install the sensor by winding the seal tape 3 or 4 turns to avoid air leakage.

<NOTE>

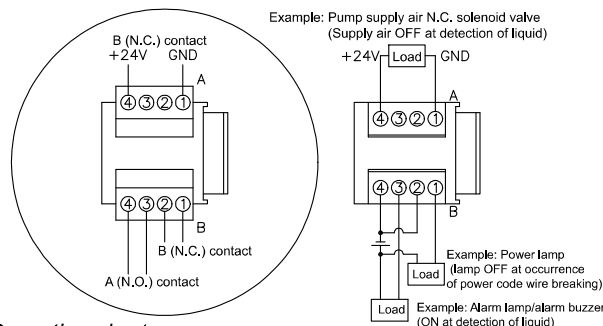
To install in NDP-40 and NDP-50 series, change the direction of the silencer by using an Elbow. (Part number: 634050(PT), 685716 (NPT)) \*sold separately.

### 7. Output Connection

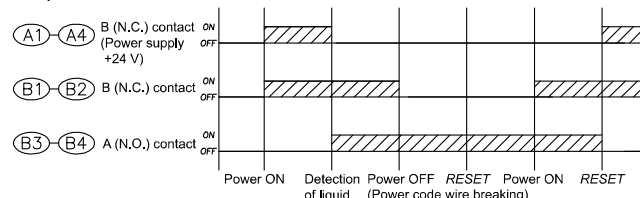
#### 7.1 Wiring connection

Perform cable wiring to the 8P connector by referring to the following diagram.

Cable insertion side



- Operation chart



\* RESET is operated only when the sensor detects no liquid.

#### 7.2 Connector connection

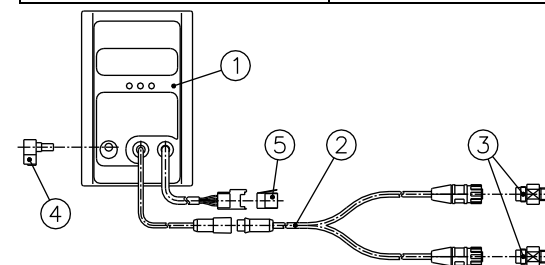
Check the pin No. by referring to the above pin No., and insert the φ1.2 to 1.6 cable (Peeling of cable sheath is not required) to the innermost part. Push the orange portion inward with pliers from the transverse direction. Make sure that there is no clearance between the white portion and the black portion and that the orange portion is horizontal, from the side and rear of the connector.



### 8. Parts List

#### 8.1 Breakage Detector Kit

Kit product No.		805139
① Controller	805140	1 unit
② Sensor code assembly	685967	1 cable
③ Sensor	683065	2 pieces
④ DC plug	685987	1 piece
⑤ 8P connector	685988	1 piece



#### 8.2 Optional Products (Separately Available)

- AC adapter (product No.685968): The supply voltage is converted.
  - Extension code (product No.685969): The length between the controller and the sensor code is extended 5 m.
  - Sensor Installation Kit (Kit product No.804042): Product dedicated to the DP-F series. (Gasket & Union)
- When you desire to get only the gasket of ①, purchase Gasket 685016.

### 9. Specifications

Specifications		
Power	24 V DC	
Power consumption	19 W max. (when using the pump controller CE-124)	
Sensitivity adjusting resistance	0 to 50 MΩ	
Operating ambient temperature	0 to 50°C (without freezing)	
Operating ambient humidity	45% to 85% RH (without condensation)	
Output specifications	Power supply output	OFF at detection of liquid 24 V DC, 5 A x 1 system
	Contact output	Liquid detection alarm contact output: ON at detection of liquid x 1 system
		Wire breaking alarm contact output: OFF at wire breaking of the power code x 1 system
		Contact resistance: 50 mΩ or less
		Insulation resistance: 1000 MΩ or more
	Dielectric strength: 1000 V AC 1 min	
	Rated load: 32 V DC, 1 A	
	Maximum value of contact voltage: 250 V AC/250 V DC, 1 A	
Dimensions	Controller: 99 (W) x 140 (H) x 55 (D) mm (DIN rail: 35 mm)	
	Sensor code assembly: Approx. 5 m	
Material	ABS (controller box)	
Mass	Approx. 450 g	

※ It cannot be used in the explosion-proof area.

### 10. Limited warranty

If an abnormality occurs during normal operation in accordance with the operating instructions and other operating cautions within the warranty period (12 months after date of purchase) that can be attributed to a manufacturing defect, the defective parts of this product will be serviced or the product will be replaced free of charge. However, this warranty will not cover compensation for incidental damage or any malfunction listed below.

- Warranty period** : This warranty will be valid for a period of 12 months after the date of purchase.
- Warranty** : If, during the warranty period, any of the material of the genuine parts of this product or the workmanship of this product is found defective, and is so verified by our company, the servicing cost will be fully born by our company.
- Exclusion** : Even during the warranty period, this warranty does not cover the following.
  - Malfunction arising from use of parts other than manufacturer-specified genuine parts
  - Malfunction arising from misuse or operating errors, or lack of storage or maintenance care
  - Malfunction arising from use with a fluid that may cause corrosion, inflation or dissolution of the component parts of the product
  - Irregularity arising from repair made by other than by our firm, our regional office, dealer or authorized service personnel
  - Malfunction arising from modification of the product by other than authorized service personnel
  - Wear and tear of parts that must be regularly replaced in the course of normal operation, such as diaphragms, center disk, valve seats, balls/flat valve, air switch sleeve valves, pilot valve, O-rings and gasket.
  - Malfunction and/or damage due to use with incorrect voltage.
  - Malfunction and/or damage due to transportation, moving or drop page of the product after purchase
  - Malfunction and/or damage due to fire, earthquake, flood or other force majeure
  - Malfunction arising from use of compressed air that contains impurities or excessive moisture or use of gases or fluids other than the specified compressed air
  - Malfunction arising from use of excessively abrasive material or of inadequate grease.

Furthermore, this warranty does not cover the rubber parts, or other parts used in this product and its accessories, which are subject to wear in normal operation.

• hoses • packings • cords

#### 4. Parts

Parts for this product will be kept available for 5 years after discontinuation of production. Once 5 years have elapsed after close of production, availability of parts for this product cannot be guaranteed.

To make inquiries about the product, please contact the following business offices.

Manufactured by:

**YAMADA CORPORATION**

International Department

1-1-3 CHOME, MINAMI MAGOME, OHTA-KU, TOKYO, 143-8504, JAPAN

PHONE : +81-(0)3-3777-0241 FAX : +81-(0)3-3777-0584