

EQUIPMENT HAZARD IDENTIFICATION AND RISK MANAGEMENT DOCUMENTATION

Equipment Description	rml Type C retractable spray nozzle unit
Client	Tetrapak CPS BV

Completed By	P J Botting
Date Last Updated	11 November 2011
Next Review Due	On modification of equipment, change of use, or after an accident

Health and Safety in Employment Act

The Health and Safety in Employment Act 1992 requires that rml Engineering Ltd systematically identify, assess and control hazards on all new and modified equipment.

Principles of Machine Safety

The basic principles for reducing risk are as follows:

1. Systematic identification of all hazards.
2. Assessment of risks.
3. Where a hazard is significant, all practicable steps must be taken to manage the hazard according to the hierarchy of controls.
 - Eliminate
 - Isolate
 - Minimise
 - Administrative Controls

Standards

Below is a list of standards referred to when identifying and assessing risks for this unit.

AS 4024.1 – 2006	Safety of Machinery
AS 4360	Risk management
EN ISO 12100 – 1	“Safety of Machinery – Basic concepts, general principles for design.”
EN ISO 14121 assessment.”	“Safety of Machinery – Principles of risk
EN ISO 13849 – 1 (EN954 – 1)	“Safety of machinery – Safety related parts of control systems.”

In assessing the equipment, the following facts were taken into consideration:

This unit has been in service since 1992, with more than 3000 individual units over 10 countries operating without any known safety related incidents.

1. Description of rml type C retractable spray nozzle unit

1.1 Intended Use

This unit is a subassembly of mechanical, pneumatic and electrical sensor components that are assembled to provide a retractable spray nozzle unit. This unit is installed into dairy processing equipment and used to clean internal equipment surfaces during the plant cleaning regimes.

1.2 Energy Sources

As a supplied subassembly this unit's energy system can comprise of either a spring or pneumatic pressure that holds the piston in the closed and/or open positions. The default position of the spring is in a semi tensioned state. Care needs to be taken when disassembling.

On installation the unit is connected to the cleaning fluid line and pneumatic air supply (for activation of device).

The optional reed indicator sensor is also connected to a 24 VDC supply.



For M901-0100

During the cleaning cycle the cleaning fluid supply operates which opens the device allowing the cleaning fluid to travel through the device and spray out. The slow closing spring device acts against the spring such that on removal of fluid pressure the device slowly closes to the default spring position.

For M901-0137 & M901-0400

During the cleaning cycle the pneumatic supply operates which opens the device allowing cleaning fluid to travel through the device and spray out. The pneumatic pressure (6 barg) acts against the spring such that on removal of air pressure and fluid pressure the device closes (fast) to the default spring position.

For M901-0200, M901-0300, M901-0700, M901-0800 & M902-0101

During the cleaning cycle the pneumatic supply operates on the extend port, which opens the device allowing cleaning fluid to travel through the device and spray out. On the supply of air pressure to the retract port, the device closes to the default position.

2. Hazard Category = Mechanical

2.1 Hazard
<ul style="list-style-type: none">Unit has sharp edges, thus potentially cutting fingers when being handled.
Risk
<ul style="list-style-type: none">Low probability of occurrence since they are not handled very often. Severity of injury likely to be finger cut.
Permanent Controls
<ul style="list-style-type: none">Ensure the surfaces are machined cleanly and free from any swarf/sharp edges.
Administrative Controls
<ul style="list-style-type: none">None required

3. Hazard Category = Electrical

3.1 Hazard
<ul style="list-style-type: none">• Reed switch attached to barrel to indicate piston proximity (optional). The component used is Festo SME-8-SL-LED24, and is supplied in the subassembly with an electric lead for connection during installation.
Risk
<ul style="list-style-type: none">• No risk relates to this component as it is supplied to customer without any power supply.
Permanent Controls
<ul style="list-style-type: none">• Nil
Administrative Controls
<ul style="list-style-type: none">• Installation and commissioning engineer must connect to 24vDC power supply correctly.

Note: There are no safety related electrical devices as part of this unit.

M901 – 0700 with reed switches on barrel.



4. Hazard Category = Environmental

4.1 Hazard
<ul style="list-style-type: none">No environmental hazards identified.
Risk
<ul style="list-style-type: none">
Permanent Controls
<ul style="list-style-type: none">
Administrative Controls
<ul style="list-style-type: none">

5. Hazard Category = Installation and Commission

These units must not be used unless installed correctly by an appropriately qualified technician. In particular, no fluid is to be pumped through the device until it is securely mounted into its final position.

5.1 Hazard
<ul style="list-style-type: none">Unit is not tightly mounted onto adaptor with RJT nut. During operation this may result in unit leaking or falling out of mounting.
Risk
<ul style="list-style-type: none">Very low probability as long as properly installed and tightened.
Permanent Controls
<ul style="list-style-type: none">Nil
Administrative Controls
<ul style="list-style-type: none">Installation technician to check prior to commencing commissioning.

5.2 Hazard
<ul style="list-style-type: none">The CIP fluid line is not tightly connected to the unit. During operation this may lead to fluid leak or spraying.
Risk
<ul style="list-style-type: none">Very low probability as long as properly connected and tightened.
Permanent Controls
<ul style="list-style-type: none">Nil
Administrative Controls
<ul style="list-style-type: none">Installation technician to check prior to commencing livening of fluid line.

5.3 Hazard
<ul style="list-style-type: none"> When fluid is being pumped through unit it leaks through seals and sprays to atmosphere.
Risk
<ul style="list-style-type: none"> Low risk of occurrence.
Permanent Controls
<ul style="list-style-type: none"> rml test unit prior to dispatch at 80°C and 6 bar fluid pressure.
Administrative Controls
<ul style="list-style-type: none"> Commissioning technician to do visual inspection on start up.

5.4 Hazard
<ul style="list-style-type: none"> Device is livened with fluid while un-mounted in duct.
Risk
<ul style="list-style-type: none"> Low occurrence, as they are not normally removed.
Permanent Controls
<ul style="list-style-type: none"> Nil
Administrative Controls
<ul style="list-style-type: none"> Any maintenance requiring removal must follow site lockout procedures for ensuring the fluid circuit cannot be livened with devices not in place.

6. Hazard Category = Maintenance

6.1 Hazard
<ul style="list-style-type: none">• Device is livened with fluid while un-mounted in duct.
Risk
<ul style="list-style-type: none">• Low occurrence, as they are not normally removed.
Permanent Controls
<ul style="list-style-type: none">• Nil
Administrative Controls
<ul style="list-style-type: none">• Any maintenance requiring removal must follow site lockout procedures for ensuring the fluid circuit cannot be livened with devices not in place.

6.2 Hazard
<ul style="list-style-type: none">• Maintained unit is replaced in line incorrectly reassembled, resulting in malfunction, leaking or spraying once livened.
Risk
<ul style="list-style-type: none">• Low occurrence.
Permanent Controls
<ul style="list-style-type: none">• Nil
Administrative Controls
<ul style="list-style-type: none">• Maintenance engineer should be fully conversant in service procedures prior to undertaking any work.

7. Supporting Documentation

The following documents are important to read for any person helping this subassembly in its application.

7.1 Original Information File

This file contains important information on the operating parameters of the unit. It also contains installation procedure.

7.2 Service Instructions

This file provides a step wise instruction for the disassembly, maintenance and reassembly of the device. It also contains a spare parts list and assembly drawing.