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HARTING Han® Pneumatic Module Metal
Technical specifications and assembly instructions

Contents

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1. Han® Pneumatic Module Metal

1.1 Transmitting compressed air with a connector system

HARTING industrial connectors help to simplify the installation, removal, and maintenance of the connecting systems used in industrial facilities. Connectors in the Han-Modular® series are particularly versatile. The modules in this series can be combined together to create many combinations of connectors. Contacts for transmitting electrical power and/or data signals can be positioned alongside contacts for compressed air connections. Ethernet, USB, FireWire, and various standards for coaxial cable networks are among the transmission types that can be used.

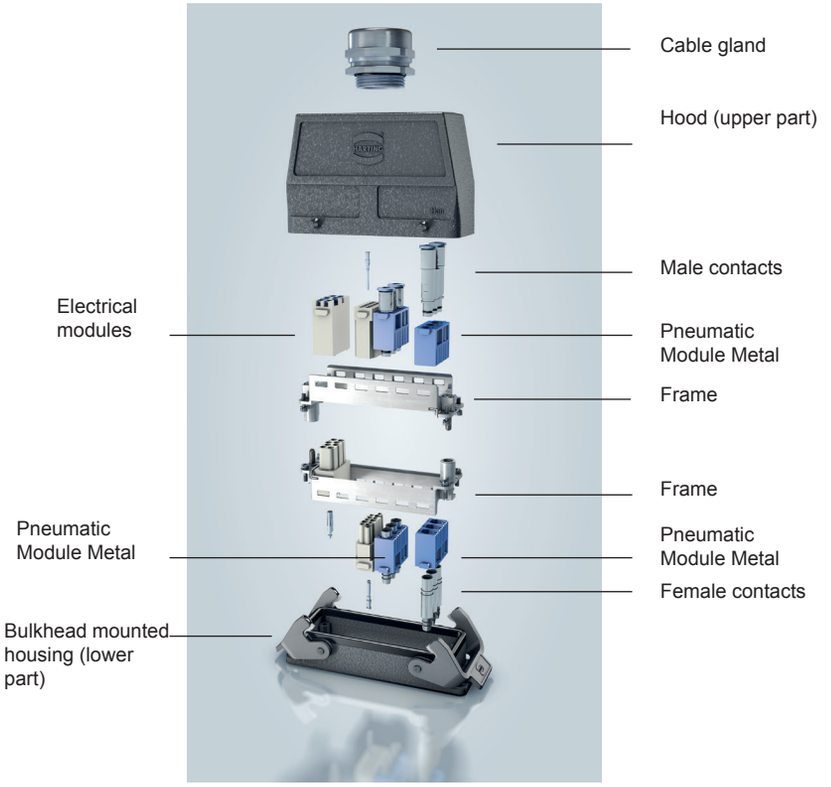


Figure 1: Assembly method for the Han-Modular® system

Properly prepared compressed air can be transmitted through the connector using the Han® pneumatic Module Metal. With its blue colouring, the Pneumatic module stands out from the electrical modules. The contact pins and sockets can be used with pneumatic hoses of varying diameters, depending on your requirements. This pneumatic module can be combined with all other modules in the series. In addition to electric power and electrical signals, they can also be used to create pluggable connections that transmit fibre optic signals and compressed air.

Refer to Table 3 on page 12 for information about the appropriate connector hoods/housings. Additional information on the modules in this series and accessories can be found in HARTING's e-Catalogue at www.harting.com or the printed catalogue HARTING Han® Industrial Connectors (especially in Chapter 6).

1.2 Pack contents

The Han® Pneumatic Module Metal has room for 3 contacts with connections for
- Tubes with inner diameter (ID) = 3.0, 4.0 or 6.0 mm
- Tubes with outer diameter (OD) = 3.0, 4.0 or 6.0 mm

At least two modules are required for each plug-in connection, and in addition:

- Han® Pneumatic male contact for ID = 3.0, 4.0 or 6.0 mm / (OD) = 3.0, 4.0 or 6.0 mm (10 pieces per pack)
- Han® Pneumatic female contact for ID = 3.0, 4.0 or 6.0 mm / (OD) = 3.0, 4.0 or 6.0 mm (10 pieces per pack)

The female contact is available in versions with or without the shut-off function.

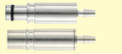
Please note the following when determining your order:

- The connecting profile of the contacts used in the Han® Pneumatic Module Metal are either designed for the hose inner or outer diameter.

Users must select the appropriate versions and dimensions for the housing and mounting frame according to the requirements of their connector applications.

The components needed by users to build pluggable systems for compressed air distribution can be found in the Han® Pneumatic Module Metal and accessories table.

Table 1: Han® Pneumatic Module Metal and accessories

Identification	*M/F*	*Part no.*	*Ø*	Product image
Han® Pneumatic Module Metal	*M / F*	*09140033501*	*3 / 4 / 6 mm*	
Male ID contact *Female ID contact*	*M* *F*	*09140006303* *09140006403*	*3 mm*	
Male OD contact *Female OD contact*	*M* *F*	*09140006353* *09140006453*	*3 mm*	
Male ID contact *Female ID contact with shut-off*	*M* *F*	*09140006303* *09140006413*	*3 mm*	
Male OD contact *Female OD contact with shut-off*	*M* *F*	*09140006353* *09140006463*	*3 mm*	
Male ID contact *Female ID contact*	*M* *F*	*09140006304* *09140006404*	*4 mm*	
Male OD contact *Female OD contact*	*M* *F*	*09140006354* *09140006454*	*4 mm*	
Male ID contact *Female ID contact with shut-off*	*M* *F*	*09140006304* *09140006413*	*4 mm*	
Male OD contact *Female OD contact with shut-off*	*M* *F*	*09140006354* *09140006464*	*4 mm*	
Male ID contact *Female ID contact*	*M* *F*	*09140006306* *09140006406*	*6 mm*	
Male OD contact *Female OD contact*	*M* *F*	*09140006356* *09140006456*	*6 mm*	
Male ID contact *Female ID contact with shut-off*	*M* *F*	*09140006306* *09140006416*	*6 mm*	
Male OD contact *Female OD contact with shut-off*	*M* *F*	*09140006356* *09140006466*	*6 mm*	
Han C contact adapter	*M* *F*	*09140006391* *09140006491*		
Contact lubricant		*09990000829*		

2. About this document

This document describes the possibilities for using the Han® Pneumatic Module Metal in HARTING modular connectors.

2.1 Target group

This document is aimed at the developers and planners of compressed air distribution systems. It is also intended for all persons responsible for assembling, installing, servicing or dismantling the pneumatic components found in HARTING industrial connectors.

2.2 Explanation of the formats and styles used here

This document uses the following special formats:

⚠ WARNING	**Precautionary statement** indicating a hazardous situation which if not avoided could result in death or serious injury.

Blue font indicates references to other chapters or links to websites.

A ► marks information used for checking or feedback. This information can help you to successfully complete an installation step.

3. General information

HARTING modular connectors meet the requirements for safety and testing as detailed in DIN EN 60 664-1 and DIN EN 61 984. The safety of modular connectors can be first ascertained when they are actually in the application (e.g. after the individual components have been selected and assembled together). This chapter defines the proper and intended usage of Han® Pneumatic Modules. It also provides general safety instructions for using the modules in the Han-Modular® connectors.

The user is responsible for determining that the HARTING industrial connectors comply with the necessary limits and safety regulations. “User” refers to those persons who select, assemble, and/or operate the individual components for the Han® industrial connectors. The technical descriptions of this document specify components; however no warranties or guarantee of specific characteristics are given.

3.1 Proper and intended use

The Han® Pneumatic Module Metal shall be used to transmit properly prepared compressed air in a Han-Modular® industrial connector. The module is suitable for use in pneumatic systems which have an operating pressure not exceeding 10 bar. Any other usage must be first agreed upon with HARTING.

3.2 General safety information

The following safety instructions must be followed during the installation, servicing and removal of Han-Modular® connectors (including the Han® Pneumatic Module):

Requirements for installation

All work that is related to installation, maintenance and removal of the Han-Modular® connectors must be performed by qualified, trained staff. If electrical modules are being used within the EU, this work must be carried out by qualified personnel in accordance with DIN EN 50110-1/-2 and IEC 60364. The relevant national accident prevention regulations must also be observed.

Never plug or unplug while under voltage or load

Han-Modular® connectors must never be plugged in or unplugged while electrical voltages or loads are applied. This prohibition does not apply if the connector contains only pneumatic modules.

Protection against electric shock

Han-Modular® connectors are designed for over-voltage category III (DIN EN 60 664-1). Users must ensure that the connector is properly installed to protect against electric shock. This protection can be ensured by using the hoods and housings provided by HARTING or by other measures that the user takes during the installation.

Only suitable for compressed air

The Han® Pneumatic Module Metal is only suitable for the transmission of dry, properly prepared compressed air. Do not use valves or sockets from the Han® Pneumatic Module Metal for transmitting other media such as other gases or liquids. Any usage that deviates from this purpose is not permissible unless it has been clarified with the relevant national associations for electrical engineering (e.g. in Germany: the VDE Association for Electrical, Electronic & Information Technologies or its regional organisations).

Permissible degree of pollution/contamination

Han-Modular® connectors are designed by default for pollution degree 3. All HARTING industrial connectors with IP54 protection or higher (IP protection classes according to DIN EN 61 984, section 6.19.2.3) comply with this pollution degree. Even connectors with a lower IP protection class are suitable for use as pollution degree 3 when they are equipped with a cap that provides them with IP54 or higher while disconnected.

Obligation for coding connectors when using multiple connectors

Connectors arranged side by side, whether they are similar or of different design, must be coded so that they cannot be plugged in improperly (refer to section 4.4, page 13-14).

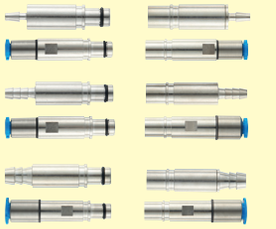
4. Technical description

4.1 Module and contacts

The Han® Pneumatic Module Metal is used to create pluggable connections for transmitting dry, properly prepared compressed air in pneumatic systems.

The female contact is available in versions with or without the shut-off function. In the shut-off version, a spring-loaded valve closes over an O-ring when the connector is opened. This prevents compressed air from escaping. When plugged in, the male contact presses against the valve and keeps the contact open.

Table 2: Technical characteristics

Module		
Number of contacts	3	
Colour	Blue	
Material	Polycarbonate	
Limiting temperatures	-20 °C ... +80 °C	
Flammability acc. to UL 94	V 0	
Mechanical working life	≥ 10,000 mating cycles	
Contacts		
Material	Stainless steel	
Colour	Metallic	
Hose connection		
- Inner diameter (ID)	- 3.0 mm - 4.0 mm (1/8") - 6.0 mm	
Operating pressure	10 bar (145 psi)	
Seals		
Material	NBR	
Shut-off valve		
Material	Polycarbonate	

4.2 Flow rate and pressure drop across the contact

To assist designers and planners as they select and dimension their compressed air systems, HARTING has determined the maximum flow rate, the pressure drop for the contacts of the Han® Pneumatic Module Metal.

Flow rate

The flow rate specifies the air volume that can be passed through the contacts of the Han® pneumatic Module Metal. The ratio between the prevailing air volume (l/min) and the resulting pressure drop (bar) is shown. This ratio is used to calculate the flow rates for the various Han® Pneumatic Metal contacts, as shown in Table 7. The flow rates were determined for the female contacts with a non-return valve.

Figure 1: Max. flow rate for pneumatic contacts with shut-off

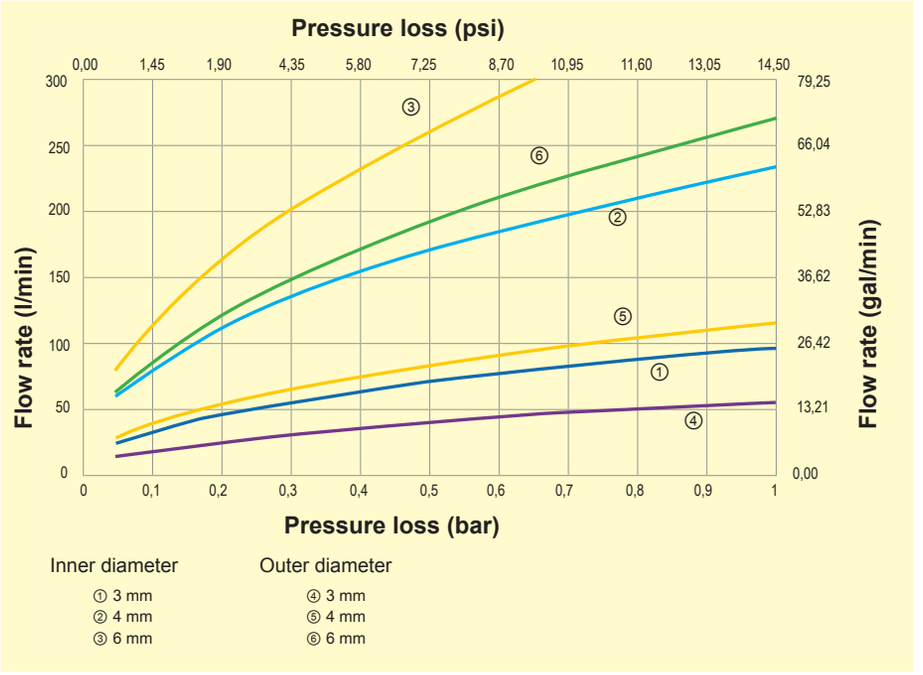
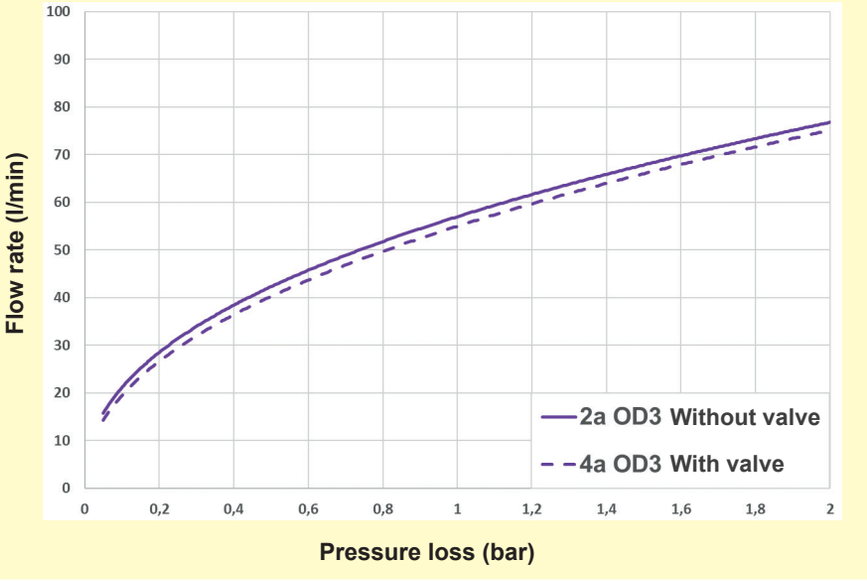


Figure 2: Comparing a female module with/without the shut-off valve



Nominal flow rate

The nominal flow rate describes the volume flowing through the interface at a relative inlet pressure of 6 bar and a pressure drop of 1 bar.

The nominal flow rate is expressed in l/min; it can be used for an initial assessment of a design for pneumatic interfaces.

4.3 Allowed hoods and housings

The Han® Pneumatic Module Metal can be used with a variety of Han® hoods and housings. An additional mechanism is needed for some hoods/housings in order to install the Han-Modular® modules (e.g. the Han® 10 A).

Table 3: Suitable connector hoods/housing for the Pneumatic Module Metal

Type of hood/ housing	Sizes	Number of possible modules
Han® A standard*	10A	1
Han® B standard	6B/10B 16B/24B 32B/48B	2/3/4/6/8/12
Han® EMC	6B/10B 16B/24B	2/3/4/6
Han® M	6B/10B 16B/24B 48B	2/3/4/6/12
Han® HPR	6B/10B 16B/24B	2/3/4/6
Han-Eco®	6B/10B 16B/24B	3/4/5/7
Han-Yellock®	30/60	2/4
Han® Snap	6B/10B 16B/24B	2/3/4/6
Han-Modular® Compact	-	1
Han-Modular® Twin	-	2

* Requires usage of the Han® A adapter (part no. 09 14 000 0304)

The high construction types of hoods and housings are normally recommended for pneumatic applications. This construction type simplifies the cabling of the modules considerably; there is no need to excessively bend the pneumatic hoses. If OD female contacts with a valve are used in a bulkhead surface-mounted housing, the pneumatic contacts with angled outlets must be selected. When selecting the hoods/ housings, make sure that the bending radii of the pneumatic hoses match their respective installation situations.

4.4 Termination techniques

The Han® Pneumatic Module Metal is offered with two different termination techniques. The selection of the proper pneumatic hose is also very important.

The following information will help you to find the proper combination of pneumatic contact and pneumatic hose:

Push-In termination technique

The pneumatic hose is clamped over the calibrated outer diameter when using the Push-In termination technique. Thus, the pneumatic contact with this connection technique is called OD (e.g. Outer Diameter). This refers to the calibrated diameter of the hose.

Termination technique using inner clamping

The inner clamping method for terminating involves pushing the pneumatic hose over the connecting surface of the pneumatic contact. Pneumatic hoses with a calibrated inner diameter should be used here. Thus, the pneumatic contact with this connection technique is called ID (e.g. Inner Diameter). This refers to the calibrated diameter of the hose.

Use of male and female guiding pins

For applying the Han® Pneumatic Module Metal the use of male (part no. 09 14 000 9908) and female guiding pins (part no. 09 14 000 9909) is not necesseraily required. The reason is that the module can withstand an oblique lengthwise tilt of more than ±5°, in accordance with DIN EN 175 301-801. However, the use of the male and female guiding pins is still helpful when coding adjacent industrial connectors. Possible codings are shown in the table below (Figures 2 and 3, page 14).

Coding for the Han-Modular® series

Figure 2: Connector with one frame

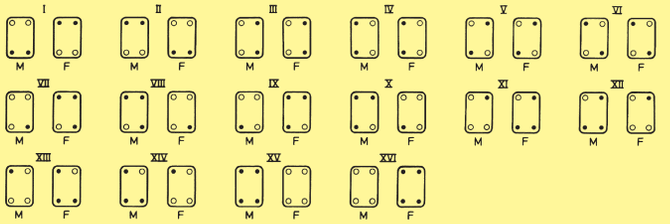
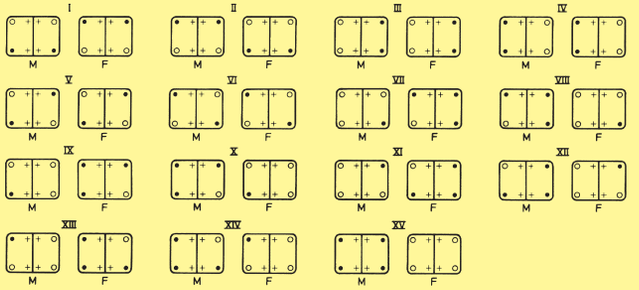


Figure 3: Connector with two frames



Legend:

● Guiding pin

○ Female guide pin

M = male

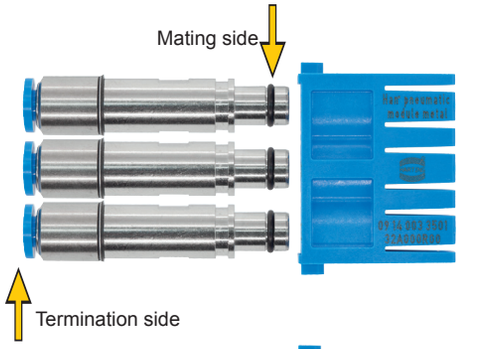
F = female

\+ Fixing screw

5. Assembly instructions

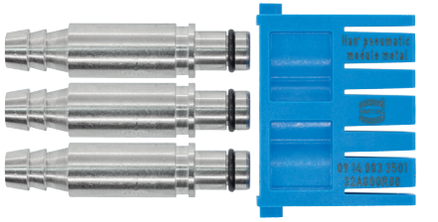
5.1 Assembly

The assembly process is shown using an example of the Han® Pneumatic Module Metal with three pneumatic OD contacts. The pneumatic ID contacts are assembled in a similar fashion.



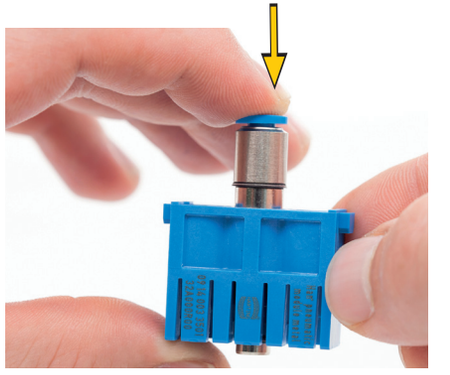
Overview

- Han® Pneumatic Module Metal
- 3 male OD contacts



Overview

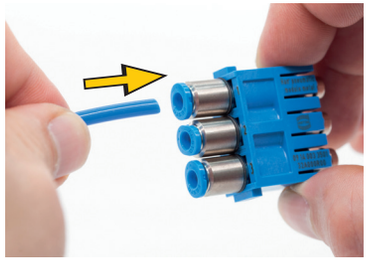
- Han® Pneumatic Module Metal
- 3 male ID contacts



1. Insert the pneumatic contact from the connection side into the pneumatic module until you feel some resistance. Then press the contact forcefully until it snaps into the module.

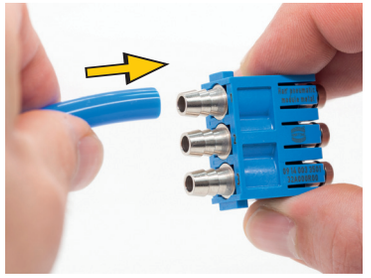
► *You will hear a click when the pneumatic contact is fully inserted into the module.*

► *The assembly of the pneumatic ID contacts is similar to the assembly of the pneumatic OD contacts.*



2. Connect the pneumatic hose with the pneumatic contact. When using the Push-In termination, insert the hose all the way into the termination side of the contact.

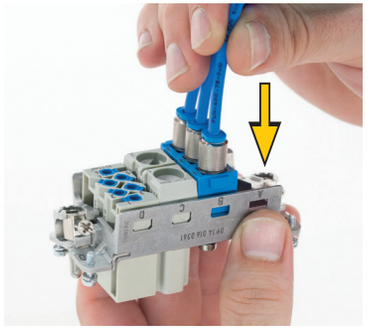
► *Pull gently on the hose to make sure it is securely attached.*



3. Connect the pneumatic hose with the pneumatic contact. When using the ID termination technique, push the hose onto the contact.

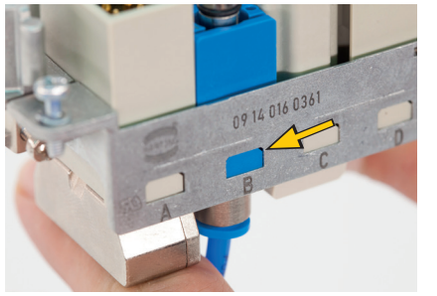
► *Make sure that the end of the hose is protruding beyond the upper profile ring.*

► *Pull gently on the hose to make sure it is securely attached.*



4. You can now install the completely assembled Pneumatic module in the Han-Modular® Hinged Frame.
Open the hinged frame and then put the module in its proper position.

► *Make sure that the module notches fit into the recesses of the hinged frame.*



5. After you have completely loaded the Han-Modular® Hinged Frame, close it by gently pressing on the outer sides of the frame.

► *Make sure that the module's notches fit precisely into the recesses of the hinged frame.*

6. Slide the Han-Modular® Hinged Frame into the hood/housing.

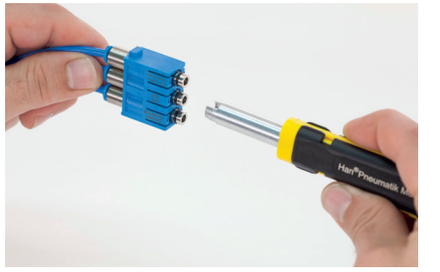
► *Make sure that the hoses are properly guided through the cable gland.*

► *Use the four screws to mount the frame in the housing.*

5.2 Removal

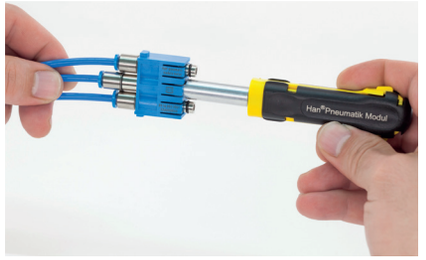
A specially designed removal tool is needed to remove the pneumatic contacts from the module.

Part number: 09 99 000 0899



1. Insert the removal tool into the mating side of the Pneumatic module.

► *The tool's prongs must spread apart the module's holding latches.*



2. With the removal tool properly inserted, pull the contact out of the module.

3. In order to remove the pneumatic hose from a pneumatic contact that uses Push-In termination, press the contact's blue ring while pulling on the hose.

4. In order to remove the pneumatic hose from a pneumatic contact that uses the ID termination technique, cut the hose along its gripping surface.
The hose can then be removed from the pneumatic contact.

6. Preventing malfunctions

Compressed air systems can become contaminated with solid particles, such as metal fragments, water, oils or grease. Such impurities can cause the pressure in the distribution system to drop. Leaks from hoses, contacts or valves can also cause pressure drops. Follow the operating and safety instructions for the compressed air processing/distribution equipment closely (and also for the silencing equipment, where applicable). Also follow the safety instructions from the manufacturers of hoses, valves, and other coupling elements.

⚠ WARNING

Verify isolation from power supply!

If there are electrical modules installed in the Han® industrial connector, you must first make sure that no voltage is applied to the connector before starting maintenance or repairs.
A trained electrician or electrical specialist must verify that there is no live voltage applied.

When troubleshooting the Han® Pneumatic Modules Metal, please note the following:

- The contacts should always be protected against external influences, even when they are unplugged (e.g. use protective caps).
- Check the condition of the pneumatic contacts.
- We recommend using highly resistant heavy-duty tubing for the compressed air for applications that are exposed to harsh conditions.

Pushing Performance

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