

rml Retractable CIP Spray Nozzles

Manual – Installation, Operating and Commissioning

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ORIGINAL FILE

Contents rml Retractable Spray Nozzle

1 Introduction	3
2 Safety Precautions	4
3 Technical Information	5
4 Installation, Operation & Commissioning	6

1 Introduction

1.1 rml Retractable CIP Nozzles

The range of rml Retractable CIP Nozzles are specifically designed to meet the needs of modern automated plants, providing superior 'cleaning in place' (CIP) efficiency and functionality. Thousands of units are in use in many plants around the world. These units are manufactured in our precision engineering facility at 66 Norris Ave, Hamilton, New Zealand.

1.2 Design / Working Principals

The rml Retractable CIP Nozzle is commonly used in situations where equipment needs to be cleaned in place. In the default on product state, the rml CIP Nozzle remains retracted, giving a smooth product surface. This is particularly important in applications such as powder dryer ducts and powder cyclones.

The unique rml spray nozzle design enables the nozzle to rotate during the cleaning cycle, ensuring maximum coverage and effectiveness of the spray profile.

1.3 Applications

The rml Retractable CIP Nozzle is used in any application where:

- It is hard to access or achieve good surface clean using traditional spray balls.
- A flush surface is required during production operation.
- An automated CIP is used and manual set up is not wanted.

1.4 Examples

- Powder Dryer Ducts
- Dryer Chambers
- Cyclones and Bag Houses
- Greasy Duct work
- Evaporative Flash Vessels
- Cooking Vessels
- Extraction Ducts
- Large processing machinery
- Fluid Bed Chambers



Model M901-0700

2 Safety Precautions

2.1 Risk Assessment

The installation and commissioning engineer should ensure they have become familiar with the risk assessment brochure relating to these units. Copies of this risk assessment can be obtained free of charge from rml prior to commencing installation. (sales@rmlengineering.com).

2.2 Safety Precautions

In all installations the unit must be connected to services and fluid lines using appropriate fittings, by a suitably qualified person. The unit must not be livened unless it is completely and securely connected to the inline position. At no time should fluid be pumped through the unit while it is removed from the mounting connection, as this exposes people in the vicinity of the unit to risks from spraying fluid.

3 Technical Information

For detailed technical information specific to each model please refer to the individual model service manual.

3.1 Technical Description

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.

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 and the AS-I model is connected to an AS-I power supply.

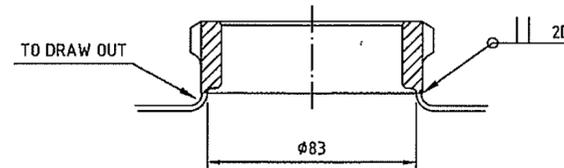
4 Installation, Operation & Commissioning

4.1 Mounting Adaptors

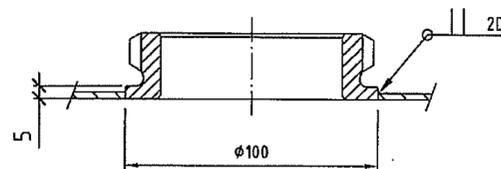
The rml Retractable CIP Nozzles are mounted to the duct or vessel by means of a special adaptor.

There are two types of adaptors available for rml's Retractable CIP/Deluge Nozzles.

M901-0108 Type A (Pulled T mounted) is recommended for ducts under 1 meter in diameter. Fabricating this adaptor requires an 83mm ID 'T' to be pulled from the duct and butt welded.



M901-0101 Type B (Flush mounted) is recommended for ducts over 1 meter in diameter and for flat surfaces. Fabricating this adaptor requires a 100mm diameter hole, to be cut and flush welded inside and out.



4.2 Mounting CIP Nozzle

The units should be inserted and securely connected to the adaptor using the included 3" union fitting.



The hoses should be mounted and positioned in such a way so that upon removal of fluid pressure to the CIP Nozzle, the residual fluid can drain back through the hose under gravity and without pooling in any looped sections of hose.



Where there is compressed air actuation, a chemical resistant 6mm airline should be run from the solenoid in the site cabinet to the air fitting on the unit.
For Model M901-0137 we recommend using a Festo QSL 6 or QST 6 push fit fitting for the pneumatic connection.



Where there are reed switch indication, a 24V supply needs to be connected to the sensors.

4.3 Removal of CIP Nozzle

Steps for safe removal of the CIP Nozzle:

1. Ensure all site safety and isolation requirements are satisfied before removing a component from a CIP line.
2. Undo the Union Nut to the inlet line.
3. Undo the 3" RJT nut holding the CIP Nozzle in the Adapter.
4. Remove the CIP Nozzle out of the Adapter.

4.4 Operation

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 & M901-0901

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.

For M901-0901

Product Characteristics	Value	Unit
Electrical design	2 inputs (LED) / 1 output (LED)	
Operating voltage	26.5...31.6 DC	V
Current consumption	<50 ¹	mA
Normal Operation (Fault LED OFF)	28 ± 2	mA
Normal Operation (Fault LED ON)	36 ± 2	mA
Environment		
Ambient temperature	-20...80	°C
Protection	IP65	
Tests / approvals		
EMC	EN 50295	
AS-i Classification		
Extended addressing mode possible	yes	
AS-i Profile	S-2.A.E	
I/O configuration (hex)	2	
ID code (hex)	A.E	
AS-i Certificate	pending	
Data Bits		
D0	Input-Nozzle Open (Amber LED) / Output-Fault (Red LED)	
D1	Input-Nozzle Closed (Green LED)	
D2	-	
D3	-	
Display		
Nozzle Closed (LED)	Green	
Nozzle Open (LED)	Amber	
Nozzle Fault PLC (LED)	Red	
Electrical Connection		
Connection	ifm E70498 or Phoenix Contact SACC-E-M12FS-4CON-PG	

Notes. 1. Use 50mA per device for power supply calculations.

General Instructions

Supplied flying lead should be securely clamped to standard AS-I flat cable. If the full 62 nodes are running off a single AS-I power supply this should be rated to 4A. Standard topology regarding distances and node number applies. Within the Master interface input 1 (I1) corresponds to nozzle closed (Green LED), input 0 (I0) corresponds to nozzle open (Amber LED), and output 0 (O0) can be used to turn the fault (red) LED on.

Addressing

The nozzle top has been supplied with an address of 0a; ensure the network being attached to does not have a slave at this address (or address 0). This address can be changed using a standard Master's interface. They are set to extended addressing mode. Auto addressing mode may also be used.