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Heated Hose

Instruction Manual

[0105TA]

Contents

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~ Preface ~

Thank you very much for purchasing our product "Heated Hose."
This instruction manual was prepared as a guide book for the customer to use Heated Hose correctly and safely.
Before using this product, read through this instruction manual carefully with a good understanding of its contents.

Heated Hose is a hose that is intended for heat insulation, temperature rise, anti-coagulation, and anti-freezing of water, oil, air and fluid. Besides that it also acts as a prevention against the increase of viscosity of slime, resin, oil and fat. Basically, it is used to transfer substances at its fixed temperature. The hose is not designed for any use other than those mentioned above.
In case the user uses this product for a purpose other than the above, resulting in an accident, we shall disclaim all the responsibility for it. Please do not use the product for any purpose other than those described above.
One of the unique characteristics of Heated Hose is that it can be connected to various applicators or devices. When using this product, please refer to this instruction manual together with the manual of the applicator or device which are to be connected.
Since Heated Hose is a custom-made product, we could not assure any responsibility if there were any failure due to the customer's carelessness, request for change of specifications, or returning of the product.

The rating and design are subject to change without prior notice for the purpose of improving the contents of design of Heated Hose.

Should you notice any defect on the Heated Hose, you are kindly requested to inform us of it.

Safety

This chapter contains important information on the safety of the user and surroundings. It also provides optimum handling advices to prevent the product from being damaged.

◎ Do not disassemble and modify Heated Hose in any case. Otherwise, it will result in a failure and cause an electric shock. It is very dangerous.

◎ Heated Hose is not designed to possess anti-explosive feature. Do not put a flammable material (Class I petroleum and Class II petroleum) into Heated Hose or use Heated Hose in a place where there is combustible gas such as propane gas or in a place where there is a possibility of gas leakage. The above is strictly prohibited because it might cause ignition, resulting in a serious accident.

◎ The surface of Heated Hose may become hot depending on its operating temperature. Avoid using flammable material (paper, waste paper, or cotton rubbish) around the operating place. Otherwise, a fire will occur.

◎ Even when the surface temperature of Heated Hose is low, the joint may become hot, thereby causing a burn. Do not touch such a part during heating or while cooling (when there is still heat remaining).

◎ Heated Hose (standard type) has not undergone any water-proof treatment. To prevent an electric shock, do not use the product under water or do not sprinkle water over it directly. Do not use or store the product in a high-humidity place or outdoors. Note that the moisture-proof or drip-proof type is not water-proof.

◎ In case that you have to touch Heated Hose directly during pressurization or temperature adjustment, take extreme care. When the set temperature is high, a burn may occur. If Heated Hose is damaged, the fluid will leak, resulting in a burn or serious injury.

◎ Instead of applying power-supply voltage directly, use a control device such as supply voltage regulator (variable transformer) and temperature controller. Neglecting this requirement will cause abnormal overheating. Thereby resulting in a serious accident such as Heated Hose damage, fire and burn. (Except for the self-temperature control type)

Installation

This chapter describes the items to be observed for installing Heated Hose correctly.
First, prepare the following tools and material.

- Torque wrench ... 1 unit
- Spanner or adjustable wrench suitable for HEX (hexagonal opposite side) of Heated Hose and nipple (adapter) .... 1 unit
- Sealing tape

◎ Turn off the power supply before starting the installation.
When installing Heated Hose, be sure to turn off the power supply beforehand and make sure that there is no current flowing. It is very dangerous if you start the installation while current is still flowing. It may cause an electric shock.

◎ Perform wiring for the cables of the power supply, sensor and etc. accurately and securely.
If the cables of the power supply, sensor and etc. are not wired accurately and securely, Heated Hose may be damaged, an electric shock may happened due to electric leakage and a burn or fire may take place from abnormal overheating.

◎ Do not stretch Heated Hose forcibly.
If Heated Hose is installed by stretching it over its free length, the pressure resistance will decrease, resulting in damage. Do not stretch Heated Hose in any condition. When the hose is pressurized, the length may change about ±3%. Therefore, perform piping with some allowance of length.

◎ Do not twist Heated Hose.
If Heated Hose is pressurized in a twisted status, the lifespan of the hose will be shortened or the joint may be loosened. At installation, take care not to twist the hose.
Procedure for installing the hose in the case of standard specification (cap nut +
(1) Install the nipple in the device where Heated Hose is to be applied.
(2) Set and tighten the cap nut so that Heated Hose itself may not be twisted.

◎ Tighten the joint with a proper torque

Tighten the hose joint with a proper torque. If the joint is not tightened enough, the fluid may leak. If the joint is tightened by excessive force, it will be damaged. For proper tightening torque values, refer to Table 1.

***Table 1**

PF (G) Screw	1/8	1/4	3/8	1/2	3/4	1 inch
Tightening torque N-m (Kg f/m)	15 (1.5)	25 (2.5)	50 (5)	60 (6)	120 (12)	140 (14)

UNF Screw	7/16-20	1/2-20	9/16-18	3/4-16	7/8-14
Tightening torque N-m (Kg f/m)	25 (2.5)	30 (3)	40 (4)	50 (5)	60 (6)

◎ For immobilizing Heated Hose

If Heated Hose is tightened strongly with a cable tie, the corresponding portion will be overheated, causing a failure to Heated Hose. Make sure that you tighten the hose just at a proper strength. (External damage-resistant type Heated Hose is an exception)

◎ Do not give excessive shock.

Do not trample down, drop, stretch, drag or place an object over Heated Hose as these action will give excessive impact to Heated Hose. Otherwise, the hose will damage or the sensor/heater's wire will break. During installation, perform piping with an extreme care of the surrounding area especially when Heated Hose is going to be operated around machines and frequent people passage. Use a protective cover so that people may not trample down the hose. (Note that the external damage-resistant type Heated Hose may also become damage due to over-limit shock.)

◎ Do not bend Heated Hose exceeding the minimum bending radius.
If Heated Hose is bent over the minimum bending radius, the hose will be damaged or wire breakage of the heater/sensor might occur. Use Heated Hose at a larger bending radius than the specified minimum bending radius. It is prohibited to bend the Heated Hose at area 100 mm from end caps. If the hose cannot be installed in a linear form due to the device shape or for another reason, change the installation angle by elbow fitting to secure a linear configuration.
Refer to Table 2 shown below for specified minimum bending radius.

***Table 2 (for reference)**

Heated Hose	Standard internal diameter	Repetitive bending radius (mm)		
Size	(mm)	Nylon/Teflon (straight)	Teflon (convoluted)	SUS flexible tube
1/8	4	100		
1/4	6	150		305
3/8	8	200		330
1/2	13	250	100	335
3/4	19	350	120	405
1 inch	25	450	150	470
1. 1/4	32	560	260	605
1. 1/2	38	640	305	720
2 inches	50	800	400	1000

Note: Each minimum bending radius described above is only a reference value. The exact values will be informed after the specifications of the product are determined.

※Please observe the above written minimum bending radius and avoid making the built-in sensor as the hose fulcrum while installing Heated Hose. The sensor may break and cause abnormality when the hose is bend repeatedly.
Please contact our sales representative if the position of the built-in sensor is unknown.

◎ Check the joint sealing surface for flaw and foreign material. (For surface sealing)
Before installing Heated Hose, check whether no flaw or foreign material is found on the sealing surface of the joint/nipple (adapter) to be used. If a flawed hose is used, leakage may occur.
For PT (taper) screw, use a sealing tape.

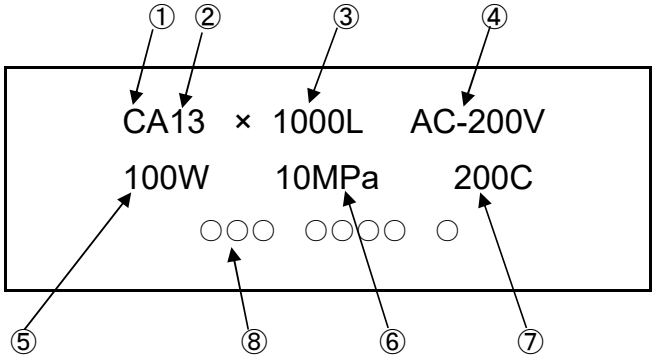
Operation

This chapter describes the items to be checked and observed before using Heated Hose in order to use it for a long term. Make sure that all items described in the previous chapter have been executed correctly, and then begin the operations.

◎ Nameplate

A nameplate is attached with every Heated Hose. Unless specified otherwise, the items shown in Figure A below are engraved on the nameplate. Verify the sensor, voltage, pressure resistance and temperature before using Heated Hose. If any of them is found, out of (or exceeds) the designated specifications, do not use the

*Figure A



① Sensor

CA = CA (K) type thermocouple
IC = IC (J) type thermocouple
PT = Pt - 100 Ω resistance thermometer
Others

② Internal diameter of the hose (φ)

③ Hose length (L = mm)

④ Power supply voltage (V)

⑤ Electric capacity (W)

⑥ Maximum operating pressure (MPa)

Do not apply pressure more than the limit shown on the nameplate under any circumstances. Otherwise, it might damage the inner tube.

⑦ Maximum operating temperature (ºC)

Do not use the hose at a temperature higher than its set value. Neglecting this may damage the hose, heater, heat

⑧ Serial number

When you make inquiries at our office, inform us of the serial number as well as the specifications.

◎ When determining the specifications of Heated Hose, a smaller external diameter might be required. In this case Heated Hose will possess high surface temperature that may cause a burn when it is touched with a bare hand. For this, a warning seal will be attached to Heated Hose as shown in Figure B.

***Figure B**

A Heated Hose with warning seal like above attached to it may cause a burn when it is touched wth a bare hand. If it is necessary to hold the hose, wear a heat-resistant

◎ Check the power cord, plug and connector for any external flaw or looseness before using Heated Hose. If any of them is found, stop your operations and inform us immediately. Using a flawed cord, plug, or connector will lead to a fire or an an electric shock.

◎ Install the lead wire with some allowance of length. Connect an operating device such as a spray gun to the opposite side of the power cord for prevention against wire breakage.

◎ Before connecting the power cord, plug and connector, confirm on the nameplate whether the setting voltage is equal to the voltage determined at the preliminary arrangement. Secure the connections firmly so that the connected device may not slip out. A loosen connection will result in an electric shock or a short circuit which are very dangerous.

◎ The material of the inner tube of Heated Hose is selected in consideration of its chemical resistance. Do not use any fluid other than that determined at the preliminary arrangement. Using a different fluid may cause a safety problem. (Eg: generation of toxic gas and melting of inner tube)

◎ A close relationship is established between temperature (heat resistance) and pressure (pressure resistance). Be sure to use Heated Hose within the set temperature and pressure engraved on the nameplate.

◎ Avoid setting Heated Hose in a condition where the ambient temperature varies at different part despite using the same hose (Example: partly covering the heat insulator, cool wind is blown to some portions, or usage of two/more bundled hoses). Otherwise, failure such as insufficient temperature rise and abnormal overheating may occur, causing damages to the inner tube of Heated Hose.

◎ In the case of thermoplastic (molten) fluid, usually the fluid in the hose is not entirely melted though the temperature had reached the set value. Do not perform pressurization until the fluid in the hose and its surrounding device is completely melted. If pressurization is performed before melting, the hose may be damaged.

Maintenance

This chapter describes the operations of regular inspection and maintenance.

Firstly, prepare the following required tools.

- Torque wrench .... 1 unit
- Spanner or adjustable wrench ... 1 unit
- Screwdriver
- Insulation resistance tester
- Electric resistance measuring instrument
- Heat-resistant gloves
- Rag ..... Several sheets

●Regular inspection operations

◎ Before starting the inspections
Make sure that the main power supply is turn off. Otherwise, an electric shock may occur, inviting great danger.

◎ Checking the power cord
Check the power cord, plug, and connector for external flaw and looseness.
If any external flaw or looseness is found, inform us immediately of it.
Using a flawed cord, plug, or connector will lead to a fire or an electric shock.

◎ Checking the joint
Check whether the joint of Heated Hose is securely tightened. If the joint is loose, tighten the joint by referring to Table 1 (page 4). Take special care for Heated Hose that encounters a lot of vibration or movement. (This check should be included in daily inspection items if required)

●Maintenance operations

◎ Before starting the operations
Make sure that the main power supply is turn off. Otherwise, an electric shock may occur, inviting great danger.

◎ When removing Heated Hose
There is a possibility that the fluid may spout out if the Heated Hose is removed while there is still remaining heat left in the fluid. Do not remove the hose until the its temperature goes down below normal. If the hose must be removed for an unavoidable reason, put on heat-resistant gloves and cover the joint with a rag and then remove it with extreme care. Do not look into the inside of Heated Hose for any reason.

◎ Bending habit of Heated Hose
The Heated Hose will possess a unique form due to its bending habit after it was installed for a certain period. Therefore install Heated Hose in its unique form again after removing it.

◎ Checking the insulation resistance
Remove the power cord, plug and connector after turning off the main power supply. Then, measure the insulation resistance between the power cord and the joint with a insulation resistance tester(500 V or 1000 V). The proper value 100 M Ω and above. If the value is below 100 MΩ, contact us immediately.

◎ Checking the resistance value
Measure the resistance between power cords with an electric resistance measuring instrument. If there is no current flow, it may be due to a wire breakage of the heater.

Electric capacity (W) = Square of voltage (V) ÷ Resistance (Ω)

By using above calculation, determine the value of electric capacity. If the value calculated is having a difference of ± 10% from the one engraved in the nameplate, a short circuit of heater might have occurred. Stop your operations

Troubleshooting

A serious accident may happen if you continue using Heated Hose even when one of the symptoms written below occurred. If even one of the symptoms happens turn off the main power supply at once and contact us immediately.

◎ Releasing of strange noise or weird smell from Heated Hose or temperature controller.

◎ Releasing of smoke from Heated Hose or temperature controller

Note: Regarding the above 2 items, weird smell or smoke may come out from a new Heated Hose. This can be attributed to the fact that sizing (glue paste) which was used in the manufacturing process gets burnt. (Aging is done to remove as much as possible the weird smell and smoke before delivery.)

◎ Leaking of fluid from one part of Heated Hose

◎ The surface of Heated Hose, temperature controller, or the power cord reaches a high temperature unlike usual.

◎ The leakage breaker is turned off.

◎ Leakage occurs clearly.

Note: Measure the insulation resistance by referring to the item "Checking the insulation resistance" on page 10.

Warranty

When a failure, fault, or part defect occurs within 12 months after delivery of Heated Hose and it is clearly attributable to our responsibility in improper design and manufacturing, we shall repair or replace it with an alternative product free of charge. However, if the hose is put in continuous use 24 hours every day, our warranty period will be shorten to only 4

Nevertheless, we shall not be responsible for any failure like the following cases.

◎ The failure or damage is attributed to the user's wrong handling.

◎ The failure or damage is due to modification or improper repair from the user side.

◎ The failure or damage is caused by natural disasters such as earthquake, flood, fire and thunderstorm.

◎ Replacement of consumable parts

◎ Heated Hose without nameplate (Nameplate been removed or damaged by user). However, this is not applicable to Heated Hose that was clearly delivered within 12

◎ The details of each hose are as follows.

Heated Hose (Teflon/PFA)					
Number	Minimum destructive pressure	Maximum pressure	Liquid temperature range	Warranty period	The number of warranty
R310-04	84MPa	19MPa	-65℃～230℃ ※As for the relationship between liquid temperature and pressure resistance of hose, please refer to the graph below.	1 Year ※Under the operation condition of 8 hour a day,5 days a week	150,000 times
R310-06	79MPa	19MPa			28,000 times
R310-07	67MPa	18MPa			22,000 times
R310-08	64MPa	16MPa			20,000 times
R310-10	56MPa	14MPa			16,000 times
R310-12	60MPa	15MPa			22,000 times
R310-16	61MPa	15MPa			26,000 times
R320-03	100MPa	25MPa			24,000 times
R320-04	90MPa	21MPa			30,000 times
R320-05	90MPa	21MPa			40,000 times
R320-08	96MPa	24MPa			29,000 times
R320-12	80MPa	20MPa			40,000 times
R320-16	80MPa	20MPa			18,000 times

Heated Hose （Nylon）					
Number	Minimum destructive pressure	Maximum pressure	Liquid temperature range	Warranty period	The number of warranty
R100-02	130MPa	32MPa	-40℃～100℃ ※ As for the relationship between liquid temperature and pressure resistance of hose, please refer to the graph below.	1 Year ※Under the operation condition of 8 hour a day,5 days a week	110,000 times
R100-04	90MPa	21Mpa			150,000 times
R100-05	84MPa	21MPa			62,000 times
R100-06	84MPa	21MPa			39,000 times
R100-08	140MPa	35MPa			22,000 times
R100-12	100MPa	25MPa			29,000 times
R100-16	100MPa	25MPa			11,000 times

Heated Hose （Stainless flexible pipe）					
Number	Minimum destructive pressure	Maximum pressure	Liquid temperature range	Warranty period	The number of warranty
8A	23.6MPa	5.9MPa	-40℃～500℃	1 Year ※Under the operation condition of 8 hour a day,5 days a week	3,000 times
10A	19.6MPa	4.9Mpa			3,000 times
15A	16.4MPa	4.1MPa			3,000 times
20A	12.4MPa	3.1MPa			3,000 times
25A	9.6MPa	2.4MPa			3,000 times

Heated Hose （Stainless pipe）					
Number	Minimum destructive	Maximum pressure	Liquid temperature range	Warranty period	The number of warranty
（φ6×φ4）	168MPa	42MPa	-40℃～500℃	1 Year ※Under the operation condition of 8 hour a day,5 days a week	3,000 times
（φ8×φ6）	96MPa	24Mpa			3,000 times
（φ10×φ8）	80MPa	20MPa			3,000 times

◎ The period of warranty shall be defined by either the duration of use or the number of times of use.

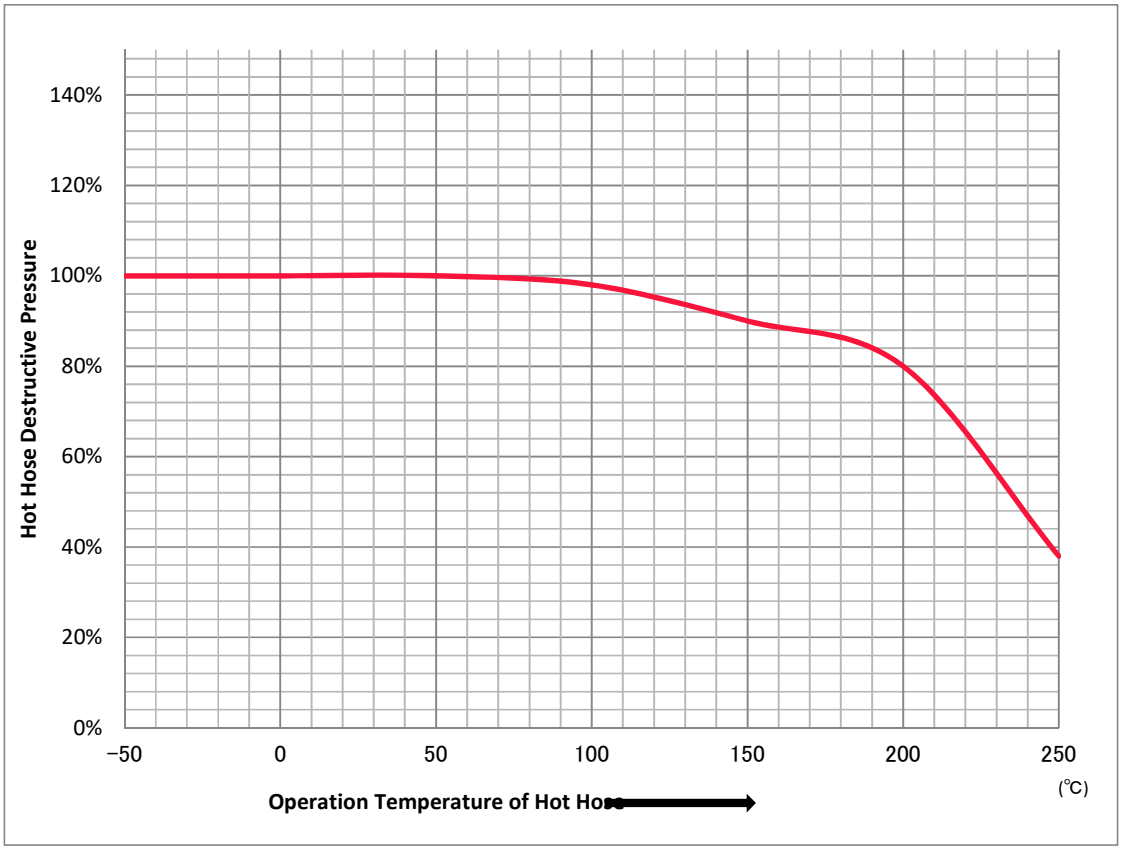
◎ “The number of times of warranty” means the number of repeated pressure under the use conditions of each hose.

◎ The repeated pressure is described as 1 Hz. Please note that the number of times of warranty will decrease in case of 1 Hz or more.

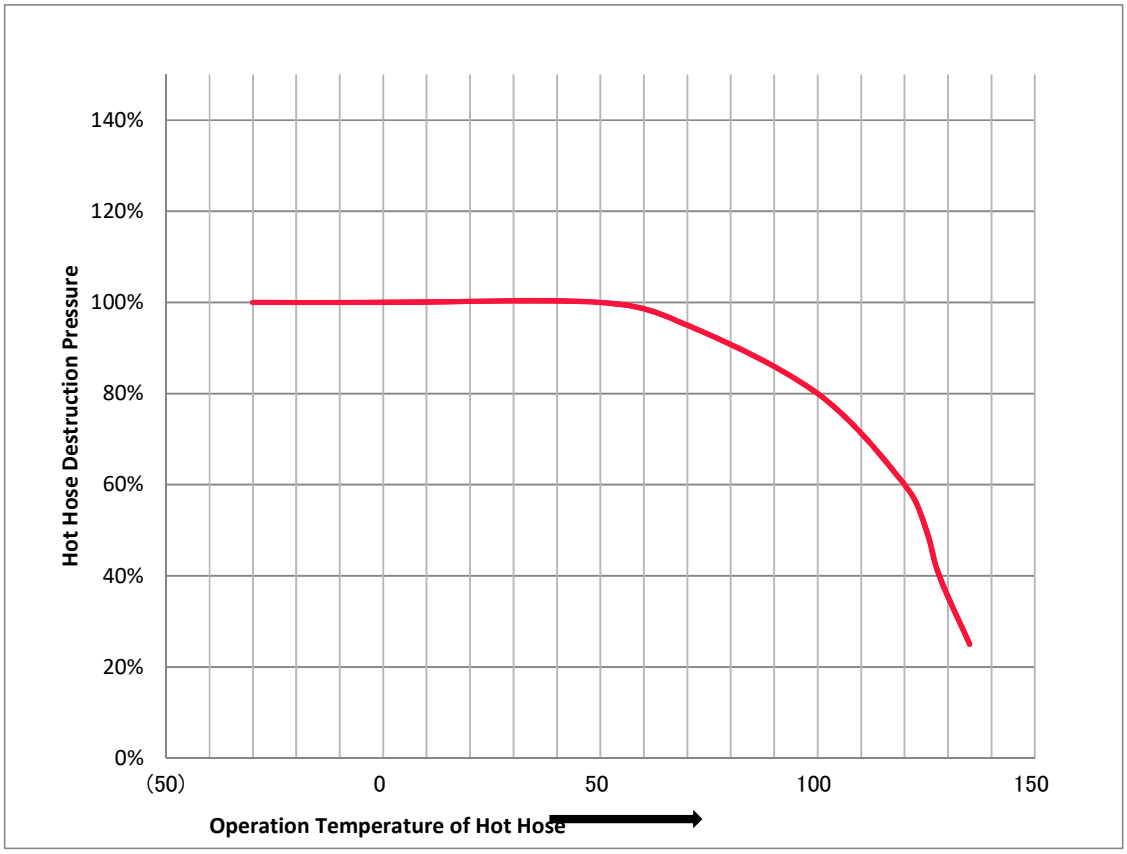
◎ The number of times of warranty for stainless flexible pipe and stainless pipe is just example and it will fluctuate greatly depending on using situation. Please confirm with sales representative.

◎ Please confirm with sales representative about the size not mentioned above list.

◎ Operation temperature of Heated Hose(Teflon/ PFA) & Destructive pressure



◎ Operation temperature of Heated Hose(Nylon) & Destructive pressure



Loss/damage of nameplate/manual

In case the user lost the instruction manual or damages the nameplate, place an order for a new one by filling in the following sheet.
Regarding the nameplate, fill in the date of purchase and known specifications as much as possible. It is better to fill in this form and keep it in a safe file immediately after receiving the Heated Hose.

Cut here.

Order sheet for instruction manual/nameplate			
Mark your necessary item in the right column with a circle.		Instruction manual for Heated Hose 0105TA	
		Nameplate Specification/Serial No	
		Nameplate Warning! Hot Surface	
Address			
Company Name			
Department/ Section			
Name			
Phone No.		FAX No.	
Date of Purchase		Purchase Order No.	
Sensor		Voltage	
Internal Diameter		Hose Length	
Pressure		Temperature	
Serial Number			