ICS LED SIGNALLING UNIT

ICS LED housing
Terminal LED module
2I/1O

ICS LED housing
LED module AS-I 2.1& 2.0
2I/1O

ICS LED housing
Multi-voltage LED module
2I/1O

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TABLE OF CONTENTS

1 CHANGE MANAGEMENT

CHANGES	INDEX	DATE	PAGES	INITIALS
Initial version	1	March 2014	/	F. MERLET
Movement of important points on the possible electrical power supplies on multi-voltage LED modules.	02	October 2014	13 – 15	F. MERLET

2 SAFETY

2.1 *Important information*

Always read the maintenance notice before manipulating the valve.

DANGER!

Failure to observe these instructions can result in serious bodily injury or loss of life.

NOTE!

This can also result in less serious injuries or damage to the equipment.

DANGER!

Electricity can result in serious bodily injury or loss of life.

CAUTION!

This can also result in less serious injuries or damage to the equipment.

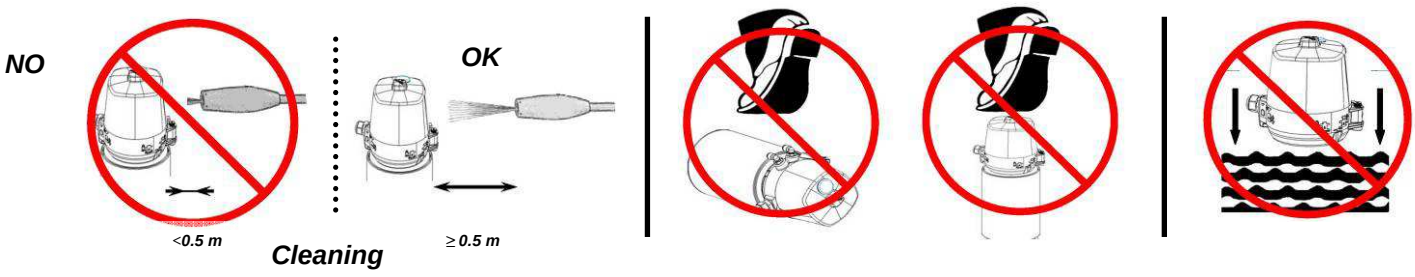
2.2 *General information*

NOTE!

The following advice is given to ensure optimum use of the equipment.

- The tasks must be performed in the order specified.

Forbidden or permitted actions:



MAINTENANCE NOTICE ICS signalling unit

3 INTRODUCTION

The ICS signalling unit is available in 3 configurations: the AS-i 2.1 2I/1O LED module, the 2I/1O multi-voltage LED module and the terminal LED module.

3.1 Disassembling the signalling unit

3.1.1 Disassembling the unit/actuator

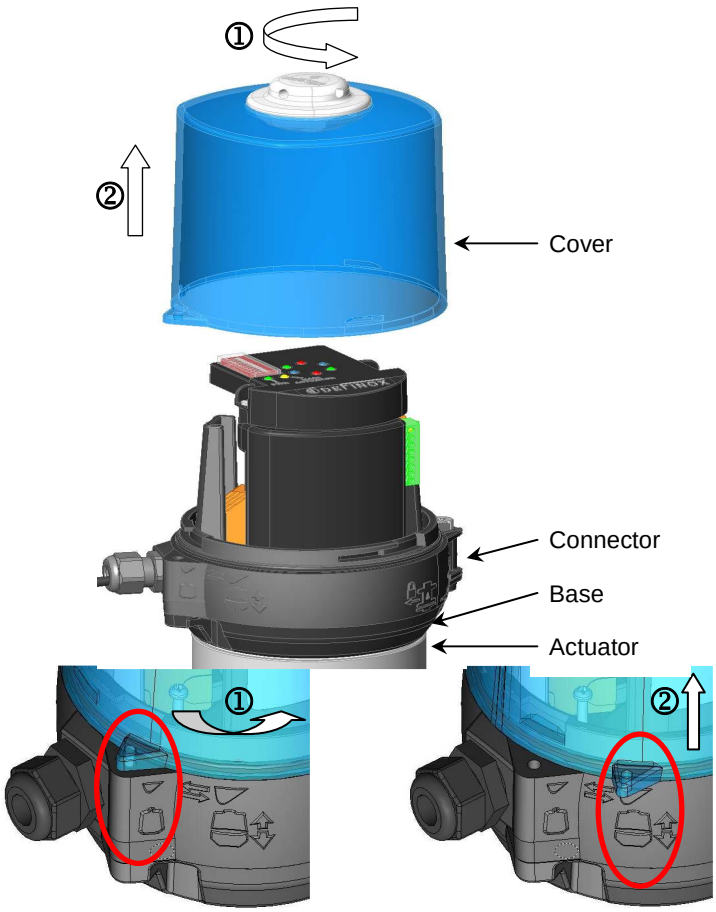
NOTE

Since the retro data LEDs are substantially diffusive, it is recommended not to look directly into the diffusion beam, otherwise there will be a risk of dazzling.

DANGER!

CAUTION: **Before starting any work on the box, it is important to ensure that the mains supply is switched off, that the air supply is closed and that the circuit is purged.**

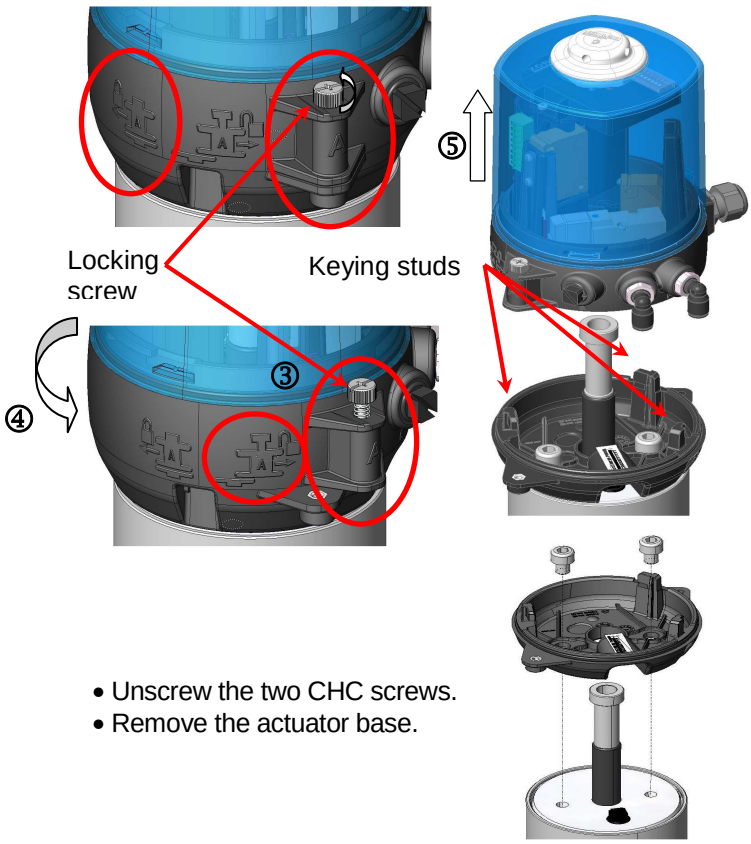
❶ ***Disassembling the cover***



- Turn ① the cover to align the pin with the pictogram, then remove the cover by pulling upwards ②.

❷ ***Disassembling connector - base/actuator***

- Disconnect the air pipes from the box.
- Unscrew the stuffing box assembly, locate and disconnect the wires on the terminal or on the supply module, then remove the supply cable, or disconnect and remove the cable from the AS-i module.
- Unscrew③ the locking screw.
- Turn④ the connector (with or without the cover) to release the three keying studs of the base.
- Separate⑤ by pulling upwards.



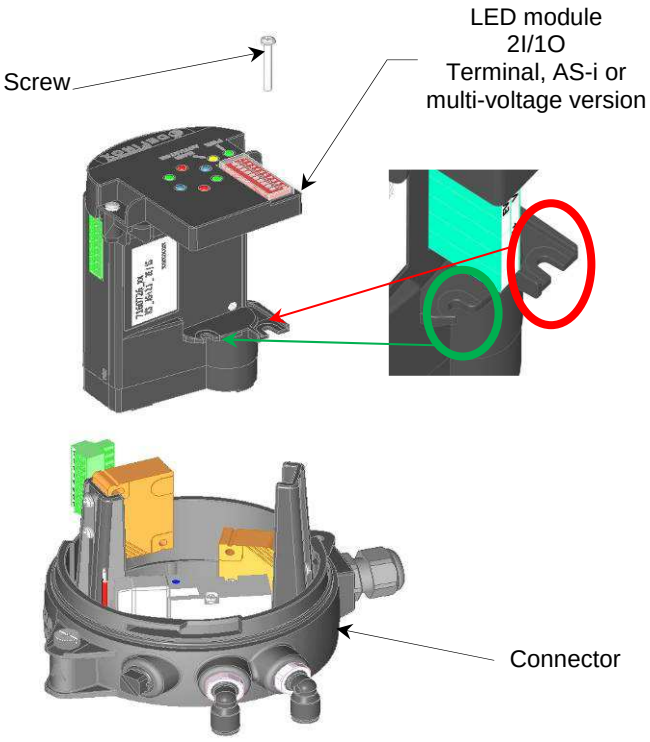
- Unscrew the two CHC screws.
- Remove the actuator base.

3.1.2 ***Disassembling the unit components***

NOTE!

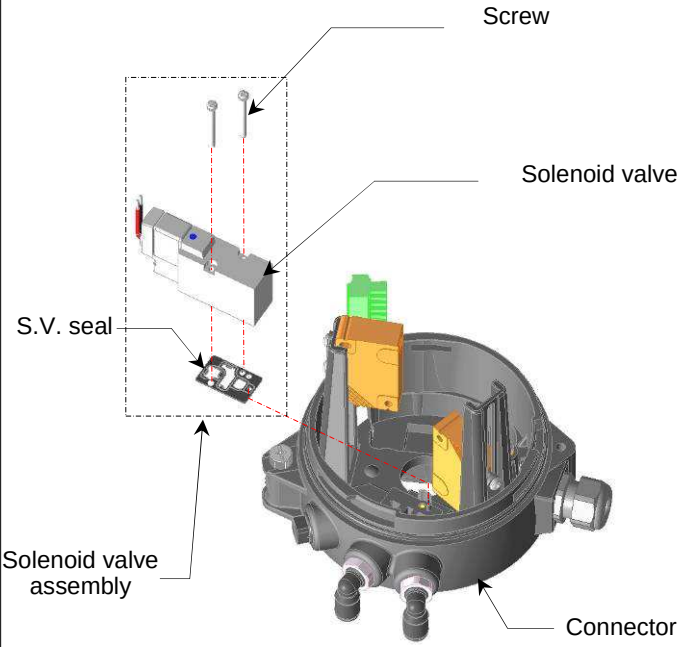
Before disassembling the components, locate and disconnect the wires connected to the LED terminal or multi-voltage module, and also those on the connector.

❸ ***Disassembling the module***



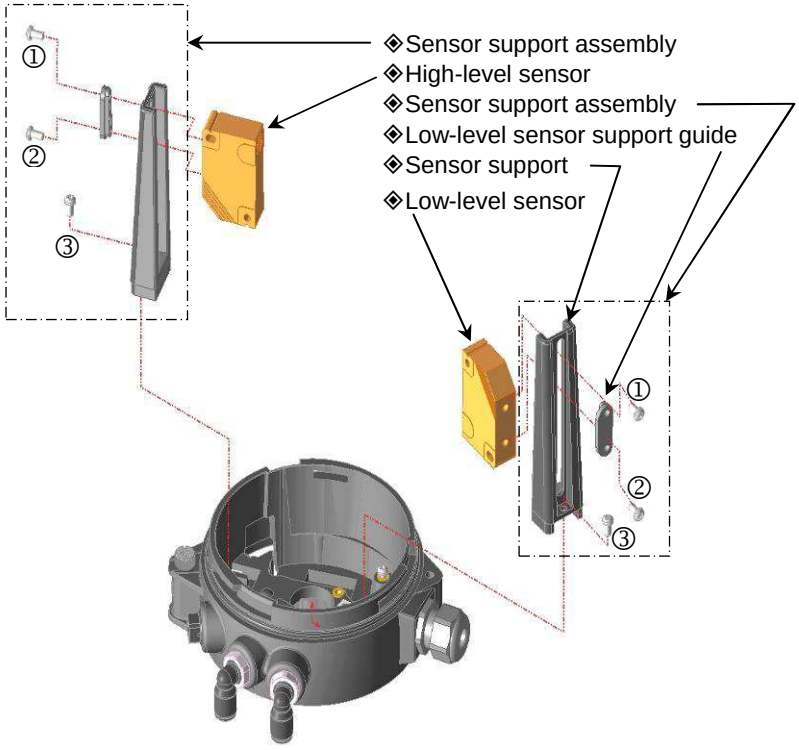
- Unscrew the fastening screw of the LED module and remove the module.

❹ ***Disassembling the SVs***



- For each solenoid valve, unscrew the two fastening screws on the solenoid valve and remove the solenoid valve together with the seal.

❺ ***Dismantling the sensors***



- Unscrew the fastening screw from the sensor support sub-assembly and remove.
- Unclip and remove the upper and lower sensors from the support sub-assembly.

3.2 Reassembling the signalling unit

3.2.1 Reassembling the unit components

❶ Reassembling the sensors

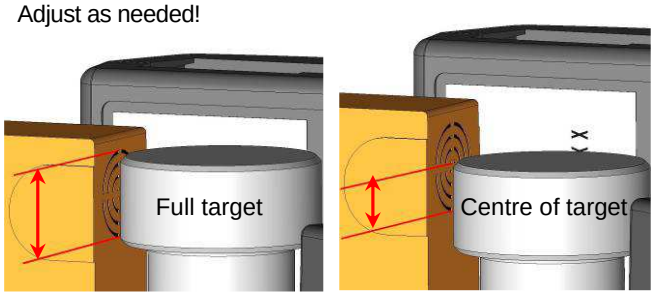
High-level sensing: locking screw side

Low-level sensing: cable gland side

As for removal, in reverse order:

- Position the sensor supports on the connector, fit the screw M3.
- Tightening torque: 0.8 Nm or 8 kgf.cm
- Position the high-level or low-level sensor on its sensor support; position each sensor support guide; fit the two M3 screws.
- Tighten the lower screws.
- Tightening torque: 0.4 Nm or 4 kgf.cm
- Adjust the high position and the low position.
- Tighten the upper screws.
- Tightening torque: 0.4 Nm or 4 kgf.cm

➢ Cam/sensor target adjustment:
The cam can be set anywhere within a range extending from the centre of the target to the full target.
Adjust as needed!

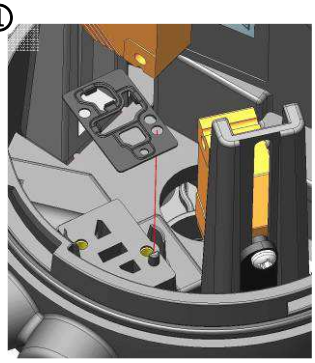


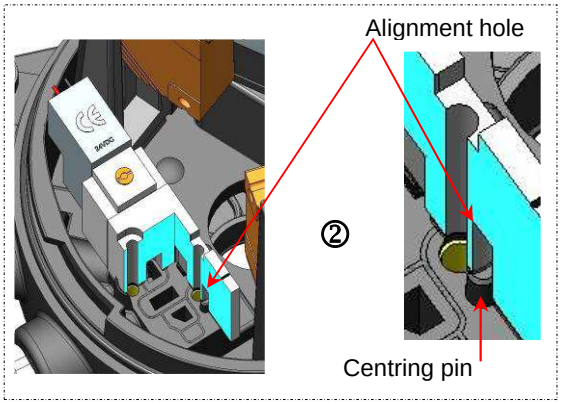
❷ Reassembling the solenoid valve

As for removal, in reverse order:

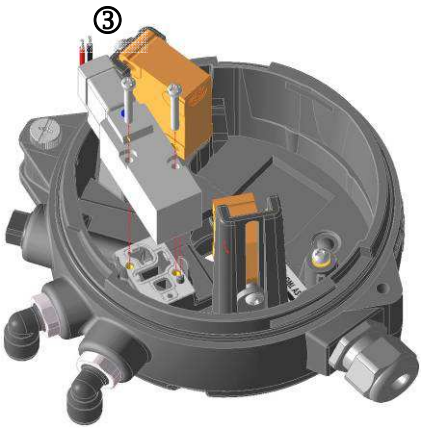
- ①Position the solenoid valve seal between the two walls and align with the centring pin on the connector seating plane.
- ②Align the solenoid valve with the same centring pin.
- ③Fit the two M2.5 fastening screws.
- Tightening torque: 0.4 Nm or 4 kgf.cm

①





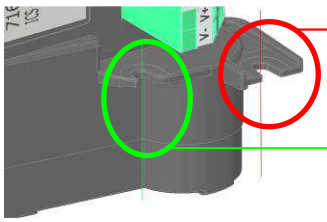
③



❸ Reassembling the module

As for removal, in reverse order:

- Position the AS-i or multi-voltage module in its housing in the connector.
- Fit the M3 screw on the fastening point corresponding to the module configuration.
- Tightening torque: 0.3 Nm or 3 kgf.cm

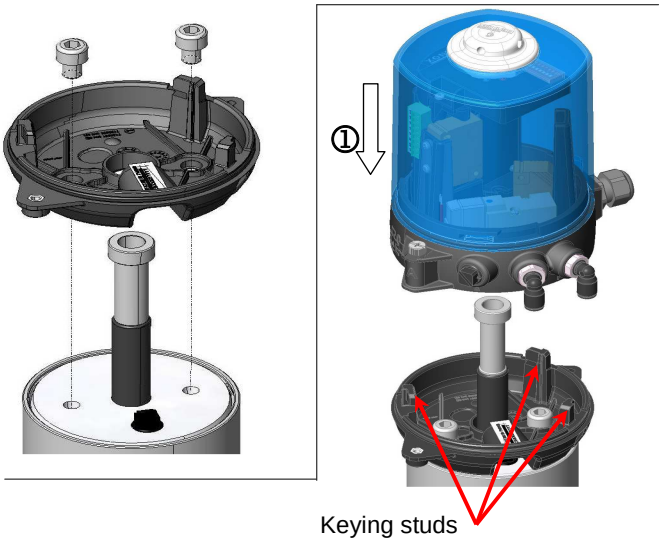


3.2.2 Reassembling the unit/actuator

❹ Reassembling connector - base/actuator

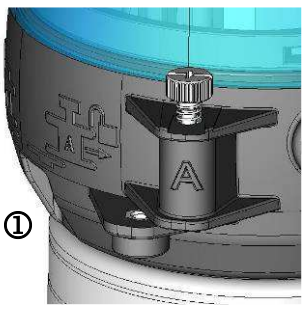
As for removal, in reverse order:

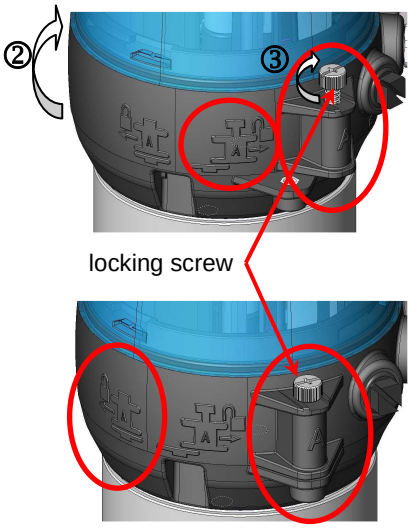
- Position the base on the actuator.
- Fit the two CHC screws (M4 for 32 interaxial, and M8 for 50 interaxial)
- Tightening torque: 0.6 Nm or 6 kgf.cm for the M4 screws.
- Tightening torque: 1 Nm or 10 kgf.cm for the M8 screws.



- ①Position the connector (with or without its cover) on the keying studs on the base.
- ②Turn the connector to lock it on the base.
- ③Tighten the locking screw to secure.
- Connect the pneumatic system.
- Remove the cover if necessary, and connect the wiring according to the type of unit and in accordance with the diagrams given herein.
- Tighten the cable gland.

In order to ensure that it is mounted on the keying studs, position the shape with the letter "A" on the connector relative to the base as shown in the figure below:



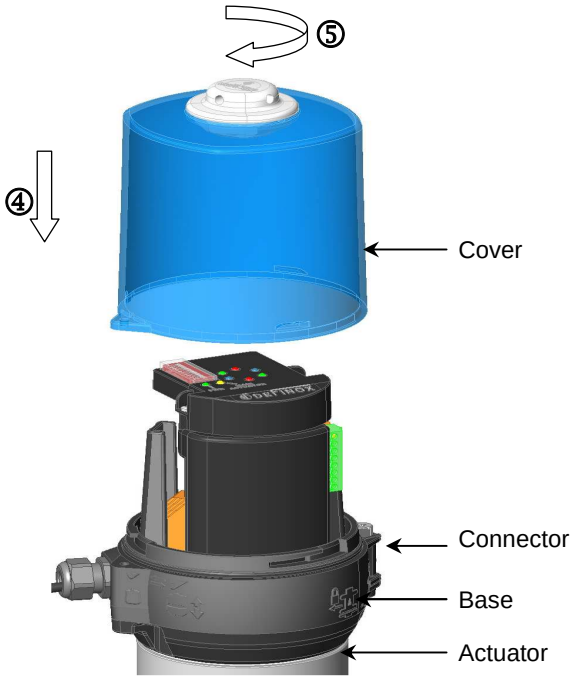


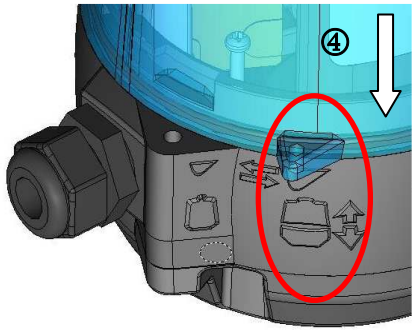
NOTE!

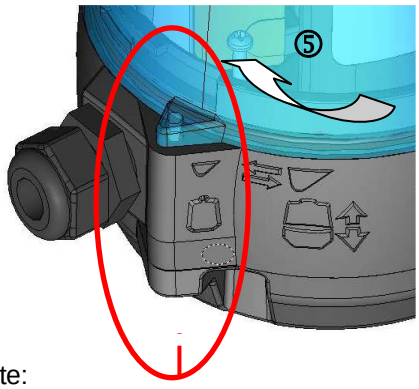
❺ Reassembling the cover

As for removal, in reverse order:

- ④Align the pin of the cover with the "open cover" pictogram, and bring the cover into contact with the connector.
- ⑤Turn the cover in the direction of the arrow to lock the cover: move the pin above the ″cover locked″ pictogram.







Note:
Under normal operation, the base, the connector and the cover can, if necessary, be lead-sealed by means of a wire or a screw in a hole passing through the entire signalling unit.

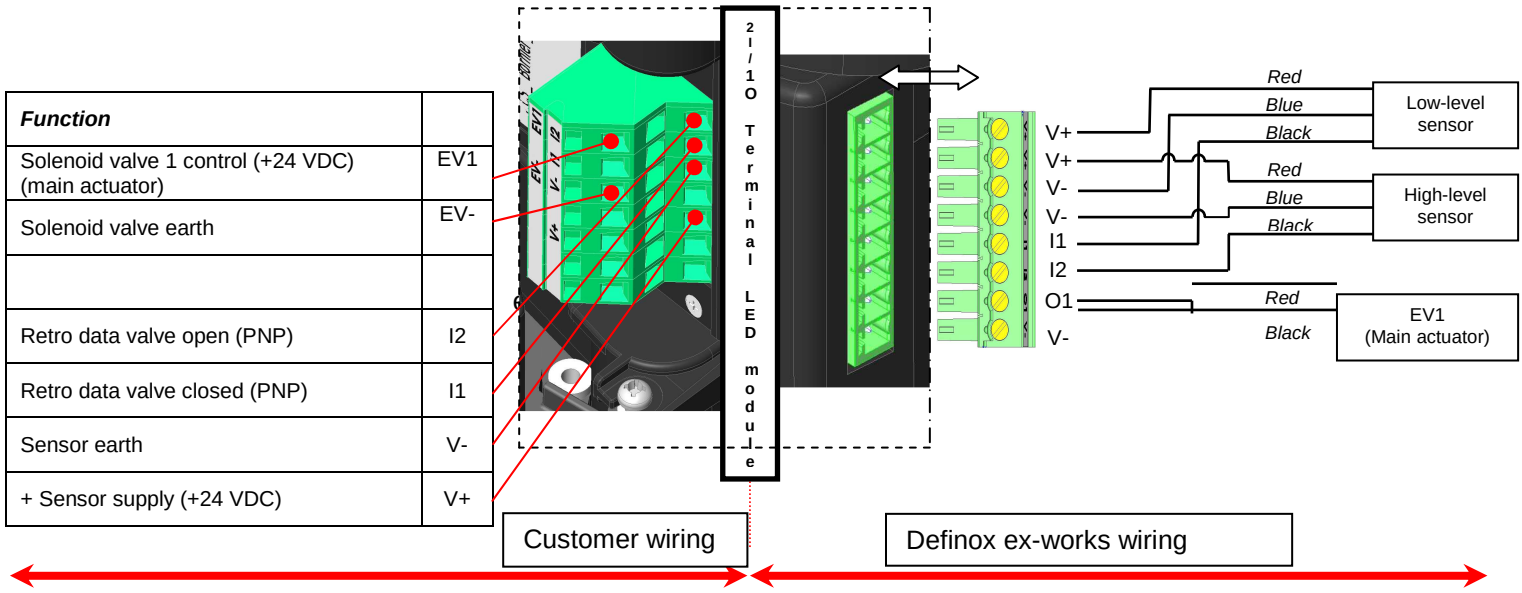
4 TERMINAL LED MODULE VERSIONS

The terminal LED module versions allow you to connect the sensors and the solenoid valves directly to the PLC. In this case the operating voltage of the sensors and the solenoid valves is only 24 VDC +/- 10%.

4.1 Wiring for 2 sensors/1 solenoid valve

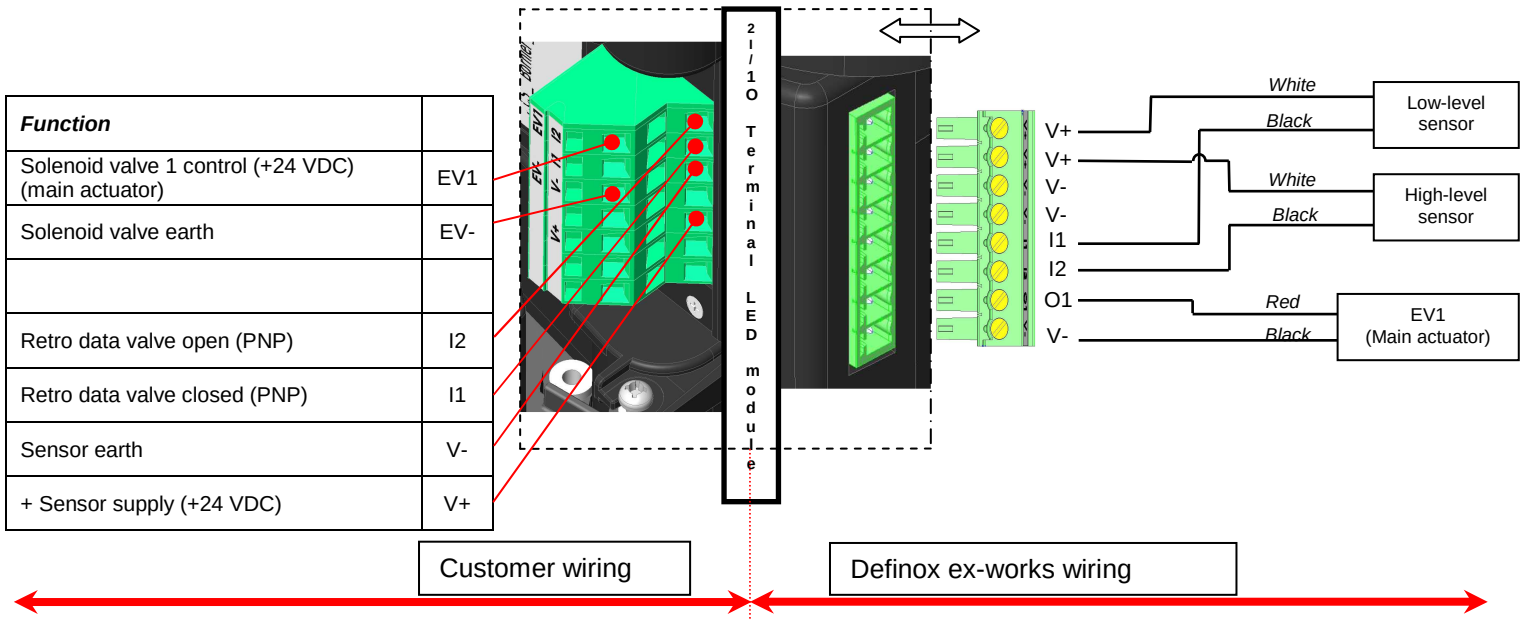
Wiring version for two 3-wire sensors and 1 solenoid valve on 2I / 1O terminal (Standard version)

Function	
Solenoid valve 1 control (+24 VDC) (main actuator)	EV1
Solenoid valve earth	EV-
Retro data valve open (PNP)	I2
Retro data valve closed (PNP)	I1
Sensor earth	V-
+ Sensor supply (+24 VDC)	V+



Wiring version for two 2-wire sensors and 1 solenoid valve on 2I / 1O terminal (Version on request)

Function	
Solenoid valve 1 control (+24 VDC) (main actuator)	EV1
Solenoid valve earth	EV-
Retro data valve open (PNP)	I2
Retro data valve closed (PNP)	I1
Sensor earth	V-
+ Sensor supply (+24 VDC)	V+



4.2 *Meaning of the LEDs in the upper part of the LED module*

The upper part of the LED modules is fitted with LEDs that display the status of the inputs/outputs.

On the upper part of the module	Status	Meaning	Colour parameterisation facility
BLUE LED *	Fixed	Status of the valve closed sensor	Yes
GREEN LED*	Fixed	Status of the valve open sensor	Yes
Main Actuator	Fixed	Status of the main actuator solenoid valve output Yellow LED illuminated = Solenoid valve controlled	No

* parameterisation of the lighting retro corresponding to ex-works parameterisation.
For any modification(s) of the colours of the lighting retro data in order to ensure standard-compliance, refer to the "lighting retro data colour parameterisation" table.

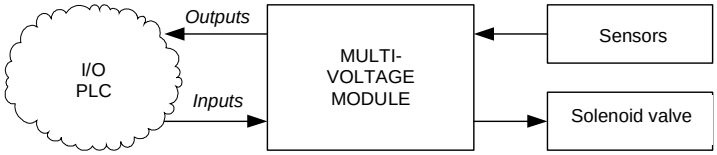
4.3 *Electrical specifications*

General specifications	
Supply voltage • Sensors • Solenoid valves	 24 VDC +/- 10% 24 VDC +/- 10%
Current consumed for 1 active solenoid valve and 1 active sensor	≤ 75 mA
Electromagnetic compatibility	EN61000-6-2, EN61000-6-4
Temperature • operating • storage/transport	 -10 to +60 °C -40 to +85 °C
Sensors	
Supply voltage	24 VDC +/- 10%
Output current	50 mA max
2-wire and 3-wire inductive sensor connection	Yes

Solenoid valves	
Supply voltage	24 VDC +/- 10%
Current consumed	30 mA max
Switching frequency on inductive load	0.5 Hz
Electrical connections to PLC	
Connection type	Spring cage terminal
Conductor section	0.75 mm² max. A cross section of 0.5 mm² is sufficient. Cable diameter: from 4 to 8 mm.

5 MULTI-VOLTAGE LED MODULE VERSIONS

The 24VAC/DC_48VAC/DC multi-voltage LED modules provide the interface between the peripherals (solenoid valves, sensors) and the command control system (PLC). Two different voltages can be used simultaneously on the module.



Terminology:

- ***The input signals*** correspond to the solenoid valve commands.
- ***The output signals*** correspond to the retro data signals from the sensors.

5.1 *The multi-voltage LED module functions*

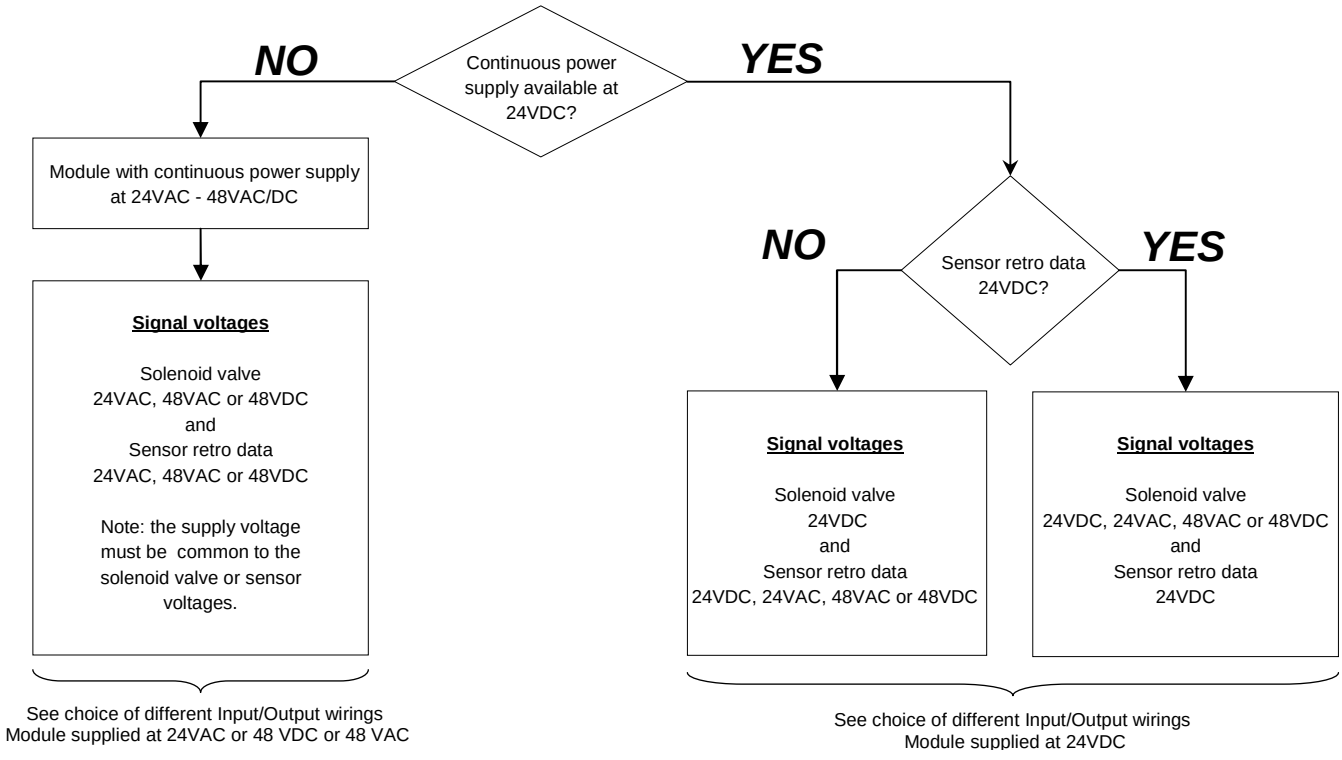
- It adapts the electrical signals between the PLC and the sensors/solenoid valve.
  Reminder: the sensors and the solenoid valve mounted in the signalling unit operate using 24VDC only.
- The retro data signal type can be selected by means of jumpers positioned as required: PNP, NPN or NO.
- In the upper part, it displays the status of the SVs, the presence of the module power supply, the status of the valve, together with the faults. The latter two are also indicated, if required, by lighting retro data in the upper part of the signalling unit.

IMPORTANT

➢ ***It must be ensured that the connection cable has sufficient conductors so that the module has a continuous power supply! (6 conductors for a unit with 1 solenoid valve and 2 sensors: 2 for the module power supply, 2 for the sensor retro data, 2 for the solenoid valve).***

5.2 *Choice of the multi-voltage LED module power supply version*

According to the voltages used on the installation, a power supply voltage will be chosen that will determine the choice of the different wiring diagrams.

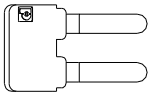


5.3 *LED module with 24VDC power supply*

- The electrical supply of the multi-voltage LED module must be 24 VDC and **continuous**.

CAUTION!

- **Wiring jaw at B1 and B2 essential for 24 VDC power supply**.
- **Must absolutely be removed for other supply voltages, otherwise irreversible damage will be caused to the module.**



- The solenoid valve signals or the sensor signals may have a voltage (24VAC, 48VDC or 48VAC) other than 24VDC.

5.3.1 *Description of the different Input/Output wirings*

The table below gives the following 8 possible wiring diagrams:

- The different voltages,
- The signal types (PNP, NPN, NO, connector used, etc.).

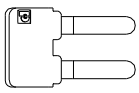
Example:
- Solenoid valve signals: 48VAC + independent connector,
- Sensor signals + fault: 24VDC PNP output.

The diagram to be used is therefore number 5.

Notes:

NOTE!

- Initially, the LED module is configured to be wired according to diagram number 3.
- The 2-point wiring jaws outside B1 and B2 serve to link the CI and CO connectors to V+ or V-.



- The bold red marks on the wiring diagrams represent the jaws of the CO and CI connectors (use tool 7708097 to remove or move the jaws).

Table of the 8 possible wiring diagrams

			SOLENOID VALVE SIGNALS		
			Connector (CO)		
			24 VDC		Independent
SENSOR SIGNALS + FAULT	*Output*	*Voltage*	V+	V-	
	PNP	24 VDC	Diagram No. 1	Diagram No. 3	Diagram No. 5
		48 VDC	Diagram No. 8	Diagram No. 7	
	NPN	24 VDC	Diagram No. 2	Diagram No. 4	Diagram No. 6
		48 VDC	Diagram No. 8	Diagram No. 7	
	NO	24 VAC, 48 VAC	Diagram No. 8	Diagram No. 7	

5.3.2 ***Wiring diagrams***

PNP OUTPUT SENSORS

DIAGRAM No. 1

Signals:
- **Solenoid valves: connector (CO) to 24VDC**
- **Sensors: 24VDC PNP outputs**

	SV	Sensor
24VDC	X	X
24VAC		
48VDC		
48VAC		

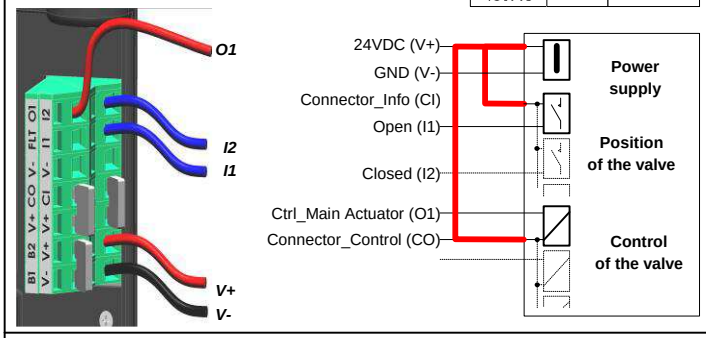


DIAGRAM No. 2

Signals:
- **Solenoid valves: connector (CO) to 24VDC**
- **Sensors: 24VDC NPN outputs**

	SV	Sensor
24VDC	X	X
24VAC		
48VDC		
48VAC		

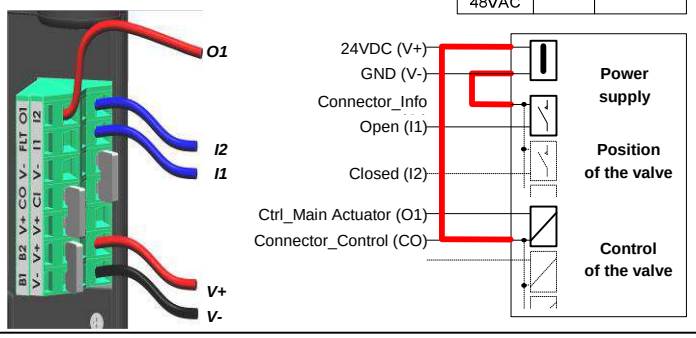


DIAGRAM No. 3

Signals:
- **Solenoid valves: connector (CO) to GND**
- **Sensors: 24VDC PNP outputs**

	SV	Sensor
24VDC	X	X
24VAC		
48VDC		
48VAC		

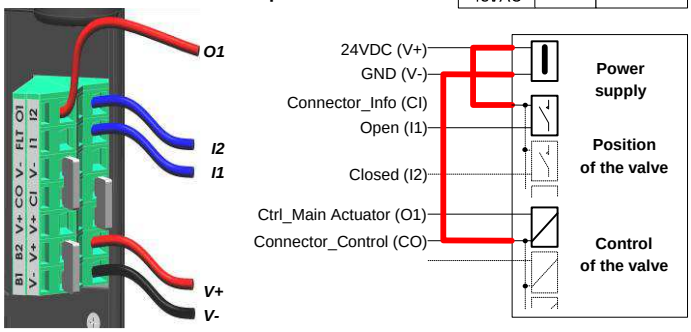
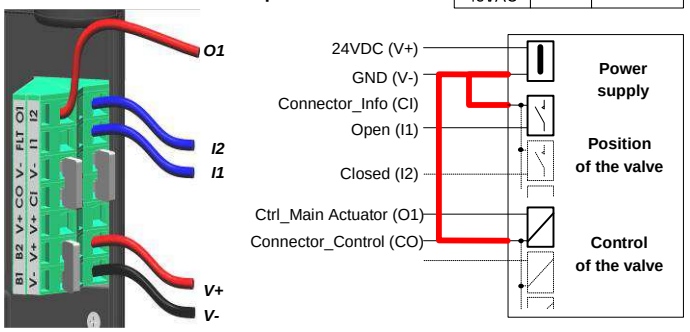


DIAGRAM No. 4

Signals:
- **Solenoid valves: connector (CO) to GND**
- **Sensors: 24VDC NPN outputs**

	SV	Sensor
24VDC	X	X
24VAC		
48VDC		
48VAC		

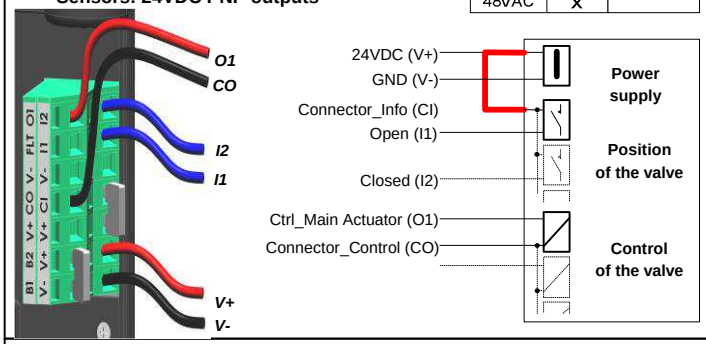


PNP OUTPUT SENSORS

DIAGRAM No. 5

Signals:
- **Solenoid valves: independent connector (CO)**
- **Sensors: 24VDC PNP outputs**

	SV	Sensor
24VDC		X
24VAC	X	
48VDC	X	
48VAC	X	

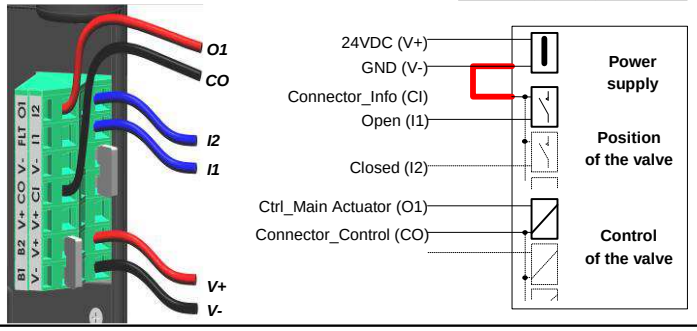


NPN OUTPUT SENSORS

DIAGRAM No. 6

Signals:
- **Solenoid valves: independent connector (CO)**
- **Sensors: 24VDC NPN outputs**

	SV	Sensor
24VDC		X
24VAC	X	
48VDC	X	
48VAC	X	



PNP, NPN OR NO OUTPUT SENSORS

DIAGRAM No. 7

Signals:
- **Solenoid valves: connector (CO) to GND**
- **Sensor: PNP, NPN or NO outputs independent connector.**

	SV	Sensor
24VDC	X	
24VAC		X
48VDC		X
48VAC		X

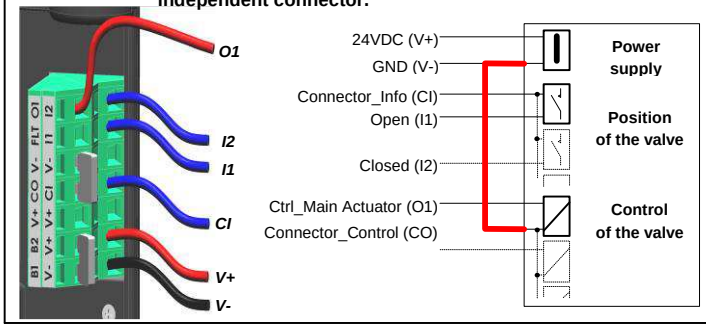
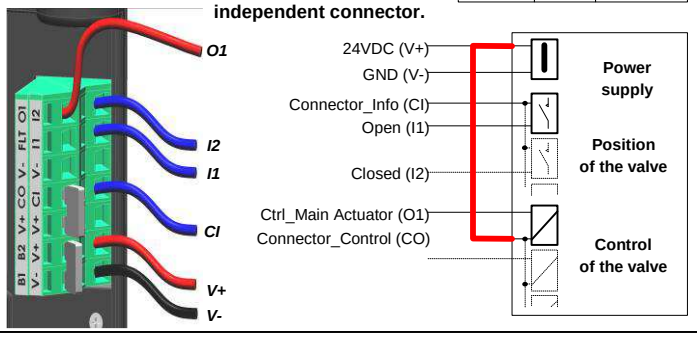


DIAGRAM No. 8

Signals:
- **Solenoid valves: connector (CO) to 24VDC**
- **Sensors: PNP, NPN or NO outputs independent connector.**

	SV	Sensor
24VDC	X	
24VAC		X
48VDC		X
48VAC		X

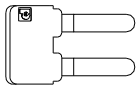


5.4 *LED modules with 24VAC, 48VAC or 48VDC power supply*

- The electrical supply of the multi-voltage LED module must be 24 VAC, 48 VAC or 48 VDC, and **continuous.**

CAUTION!

- **Except for a 24 VDC power supply, it is essential to remove the wiring jaw between B1 and B2, otherwise irreversible damage will be caused to the module.**



- The solenoid valve signals or the sensor signals may have a voltage (24VAC, 48VAC or 48VDC) different from the power supply.

5.4.1 *Description of the different Input/Output wirings*

The table below gives the following 14 possible wiring diagrams:

- the different voltages,
- the signal types (PNP, NPN, NO, connector used, etc.).

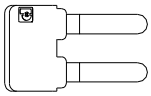
Example:
- Power supply 48 VAC,
- Solenoid valve signals: 48 VAC,
- Sensor signals + fault: 24 VAC NO outputs.

The diagram to be used is therefore number 6.

Notes:

NOTE!

- Initially, the LED module is configured to be wired according to diagram number 1 or 2.
- The 2-point wiring jaws outside B1 and B2 serve to link the CI and CO connectors to V+ or V-.



- The bold red marks on the wiring diagrams represent the jaws of the CO and CI connectors (use tool 7708097 to remove or move the jaws).

Table of the 14 possible wiring diagrams

			SOLENOID VALVE SIGNALS				
			Connector (CO)				
	Output	***Voltage***	24 VAC	48 VAC	48 VDC		Independent
					V+	V-	
SENSOR SIGNALS + FAULT	NO	24 VAC	Diagram No. 1	Diagram No. 6	Diagram No. 13	Diagram No. 14	Diagram No. 3
	NO	48 VAC	Diagram No. 5	Diagram No. 2	Diagram No. 13	Diagram No. 14	Diagram No. 4
	PNP	48 VDC	Diagram No. 5	Diagram No. 6	Diagram No. 7	Diagram No. 8	Diagram No. 11
	NPN		Diagram No. 5	Diagram No. 6	Diagram No. 9	Diagram No. 10	Diagram No. 12

5.4.2 ***Wiring diagrams***

NO OUTPUT SENSORS

DIAGRAM No. 1

Signals:
- **Solenoid valves: connector (CO) to V+**
- **Sensors: 24VAC NO outputs**

	SV	Sensor
24VAC	X	X
48VDC		
48VAC		

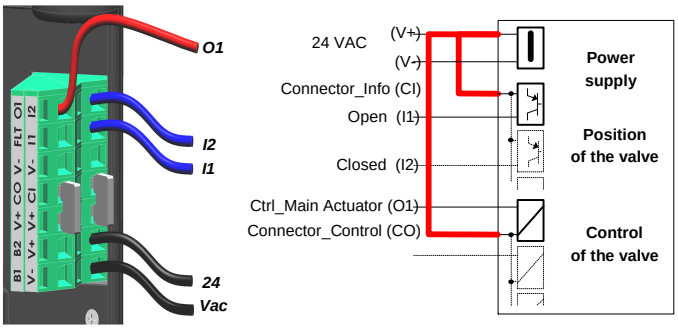


DIAGRAM No. 2

Signals:
- **Solenoid valves: connector (CO) to V+**
- **Sensors: 48VAC NO outputs**

	SV	Sensor
24VAC		
48VDC		
48VAC	X	X

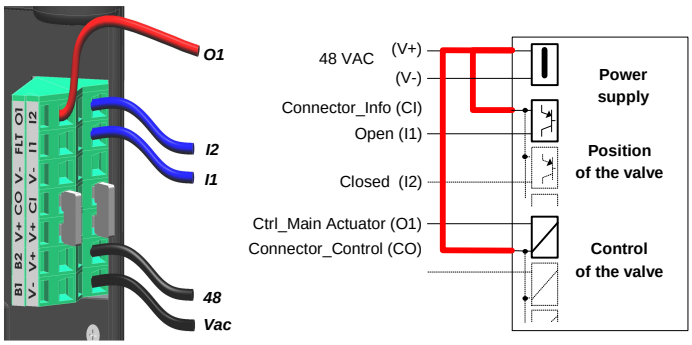


DIAGRAM No. 3

Signals:
- **Solenoid valves: independent connector (CO)**
- **Sensors: 24VAC NO outputs**

	SV	Sensor
24VAC		X
48VDC	X	
48VAC	X	

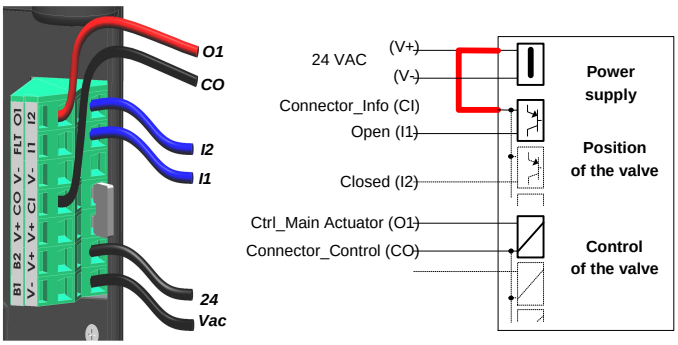
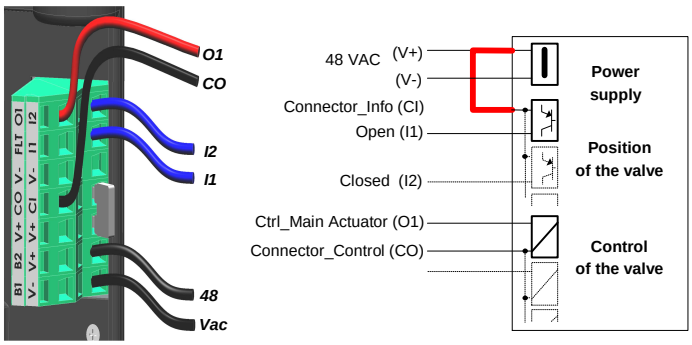


DIAGRAM No. 4

Signals:
- **Solenoid valves: independent connector (CO)**
- **Sensors: 48VAC NO outputs**

	SV	Sensor
24VAC	X	
48VDC	X	
48VAC		X



PNP, NPN OR NO OUTPUT SENSORS (independent connector)

DIAGRAM No. 5

Signals:
- **Solenoid valves: connector (CO) to V+**
- **Sensors: 48VDC PNP or NPN outputs**
  48VAC NO outputs

	SV	Sensor
24VAC	X	
48VDC		X
48VAC		X

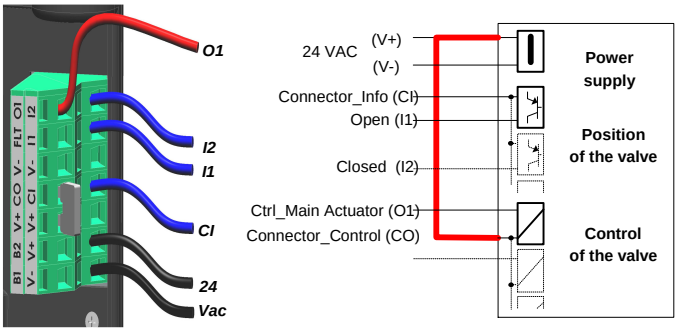
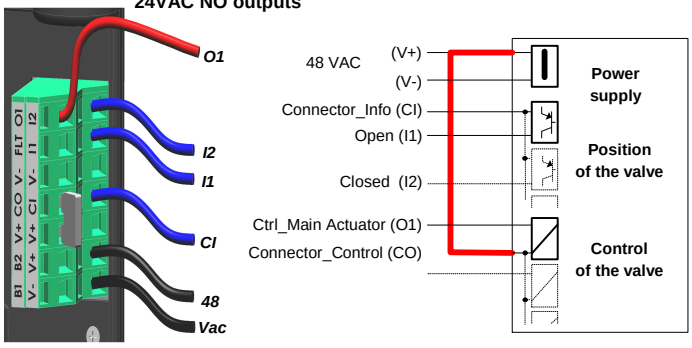


DIAGRAM No. 6

Signals:
- **Solenoid valves: connector (CO) to V+**
- **Sensors: 48VDC PNP or NPN outputs**
  24VAC NO outputs

	SV	Sensor
24VAC		X
48VDC		X
48VAC	X	



PNP OUTPUT SENSORS

DIAGRAM No. 7

Signals:

- **Solenoid valves: connector (CO) to 48VDC**
- **Sensors: 48VDC PNP outputs**

	SV	Sensor
24VAC		
48VDC	X	X
48VAC		

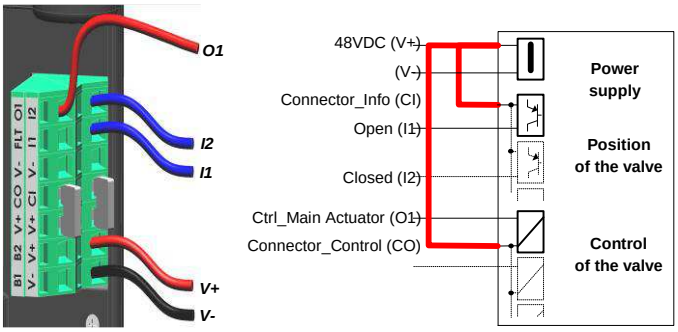


DIAGRAM No. 9

Signals:

- **Solenoid valves: connector (CO) to GND**
- **Sensors: 48VDC PNP outputs**

	SV	Sensor
24VAC		
48VDC	X	X
48VAC		

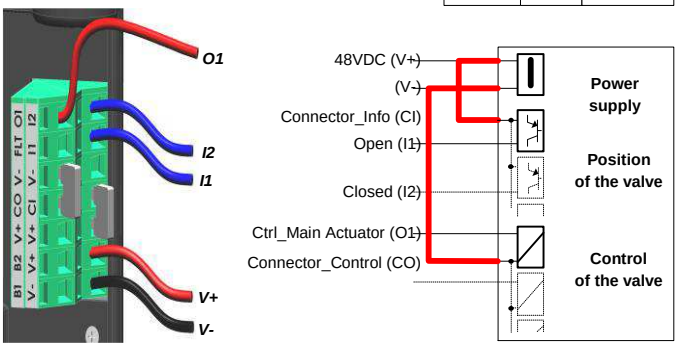
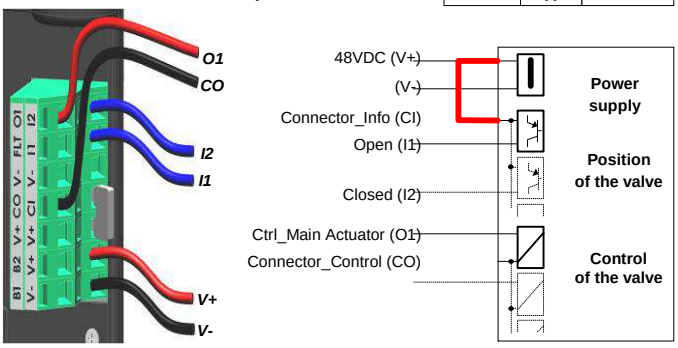


DIAGRAM No. 11

Signals:

- **Solenoid valves: independent connector (CO)**
- **Sensors: 48VDC PNP outputs**

	SV	Sensor
24VAC	X	
48VDC		X
48VAC	X	



NPN OUTPUT SENSORS

DIAGRAM No. 8

Signals:

- **Solenoid valves: connector (CO) to 48VDC**
- **Sensors: 48VDC NPN outputs**

	SV	Sensor
24VAC		
48VDC	X	X
48VAC		

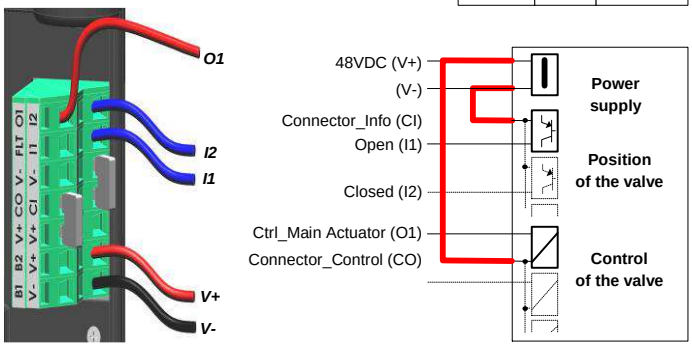


DIAGRAM No. 10

Signals:

- **Solenoid valves: connector (CO) to GND**
- **Sensors: 48VDC NPN outputs**

	SV	Sensor
24VAC		
48VDC	X	X
48VAC		

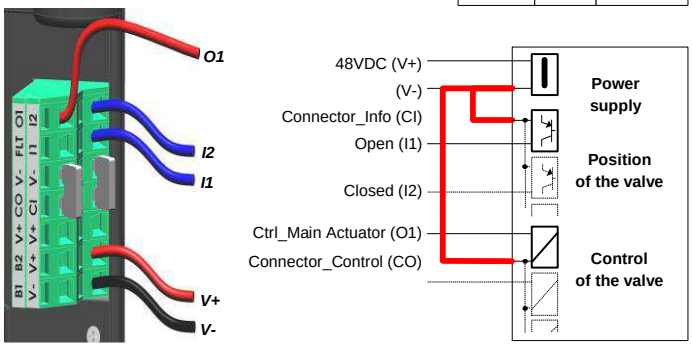
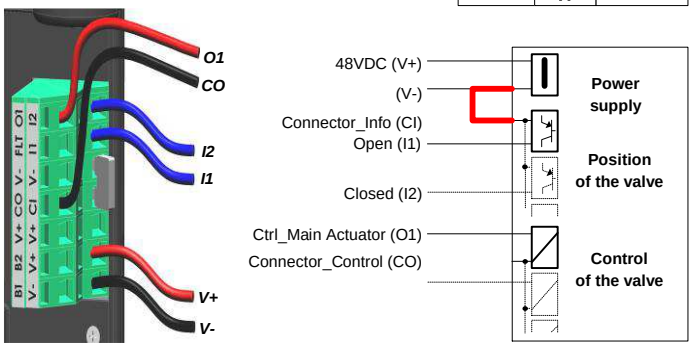


DIAGRAM No. 12

Signals:

- **Solenoid valves: independent connector (CO)**
- **Sensors: 48VDC NPN outputs**

	SV	Sensor
24VAC	X	
48VDC		X
48VAC	X	



NO OUTPUT SENSORS

DIAGRAM No. 13

Signals:

- **Solenoid valves: connector (CO) to 48VDC**
- **Sensors: NO outputs independent connector**

	SV	Sensor
24VAC		X
48VDC	X	
48VAC		X

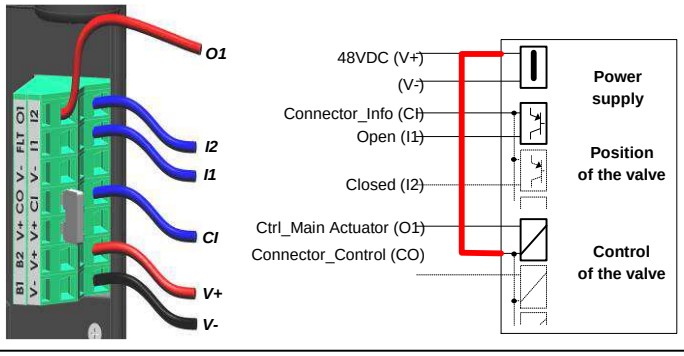
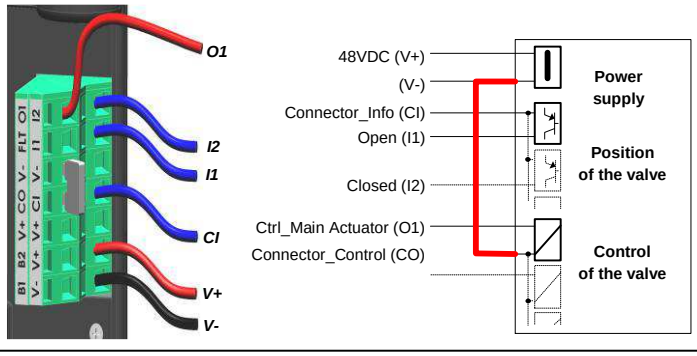


DIAGRAM No. 14

Signals:

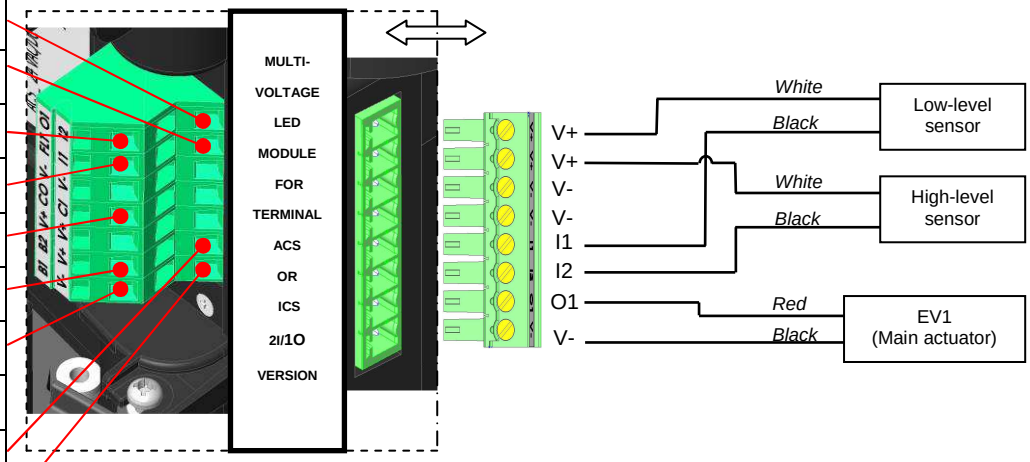
- **Solenoid valves: connector (CO) to GND**
- **Sensors: NO outputs independent connector**

	SV	Sensor
24VAC		X
48VDC	X	
48VAC		X



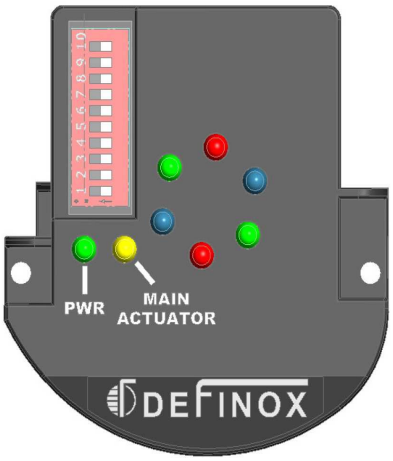
5.5 *Wiring to PLC & signalling unit internal wiring*

Function	
Retro data valve open (PNP)	I2
Retro data valve closed (PNP)	I1
Solenoid valve control 1 (main actuator)	O1
Retro data error	FLT
Solenoid valve connector command (see wiring diagrams)	CO
Shunt to be implemented with B1, if module has 24 VDC power supply	B2
Shunt to be implemented with B2, if module has 24 VDC power supply	B1
Common retro data (see wiring diagrams)	CI
+ Power supply	V+
- Power supply	V-



5.6 *Meaning of the LEDs in the upper part of the LED module*

The upper part of the LED modules is fitted with LEDs that display the status of the inputs/outputs, as well as the presence of the power supply or a local fault.



On the upper part of the module	Status	Meaning	Colour parameterisation facility
RED LED *	Fixed	Power supply fault	Yes
	Flashing	Overload or short circuit fault on a peripheral	
BLUE LED *	Fixed	Status of the valve closed sensor	Yes
GREEN LED*	Fixed	Status of the valve open sensor	Yes
Main Actuator	Fixed	Status of the main actuator solenoid valve output Yellow LED illuminated = Solenoid valve controlled	No
PWR	Fixed	Power supply present Green LED illuminated = module power supply on	No

* parameterisation of the lighting retro corresponding to ex-works parameterisation.
For any modification(s) of the colours of the lighting retro data in order to ensure standard-compliance, refer to the “lighting retro data colour parameterisation” table.

5.7 *Technical specifications of the multi-voltage modules*

General specifications	
Supply voltage	
• 24 VDC modules	24 VDC +/- 5%
• 24 VAC – 48 VAC/DC modules	24 VAC – 48 VAC/DC +/- 10%
Current consumed for 1 active solenoid valve and 1 active sensor	≤ 80 mA DC (24 VDC supply) ≤ 155 mA AC (24 VAC supply) ≤ 60 mA DC (48 VDC supply) ≤ 115 mA AC (48 VAC supply)
Electromagnetic compatibility	EN61000-6-2, EN61000-6-4
Temperature	
• operating	-10 to +60 °C
• storage/transport	-40 to +85 °C
Diagnostic functions	
Supply voltage display	Green “POWER” LED
Unit status display	Red “FAULT” LED
Sensor inputs	
Nominal input voltage	24 VDC
2-wire and 3-wire inductive sensor connection	Yes
Solenoid valve output	
Output voltage	24 VDC
Output current	50 mA max
Switching frequency on inductive load	0.5 Hz
Short-circuit protection	Yes
Electrical connections to PLC	
Connection type	Spring cage terminal
Conductor section	0.75 mm² max. A cross section of 0.5 mm² is sufficient. Refer to the cable gland specifications to find out the maximum aperture diameter for the cable.
Solenoid valve signals from the PLC	
Number	1
Nominal input voltage +/- 10%	24 VAC/DC to 48 VAC/DC
Minimum current	≥ 6mA
Signal type	PNP or NPN
Sensor signals to PLC	
Number	1
Fault signal	Yes
Output voltage +/- 10%	24 VAC/DC to 48 VAC/DC
Output current	50 mA max
Signal type	PNP, NPN or NO

5.8 1ST level maintenance

5.8.1 Power ON indicator light is off

- Check that the LED module power supply is wired correctly.
- Check that the voltage between V+ and V- (two-stage terminal) is equal to 24 VDC +/- 5% or 24 VAC – 48 VAC/DC +/- 10% depending on the voltage chosen to power the LED module.

If the result of these actions is negative, replace the module!

5.8.2 Fault LED illuminated or flashing

Reminder: red LED in ex-works configuration

- Red LED flashing = Overload or short circuit on sensor or solenoid valve.
- Disconnect the sensor/solenoid valve connector and check that the fault has disappeared. Check the sensors and solenoid valve one by one.
- Red LED illuminated = supply voltage too low or overload or short circuit on a peripheral of the LED module (faulty solenoid valve, etc.).
- Check that the voltage between V+ and V- (two-stage terminal) is equal to 24 VDC +/- 5% or 24 VAC – 48 VAC/DC +/- 10% depending on the voltage chosen to power the LED module.
- Disconnect the sensor/solenoid valve connector and check that the fault has disappeared. Check the sensors and solenoid valve one by one.

5.8.3 Testing the solenoid valve

- The green LED on the LED module must be illuminated.
- Control the solenoid valve coil using the PLC.
- Measure the voltage on the peripheral connector using a voltmeter between the terminals O1 and CO. Check that this voltage corresponds to the control voltage of the solenoid valve. If the result of this step is negative, check the wiring between the LED module and the PLC.
- If the “Main actuator” LED is illuminated, measure the voltage on the peripheral connector between the terminals EV1 and EV-. This voltage must be between 20 and 24VDC.
- If this voltage is correct, change the solenoid valve.
- If not, disconnect the peripheral connector. If the “Main actuator” LED is extinguished, change the LED module.

5.8.4 Testing the sensors

The LED module must be connected electrically to the PLC.

- Use a voltmeter to check that the voltage between terminals V+ and V- on the sensor side of the terminal is between 20 and 24 VDC.
- Place a metallic object in front of sensor target to check that the LED on the sensor illuminates correctly.
- The LED does not illuminate: change the sensor and restart the tests at step 1.
- The LED illuminates = measure the voltage using a voltmeter between terminals V- and I1 or I2 on the peripheral terminal of the LED module in order to check that the voltage is ≥12 VDC.
- Check that the LED on the unit corresponding to the sensor is illuminated correctly.
- LED extinguished = change the LED module.
- LED illuminated = check the voltage on the two stage connector between the terminals I1 and CI or I2 and CI depending on the sensor to be tested.
- If the voltage is correct, check the wiring between the LED module and the PLC, otherwise change the LED module.

6 AS-i MODULE VERSIONS

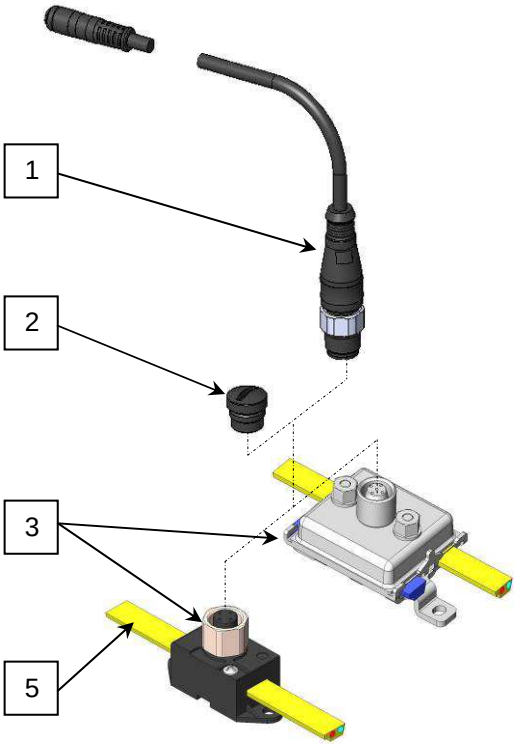
The AS-i LED modules provide the interface between the peripheral devices (solenoid valves, sensors) and the command control system (PLC) via the AS-i network.
AS-i modules are compatible as standard with AS-i 2.1 and can **on request** be supplied in version 2.0.

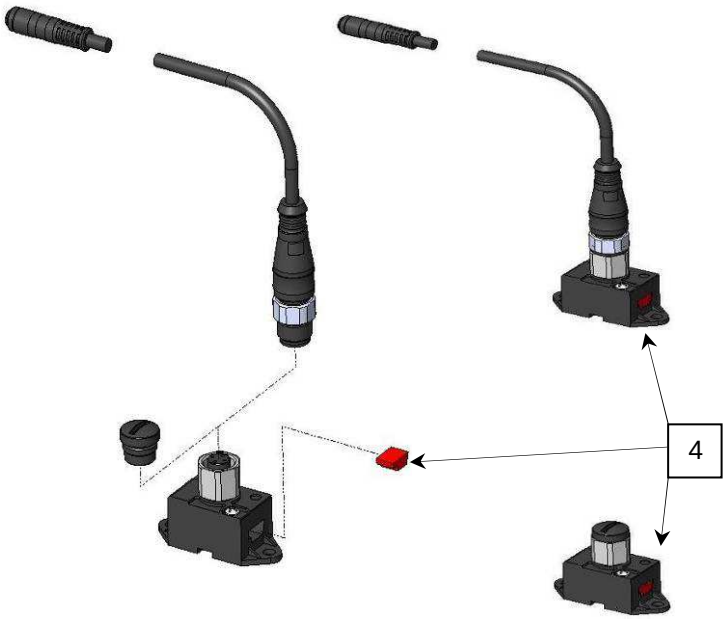
6.1 Wiring to the AS-i network

The connection to the AS-i network [5] (7008024) is established via an M8 - M12 [1] lead and a vampire clip [3] (plastic standard – stainless steel optional).

The M12 connector can be used to disconnect the LED module from the AS-i network and to program the network address via the addressing terminal (7008215).

If a vampire clip is not used temporarily or permanently, then insert the M12 stopper (7008123) [2].



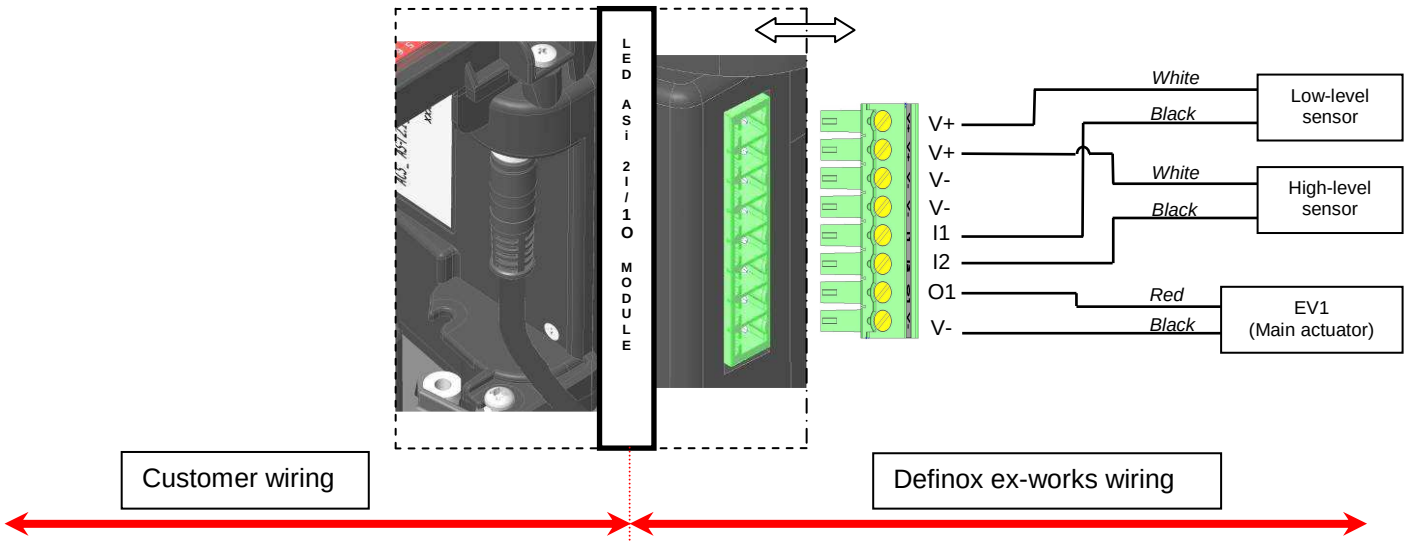


CAUTION!

Note:

- At the end of the AS-i network, insert the seal (7008228) [4] in the plastic vampire clip.

6.2 Wiring to solenoid valves and sensors



6.3 *The AS-i network*

The AS-i network can be wired according to a tree configuration, a linear configuration with sections or a star configuration. These three architectures can be used simultaneously**.**

6.3.1 *AS-i power supplies*

An AS-i power supply is specific to the AS-i network.

- Output voltage between 31.6 VDC and 29.5 VDC
- Output current:
  - 4A for 31 installed slaves
  - 8A for 62 installed slaves

I = (No. of AS-i modules x 0.092) + gateway intensity

6.3.2 *AS-i address programming*

The AS-i address for the module is programmed either via the AS-i master (PLC coupling, gateway, etc.) or via the addressing terminal (7008215).

The M12 connector can be used to disconnect the module from the AS-i network and to program the network address via the 7008215 addressing terminal.

NOTE!

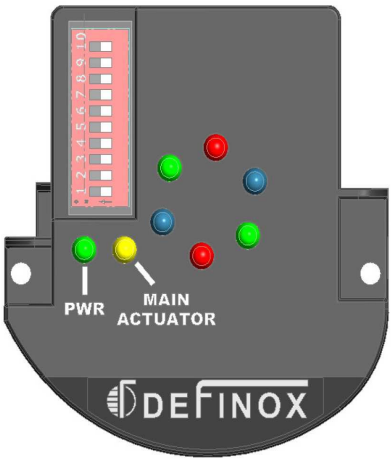
Notes:

- The module is programmed to address 0 by default.
- Do not program two modules with the same network address.
- The AS-i 2.0 modules have an address between 1 and 31.
- The AS-i 2.1 modules have an address between 1A and 31A and 1B and 31B.

6.4 *Meaning of the LEDs in the upper part of the LED module*

The upper part of the LED modules is fitted with LEDs that display the status of the inputs/outputs, as well as the presence of the power supply, a zero addressing or a local fault.

On the upper part of the module	Status	Meaning	Colour parameterisation facility
RED LED *	Fixed	Module with address 0	Yes
	Flashing	AS-i power supply fault, or overload or short circuit on a peripheral	
BLUE LED *	Fixed	Status of the valve closed sensor	Yes
GREEN LED*	Fixed	Status of the valve open sensor	Yes
Main Actuator	Fixed	Status of the main actuator solenoid valve output Yellow LED illuminated = Solenoid valve controlled	No
PWR	Fixed	AS-i power supply present Green LED illuminated = module power supply on	No
* parameterisation of the lighting retro corresponding to ex-works parameterisation. For any modification(s) of the colours of the lighting retro data in order to ensure standard-compliance, refer to the “lighting retro data colour parameterisation” table.			



6.5 *Meaning of I/O bits via AS-i*

Bit I 0 = 1 when the valve closed sensor is at 1.

Bit I 1 = 1 when the valve open sensor is at 1.

Bit O0 = 1 to control the main actuator solenoid valve.

6.6 *Technical specifications of the AS-i LED modules*

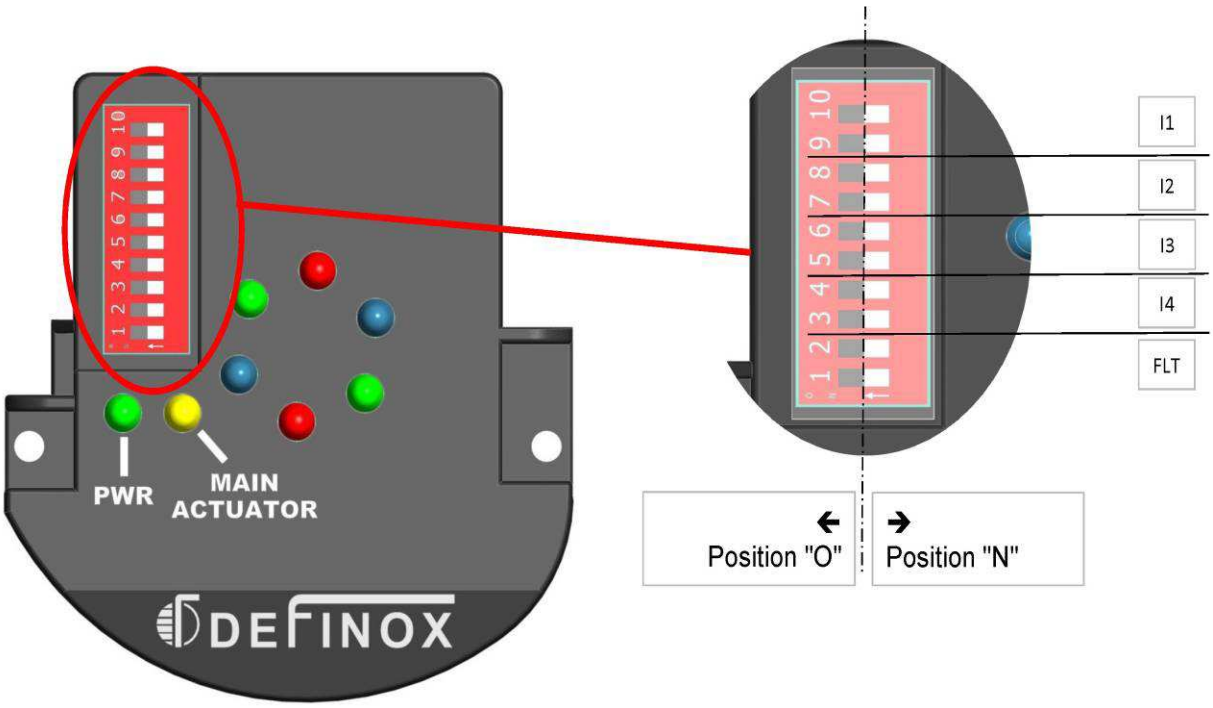
General specifications	
AS-i supply voltage	25 … 31.6 VDC
Current consumed for 1 active solenoid valve and 1 active sensor	≤ 92 mA
Electromagnetic compatibility	EN61000-6-2, EN61000-6-4
Temperature	
•operating •storage/transport	-10 to +60 °C -40 to +85 °C
Communication specifications	
Protocol	Complies with AS-i specification V3.0 Rev. 4
Profile AS-i 2.1	IO code: 7 ID code: A ID2 code: E
Profile AS-i 2.0	IO code: 7 ID code: 0 ID2 code: F
AS-i certificate following C.S.3.0_Revision 4	No. 101101
Diagnostic functions	
AS-i voltage display	Green “POWER” LED
Module status display	Red “FAULT” LED
Sensor inputs	
Nominal input voltage	24 VDC
2-wire inductive sensor connection	Yes
Solenoid valve output	
Output voltage	24 VDC
Output current	50 mA max
Switching frequency on inductive load	0.5 Hz
Short-circuit protection	Yes

7 CHANGE OF CONFIGURATION OF THE LIGHTING RETRO DATA

ICS SIGNALLING UNIT (2I/1O ⇔ 2SP/1 SV)

☒ Ex-works configuration	RETRO DATA	SWITCH	COLOURS							
			BLUE		GREEN		INHIBITED		RED	
			SWITCH POSITION		SWITCH POSITION		SWITCH POSITION		SWITCH POSITION	
			O	N	O	N	O	N	O	N
LED MODULE / LED TERMINAL	I1	10		☒						
		9		☒						
	I2	8				☒				
		7				☒				
		6								
		5								
		4								
		3								
	FLT	2								☒
		1								☒

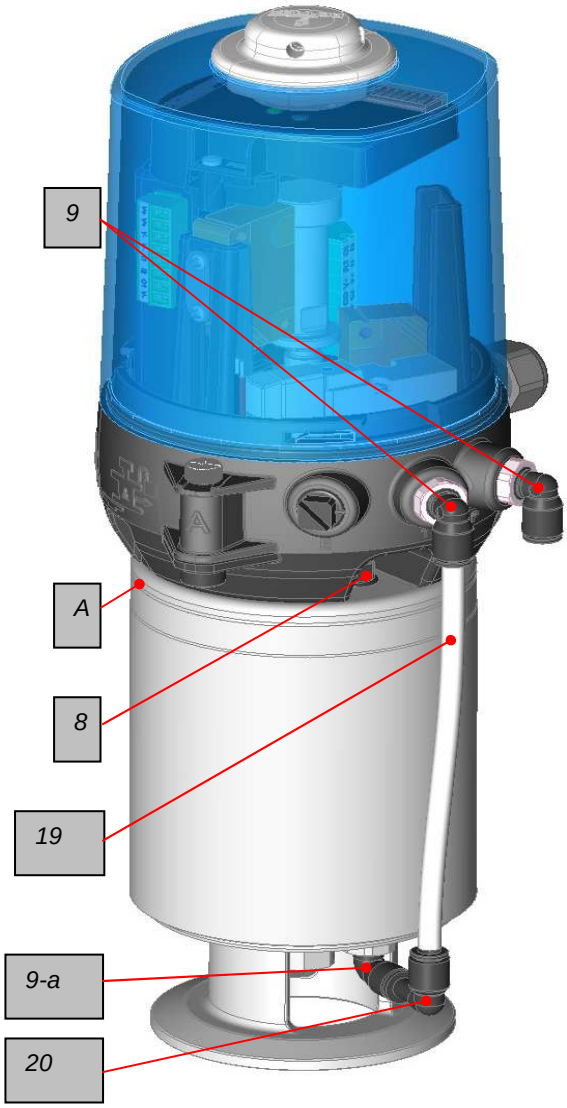
- Remove the transparent cover of the selector.
- Using a small tool, move the white cursor to place it at the position “O” or “N” according to your choice of colour, determined using the table above.
- Replace the transparent cover of the selector.



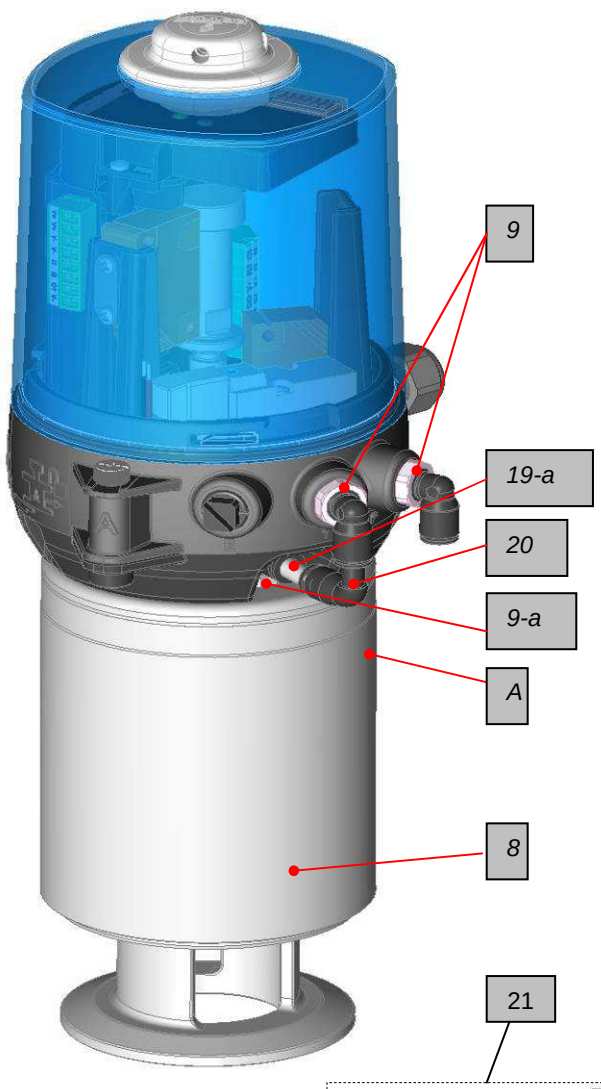
8 CHANGE OF CONFIGURATION & PNEUMATIC CONNECTIONS

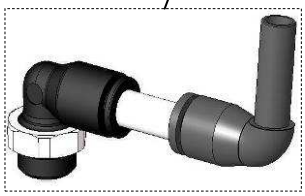
Switch from an NC (normally closed) unit (terminal or module) to NO (normally open)

N.C. VALVE ASSEMBLY



N.O. VALVE ASSEMBLY





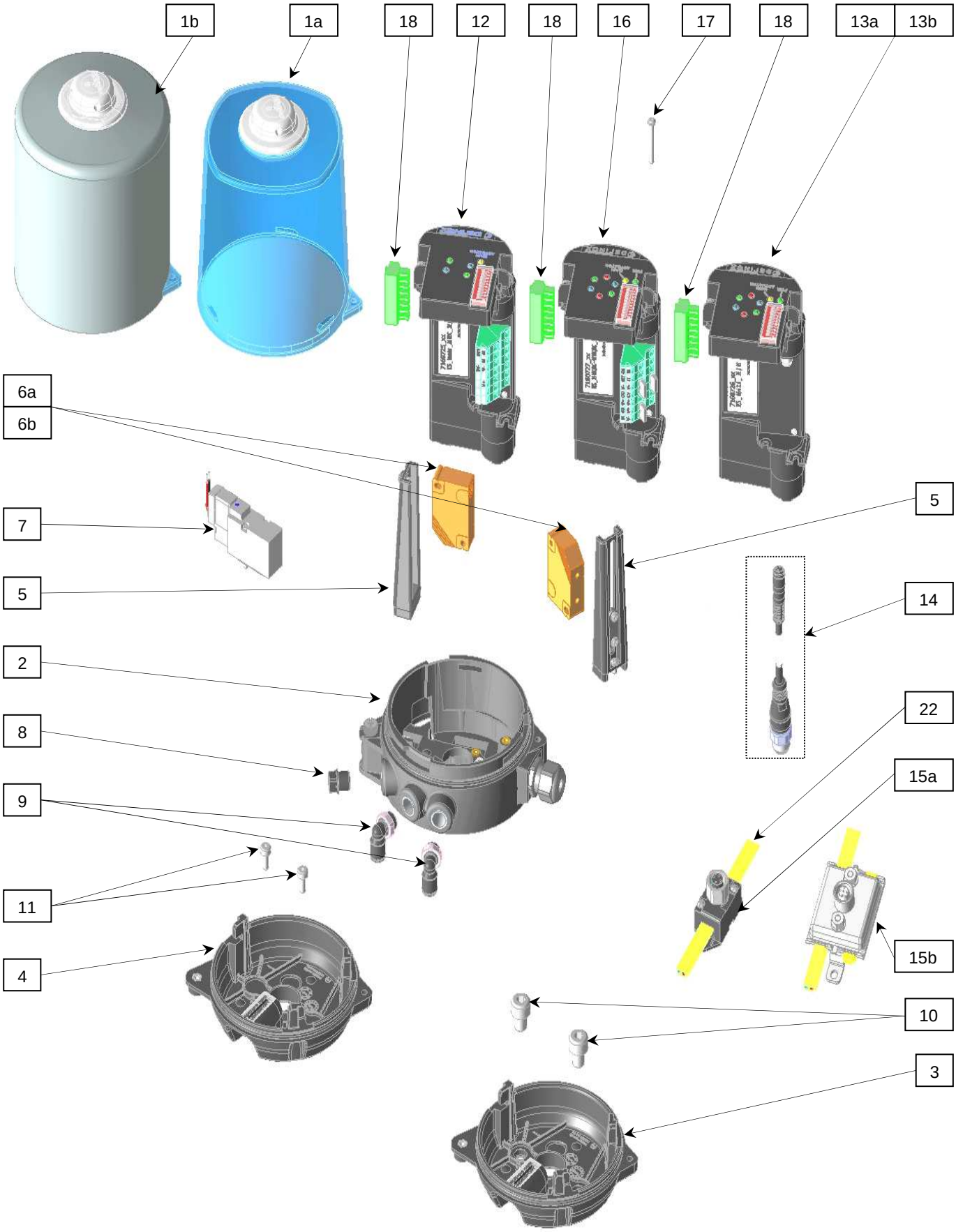
Note:

For the NC actuators fitted with a quick connect elbow connector other than 9-a, a transformation kit known as the "NC to NO _ ICS unit transition kit" is available 21. This kit is made up of the components 9, 20, and 19-a.

- Remove the air tubes ∅ 4/6 19 from the quick connect elbow connectors 9 of channels 1 and P of the signalling unit and the actuator A.
- After altering the actuator to a NO configuration:
- On the actuator, remove the plain shank elbow 20, the quick connect elbow connector 9-a and the pierced cap 8.
- Reassemble the quick connect elbow connector 9-a and the pierced cap 8 by inverting them.
- Mount the signalling unit (base and connector) on the actuator.
- Fit the plain shank elbow 20 on the quick connect elbow connector of channel 1 of the signalling unit.
- Connect the plain shank elbow 20 to the actuator's quick connect elbow connector 9-a by means of a 40 mm long ∅ 4/6 pneumatic tube 19-a.
- Connect the wiring according to the unit type and in accordance with the connection diagrams provided herein.
- Re-pressurize channel P.

9 PARTS FOR ICS UNIT

9.1 *Exploded view of the ICS unit*



9.2 List of ICS unit parts

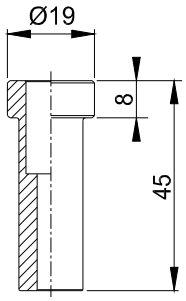
Ref.	Designation	Material	Qty	Reference
1a	***ICS** unit valve cover assembly _PSU version (standard)*	PSU	1	7160720
1b	***ICS** unit valve cover assembly _ stainless steel version (optional)*	A2	1	7160721
2	***ICS** unit connector assembly*		1	7160385
3	***ICS** unit base assembly interaxial 50*		1	7160350
4	***ICS** unit base assembly interaxial 32*		1	7160351
5	*ICS unit detector support assembly (support + guide + screw)*		1 / 2 (spec/std)	7160372
6a	***24 VDC 2-wire** sensor*		1 / 2 (spec/std)	7008045
6b	***24 VDC 3-wire** sensor*		1 / 2 (spec/std)	7007922
7	*¼ turn lockable manually operated **N.C.** solenoid valve*		1	7708151
8	*1/8" pierced plastic cap 3 mm*		1	7002496
9	*D6 1/8" quick connect elbow connection*		2	7010116
10	*10 CHc M8 screws*	A2	2	7006756
11	*10 CHc M4 screws*	A2	2	7380196
12	*ICS terminal LED module 2I/1O*		1	7160725
13a	*ICS **AS-i 2.1** 2I/1O LED module (addresses from 1A to 31A or 1B to 31B)*		1	7160726
13b	***AS-i 2.0** 2I/1O LED module (addresses from 1 to 31)*		1	7160795
14	***AS-i** cord M8 – M12 (length 0.7m)*		1	7008226
15a	***AS-i** vampire clip*		1	7008227
15b	***AS-i stainless steel** vampire clip*		1	7008268
16	*ICS multi-voltage LED module **24 VAC/DC – 48 VAC/DC 2I/1O***		1	7160727
17	*25 TCL M3 screws*	A2	1	7006894
18	***2I/1O** module terminal*		1	7008251
19	*Pneumatic tube ∅ **4/6***	PTFE		7030497
20	*Plain shank elbow ∅ **6***		- / 1 (NC/NO)	7009060
21	*ICS unit_NC to NO transformation kit*			7009154
22	*AS-i cable*	***Thermoplastic elastomer***		7008024

Ref.	Designation	Material	Qty	Reference
	Standard references incorporating the following components:			
	ICS connector assembled for terminal LED module version: 1a+2+5+6b+7+8+9+17+18			7160700
	ICS connector assembled for AS-i or multi-voltage LED module version: 1a+2+5+6a+7+8+9+17+18			7160701

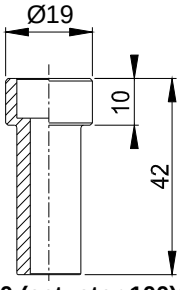
9.3 *Dimensions, assignment and reference of sensor cams for ICS units*

Note: The cams are specific to the signalling of the new generation ICS and ACS units, as well as the 2004 version units. For all earlier signalling, check that the cam diameter complies with the values given below.

9.3.1 *For DPAX valves DN25 to 150*

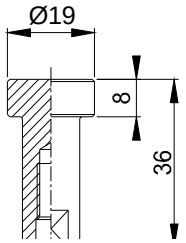


DN25 –80 (actuator76)
ref.: 7003388
Fastening screw ref.: 7006770



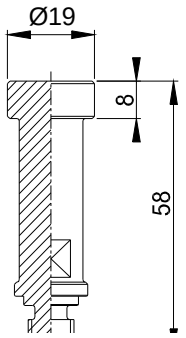
DN80 (actuator 100)/150
ref.: 7003390
Fastening screw ref.: 7006830

9.3.2 *For DCX3 & 4 mini valves DN1/2" to 1"*

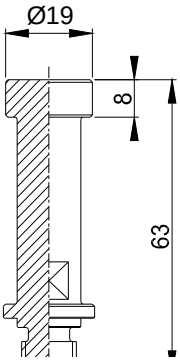


DN1/2'' to 1'' ref.: 7301424

9.3.3 *For DCX3 & 4 valves DN25 to 76*

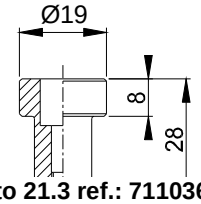


DN25 to 40 ref.: 7301422

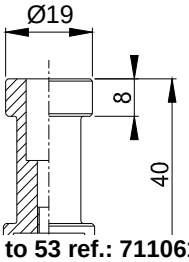


DN51 to 76 ref.: 7301423

9.3.4 *For DMAX valves DN9 to 53*



DN9 to 21.3 ref.: 7110369
Fastening screw ref.: 7006740



DN22 to 53 ref.: 7110616
Fastening screw ref.: 7006740

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