SCHUNK

Hand in hand for tomorrow

Monitoring System

VERO-S AFS3 IOL 99; AFS3 IOL 100-75; AFS3 IOL 138; AFS3 IOL 176

VERO-S AFS3 IOL 99; AFS3 IOL 100-75; AFS3 IOL 138; AFS3 IOL 176

Montage und Betriebsanleitung

Assembly and Operating Manual

Dear
Customer,

Thank you for putting your trust in our products and our family-owned company, the leading technology supplier of robots and production machines.

Our team is always available to answer any questions on this product and other solutions. We look forward to your challenging questions. We will find a solution!

Best regards,

The SCHUNK Team

Technical changes:
We reserve the right to make technical improvements.

Document number: 1493213
Version: 03.00 | 08/09/2023 | en

SCHUNK SE & Co. KG
Toolholding and Workholding | Gripping Technology | Automation Technology

Bahnhofstr. 106 – 134
D-74348 Lauffen/Neckar
Tel.+49-7133-103-0
Fax +49-7133-103-2399

info@de.schunk.com
schunk.com

1 General

1.1 About this manual

This manual contains important information for a safe and appropriate use of the product.
This manual is an integral part of the product and must be kept accessible for the personnel at all times.
Before starting work, the personnel must have read and understood this operating manual. Prerequisite for safe working is the observance of all safety instructions in this manual.
NOTE: The illustrations in this manual are intended to provide a basic understanding and may deviate from the actual version.

1.1.1 Presentation of Warning Labels

To make risks clear, the following signal words and symbols are used for safety notes.

⚠ WARNING

Indicates a hazard with a medium degree of risk, which, if not avoided could result in death or serious injury.

CAUTION

Material damage

Information about avoiding material damage

1.1.2 Applicable documents

- General terms of business *
- Catalog data sheet of the purchased product *
- Assembly and Operating Manual for the SCHUNK quick-change pallet system on which the monitoring system is used*
- "SCHUNK monitoring system with IO-Link" software manual

The documents labeled with an asterisk (*) can be downloaded from **schunk.com**.

1.1.3 Sizes

This manual applies to the following sizes:

- AFS3 IOL 99
- AFS3 IOL 100-75
- AFS3 IOL 138
- AFS3 IOL 176

1.2 Warranty

If the product is used as intended, the warranty is valid for 24 months from the ex-works delivery date under the following conditions:
- Observe the applicable documents, see *Chapter 1.1.2 Applicable Documents*
- Observe the ambient and operating conditions, see *Chapter 2.3 Ambient and Operating Conditions*

1.3 Scope of delivery

The scope of delivery includes
- AFS3 IOL monitoring unit
- AFS3 IOL 99 / AFS3 IOL 100-75 / AFS3 IOL 138 / AFS3 IOL 176 attachment kit
- Assembly and Operating Manual

2 Basic safety notes

2.1 Intended use

The monitoring system is used to record the clamping slide position and pallet presence on the SCHUNK quick-change pallet system NSE3.
- The product is intended for installation in a machine/automated system. The applicable guidelines must be observed and complied with.
- The product may only be used within the scope of its technical data, see Chapter 3 Technical Data.

2.2 Not intended use

The product is not a safety component in accordance with the EC Machinery Directive 2006/42/EC and must not be used in safety-relevant parts of machine control systems.

2.3 Environmental and operating conditions

Required ambient conditions and operating conditions

Incorrect ambient and operating conditions can make the product unsafe, leading to the risk of serious injuries, considerable material damage and/or a significant reduction to the product's life span.
- Make sure that the product is used only within its defined application parameters, see *Chapter 3 Technical Data*.
- Make sure that the environment is free from splash water and vapors, as well as abrasion or processing dust. Exceptions to this are products that are specially designed for dirty environments

2.4 Constructional changes

Implementation of structural changes

Modifications, changes or reworking, e.g. additional threads, holes, or safety devices, can damage the product or impair its functionality or safety.
- Structural changes should only be made with the written approval of SCHUNK.

2.5 Spare parts

- Only use original spare parts and spares authorized by SCHUNK.

2.6 Personnel qualification

Any work on the product by inadequately qualified personnel can lead to serious injuries and considerable material damage.
- All work must only be performed by appropriately qualified personnel.
- Personnel must have read and understood the complete manual before beginning any work on the product.
- Observe country-specific accident prevention regulations and the general safety notes.

2.7 Disposal

- Follow local regulations on dispatching product components for recycling or proper disposal.

3 Technical data

	VERO-S AFS3 IOL			
Description	**99**	**100-75**	**138**	**176**
ID number	1488904	1528100	1488905	1536492
Application for SCHUNK quick-change pallet modules	NSE3 99, NSE3 99-K, NSE3 99-V1, NSE3 99-V1-K	NSE3 100-75, NSE3 100-75-K **	NSE3 138, NSE3 138-K, NSE3 138-V1, NSE3 138-V1-K	NSE3 176, NSE3 176-K, NSE3 176-V1, NSE 176-V1-K
Operating temperature [°C]	+5 to +60	+5 to +60	+5 to +60	+5 to +60
Weight [kg]	0.1	0.1	0.1	0.1
Rated voltage [VDC] min. / max.	24 18/30	24 18/30	24 18/30	24 18/30
Current input [mA]	< 15	< 15	< 15	< 15
Protection class	III	III	III	III
Protection class IP	67*	67*	67*	67*
Communication interface	IO-Link	IO-Link	IO-Link	IO-Link
Specification	V1.1	V1.1	V1.1	V1.1
Transmission rate	COM 2 (38.4 kBaud)	COM 2 (38.4 kBaud)	COM 2 (38.4 kBaud)	COM 2 (38.4 kBaud)
Port	Class A	Class A	Class A	Class A

* Applicable only for monitoring unit. Surrounding media may impair sensor values in overall system.

** When using the standard pallet PAL S 119 x 75 no query of the pallet presence is possible

4 Information

4.1 Software

To operate the sensor with IO-Link, an IO-Link master and the corresponding software are required. Operating the monitoring system without an IO-Link master (SIO mode) is not possible due to the complexity of the overall system. The IODD required for operation can be downloaded from **ioddfinder.iolink.com** or **schunk.com**.

4.2 Environment

⚠ WARNING

Surrounding media (e.g. water) influence the sensor signal and may lead to the display of incorrect clamping statuses.

5 Function

The operating principle of the monitoring system is based on several internal sensors. These are evaluated and the results as well as the raw sensor values are transmitted via IO-Link. After each assembly, see *Chapter 6 Assembly and Settings*, a teaching-in procedure is necessary to set the monitoring system to the respective conditions, see *Chapter 6.3 Teaching-In Procedure*.

5.1 Sensors

The sensors detect the following conditions:

Clamping slide sensor	presence sensor
– Opened – Clamped – Closed without clamping pin	– Presence detected – Presence not detected

5.2 LED

The LED on the side of the monitoring system serves as the status display:

	Clamping slide	Presence
No signal	Opened	Detected / not detected
Red	Undefined / closed without clamping pin	Detected / not detected
Green	Clamped	Presence detected
Flashing red	Device error / connection establishment / no IOL connection	Device error / connection establishment / no IOL connection

6 Assembly and settings

CAUTION

Material damage due to incorrect tightening torque!

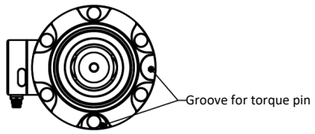
Tighten the screws with the specified torque.

Note:
- Do not use the sensor as a safety component
- Do not pull on the cable of the sensor
- Secure the cable and connector so that they are not taut and cannot move during operation
- Do not exceed the permitted bending radius of the cable
- Do not allow the sensor to come into contact with hard objects or chemicals (in particular nitric, chromic or sulfuric acid)

The sensor is an electronic component that can be sensitive to high-frequency interference or electromagnetic fields.
- Check whether there is sufficient distance between the sources of interference and their supply cables.

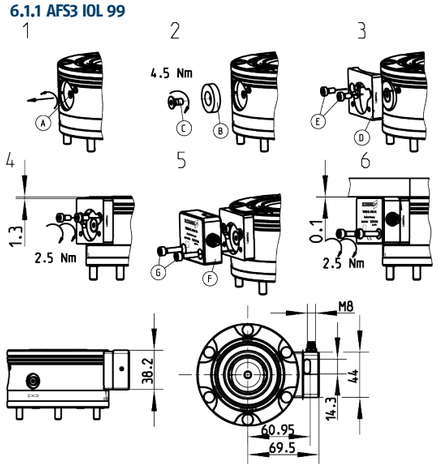
6.1 Mechanical connection

The monitoring system is attached to the existing M4 threaded holes on the outer circumference of the quick-change pallet module using intermediate pieces. A clamping slide extension is also mounted. The exact dimensions can be taken from the installation drawings, which are available from SCHUNK on request. For modules with a torque pin*, the monitoring system can only be mounted on one side:



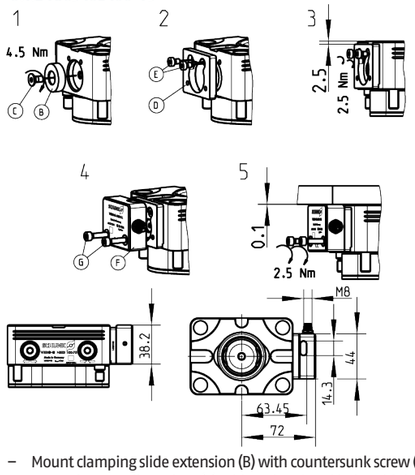
* not applicable for AFS3 IOL 100-75

6.1.1 AFS3 IOL 99



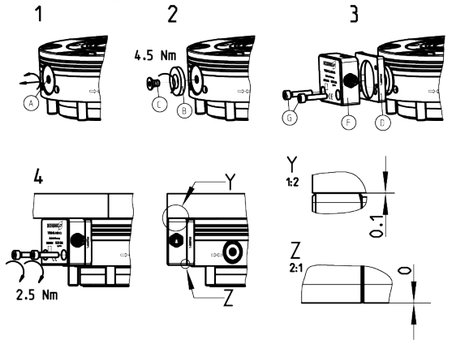
- (if present) Remove set-screw (A)
- Mount clamping slide extension (B) with countersunk screw (C)
- Mount intermediate piece (D) with socket-head bolts with low head (E)
- Screw on monitoring system (F) with socket-head bolts (G), set gap dimension of 0.1 mm with pallet clamped

6.1.2 AFS3 IOL 100-75



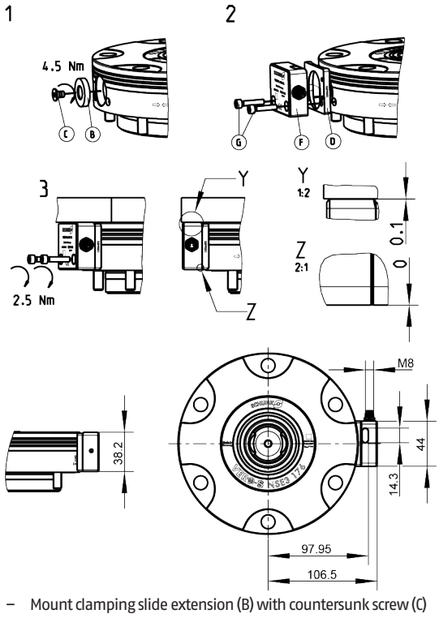
- Mount clamping slide extension (B) with countersunk screw (C)
- Mount intermediate piece (D) with socket-head bolts with low head (E)
- Screw on monitoring system (F) with socket-head bolts (G), set gap dimension of 0.1 mm with pallet clamped

6.1.3 AFS3 IOL 138



- (if present) Remove set-screw (A)
- Mount clamping slide extension (B) with countersunk screw (C)
- Screw on monitoring system (F) with intermediate piece (D) with socket-head bolts (G), set gap dimension of 0.1 mm with pallet clamped

6.1.4 AFS3 IOL 176

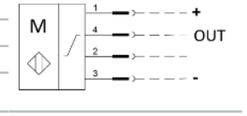


- Mount clamping slide extension (B) with countersunk screw (C)
- Screw on monitoring system (F) with intermediate piece (D) with socket-head bolts (G), set gap dimension of 0.1 mm with pallet clamped

6.2 Electrical connection

Device side		Connection by customer *(not included in scope of delivery)*	
– Connector M8 4-pin – Class A – DIN EN 61076-2-104 (M8)	Male	– Socket M8 4-pin – Class A – DIN EN 61076-2-104 (M8)	Female

PIN	Signal	Description	Connection diagram
1	L+	+24	
2	I/QN	Not assigned	
3	L-	GND	
4	C/Q	Switching signal IO-Link (SDCI)	



6.3 Teaching in

After each assembly, the AFS3 IOL must be taught-in for the operating conditions. The exact sequence for this teaching-in procedure is described in the software manual "SCHUNK Monitoring Systems with IO-Link".

SCHUNK

Hand in hand for tomorrow

Monitoring System

VERO-S AFS3 IOL 99; AFS3 IOL 100-75; AFS3 IOL 138; AFS3 IOL 176

VERO-S AFS3 IOL 99; AFS3 IOL 100-75; AFS3 IOL 138; AFS3 IOL 176

Montage und Betriebsanleitung

Assembly and Operating Manual

Dear
Customer,

Thank you for putting your trust in our products and our family-owned company, the leading technology supplier of robots and production machines.

Our team is always available to answer any questions on this product and other solutions. We look forward to your challenging questions. We will find a solution!

Best regards,

The SCHUNK Team

Technical changes:
We reserve the right to make technical improvements.

Document number: 1493213
Version: 03.00 | 08/09/2023 | en

SCHUNK SE & Co. KG
Toolholding and Workholding | Gripping Technology | Automation Technology

Bahnhofstr. 106 – 134
D-74348 Lauffen/Neckar
Tel. +49-7133-103-0
Fax +49-7133-103-2399

info@de.schunk.com
schunk.com

7 Parts list

Item		Designation	Quantity	Note
1	D	Intermediate piece NSE3 AFS3 IOL	1	
2	B	Clamping slide extension NSE3 AFS3 IOL	1	
3	C	Countersunk screw	1	
4	E	Socket-head bolt with low head	2	99 / 100-75
	G	Socket-head bolt	2	138 / 176
5	G	Socket-head bolt	2	99 / 100-75
6	F	AFS3 IOL monitoring unit	1	

Part list key			
99	for NSE3 AFS3 IOL 99	138	for NSE3 AFS3 IOL 138
100-75	for NSE3 AFS3 IOL 100-75	176	for NSE3 AFS3 IOL 176

8 Troubleshooting

8.1 LED flashes red

Possible cause	Solution(s)
Device error	Check device and operating conditions
No IOL connection	Check IOL connection, reconnect if necessary

8.2 Monitoring system delivers incorrect values

Possible cause	Solution(s)
Screw connection	Check the fit of the screw connections
Faulty gap dimension	Set gap dimension to 0.1 mm from pallet
Clamping slide extension	Check whether the clamping slide extension is mounted correctly
Clamping pins	Check whether the clamping pin in the pallet is correctly mounted and tightened with the specified torque
Operating conditions	Teaching in monitoring system again
Surrounding media	Teach-in Monitoring system in media in which it is operated

9 CE Declaration of Conformity

EC declaration of conformity

in accordance with the Directive 2014/30/EU (electromagnetic compatibility), Annex IV, of the European Parliament and of the Council of 26 February 2014.

The manufacturer is solely responsible for the issuing of this EU declaration of conformity.

Manufacturer: H.-D. SCHUNK GmbH & Co. Spanntechnik KG
Lothringer Str. 23
D-88512 Mengen

We hereby declare that on the date of the declaration the following mentioned product, based on its construction and design as well as the version thereof released by ourselves commercially, complies with all basic safety and health regulations found in the directive 2014/30/EU.
This declaration is no longer valid if the product is modified.

Product designation: Monitoring System VERO-S AFS3 IOL

Type designation: VERO-S AFS3 IOL 99, VERO-S AFS3 IOL 138, VERO-S AFS3-R IOL 138, VERO-S AFS3 IOL 100-75, VERO-S AFS3 IOL 176

Ident number: 1488904, 1488905, 1491363, 1528100, 1536492

Serial number: ...

The object of declaration described above satisfies the following harmonization legislation:

2011/65/EU RoHS Directive
EG 1907/2006 REACH Regulation

Applied harmonized european standards:

DIN EN ISO 12100:2011-03
EN 55011:2016 +A1:2017 +A11:2020
EN 61000-6-2:2019
EN 61131-9:2013
EN 61000-4-2:2009
EN IEC 61000-4-3:2020
EN 61000-4-4:2012
EN 61000-4-6:2014
EN 61000-4-8:2010

Applied technical standards and specifications:

-

Authorized person to compile the technical documentations:
Philipp Schräder, Address: see manufacturer´s address

Mengen, 16.01.2023 i.V.

Philipp Schräder
Head of the development department clamping technology

FB 104 M_EMV / Änderungsdatei 01, Gedruckt: P. Schräder, Copyright: M. Rieger