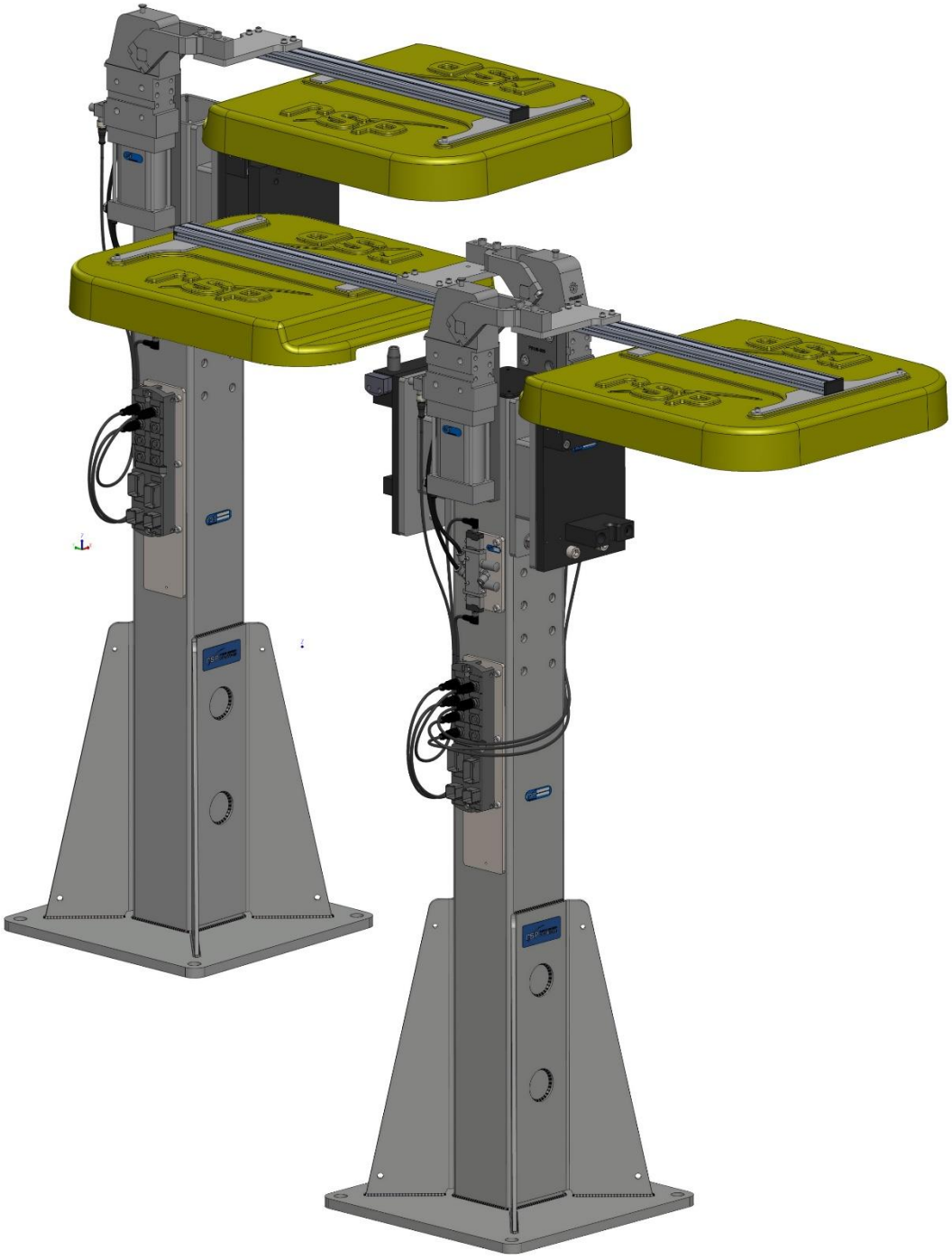
Product Manual

Tool parking system TPS400

M8311-1

Tool changers | Swivels | Swivel tool changers | **Tool parking** | Hose packages | Valve units | Tool systems



robot system products

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CONTENTS

0 CONFIGURING A BASE TOOL PARKING SYSTEM

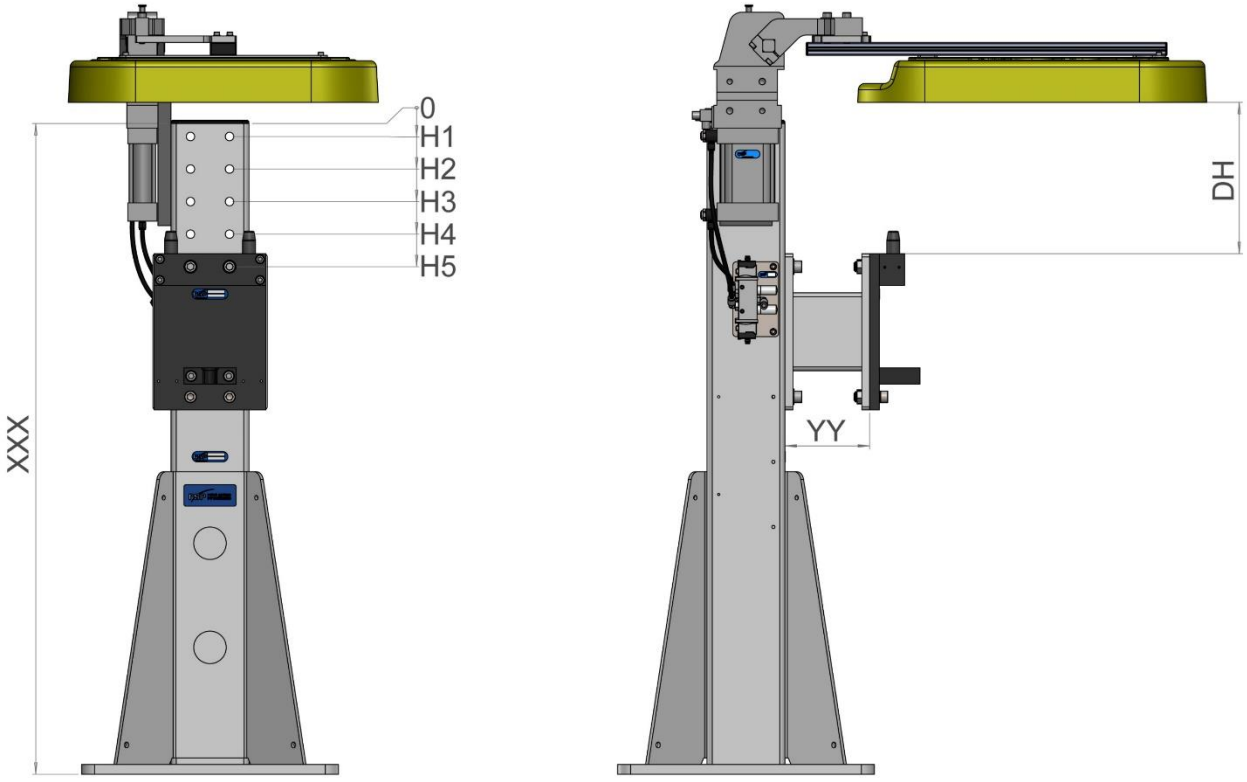
RSP TPS400 is modular and easy to install, has a robust design and includes options – which also can be ordered for retrofitting. RSP offers a variety of tool parking system components which can easily be combined and tailored for parking solutions that fits individual robot system requirements, support manufacturing standardisation, and save time for the line builder.

NOTE! For available options see sections 2.2 and 2.4. Detailed specifications of base and optional components are described in chapters 3 and 4, respectively.

0.1 Naming convention and dust cover positioning

The naming convention of a TPS 400 system is designed to include all necessary information for selection of base components and mounting at correct positions at delivery.

0.1.1 Tool parking system single, P8525-XXX-YY-DH

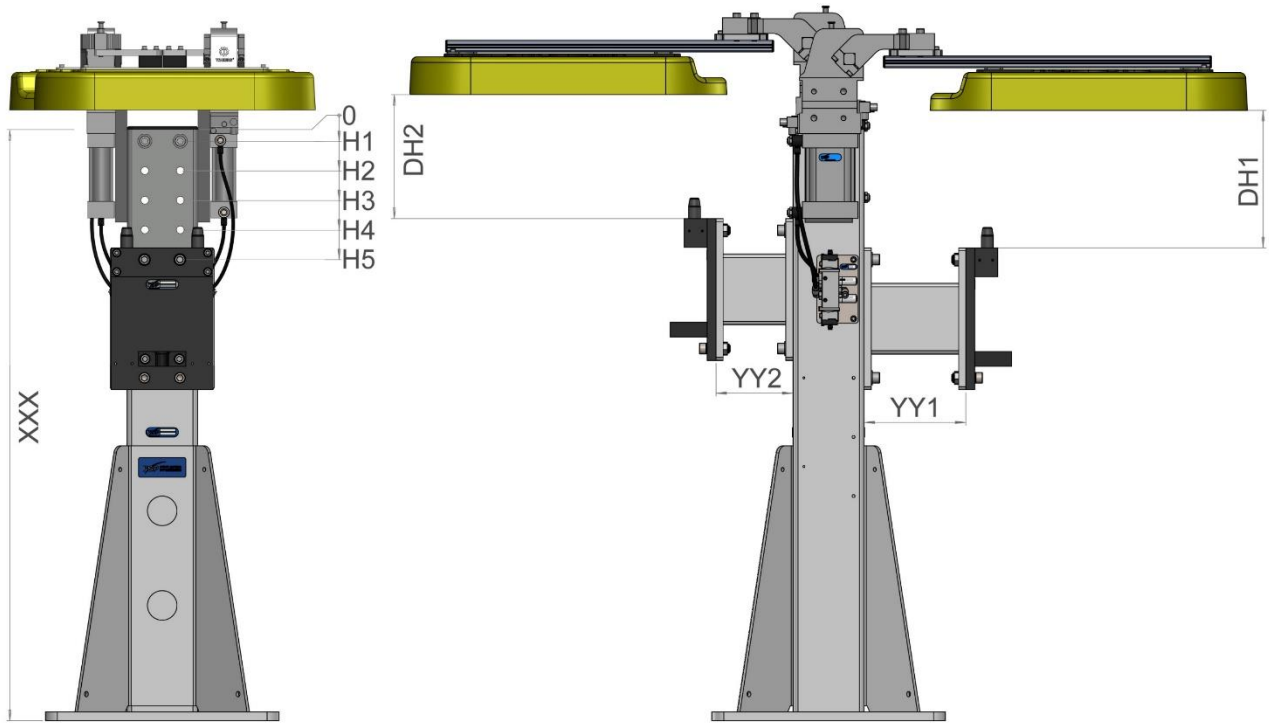


Where:

- **XXX** is the height of the tool stand column in cm; 100, 125 or 150.
- **YY** is the horizontal distance of the tool stand hanger from the column (in cm): 00 (Base), 08, 13 or 18 can be selected.
- **D** corresponds to the dust cover position (section 2.6).
- **H** corresponds to the tool hanger position: 0, 1, 2, 3, 4 or 5 can be selected.

DH becomes the vertical distance between tool stand hanger and dust cover as a function of **D** and **H** (section 0.1.3).

0.1.2 Tool parking system dual, P8526-XXX-YY1-YY2-DH1-DH2



Where:

- **XXX** is the height of the tool stand column in cm; 100, 125 or 150.
- **YY1** is the horizontal distance at the right hand side of the tool stand hanger from the column and **YY2** is the horizontal distance at the left hand side (in cm):
  08 (Base), 13 or 18 can be selected.
- **D** corresponds to respective dust cover position (section 2.6).
- **H** corresponds to respective tool hanger positions:
  0, 1, 2, 3, 4 or 5 can be selected.

DH1 and **DH2** become the vertical distances between tool stand hanger and dust cover as a function of respective **D** and **H** (section 0.1.3).

0.1.3 Vertical distance between tool stand hanger and dust cover

The vertical distance between the tool stand hanger and the dust cover is a function of the dust cover position **D**, and the tool hanger position **H**. There are two dust cover positions, with 2.5 cm spacing and five tool hanger positions with 5 cm spacings (section 2.6 Tool stand hanger and dust cover positions). The distance from the default position (DH=11) is according to the following table:

DH	**11**	**21**	**12**	**22**	**13**	**23**	**14**	**24**	**15**	**25**
Distance (mm)	32	57	82	107	132	157	182	207	232	257

The default configuration for a single tool parking system is **P8525-125-00-11** and for a dual system **P8526-125-08-08-11-11**.

NOTE! The distance between the tool and the dust cover should be kept as small as possible when parked for maximum protection against dust and particles.

1 INTRODUCTION

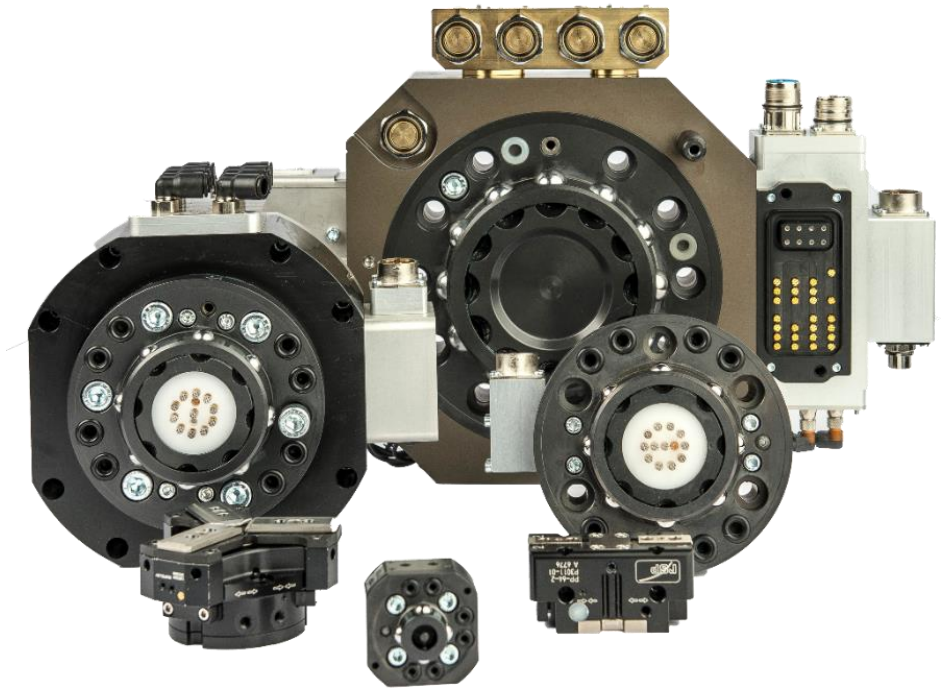
Robot System Products is a front-rank provider of peripheral products for high performance robot applications. We provide complete tool systems solutions for your robot installations, aiming to improve your productivity with the most reliable and cost-effective tooling on the market. Continuously we explore emerging technologies, working with leading edge design.

Robot System Products has a wide range of standard robot peripheral products:

- Tool changers
- Swivels
- Swivel tool changers
- CiRo
- Grippers
- Hose Packages
- Valve units
- Tool systems
- Tool parking systems

Robot System Products' tool changers are constructed to maximize the flexibility and reliability of your robot fleet. Through our patented locking device TrueConnect™ robustness and high safety are combined with low weight and compactness. With our swivels compressed air, water, electrical and data signals as well as weld and servo power are transferred to your tools with robot motion capabilities fully maintained. Our Swivel tool changers unite the TrueConnect™ mechanism with our swivel technology, combining the best out of the two technologies. With RSPs unique CiRo-technology cables and hoses can be freely selected with high robot flexibility maintained, and the space requirements reduced. RSP's integrated Tool systems are delivered as complete plug-and-play solutions designed for quick and simple installation.

Robot System Products' product lines are available for all major robot brands and come with complete documentation. 3D-models for simulation are available for download at: www.rsp.eu.com



1.1 Safety

1.1.1 General

The integrator installing the tool parking system must follow the safety demands stated in standards and provisions applicable in the country where the tool parking system is installed.

The user of the Robot System Products tool parking system is responsible that law and directives applicable in respective countries, with regards to safety, are adhered to. The user is also responsible to guarantee that all safety devices are installed correctly.

WARNING!
Never carry out service work on a robot that has not been taken out of operation. See safety information for the robot.

WARNING!
Only perform work on grippers or tools docked to the tool parking system if the air pressure is safely switched off.

WARNING!
Be aware that tool stand hangers, tool plates and tool stands are heavy and may cause personal injury and equipment damage if dropped.

WARNING! The electrical control of the moveable dust cover must be interlocked by the normal safety system of the robot cell.

NOTE!
Tool changers shall always be in locked position, also when empty, to avoid unexpected locking if air pressure is lost.

1.1.2 Explanation of warnings

The warnings in this document are specific to the products in this manual. It is expected that the user also pay attention to certain notifications from the robot manufacturer and/or the manufacturers of other components used in the installation.

WARNING!
The warning sign will make you aware that a situation could result in potential serious injury or damage to equipment.

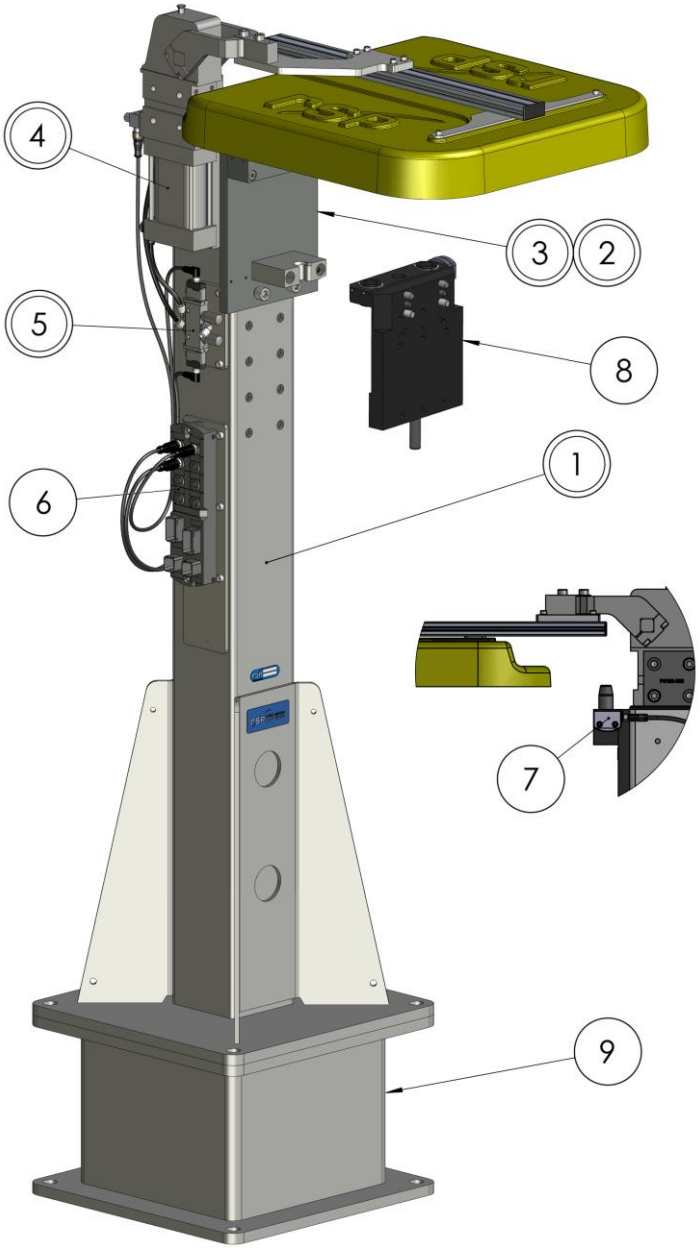
NOTE!
The note sign will alert you about something important to consider.

2 TECHNICAL SPECIFICATIONS

This document describes RSP tool parking system TPS400 and its components, designed to be used together with RSP tool changers TC240, TC480, TC720, TC960 and TC500. The tool parking system enables easy parking of tools in applications such as material handling and spot welding. 3D-models of the tool parking systems are available in STEP and Parasolid-format.

2.1 Tool parking system single, TPS400-1. Article: P8525-XXX-YY-DH

Single hanger for use together with RSP tool changers and tool attachments. The nominator XXX specifies the height of the tool stand column. The nominator YY specifies the extension of the tool stand hanger from the column and DH is a mounting instruction (section 0.1.1)



NOTE! Components included in a base tool parking system configuration (section 0.1.1) are marked with double circles, while components marked with single circles are options to be ordered separately!

Item	Product number	Description	Pcs	Section
1	P8380-XXX	Tool stand column, H=1000/1250/1500 mm	1	3,1
2	P8507	Tool stand hanger	1	3.2
3	P8370 / P8518-YY	Mounting/extension kit for tool stand hanger	1	3.2.1/3.2.2
4	P8517-1	Dust cover with pneumatic tilting clamp	1	3.3
5	P8513A	Valve unit for dust cover, bistable	1	3.4

Technical data, single hangers

Product number	Column height	Extension	Weight
P8525-100-00/08/13/18	1 m	0/80/130/180 mm	68/75/76/77 kg
P8525-125-00/08/13/18	1.25 m	0/80/130/180 mm	73/80/81/82 kg
P8525-150-00/08/13/18	1.5 m	0/80/130/180 mm	81/89/90/91 kg

2.2 Options for TPS single

2.2.1 I/O connection modules

Item	Product number	Description	Section
6	P8391	Connection module 4 X M12 4S	4.1.1
6	P8372	Connection module Push Pull, Profinet, single	4.1.4
6	P8516-1	Connection module 7/8", Profinet, single	4.1.8
6	P8533-1	Connection module 7/8", Profinet, single	4.1.12
	P8398-150	Floor cable for P8391 (15 meter)	4.1.2
	P8398-300	Floor cable for P8391 (30 meter)	4.1.2

2.2.2 Sensors

Item	Product number	Description	Section
7	P8382	Tool-in-stand/tool present sensor, active	4.3.1
7	P8528	Tool-in-stand sensor for Moduflex safety,	4.3.2
7	P8369	Tool-in-stand/tool present sensor, passive	4.3.3
7	P8373	Spacers for tool-in-stand sensors	4.3.5
7	P8312	Tool present sensor, inductive	4.3.6
7	P8530	Tool present sensor, active	4.4.1

2.2.3 Tool plates

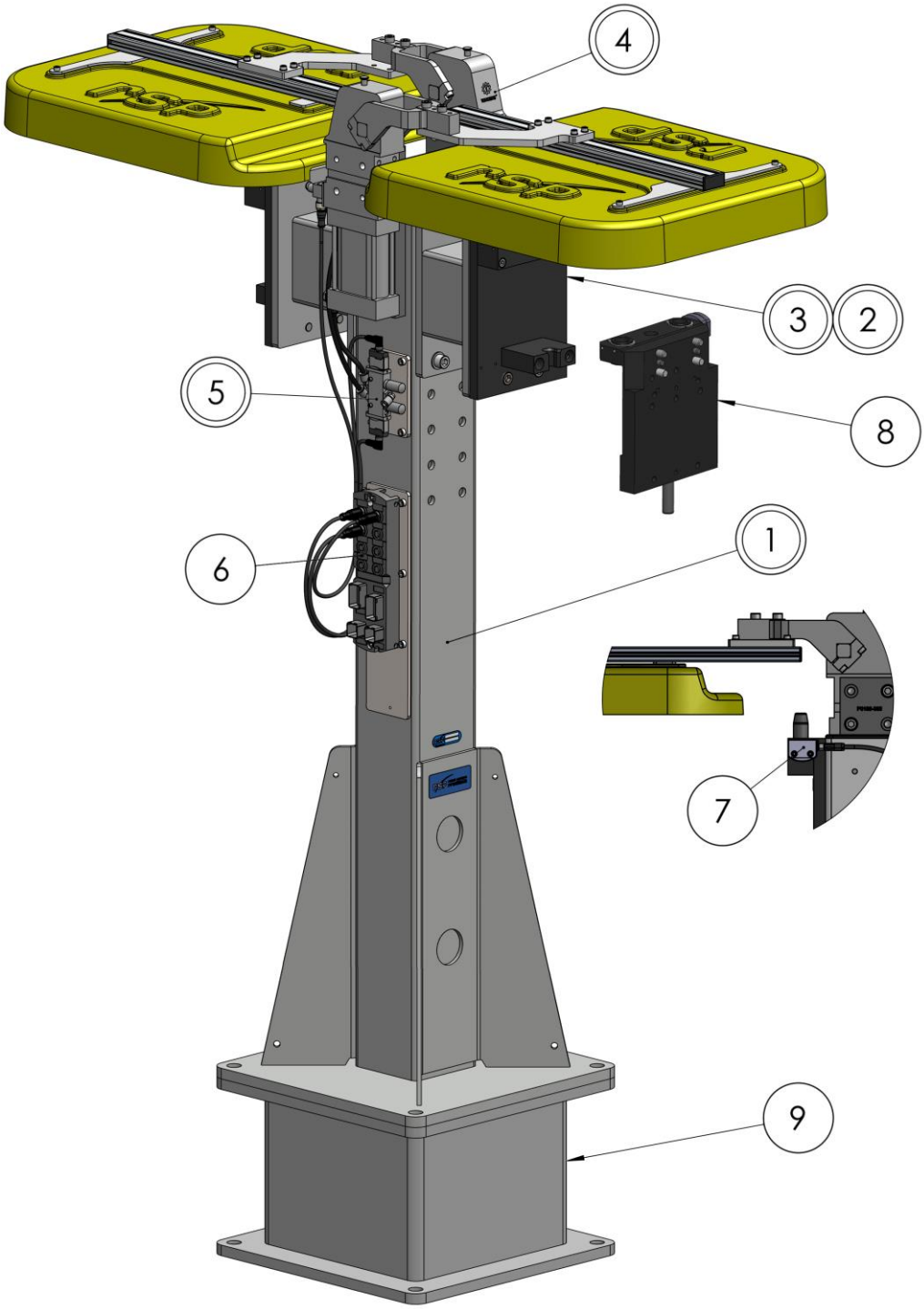
Item	Product number	Description	Section
8	P8303A	Tool plate (can be delivered separately)	4.2

2.2.4 Pedestals

Item	Product number	Description	Section
9	P8376-025	Pedestal for tool stand column, 250 mm	3.1.2
9	P8376-035	Pedestal for tool stand column, 350 mm	3.1.2

2.3 Tool parking system dual, TPS400-2. Article: P8526-XXX-YY1-YY2-DH1-DH2

Dual hanger for use together with RSP tool changers and tool attachments. The nominator XXX specifies the height of the tool stand column. The nominators YY1 and YY2 specify the extensions of the tool stand hangers from the column and DH1 and DH2 are mounting instructions (section 0.1.2).



NOTE! Components included in base tool parking system configurations (section 0.1.2) are marked with double circles, while components marked with single circles are options to be ordered separately!

Item	Product number	Description	Pcs	Section
1	P8380-XXX	Tool stand column, H=1000/1250/1500 mm	1	3,1
2	P8507	Tool stand hanger	2	3.2
3	P8518-YY	Extension kit for tool stand hanger	2	3.2.2
4	P8517-1	Dust cover with pneumatic tilting clamp	2	3.3
5	P8513A	Valve unit for dust cover, bistable	2	3.4

Technical data, dual hangers

Product number	Column height	Extension (see Note! below)	Weight
P8526-100-08	1 m	80/130/180 mm	99/101/103 kg
P8526-125-08	1.25 m	80/130/180 mm	104/106/108 kg
P8526-150-08	1.5 m	80/130/180 mm	113/115/117 kg

2.4 Options for TPS dual

2.4.1 I/O connection modules

Item	Product number	Description	Section
6	P8372-2	Connection module Push Pull, Profinet, dual	4.1.6
6	P8516-2	Connection module 7/8", Profinet, dual	4.1.10
6	P8533-2	Connection module 7/8", Profinet, dual	4.1.14

2.4.2 Sensors

Item	Product number	Description	Section
7	P8382	Tool-in-stand/tool present sensor, active	4.3.1
7	P8528	Tool-in-stand sensor for Moduflex safety,	4.3.2
7	P8369	Tool-in-stand/tool present sensor, passive	4.3.3
7	P8373	Spacers for tool-in-stand sensors	4.3.5
7	P8312	Tool present sensor, inductive	4.3.6
7	P8530	Tool present sensor, active	4.4.1

2.4.3 Tool plates

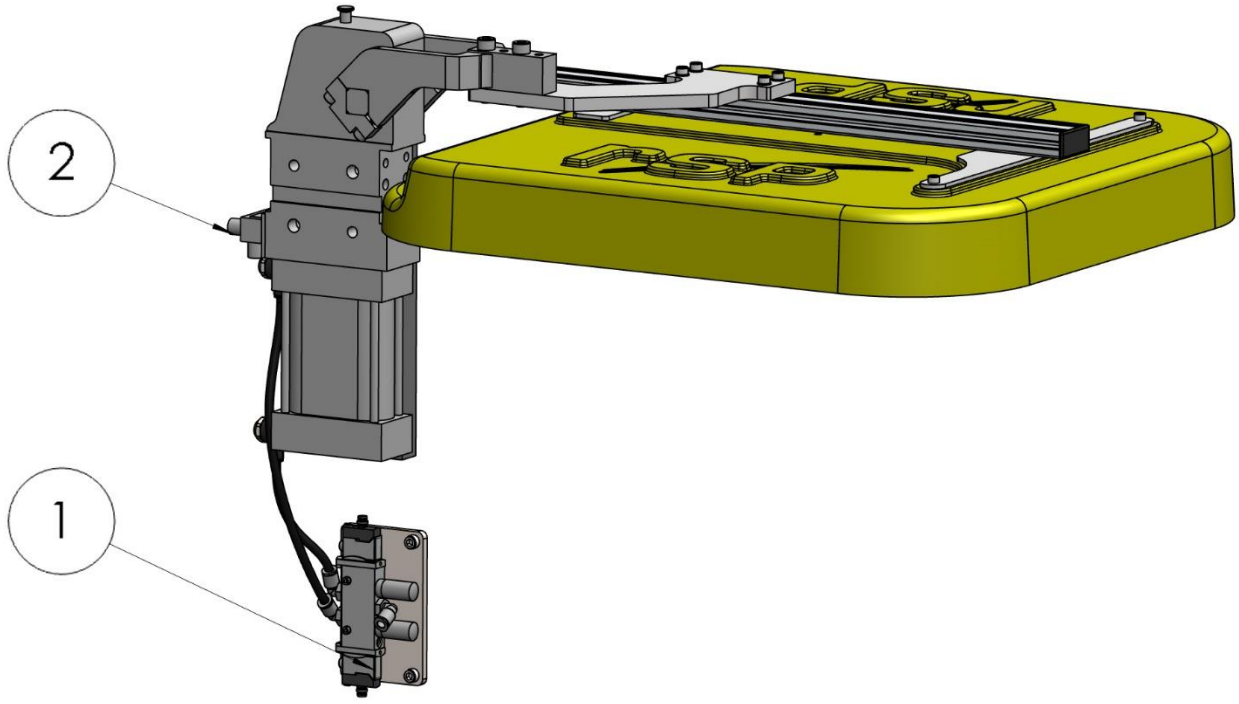
Item	Product number	Description	Section
8	P8303A	Tool plate (can be delivered separately)	4.2

2.4.4 Pedestals

Item	Product number	Description	Section
9	P8376-025	Pedestal for tool stand column, 250 mm	3.1.2
9	P8376-035	Pedestal for tool stand column, 350 mm	3.1.2

2.5 Dust cover kit, TPS400-1. Article: P8532

Dust cover kit for tool parking system (customer solutions) for use together with RSP tool changers and tool attachments.



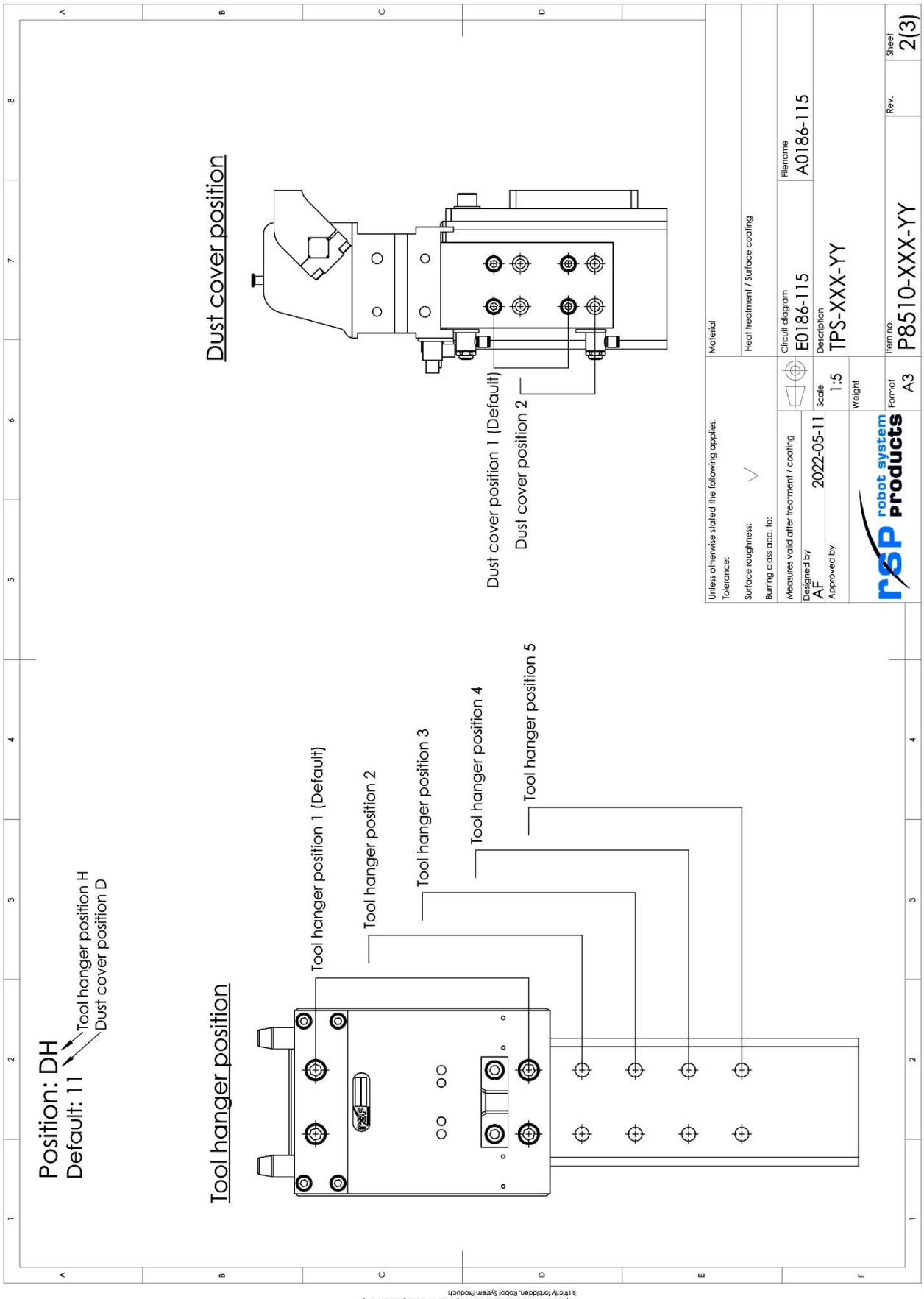
Item	Product number	Description	Pcs	Section
1	P8513A	Valve unit for dust cover, bistable	1	3.4
2	P8517-1	Dust cover with pneumatic tilting clamp	1	3.3

Technical data

Weight	8.4 kg

NOTE! Options to be selected (section 4) are dependent on actual configuration as decided by the customer.

2.6 Tool stand hanger and dust cover positions



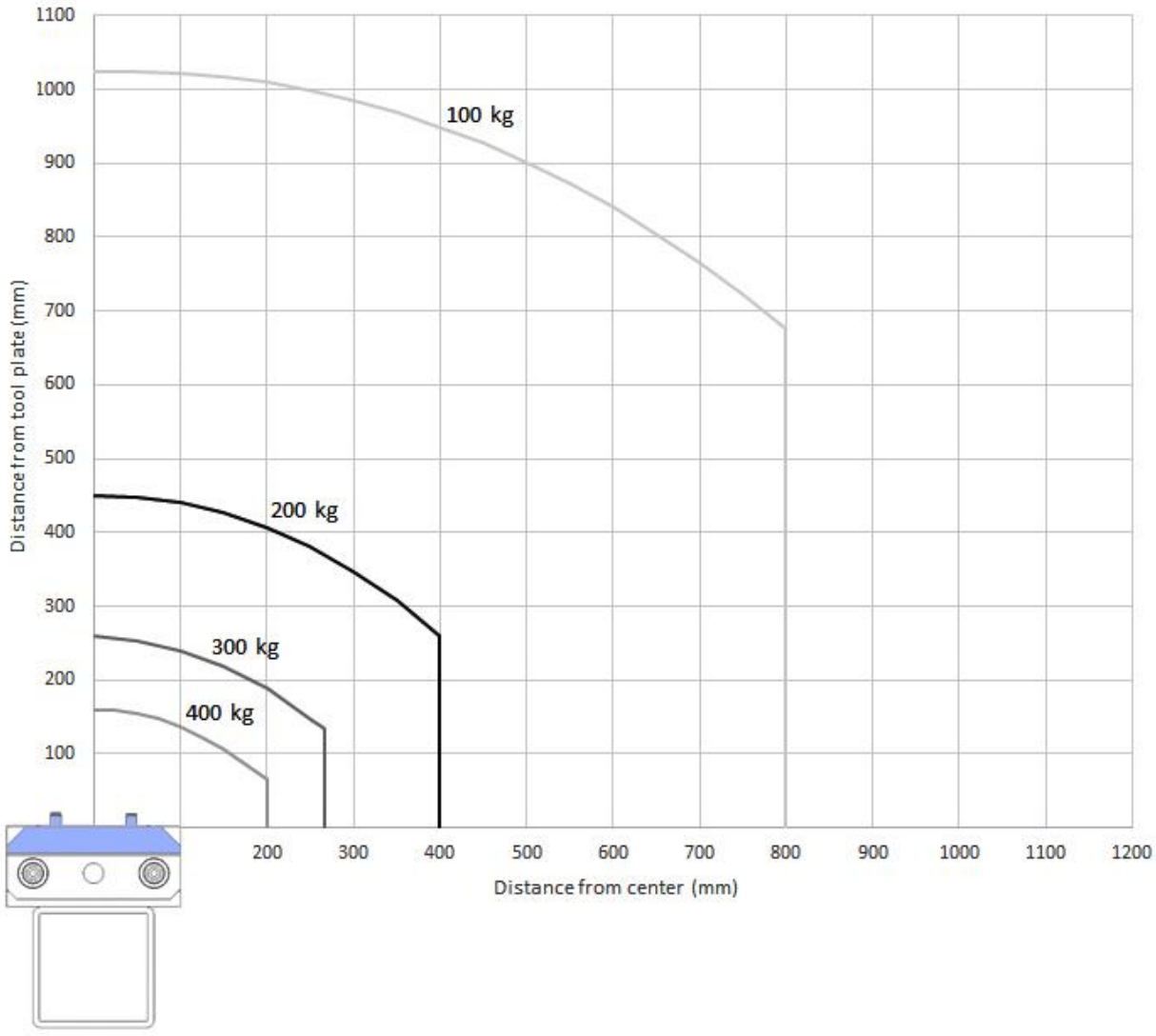
2.7 Load diagrams for tool parking system

The diagram shows the load corresponding to a maximum displacement of 0.5 mm of the docking position for drop off/pick up.

NOTE! The displacement of the docking position for drop off/pick up depends on the distance from the tool plate to the centre of gravity of the tool attachment and tool. To minimize the wear of the tool changer we recommend a docking position tolerance of maximum 1 mm.

2.7.1 Load diagram, tool stand column, 1 and 1.25 meter

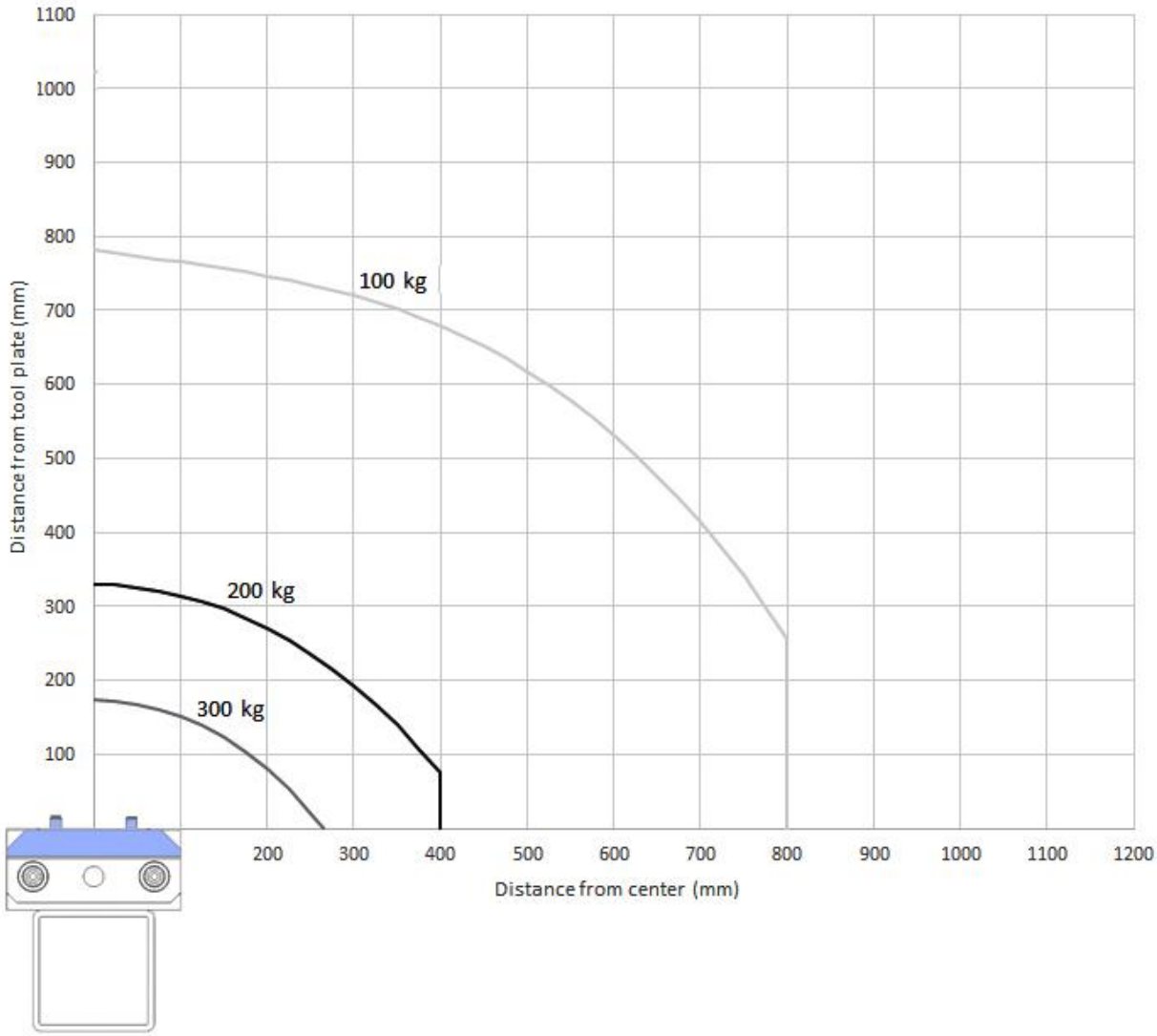
Load diagram for tool parking system with a 1 or 1,25-meter high tool stand column P8380-100 and column P8380-125.



NOTE! In the diagram the tool stand column is shown from above with the tool stand hanger attached and the tool plate side shown in blue!

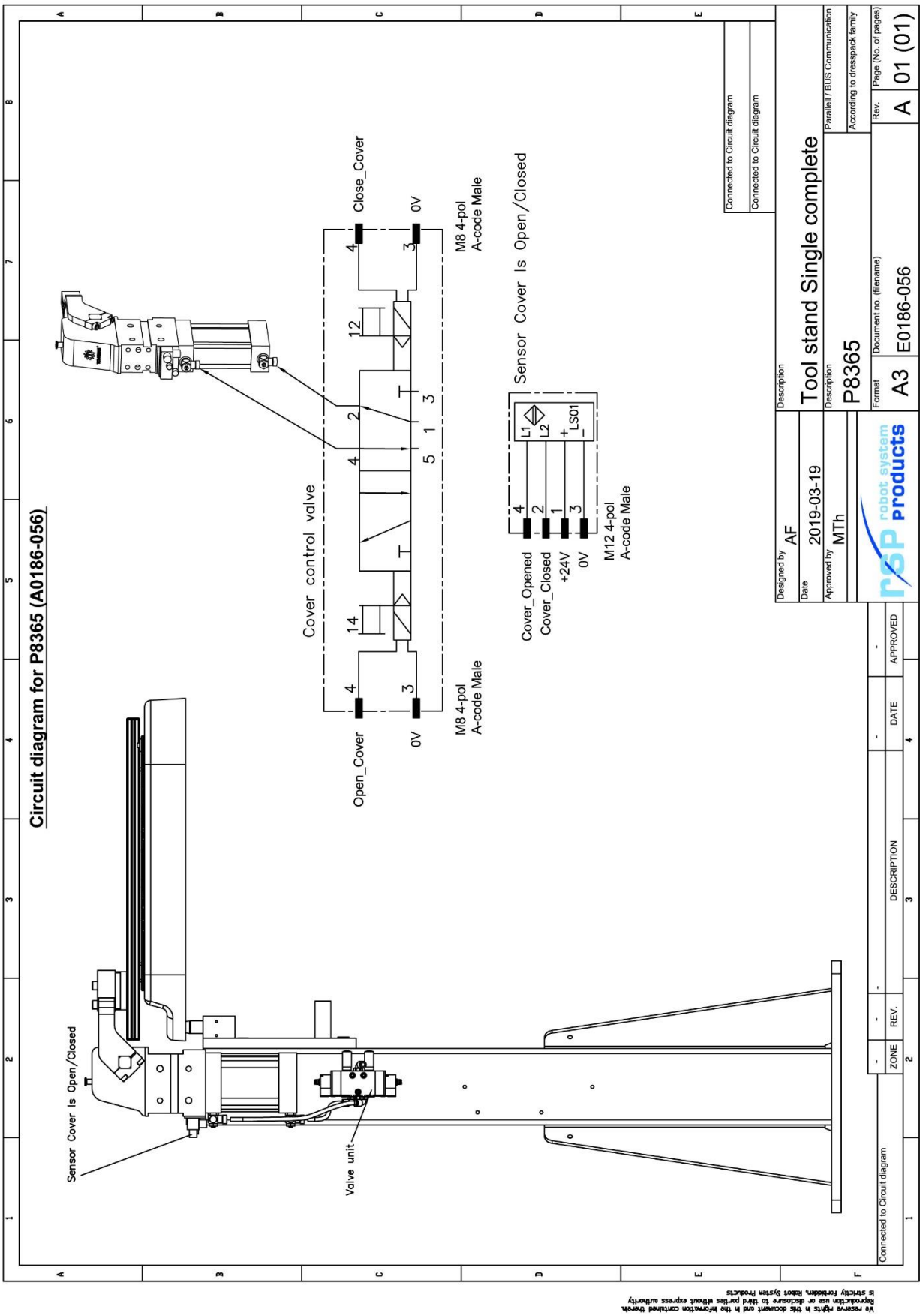
2.7.2 Load diagram, tool stand column, 1.5 meter

Load diagram for tool parking system with a 1,5-meter high tool stand column P8380-150.



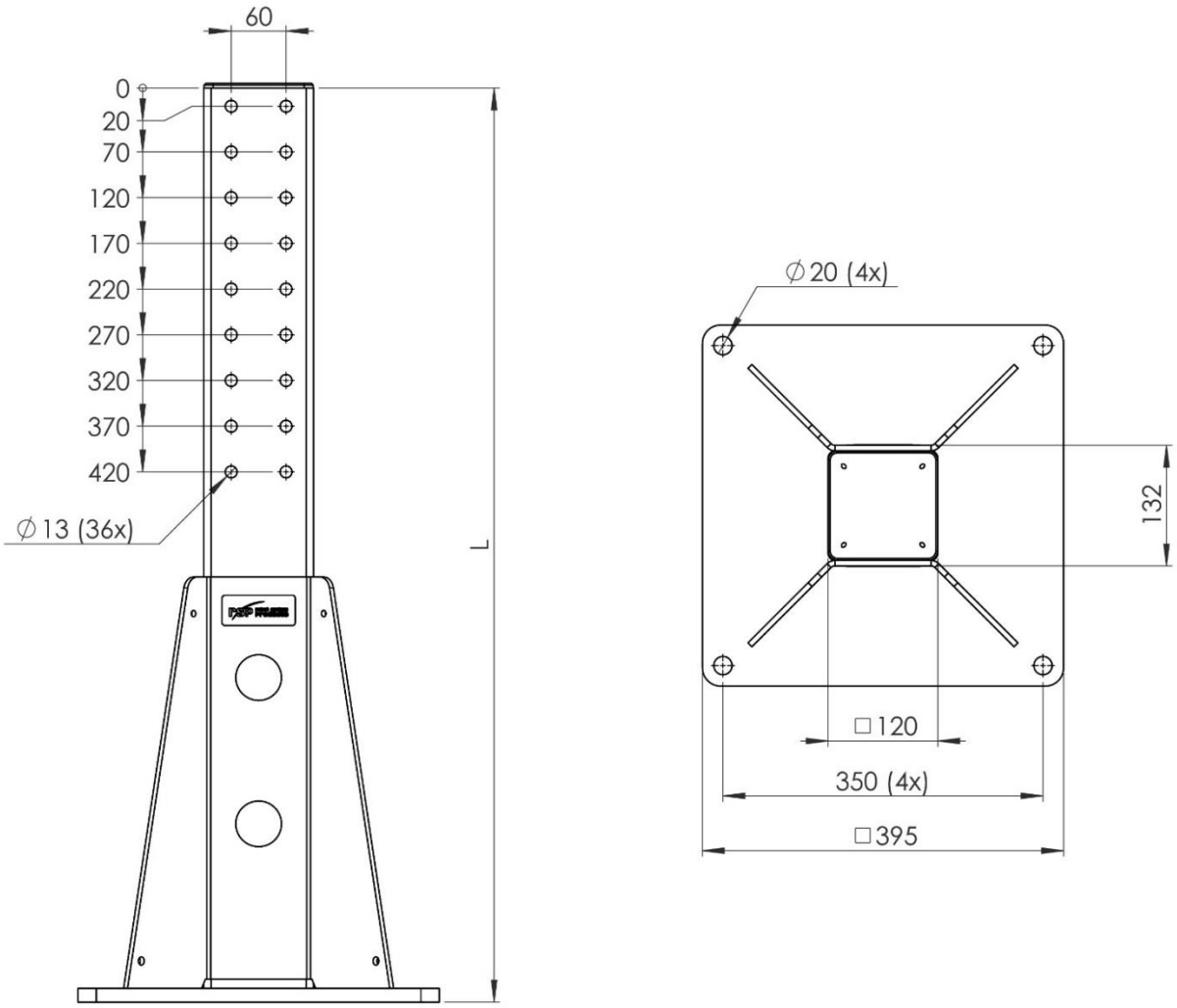
NOTE! In the diagram the tool stand column is shown from above with the tool stand hanger attached and the tool plate side shown in blue!

2.8 Circuit diagram E0186-056



3 TOOL PARKING SYSTEM COMPONENTS AND OPTIONS

3.1 Tool stand column. Article: P8380-xxx



The tool stand column P8380-xxx gives together with the tool stand hanger P8507 and tool plate P8303A a robust tool parking system for easy tool changing. The tool stand column comes in different heights and is prepared for mounting of a single or dual hanger, valve units, dust cover, connection modules, extension kits and sensors,

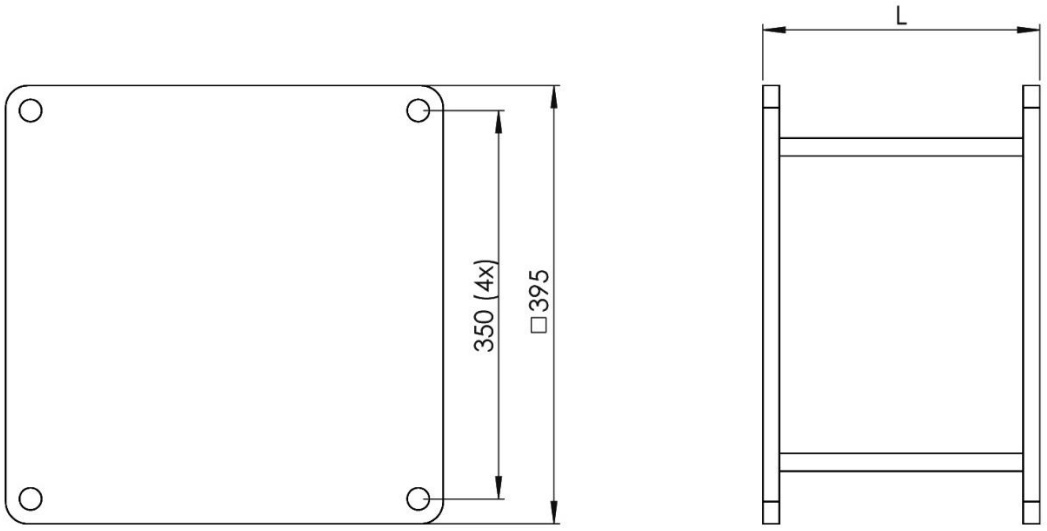
Technical data

Article number	Height (L)	Weight
P8380-100	1000 mm	51 kg
P8380-125	1250 mm	56 kg
P8380-150	1500 mm	65 kg

NOTE! The tool stand column must be rigidly mounted on a levelled and stable pavement using all four holes.

NOTE! For dual mounting Tool hanger extension kit P8518-YY is required on both sides.

3.1.2 Pedestal for tool stand column. Article: P8376-xxx

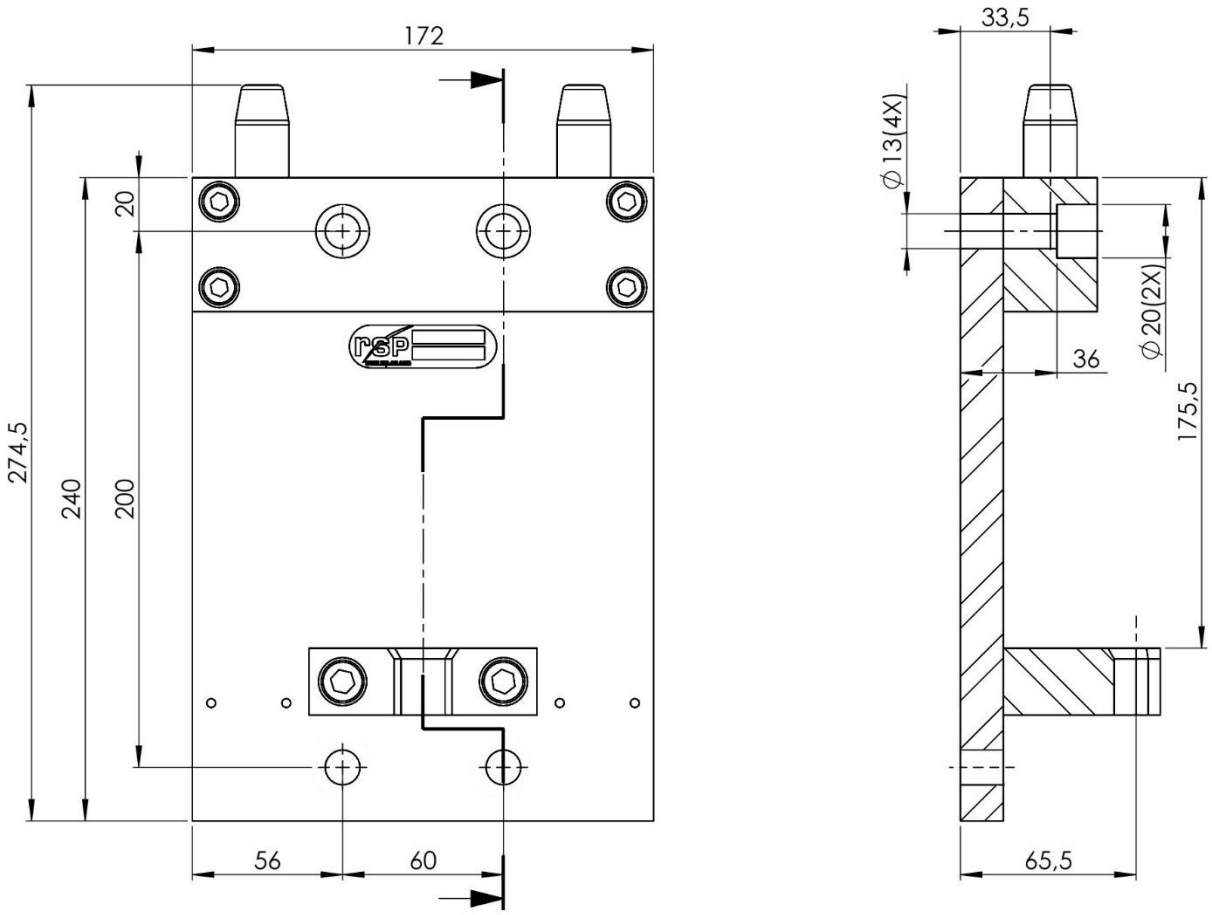


Option to be used to elevate the tool stand by mounting under a tool stand column P8380-xxx.

Technical data

Article	Height (L)	Weight
P8376-025	250 mm	56 kg
P8376-035	350 mm	65 kg

3.2 Tool stand hanger. Article: P8507

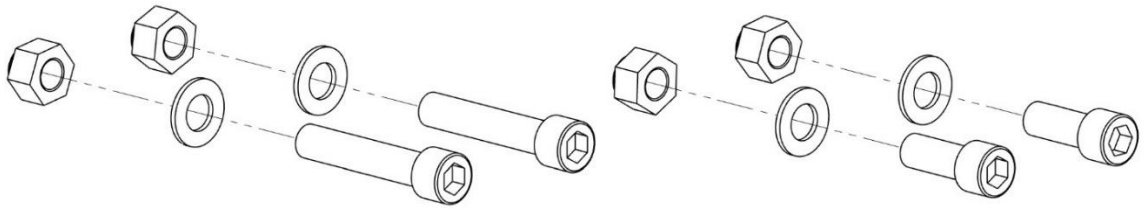


The tool stand hanger P8507, mounted on the tool stand column P8380-xxx, gives together with tool plate P8303A a robust tool parking system for easy tool changing. To be mounted using mounting kit for tool stand hanger, P8370 or extension kit P8518-YY.

Technical data

Weight	8.2 kg

3.2.1 Mounting kit. Article: P8370



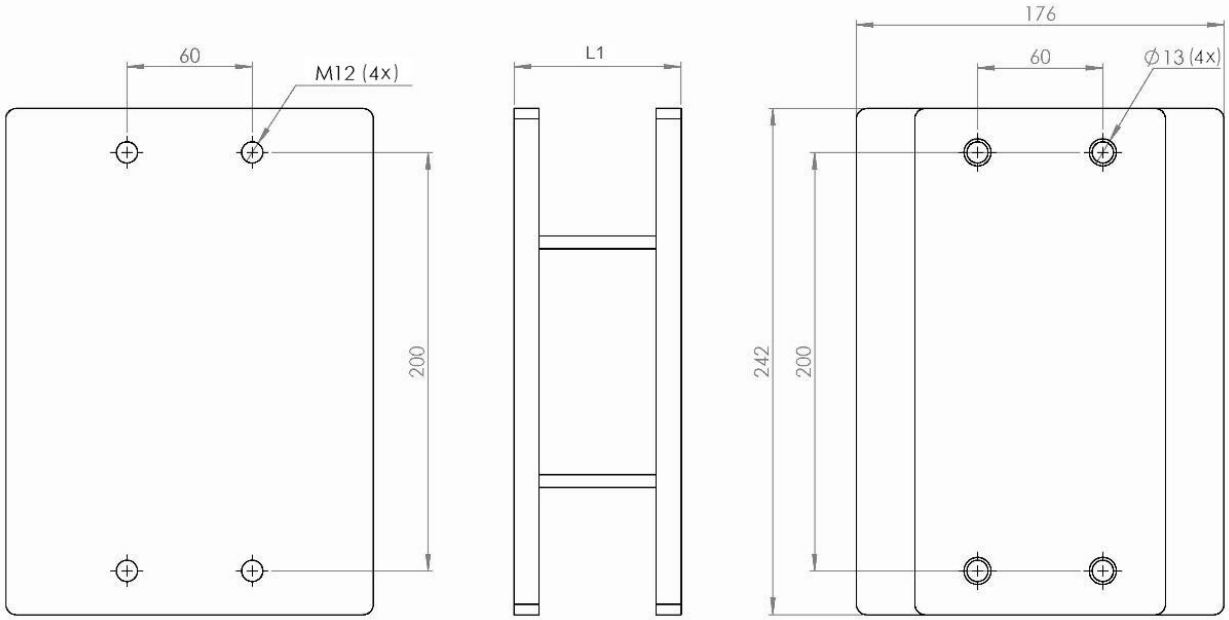
The mounting kit P8370, consists of two M12 x 60 and two M12 x 30 screws with corresponding nuts and washers, is used for mounting of tool stand hanger, P8507, on a tool stand column.

Technical data

Weight	0.3 kg

NOTE! The mounting kit P8370 is exclusively used for mounting directly on a tool stand column, P8380.

3.2.2 Tool hanger extension kit. Article no: P8518-YY



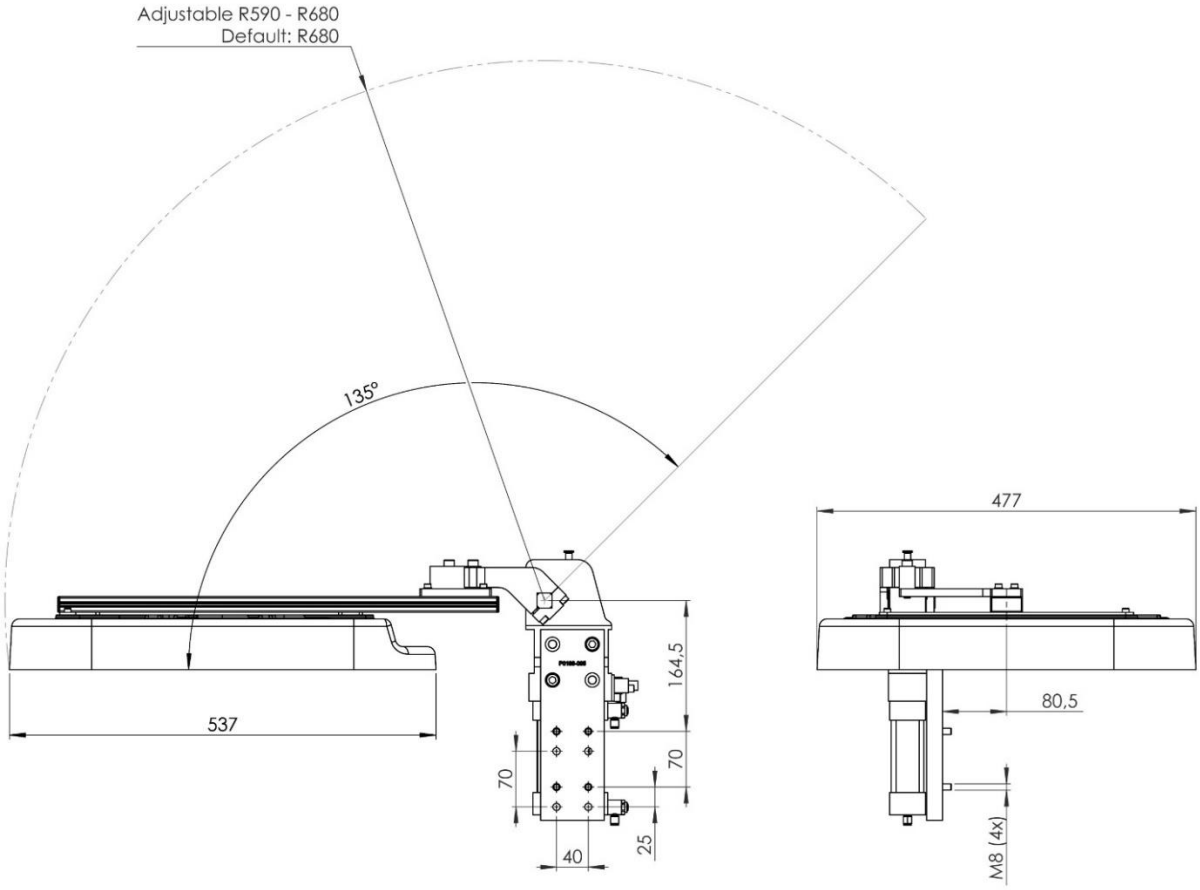
To be mounted between the tool stand column, P8380-XXX, and the tool stand hanger, P8507.

Technical data

Article number	Width (L1)	Weight
P8518-08	80 mm	7.7 kg
P8518-13	130 mm	8.5 kg
P8518-18	180 mm	9.4 kg

NOTE! All screws, with corresponding nuts and washers, for mounting of the tool stand hanger and tool hanger extension are included in P8518.

3.3 Dust cover with pneumatic tilting clamp. Article no: P8517-1



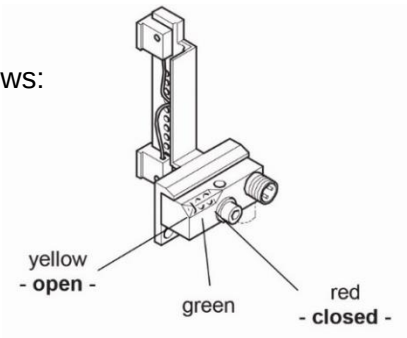
The dust covers with pneumatic tilting clamp, P8517-1, shall be mounted on the tool stand column P8380. The dust covers are used for efficiently protecting the tool and tool attachment, including modules, when parked on the tool stand. The tilting angle is adjustable within the range of 10°–135°, the default tilting angle being fully open, 135°. Two flow control valves are installed for reduction of the tilting clamps opening and closing speed.

NOTE! To ensure a smooth dust cover operation, and protect the dust cover from damage, the opening and closing speed shall be adjusted by the two flow control valves (sections 5.3 or 5.4.3).

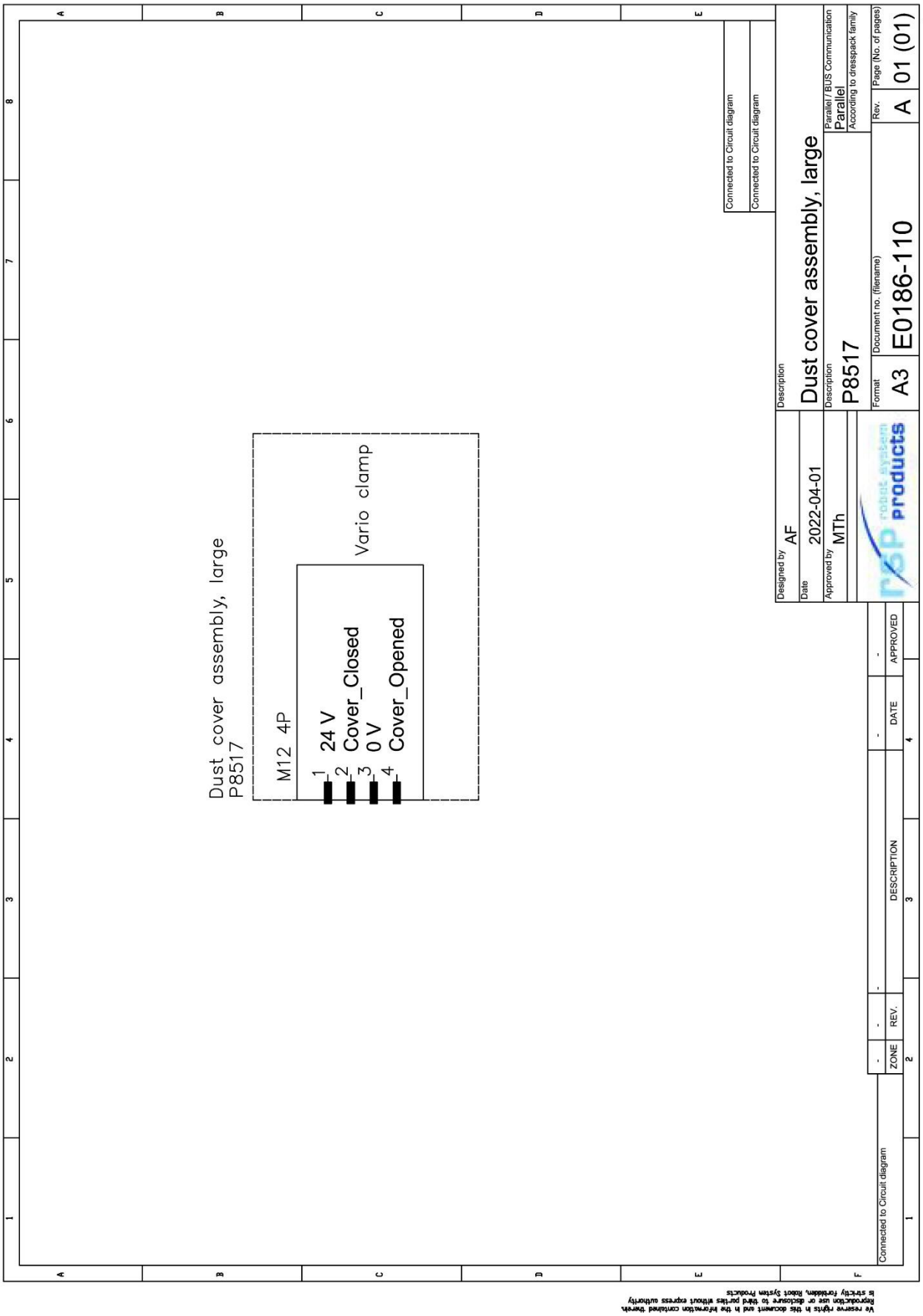
Weight		7.8 kg
Electrical signals	Circuit diagram	E0186-110 (section 3.3.1)
	Pneumatic diagram	Pne0186-110 (section 3.3.2)
	M12 4-pole, male	0V, 24V, Cover_Closed, Cover Opened

The function of the integrated LEDs is as follows:

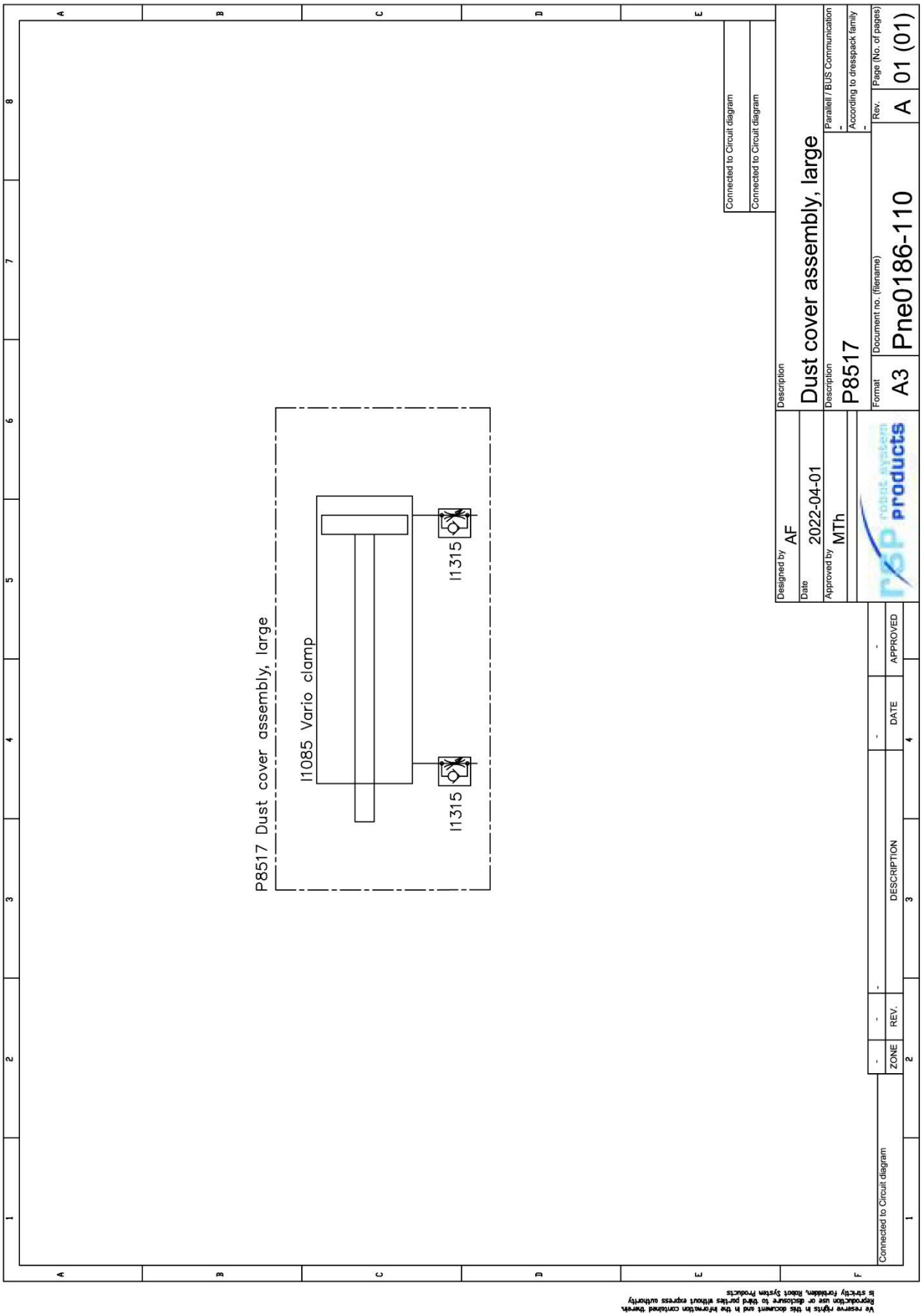
- Green System current
- Red Cover_Closed
- Yellow Cover Opened



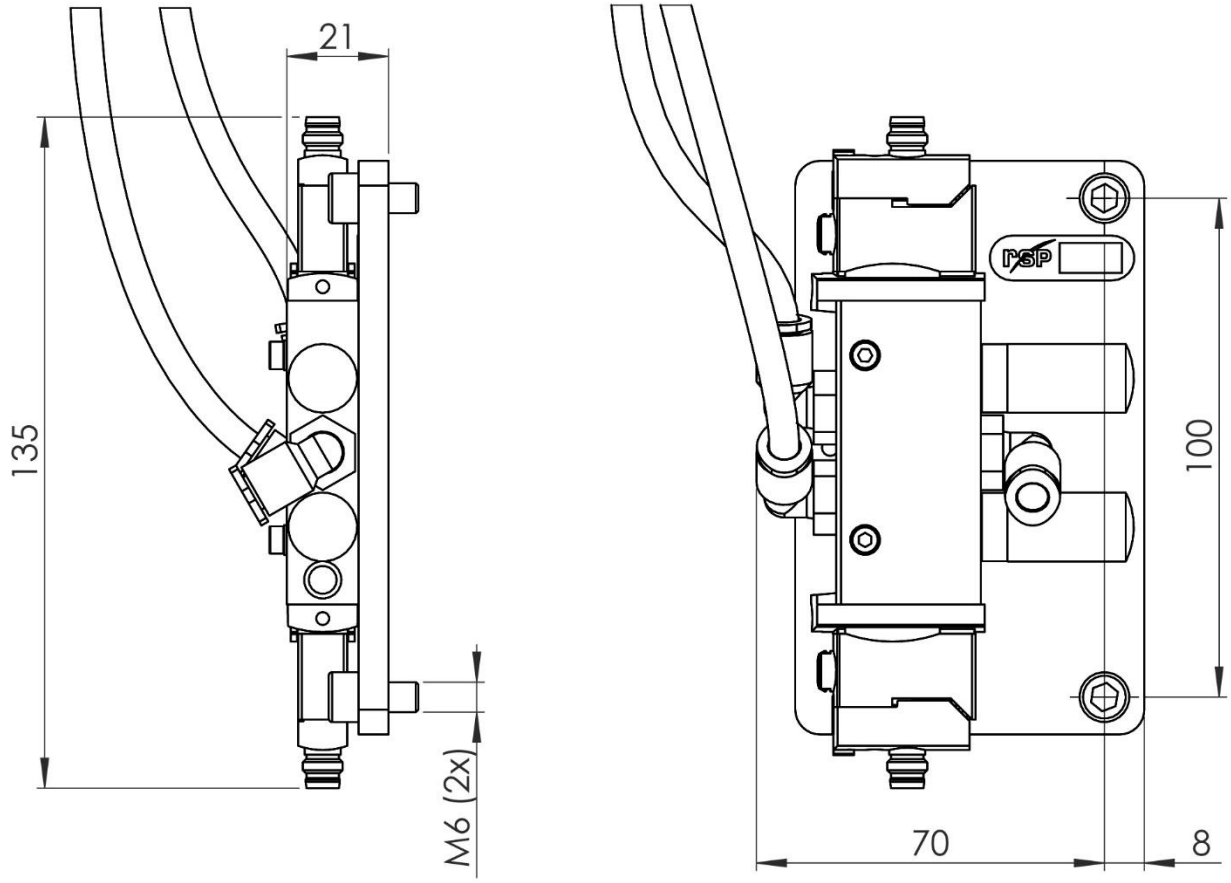
3.3.1 Circuit diagram E0186-110



3.3.2 Pneumatic diagram Pne0186-110



3.4 Valve unit for dust cover. Article no: P8513A

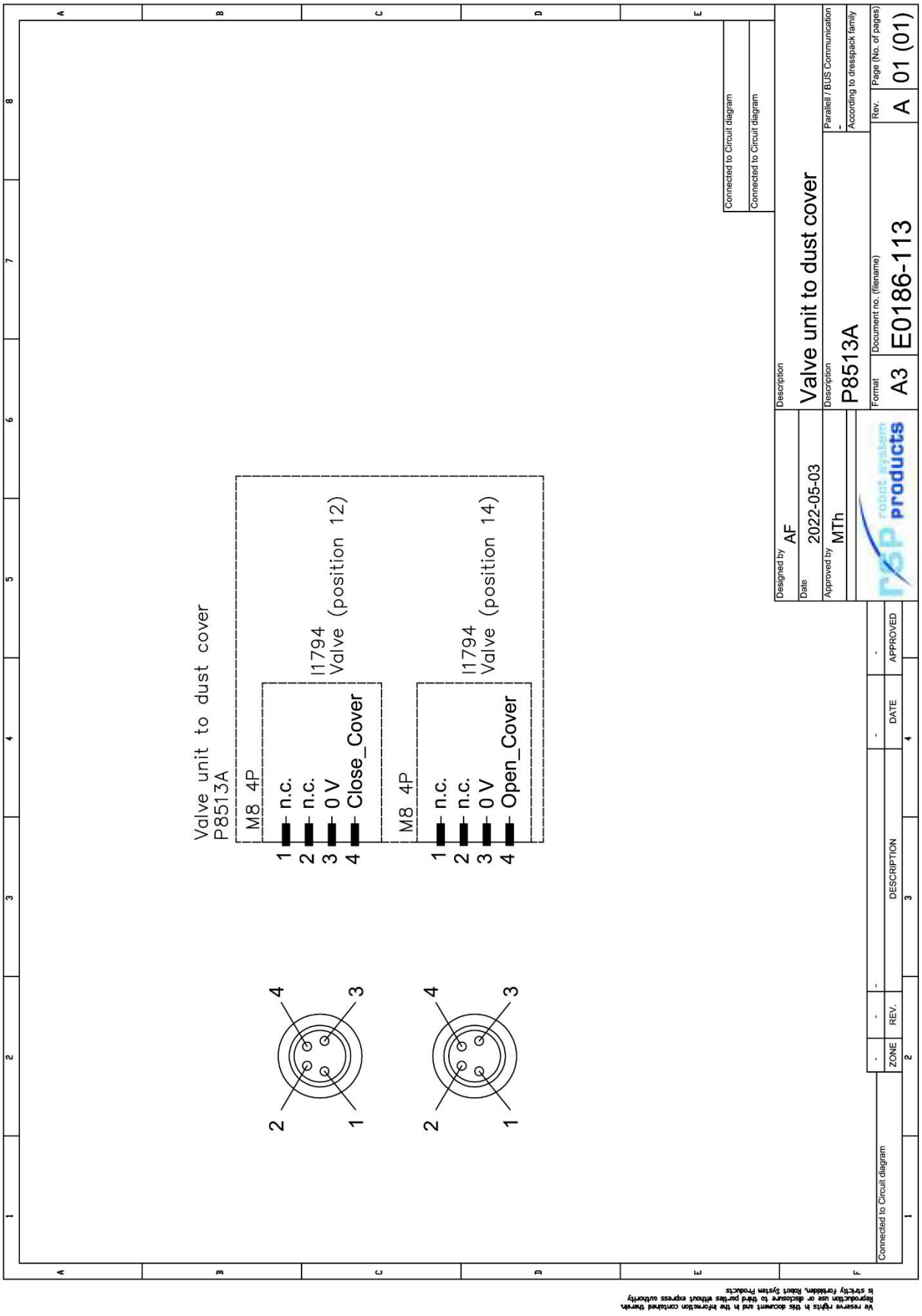


A bi-stable 5/2-valve, including hoses, screws, and washers, to be mounted on the tool stand column P8380 and used together with P8517-1 (dust cover with pneumatic tilting clamp).

Technical data

Weight		0,5 kg
Electrical signals	Circuit diagram M8 4P A-code M8 4P A-code	E0186-113 (section 3.4.1) 0V, OpenCover, 0V, CloseCover

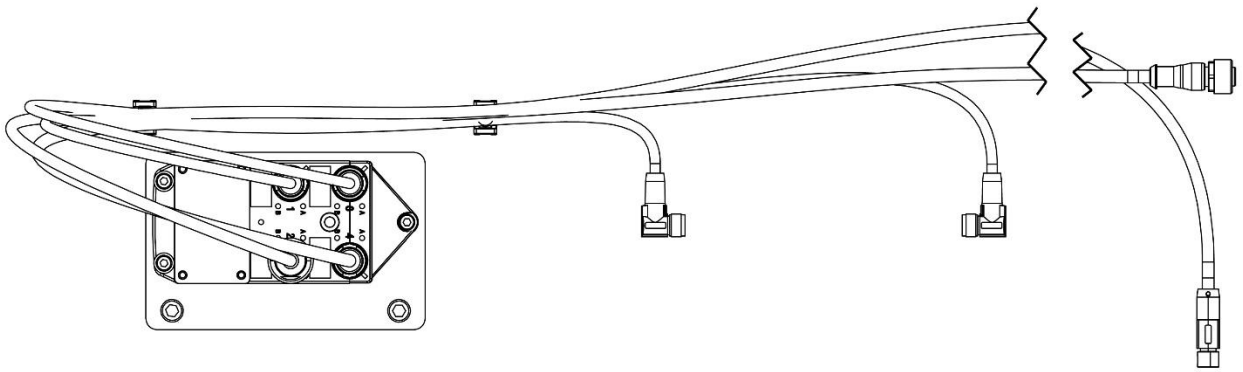
3.4.1 Circuit diagram E0186-113



4 OPTIONS

4.1 I/O Connection modules

4.1.1 Connection module 4 X M12. Article: P8391

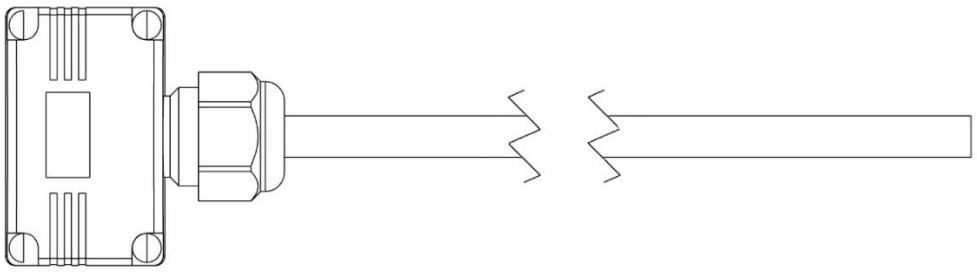


Option to tool parking system single P8525-XXX-YY. The Connection module, P8391, can be mounted on the tool stand column and connected to the tilting clamp for the dust cover (P8517-1), the valve unit (P8513A), a floor cable (P8398) and an optional tool present sensor (P8382).

Technical data

Weight		0.6 kg
Electrical signals	Circuit diagram Floor cable, P8398	E0186-090 (section 4.1.3) 10 x (2A, 30V) + PE
Input	M12 4S, Tilting clamp (P8517-1) M8 8S, Tool present (P8382)	24V, Cover_Closed, 0V, Cover_Opened Tool present 1, Tool present 2
Output	M8 4S, Valve unit (P8513A)) M8 4S, Valve unit (P8513A)	0V, Close_Cover 0V, Open_Cover

4.1.2 Floor cable TPS 400. Article: P8398

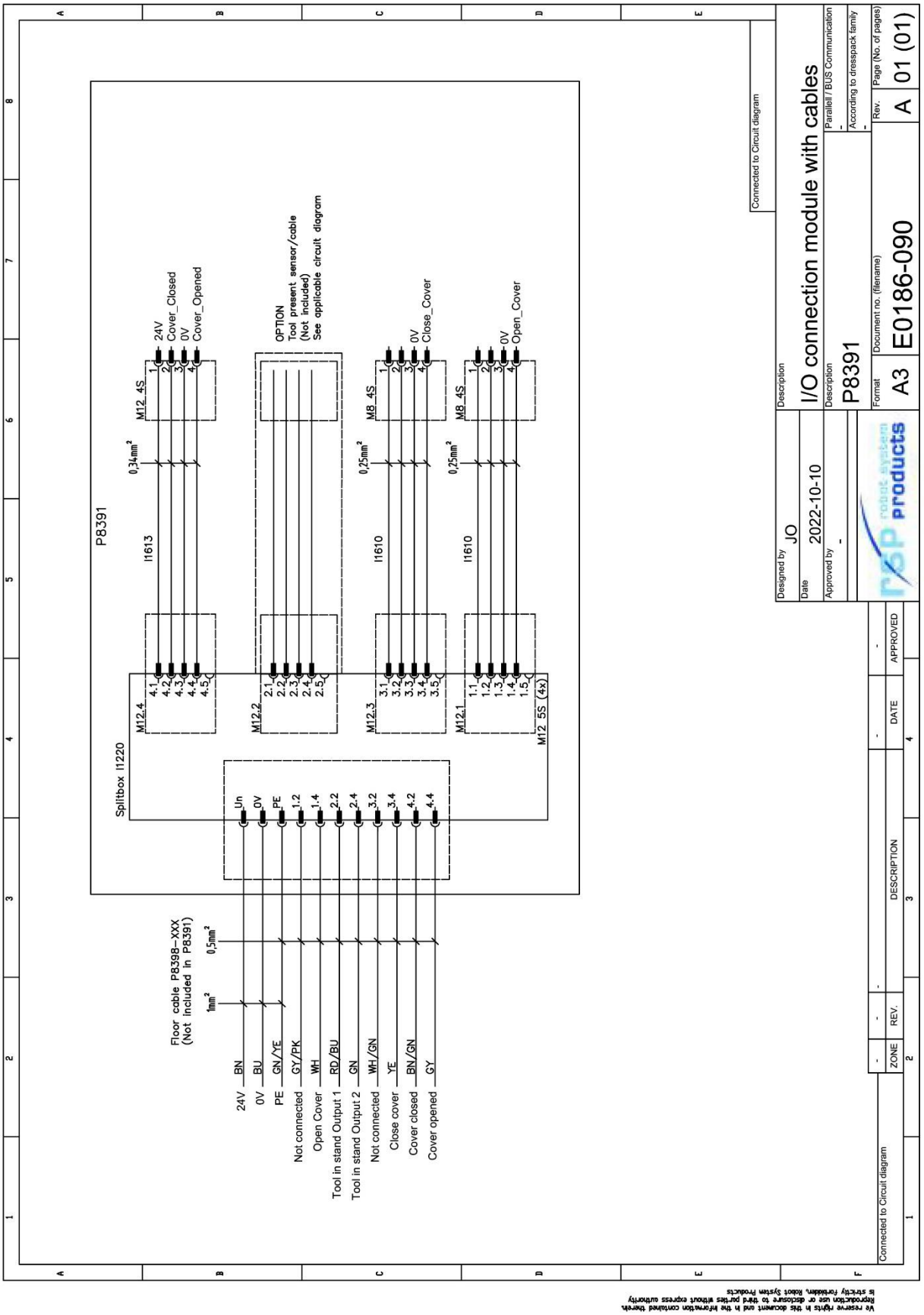


The open-ended floor cable P8398 is prepared for direct mounting to the Connection module 4 X M12, P8391.

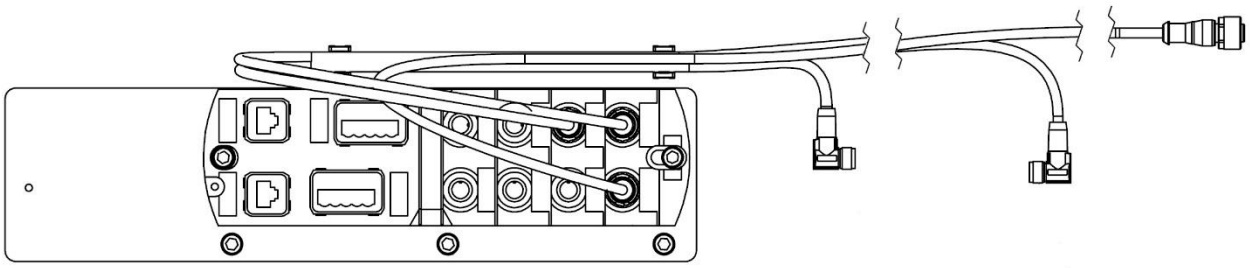
Technical data

Article number	Length	Weight	Circuit diagram
P8398-150	15 meter	1.8 kg	E0186-090 (section 4.1.3)
P8398-300 (optional)	30 meter	3.8 kg	E0186-090 (section 4.1.3)

4.1.3 Circuit diagram E0186-090 for P8391 and P8398



4.1.4 Connection module Push Pull, Profinet, single. Article: P8372



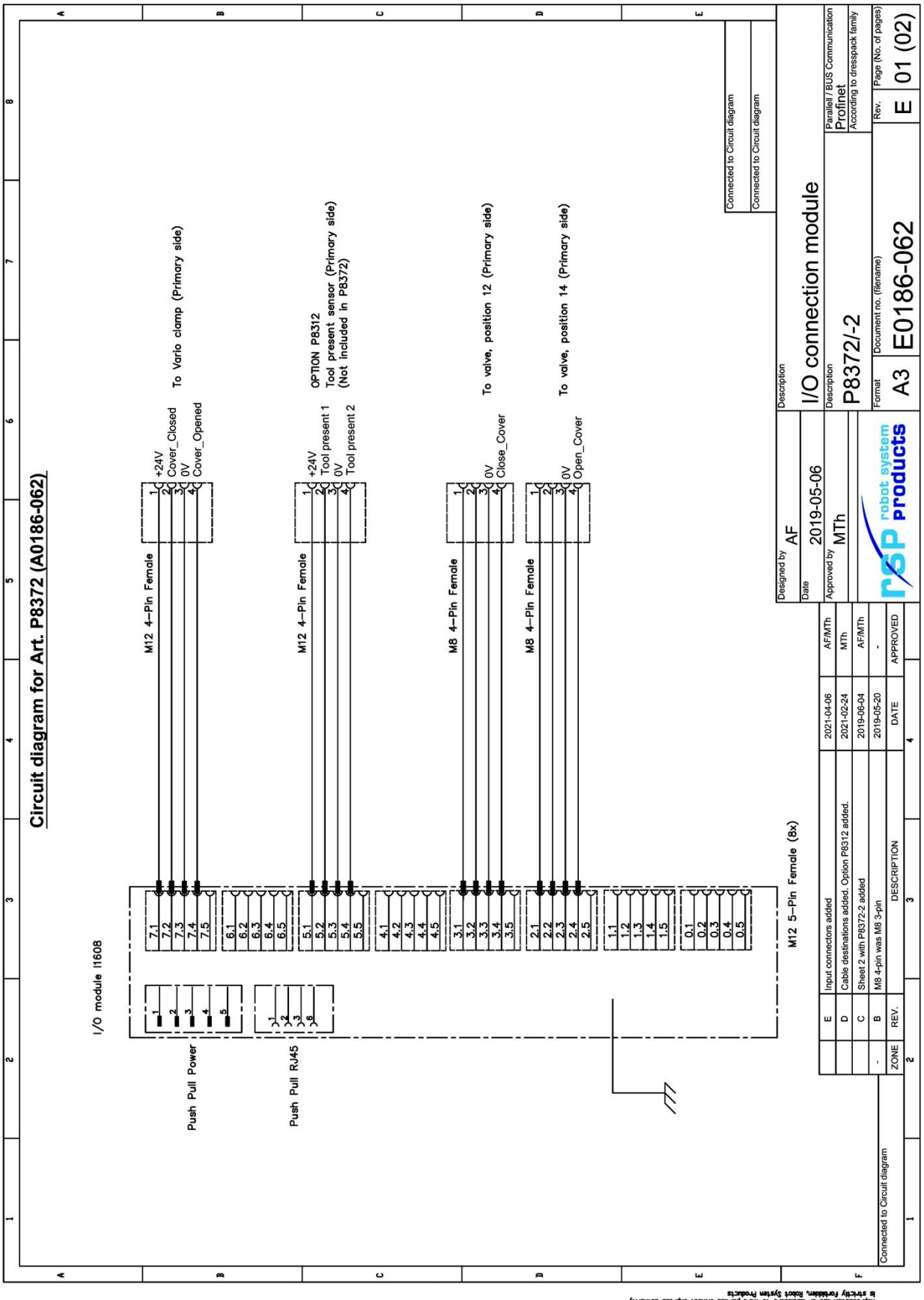
Option to tool parking system single P8525-XXX-YY. The Connection module Push Pull Profinet, P8372, based on Murrelektronik 55529, can be mounted on the tool stand column and connected to the tilting clamp for the dust cover (P8517-1), the valve unit (P8513A), power supply, field bus and an optional tool present sensor (P8312),

Technical data

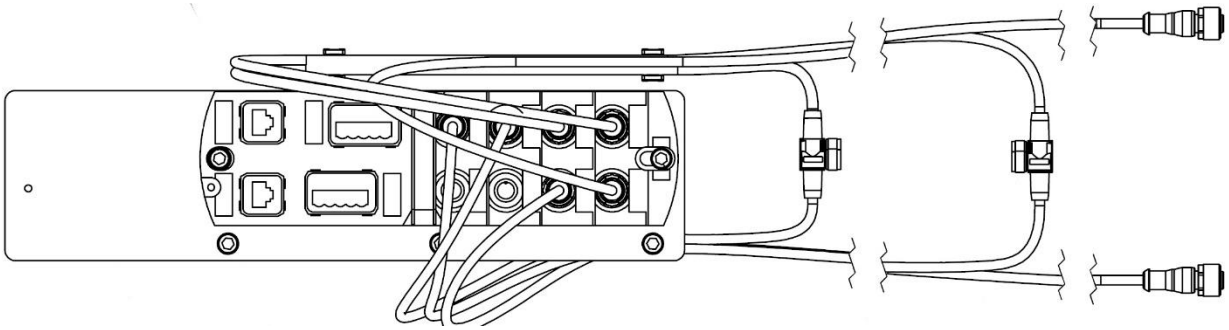
Electrical signals	Circuit diagram	E0186-062-1 (section 4.1.5)
Input	Push Pull RJ45 Push Pull power M12 4S, Tilting clamp (P8517-1) M12 4S, Tool present (P8312)	Profinet Power supply 24V 24V, Cover_Closed, 0V, Cover_Opened 24V, Tool present 1, 0V, Tool present 2
Output	M8 4S, Valve unit (P8513A) M8 4S, Valve unit (P8513A)	0V, Close_Cover 0V, Open_Cover

NOTE! Cables with connectors are included for the dust cover, the valve unit and an optional tool present sensors.

4.1.5 Circuit diagram E0186-062-1 for P8372



4.1.6 Connection module Push Pull, Profinet, dual. Article: P8372-2



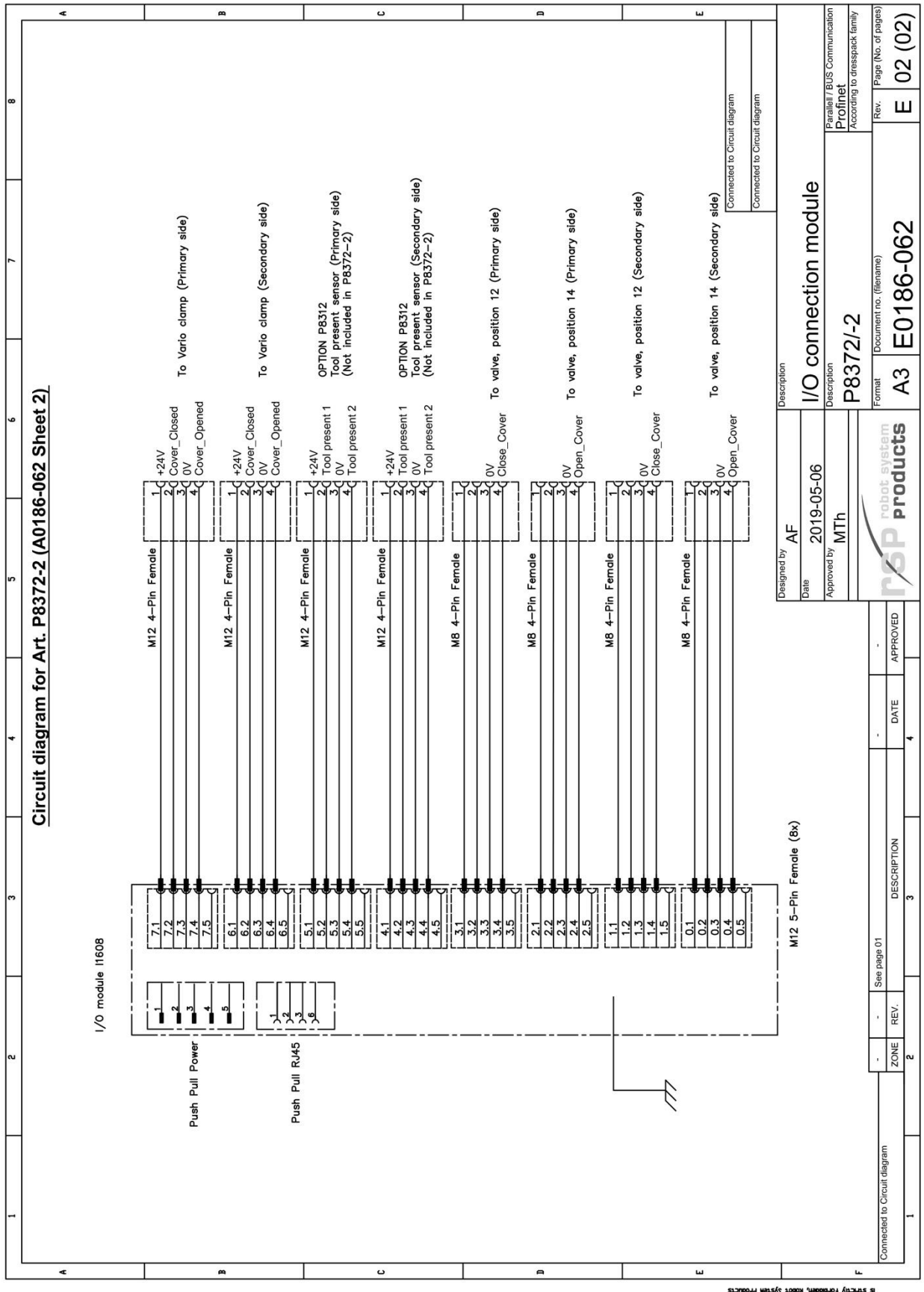
Option to tool parking system dual P8526-XXX-YY. The Connection module Push Pull Profinet dual, P8372-2, based on Murrelektronik 55529, can be mounted on the tool stand column and connected to the two tilting clamps for the dust covers (P8517-1), the two valve units (P8513A), power supply, field bus and optional tool present sensors (P8312).

Technical data

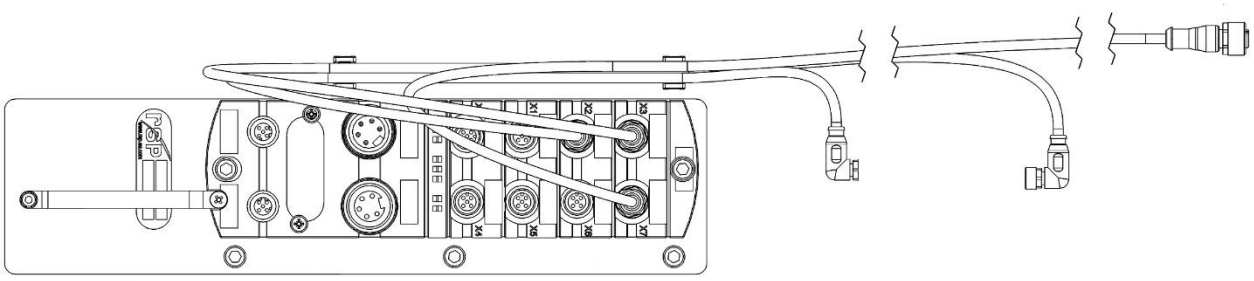
Electrical signals	Circuit diagram	E0186-062-2 (section 4.1.7)
Input	Push Pull RJ45	Profinet
	Push Pull power	Power supply 24V
	M12 4S, Tilting clamp #1 (P8517-1)	24V, Cover_Closed, 0V, Cover_Opened
	M12 4S, Tilting clamp #2 (P8517-1)	24V, Cover_Closed, 0V, Cover_Opened
	M12 4S, Tool present #1 (P8312))	24V, Tool present 1, 0V, Tool present 2
	M12 4S, Tool present #2 (P8312))	24V, Tool present 1, 0V, Tool present 2
Output	M8 4S, Valve unit #1 (P8513A)	0V, Close_Cover
	M8 4S, Valve unit #1 (P8513A)	0V, Open_Cover
	M8 4S, Valve unit #2 (P8513A)	0V, Close_Cover
	M8 4S, Valve unit #2 (P8513A)	0V, Open_Cover

NOTE! Cables with connectors are included for the dust covers, the valve units and optional tool present sensors.

4.1.7 Circuit diagram E0186-062-2 for P8372-2



4.1.8 Connection module 7/8", Profinet, single. Article no: P8516-1



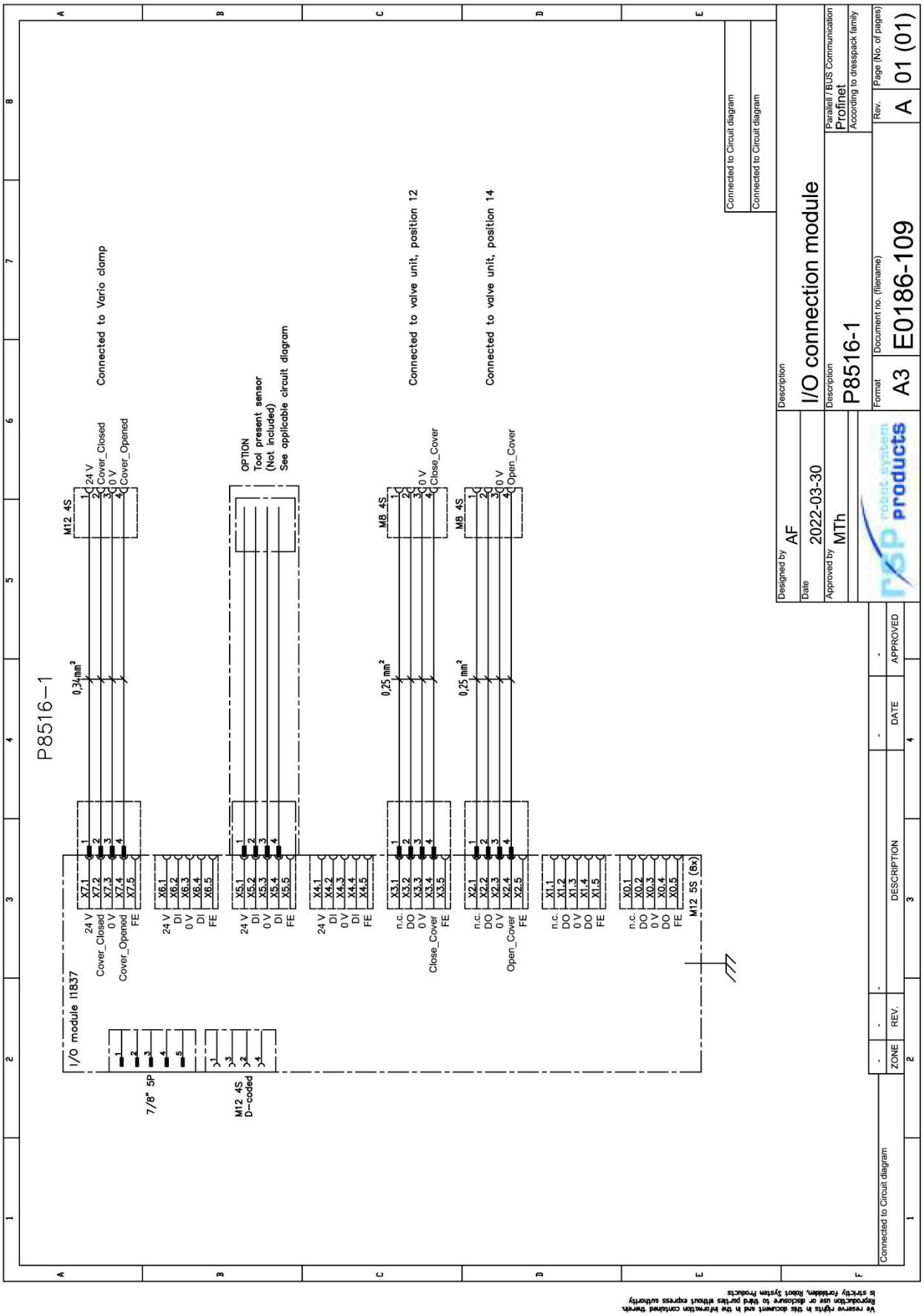
Option to tool parking system single P8525-XXX-YY. The Connection module 7/8" Profinet, P8516-1, based on Murrelektronik 55339, can be mounted on the tool stand column and connected to the tilting clamp for the dust cover (P8517-1), the valve unit (P8513A), power supply, field bus and an optional tool present sensor (P8312),

Technical data

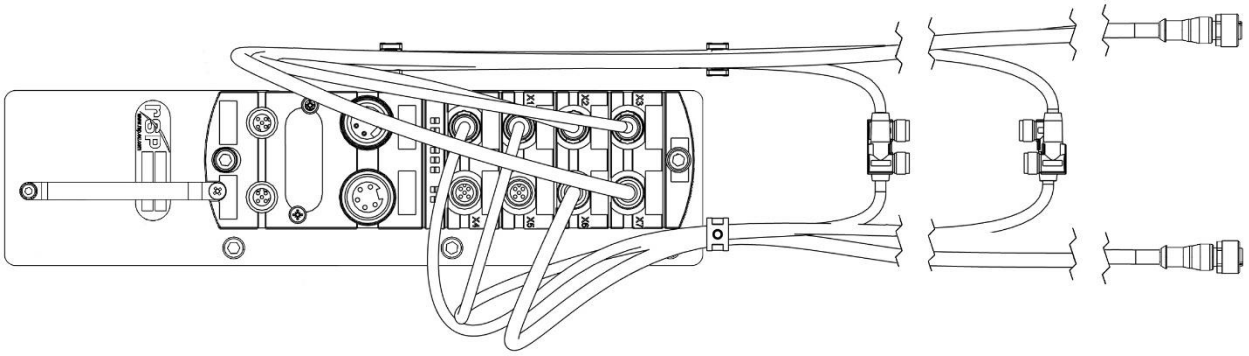
Electrical signals	Circuit diagram	E0186-109 (section 4.1.9)
Input	7/8" 5-pole	Power supply 24V
	M12 4S, D-coded	Profinet
	M12 4S, Tilting clamp (P8517-1)	24V, Cover_Closed, 0V, Cover_Opened
	M12 4S, Tool present, optional (P8312)	24V, Tool present 1, 0V, Tool present 2
Output	M8 4S, Valve unit (P8513A) M8 4S, Valve unit (P8513A)	0V, Close_Cover 0V, Open_Cover

NOTE! Cables with connectors are included for the dust cover, the valve unit and an optional tool present sensors.

4.1.9 Circuit diagram E0186-109-1 for P8516-1



4.1.10 Connection module 7/8", Profinet, dual. Article: P8516-2



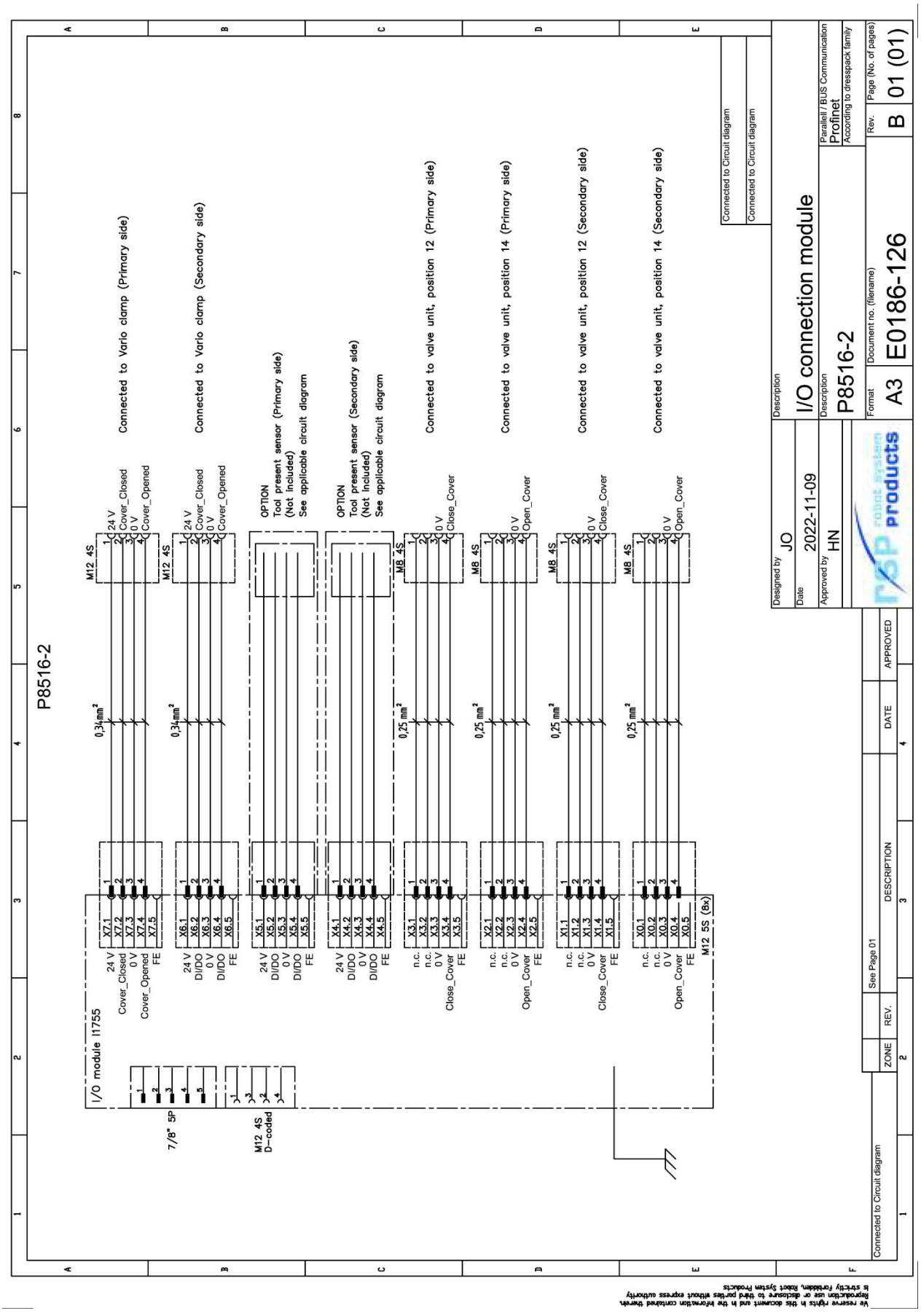
Option to tool parking system dual P8526-XXX-YY. The Connection module 7/8" Profinet dual, P8516-2, based on Murrelektronik 55339, can be mounted on the tool stand column and connected to the two tilting clamps for the dust covers (P8517-1), the two valve units (P8513A), power supply, field bus and optional tool present sensors (P8312).

Technical data

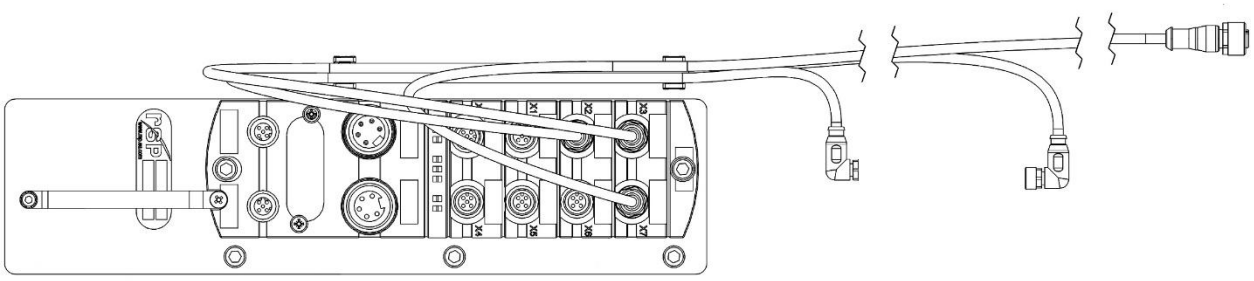
Electrical signals	Circuit diagram	E0186-126 (section 4.1.11)
Input	7/8" 5-pole	Power supply 24V
	M12 4S, D-code	Profinet
	M12 4S, Tilting clamp #1 (P8517-1)	24V, Cover_Closed, 0V, Cover_Opened
	M12 4S, Tilting clamp #2 (P8517-1)	24V, Cover_Closed, 0V, Cover_Opened
	M12 4S, Tool present #1 (P8312))	24V, Tool present 1, 0V, Tool present 2
	M12 4S, Tool present #2 (P8312)	24V, Tool present 1, 0V, Tool present 2
Output	M8 4S, Valve unit #1 (P8513A) M8 4S, Valve unit #1 (P8513A) M8 4S, Valve unit #2 (P8513A) M8 4S, Valve unit #2 (P8513A)	0V, Close_Cover 0V, Open_Cover 0V, Close_Cover 0V, Open_Cover

NOTE! Cables with connectors are included for the dust covers, the valve units and optional tool present sensors.

4.1.11 Circuit diagram E0186-126 for P8516-2



4.1.12 Connection module 7/8", Profinet, single. Article no: P8533-1



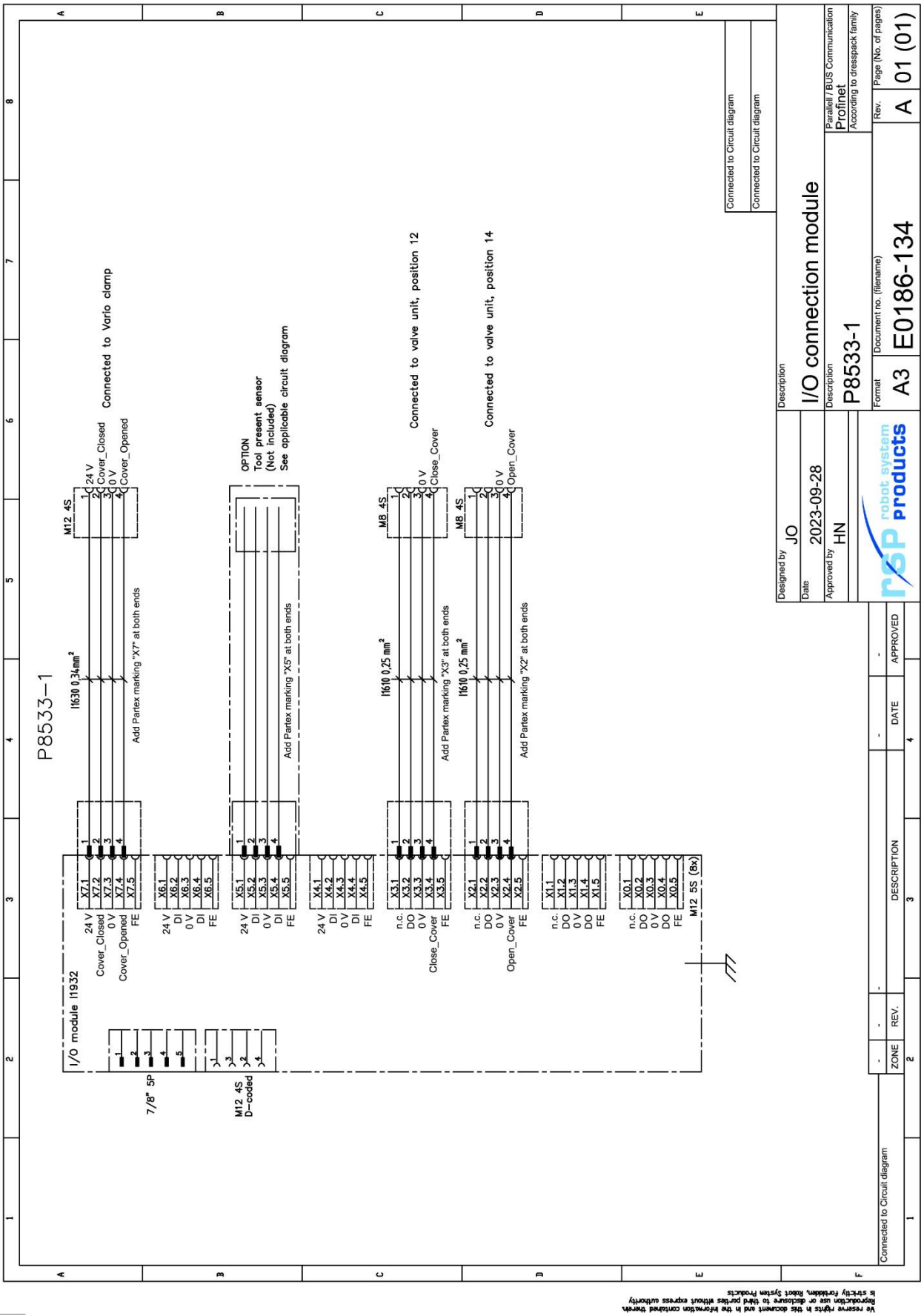
Option to tool parking system single P8525-XXX-YY. The Connection module 7/8" Profinet, P8533-1, based on Murrelektronik 54531, can be mounted on the tool stand column and connected to the tilting clamp for the dust cover (P8517-1), the valve unit (P8513A), power supply, field bus and an optional tool present sensor (P8312),

Technical data

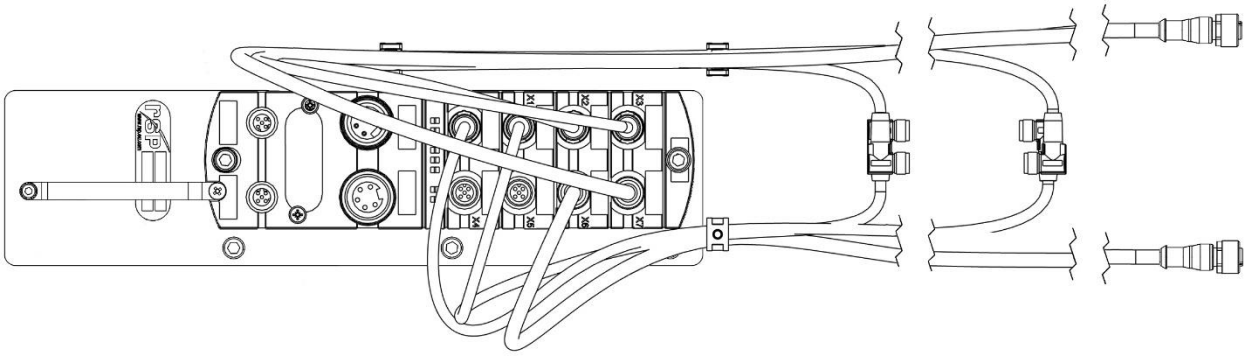
Electrical signals	Circuit diagram	E0186-134 (section 4.1.13)
Input	7/8" 5-pole	Power supply 24V
	M12 4S, D-coded	Profinet
	M12 4S, Tilting clamp (P8517-1)	24V, Cover_Closed, 0V, Cover_Opened
	M12 4S, Tool present, optional (P8312)	24V, Tool present 1, 0V, Tool present 2
Output	M8 4S, Valve unit (P8513A) M8 4S, Valve unit (P8513A)	0V, Close_Cover 0V, Open_Cover

NOTE! Cables with connectors are included for the dust cover, the valve unit and an optional tool present sensors.

4.1.13 Circuit diagram E0186-134 for P8533-1



4.1.14 Connection module 7/8", Profinet, dual. Article: P8533-2



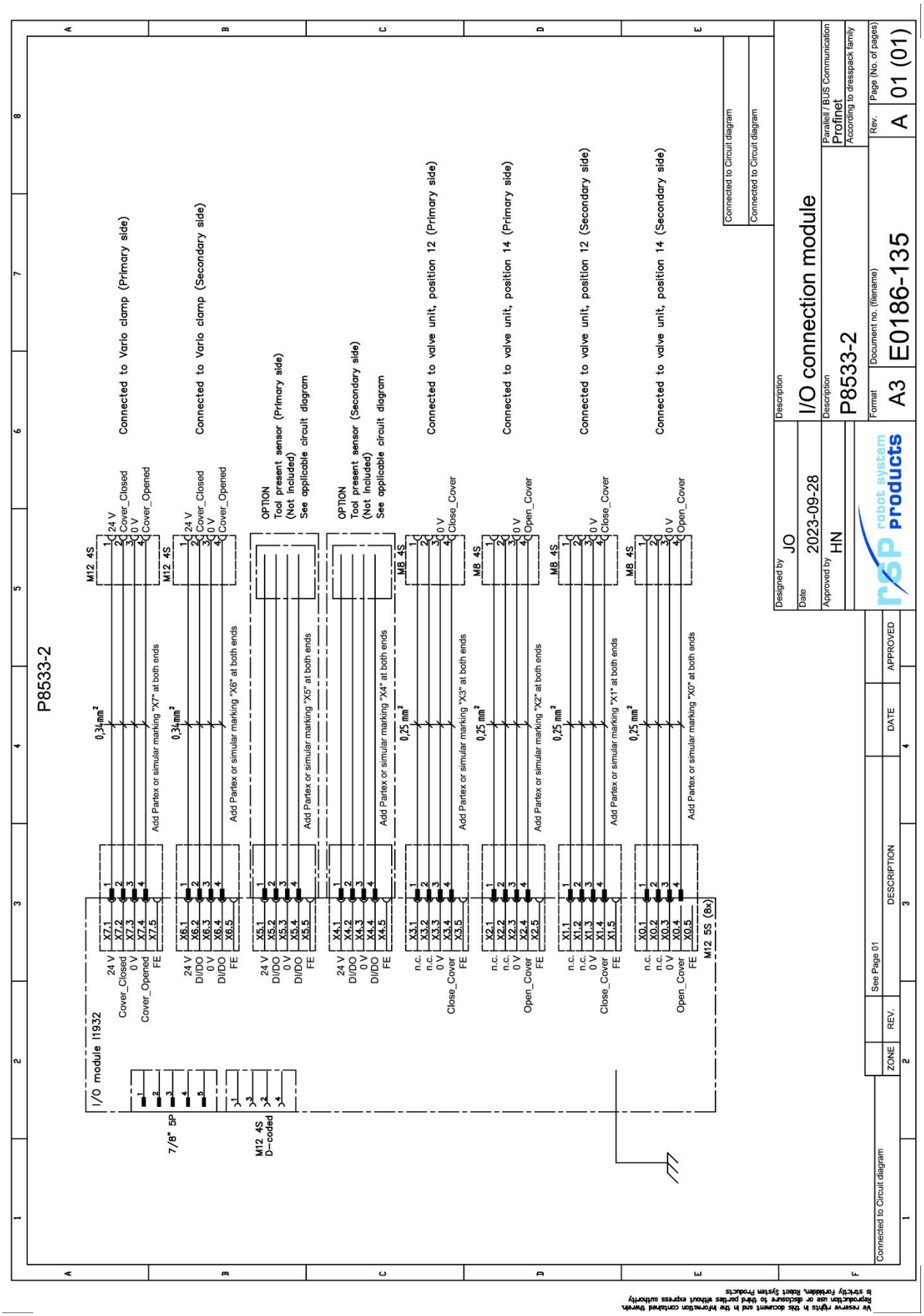
Option to tool parking system dual P8526-XXX-YY. The Connection module 7/8" Profinet dual, P8533-2, based on Murrelektronik 54531, can be mounted on the tool stand column and connected to the two tilting clamps for the dust covers (P8517-1), the two valve units (P8513A), power supply, field bus and optional tool present sensors (P8312).

Technical data

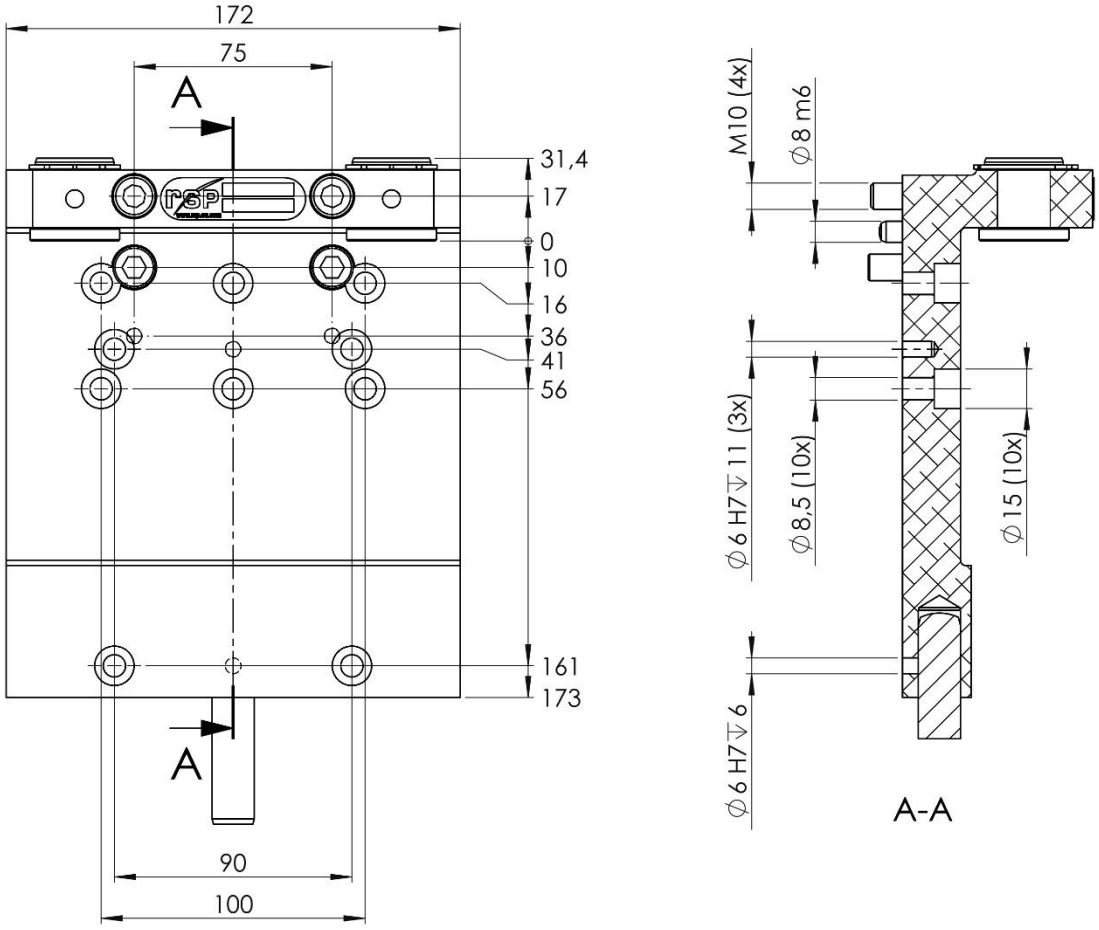
Electrical signals	Circuit diagram	E0186-135 (section 4.1.15)
Input	7/8" 5-pole	Power supply 24V
	M12 4S, D-code	Profinet
	M12 4S, Tilting clamp #1 (P8517-1)	24V, Cover_Closed, 0V, Cover_Opened
	M12 4S, Tilting clamp #2 (P8517-1)	24V, Cover_Closed, 0V, Cover_Opened
	M12 4S, Tool present #1 (P8312))	24V, Tool present 1, 0V, Tool present 2
	M12 4S, Tool present #2 (P8312)	24V, Tool present 1, 0V, Tool present 2
Output	M8 4S, Valve unit #1 (P8513A) M8 4S, Valve unit #1 (P8513A) M8 4S, Valve unit #2 (P8513A) M8 4S, Valve unit #2 (P8513A)	0V, Close_Cover 0V, Open_Cover 0V, Close_Cover 0V, Open_Cover

NOTE! Cables with connectors are included for the dust covers, the valve units and optional tool present sensors.

4.1.15 Circuit diagram E0186-135 for P8533-2



4.2 Tool plate. Article: P8303A



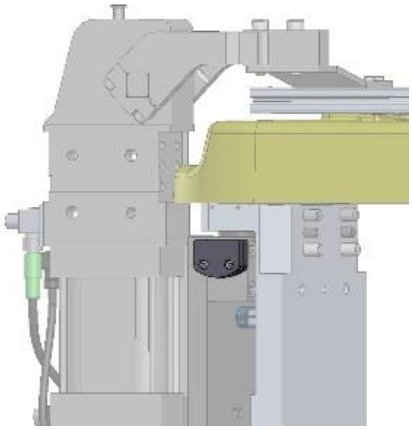
The tool plate P8303A, mounted on the tool attachment or tool, gives together with tool stand hanger P8302 and tool stand column P8380-xxx a robust tool parking system for easy tool changing.

NOTE! When used in combination with the safety signal modules P7501-xxx the tool plate P8303A can with the active tool-in-stand sensor P8528 mounted be used together with the passive tool-in-stand sensor P8369, mounted on the tool stand hanger, in order to get a presence signal for the safety logic.

Technical data

Weight	2.6 kg

4.3 Tool-in-stand/Tool present Schmersal sensor



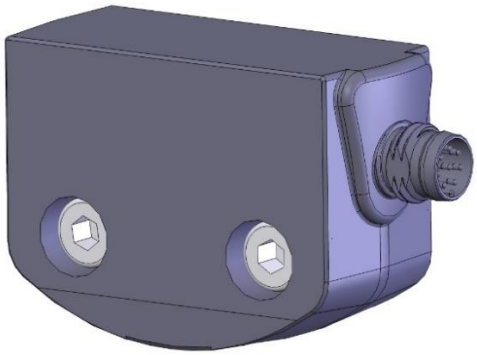
Active and passive RFID-based Schmersal sensors used in combination for detecting when the tool/tool attachment is present in the parking position before permitting the tool changer to open.

Can be configured in two different ways, one with the active sensor on the tool parking side for external safety solutions and the other with the active sensor mounted on the tool side for the use with a safety signal module P7501-xxx (Moduflex Safety).

NOTE! When the active sensor Is mounted on the tool stand side the dual signals confirming that the tool is in the stand are named *Tool Present 1* and *Tool Present 2*. When the active sensor is mounted on the tool side the corresponding dual signals are named *Tool_In_Stand1* and *Tool_In_Stand2*.

NOTE! Maximum tightening torque when mounting the Tool-in-stand/Tool present Schmersal sensor is 0.8 Nm!

4.3.1 Tool-in-stand/Tool present sensor. Article: P8382



Active tool-in-stand sensor, based on a Schmersal RSS260-D-ST, which gives dual (+24V) confirmation signals when a tool is positioned in tool stand.

When the active sensor P8382 is mounted on the tool stand hanger a passive sensor P8369 shall be mounted on the tool plate or the tool attachment. Alternatively, when the active sensor P8382 is mounted on the tool side a passive sensor P8369 shall be mounted on the tool stand hanger.

Technical data

Weight		0.02 kg
Electrical signals	Circuit diagram	E0186-075 (section 4.3.4)
	M8 8P	
	On tool stand hanger	3 x 24V, 0V. Tool Present 1, Tool Present 2
	On tool plate	3 x 24V, 0V. Tool_In_Stand1, Tool_In_Stand2

4.3.2 Active Tool-in-stand sensor for Moduflex safety. Articles: P8528

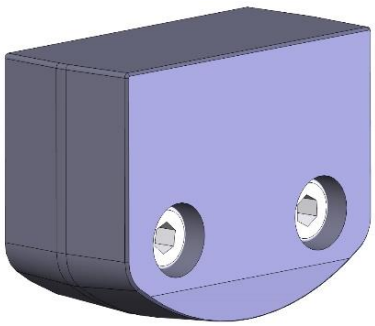
Active tool-in-stand sensor, based on a Schmersal RSS260-D-ST, which gives +24V signals “Tool_In_Stand1” and “Tool_In_Stand2” when tool is positioned in tool stand

The active tool-in-stand sensor P8528 includes connection and cables dedicated for the use with a safety signal module P7501-xxx (Moduflex Safety). It shall be mounted on the tool attachment and combined with passive sensor P8369 mounted on the corresponding position on the tool stand hanger.

Technical data

Weight		0.05 kg
Electrical signals	Circuit diagram	E0186-075 (section 4.3.4)
	M8 4S	0V, 24V, Tool_In_Stand1, Tool_In_Stand2

4.3.3 Passive tool-in-stand sensor. Article: P8369



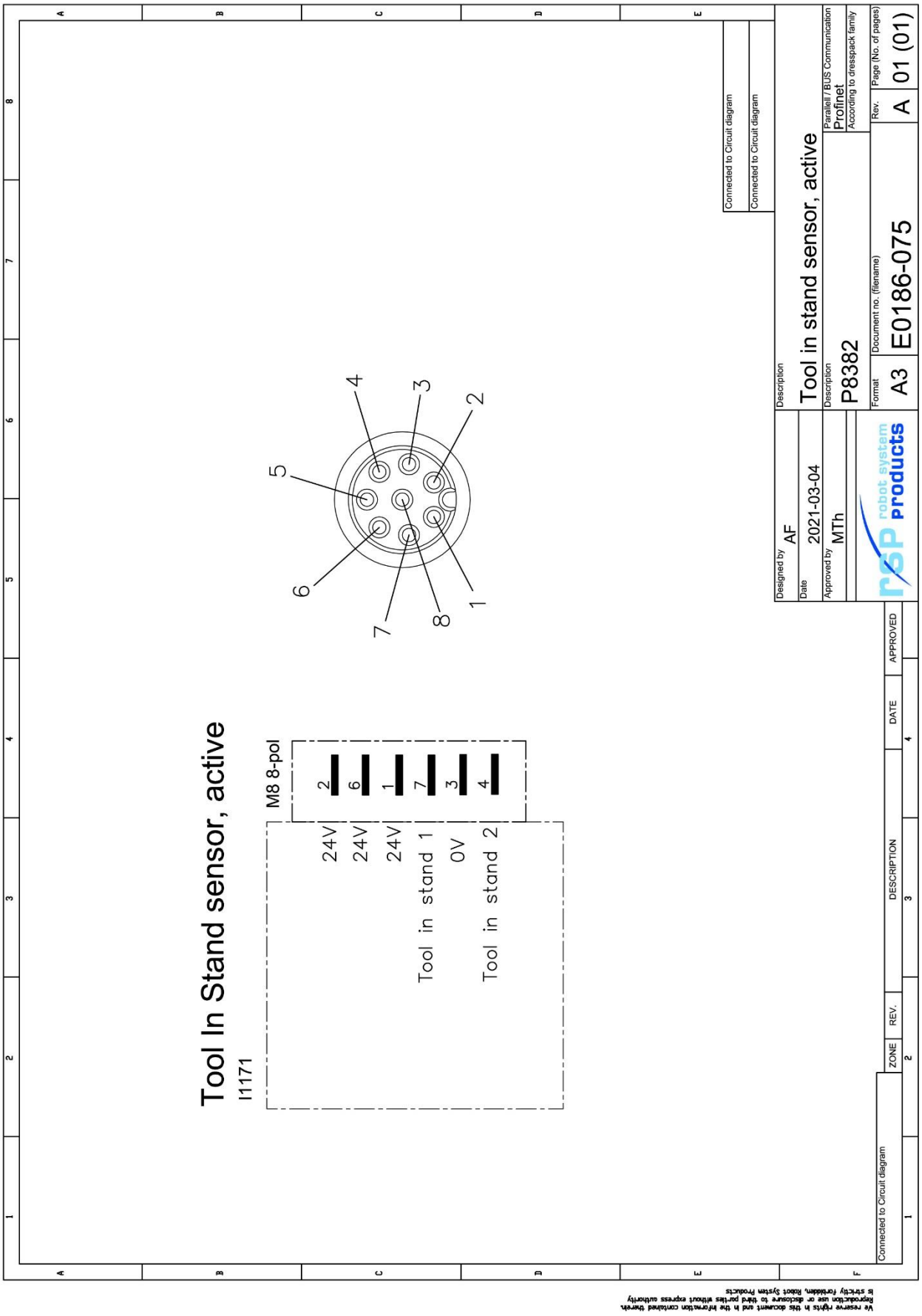
The passive tool-in-stand sensor P8369, based on a Schmersal RST260-1, shall be used together with an active tool-in-stand sensor, P8382 or P8528, for checking that the tool/tool attachment is present in the parking position.

When the passive sensor P8369 is mounted on the tool stand hanger the active sensor P8528 (dedicated for the use with Moduflex safety) or the active sensor P8382 shall be mounted on the tool side. When the passive sensor P8369 is mounted on the tool side an active sensor P8382 shall be mounted on the tool stand hanger.

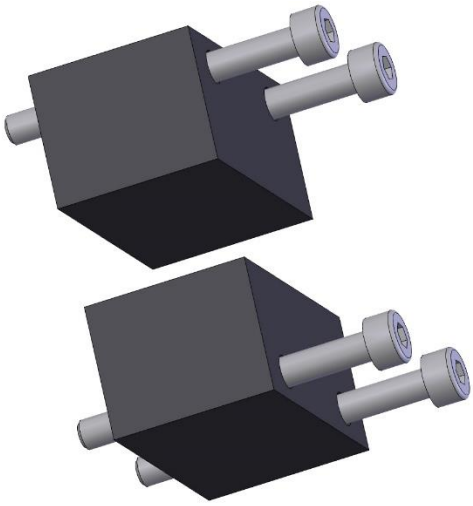
Technical data

Weight	0.02 kg

4.3.4 Circuit diagram E0186-075 for P8382



4.3.5 Spacers for tool-in-stand sensors. Article: P8373



Optional spacers for mounting of tool-in-stand sensors P8528/P8382 and P8369 on the tool stand hanger and on the tool plate.

NOTE! Must be used together with TA720 to provide clearance between sensor cable and tool attachment.

Technical data

Weight	0.1 kg
Thickness	22 mm

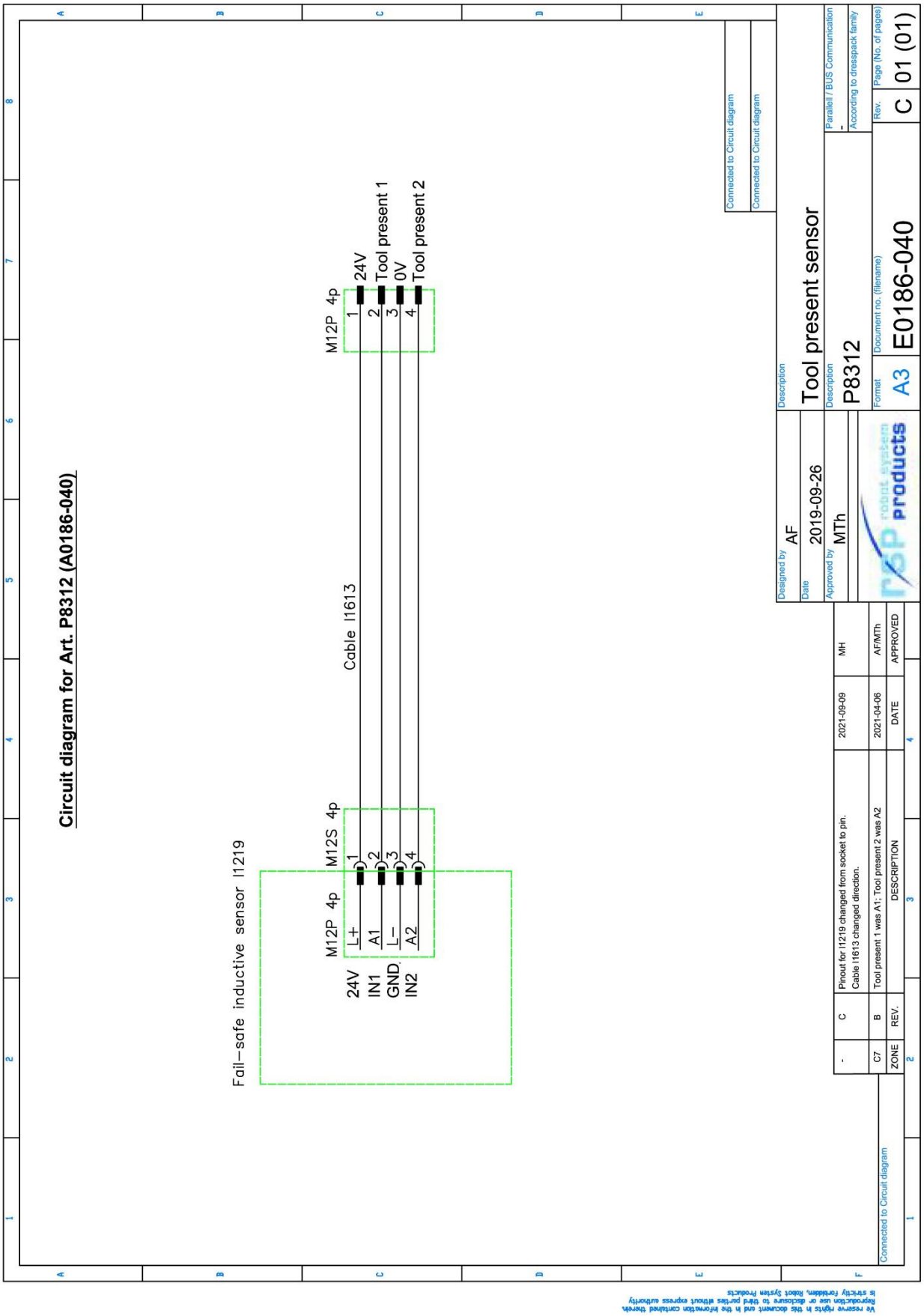
4.3.6 Tool present sensor, inductive. Article: P8312

Fail-safe inductive sensor, based on IFM GG711S, to be mounted on the tool stand hanger P8507, and connected to connection modules P8372, P8372-2, P8378, P8378-2 or P8516-1 with the included 0.8-meter cable. Transmits a dual channel signal to detect presence of tool in the tool parking system.

Technical data

Weight		0.2 kg
Electrical signals	Circuit diagram M12 4P	E0186-040 (section 4.3.7) 24V, Tool present 1, 0V, Tool present 2
Safety classification (ISO13849-1)		Category 2, PL d

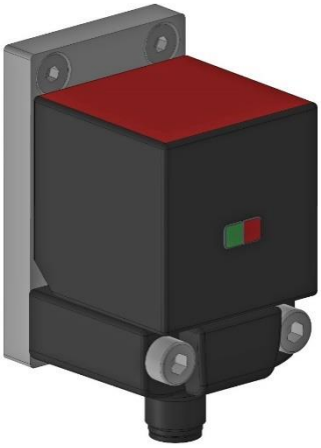
4.3.7 Circuit diagram E0186-040 for P8312



4.4 Tool present sensor

The tool present sensors P8530 and P8531 are used in combination for checking that the tool/tool attachment is present in the parking position.

4.4.1 Tool present sensor, active. Article: P8530



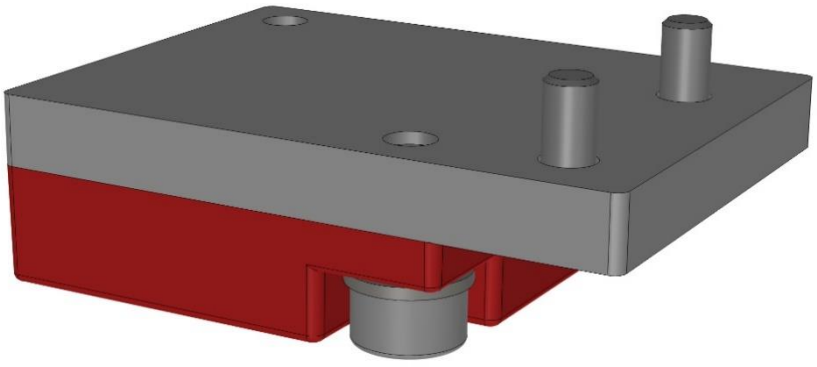
The tool present sensor P8530 (Euchner 111708) shall be mounted on the tool stand hanger P8507 and used together with P8531 mounted on the tool plate. Pairing of P8530 with P8531 will detect that the tool is in safe position before allowing the tool changer to open. Includes short circuit monitoring and double safety output. To be used when safe move application is required.

NOTE! For pairing (teach-in) of P8530 with a dedicated passive sensor P8531, see *EUCHNER Operating Instructions Non-Contact Safety Switch CES-AP-C01-CH-SB-111708 (Multicode).*

Technical data

Weight		0.3 kg
Electrical signals	Circuit diagram M12 5P	E0186-103 (section 4.4.3) 24V, Tool present 1, 0V, Tool present 2
Safety classification (ISO 13849-1)		Category 4 / PL e
Connection kit (optional)	P8441-150 P8441-300	M12 4S, 15-meter cable (4x0,34 mm²), open end M12 4S, 30-meter cable (4x0,34 mm²), open end

4.4.2 Tool present sensor, passive. Article: P8531

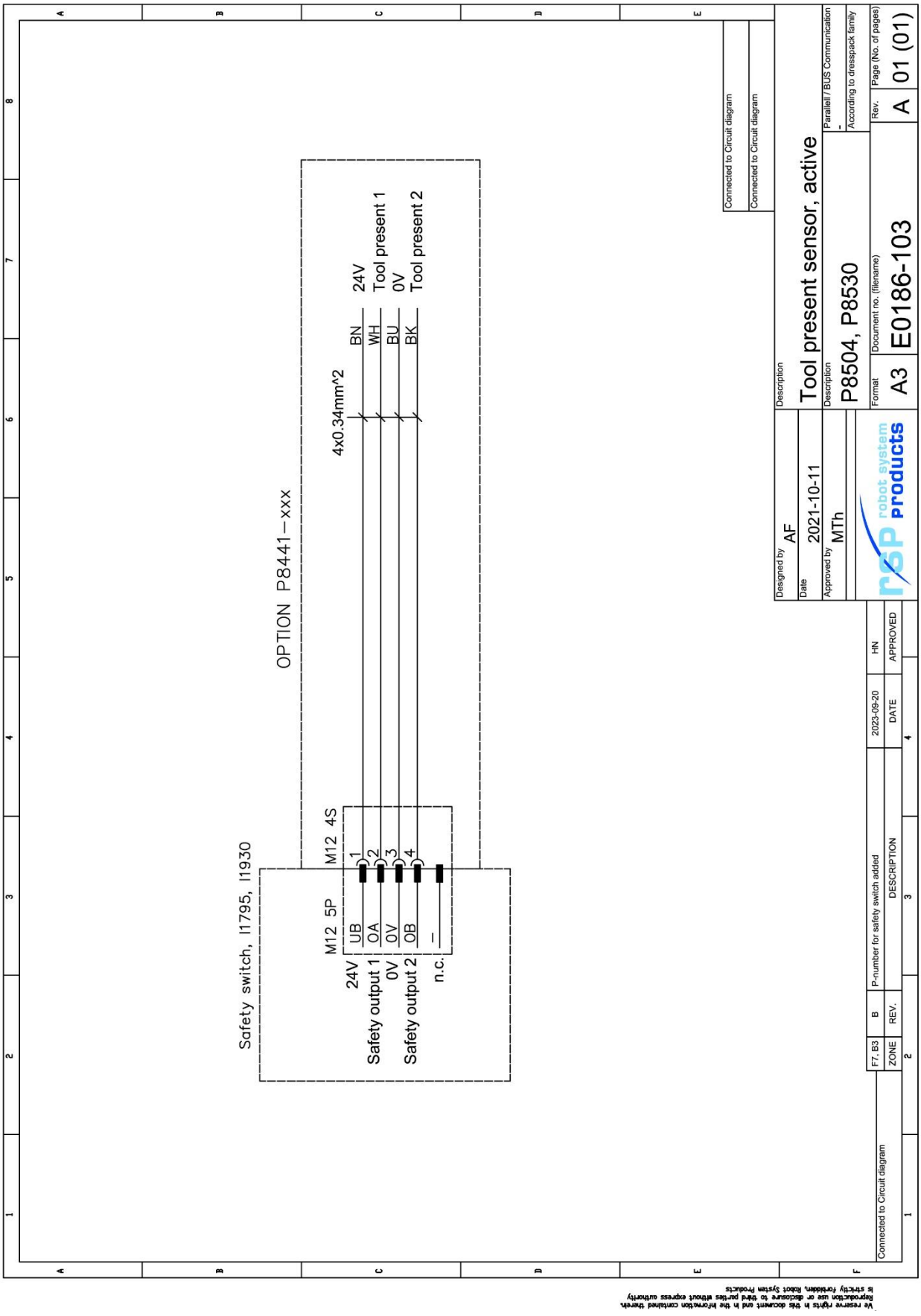


The tool present sensor P8531 (Euchner 098775) can be mounted on the tool plate P8303A and used together with P8530.

Technical data

Weight	0.1 kg

4.4.3 Circuit diagram E0186-103 for P8530



5 INSTALLATION AND MOUNTING

5.1 Tightening torques

Tightening torques for mounting (screw class 8.8)

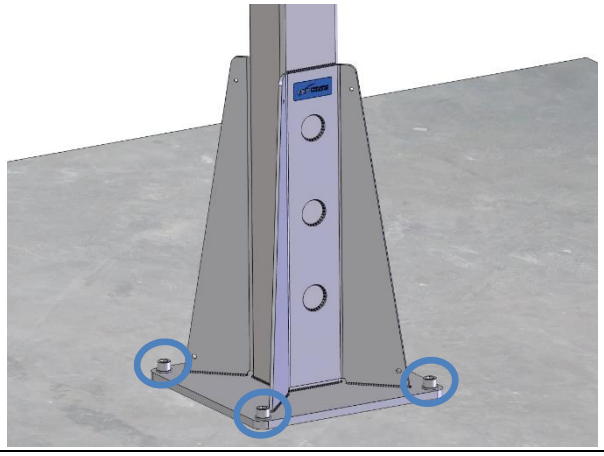
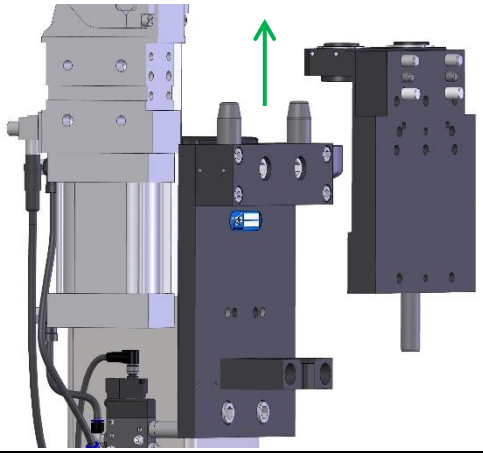
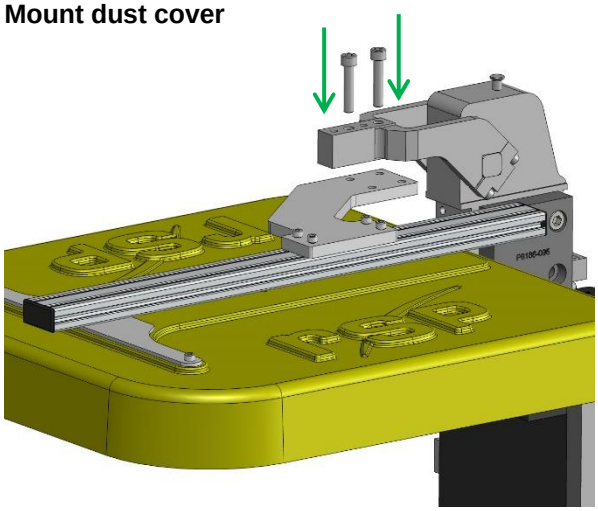
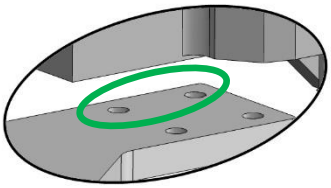
Dimension	Torque
M4	3 Nm
M5	6 Nm
M6	10 Nm
M8	24 Nm
M10	47 Nm
M12	82 Nm
M16	200 Nm

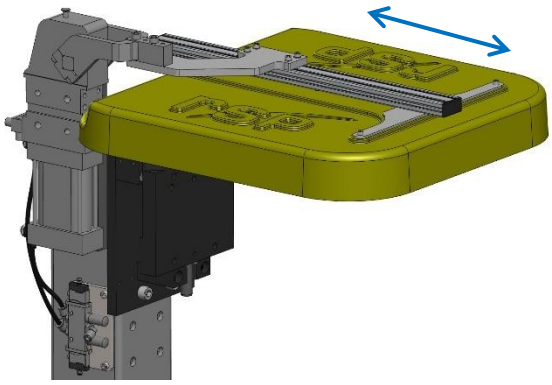
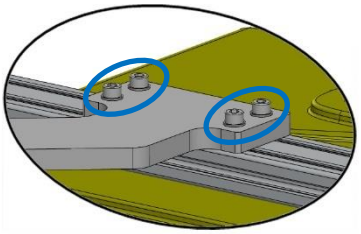
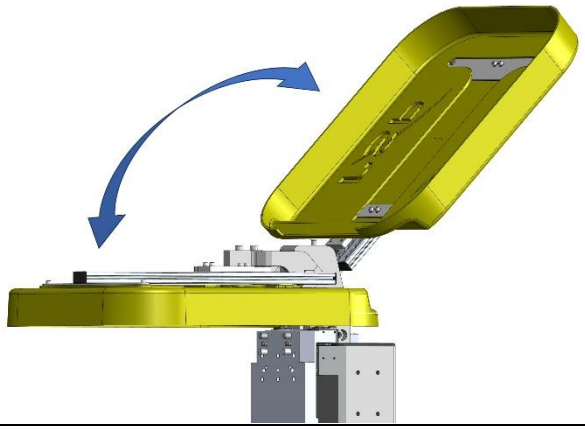
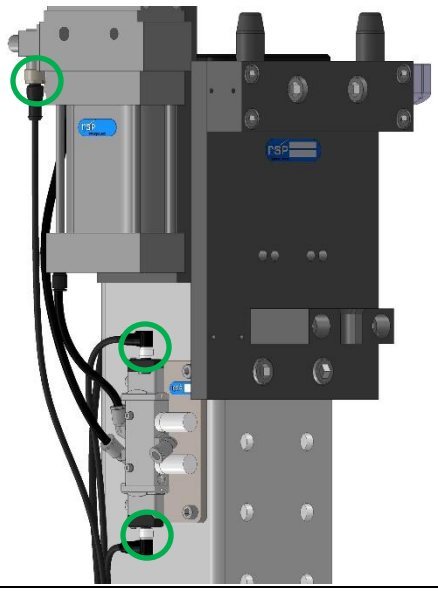
5.2 Recommended tools

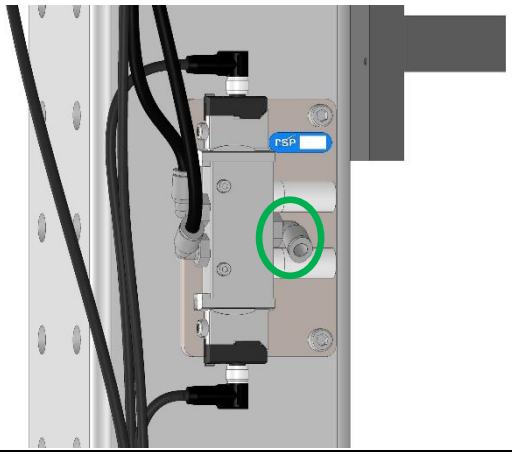
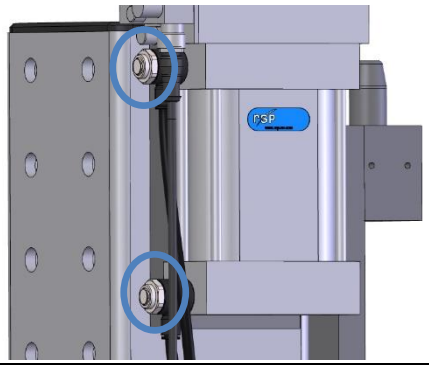
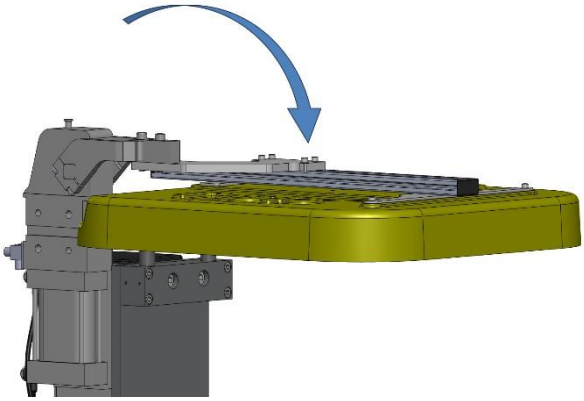
Tools	Applications
Complete set of Allen keys	For dismounting and mounting.
Torque wrench	For all socket head cap screws

NOTE! Robot System Products' tool parking systems are normally delivered fully assembled and ready to be installed after mounting of dust cover (section 5.3). For installation and mounting of items delivered separately see section 5.4.

5.3 Mounting upon delivery

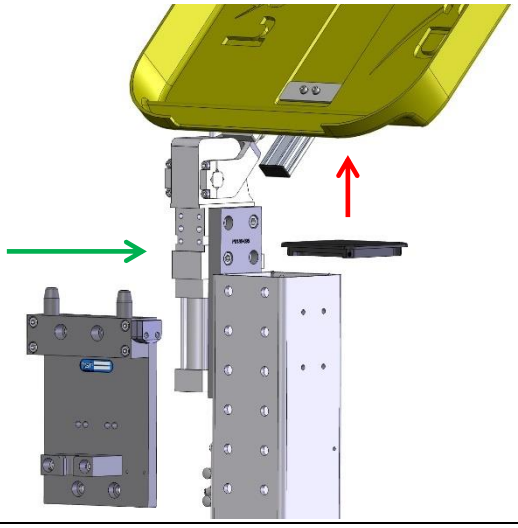
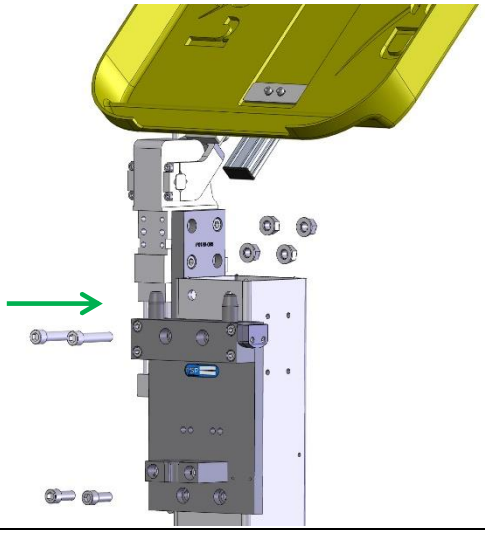
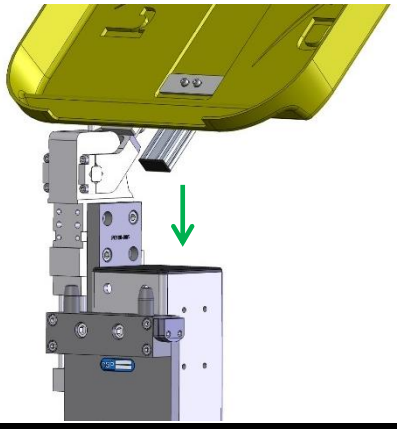
	Action	Note
1	**Safety**	Read the safety section (1.1).
2	**Mount tool stand column** 	Mount the tool stand on a levelled and stable pavement. **NOTE!** The tool stand must be rigidly mounted using all four holes in the tool stand column.
3	**Remove tool plate** 	Remove the tool plate from the tool stand hanger by firstly removing the transport screw holding it. **NOTE!** Only applicable when the tool plate is not delivered separately. **WARNING!** The tool plate is heavy and might cause personal injury and equipment damage if dropped.
4	**Mount dust cover** 	Place the dust cover in position and mount it to the outer screw holes on the tool stand hanger using two M8-screws. See tightening torques in section 5.1.  **NOTE!** Except for the dust cover RSP's tool parking systems are normally delivered fully mounted.

5	**Adjust dust cover distance** 	Adjust the dust cover distance by loosening the four M5 screws holding the profile. Tighten screws after adjustment.  **NOTE!** The dust cover shall fully cover the tool plate, tool attachment and tool!
6	**Check free movement** 	Move cover back and forth between vertical and horizontal positions to verify that the dust cover can move freely without mechanical interference. **NOTE!** Always check for free movement before connecting pneumatic air.
7	**Connect signals (if not mounted)** 	Connect the signal cables from the valve unit to respective contact according to respective circuit diagram (depending on option).

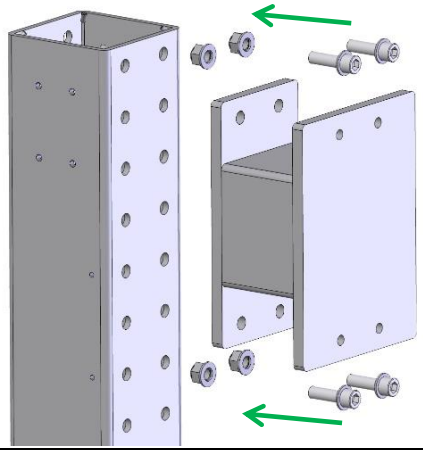
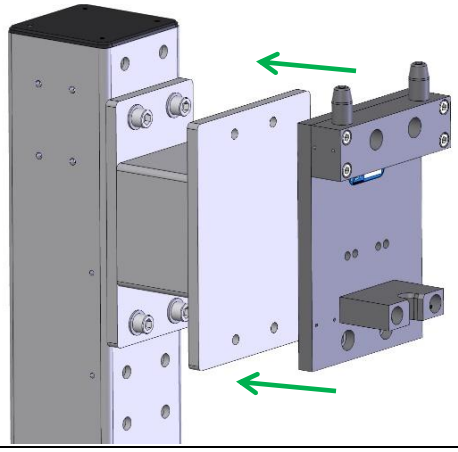
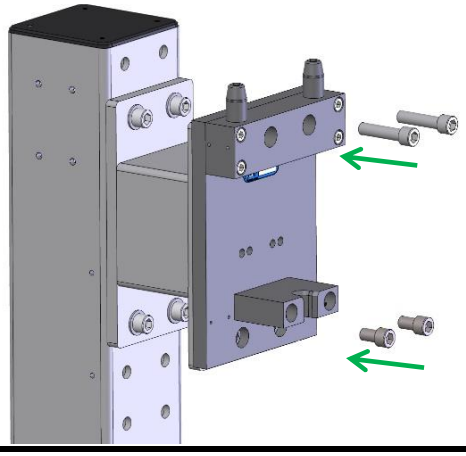
	8	**Connect air** 	Connect pneumatic air to the valve unit according to pneumatic diagram Pne0186-110 (section 3.3.2).
	9	**Adjust dust cover operation** 	Adjust the opening and closing speed with the two flow control valves to ensure a smooth dust cover operation (section 3.3) **NOTE!** The recommended time for opening of the dust cover to fully open (135°), respectively closing, should be minimum 2,5 seconds.
	10	**Closure of dust cover** 	**NOTE!** Ensure that the dust cover takes closed position also when tool attachment and tool not is present. This shall be done to avoid that dust and particles accumulates inside the open dust cover and discharged on tool attachment and tool during closing.

5.4 Mounting of items delivered separately

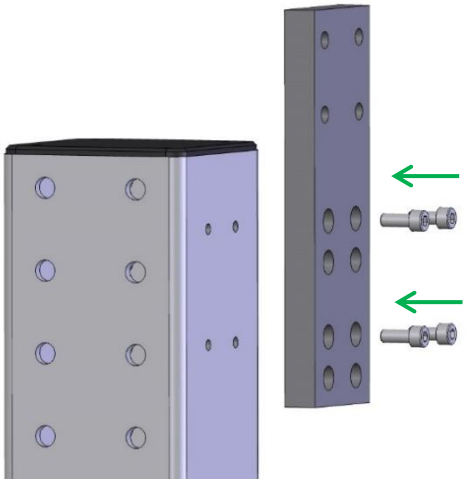
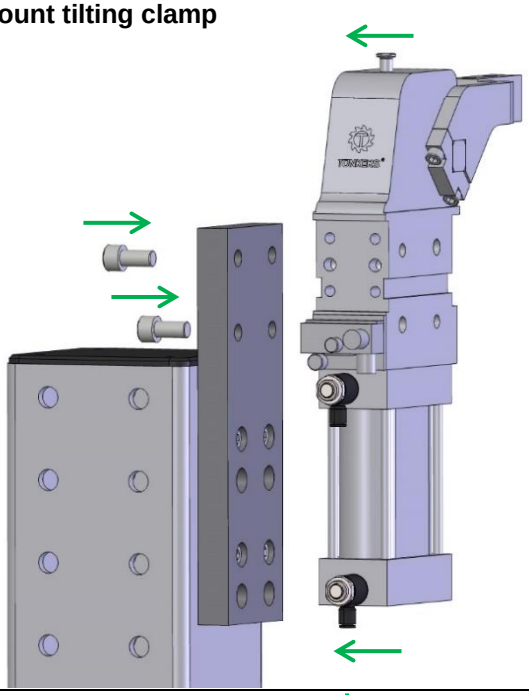
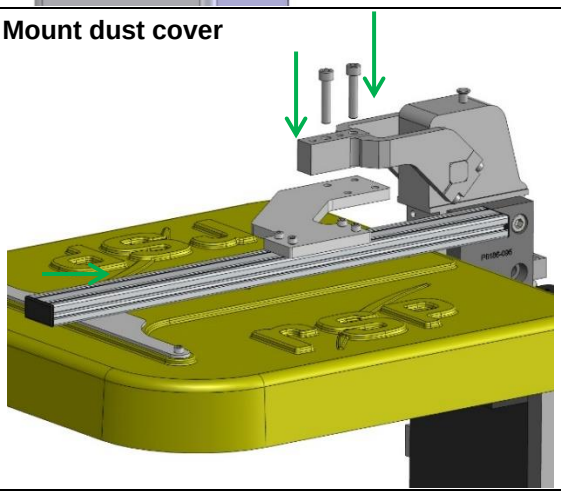
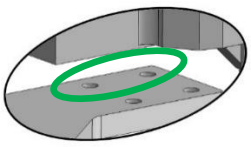
5.4.1 Mounting of tool stand hanger on tool stand column

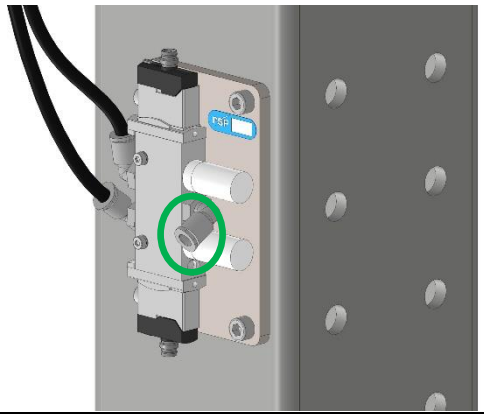
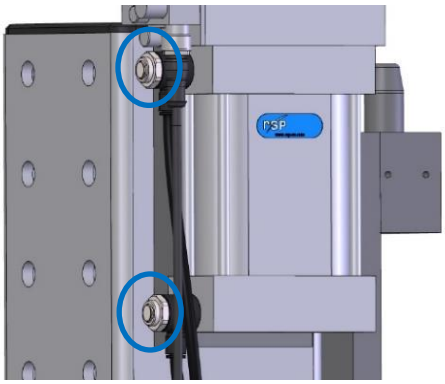
	Action	Note
1	**Safety**	Read the safety section (1.1).
2	**Fit tool stand hanger** 	Remove cap. Lift and fit the tool stand hanger to the tool stand column. **WARNING!** The tool stand hanger is heavy and might cause personal injury and equipment damage if dropped. **NOTE!** The tool stand hanger can be placed on five different heights with 5 cm in between.
3	**Mount tool stand hanger** 	Mount the tool stand hanger to the tool stand column using a torque wrench with two M12x60 screws, two M12x30 screws and the corresponding washers and locking nuts. See tightening torques in section 5.1. **NOTE!** The nuts (with corresponding washers) must be entered through the top of the tool stand column.
4	**Mount cap** 	Remount the cap on the top of the tool stand column.

5.4.2 Mounting of extension kit for tool stand hanger

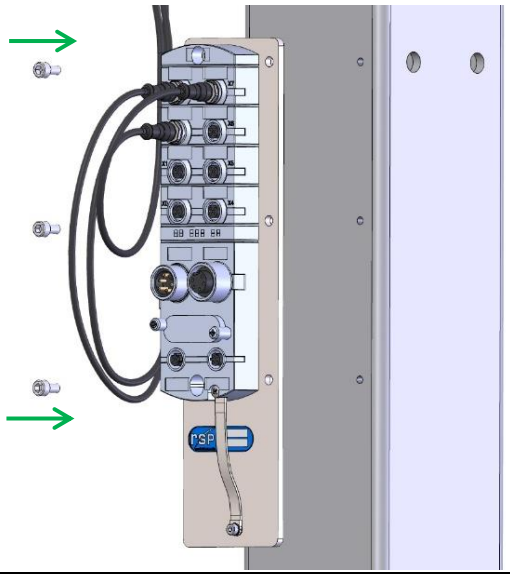
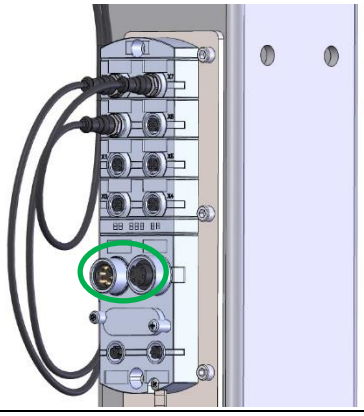
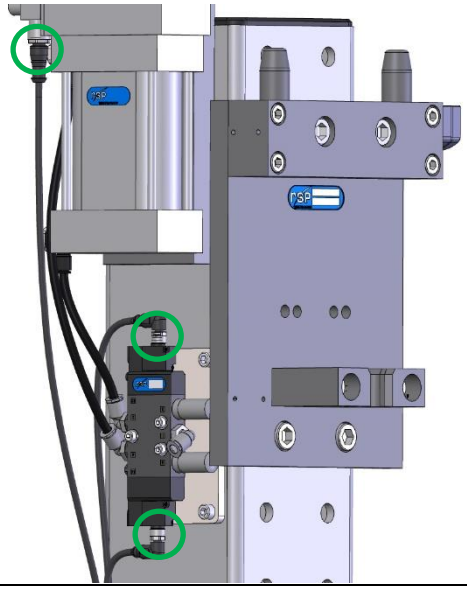
	Action	Note
1	**Safety**	Read the safety section (1.1).
2	**Mount extension** 	Remove cap. Mount the tool hanger extension (P8518-YY) to the tool stand column with the enclosed four M12x40 screws and the corresponding washers and locking nuts. See tightening torques in section 5.1. **NOTE!** The nuts (with corresponding washers) must be entered through the top of the tool stand column. **NOTE!** The tool hanger extension can be placed on five different heights with 5 cm in between.
3	**Fit tool stand hanger** 	Remount cap. Lift and fit the tool stand hanger to the tool hanger extension. **WARNING!** The tool hanger extension and tool stand hanger are heavy and might cause personal injury and equipment damage if dropped.
4	**Mount tool stand hanger** 	Mount the tool stand hanger on the tool hanger extension with the enclosed two M12x50 and two M12x30 screws using a torque wrench See tightening torques in section 5.1.

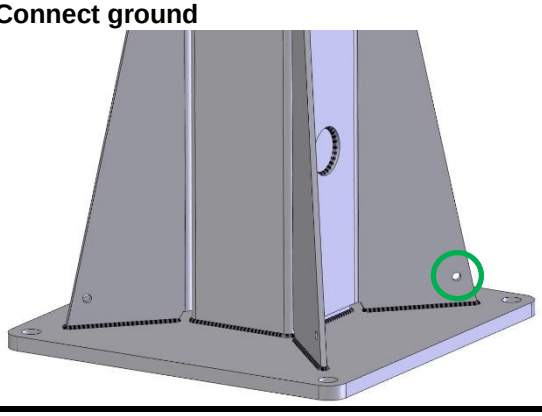
5.4.3 Installation of dust cover with pneumatic tilting clamp

	Action	Note
1	**Safety**	Read the safety section (1.1).
2	**Mount tilting clamp bracket** 	Mount the tilting clamp bracket on the tool stand support unit with the four enclosed M8-screws. See tightening torques in section 5.1. **NOTE!** The tilting clamp bracket can be placed on two different heights with 2.5 cm in between. .
3	**Mount tilting clamp** 	Position the tilting clamp on the bracket. Fasten with two M10-screws. See tightening torques in section 5.1.
4	**Mount dust cover** 	Place the dust cover in position and mount it to the outer screw holes on the tool stand hanger using two M8-screws. See tightening torques section 5.1.  **NOTE!** Except for the dust cover RSP's tool parking systems are normally delivered fully mounted.

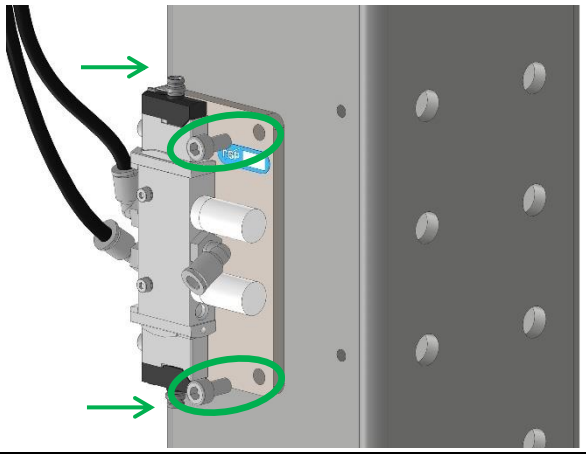
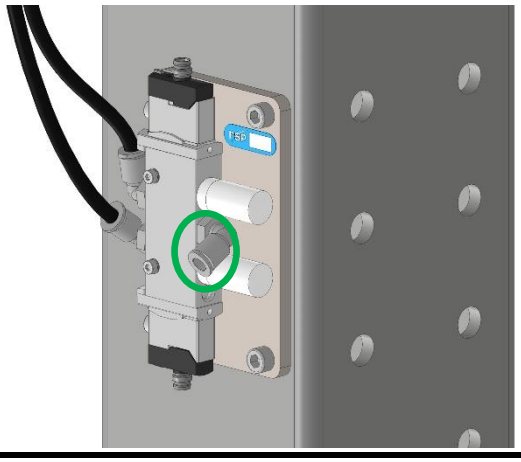
5	**Connect air** 	Connect pneumatic air to the valve unit.
6	**Adjust tilting angle** **Tool parking system** / **Recommended tilting angle** Single (P8525) — 135° Dual (P8526) — 90°	Adjust the tilting angles of the dust cover (section 5.5). The recommended tilting angle are stated in the table to the left. **WARNING!** To avoid damage on the dust covers the tilting angle of the dust cover for TPS dual (P8526) must never exceed 90°!
7	**Adjust dust cover operation** 	Adjust the opening and closing speed with the two flow control valves to ensure a smooth dust cover operation. **NOTE!** The recommended time for opening of the dust cover to fully open (135°), respectively closing, should be minimum 2,5 seconds.

5.4.4 Installation of connection module (option)

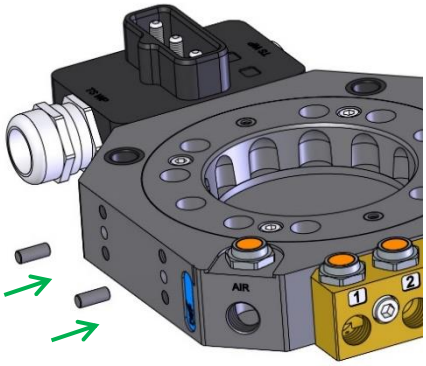
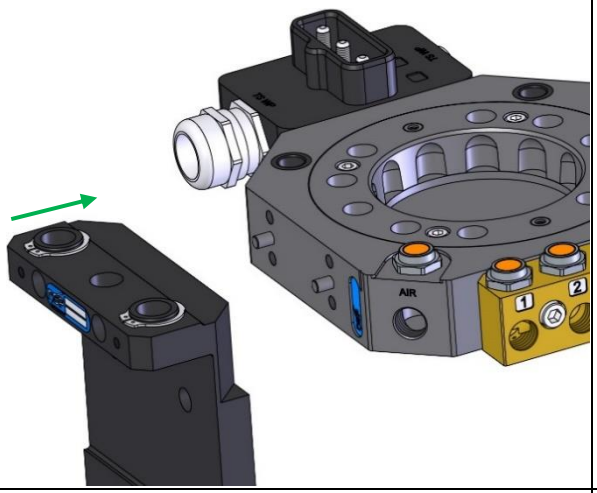
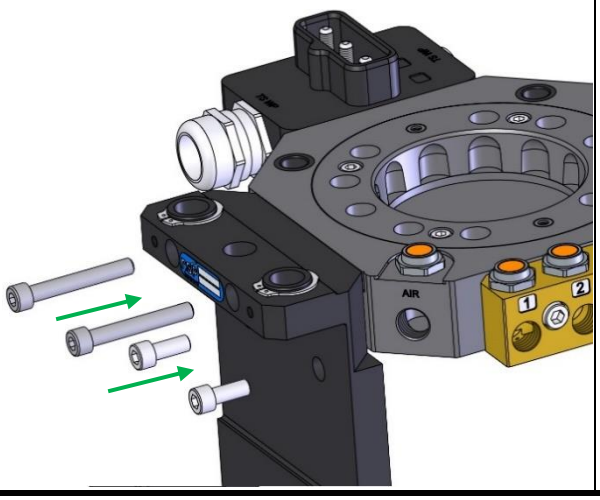
	Action	Note
1	**Safety**	Read the safety section (1.1).
2	**Mount connection module** 	Mount the connection module (optional) on the tool stand column with two or three enclosed M6x12 screws (screw holes are situated on the right side of the module). See tightening torques in section 5.1.
3	**Connect external power and signal** 	Connect the external power and signal cables to respective contact according to respective circuit diagram (depending on option).
3	**Connect signals** 	Connect the signal cables from the valve unit to respective contact according to respective circuit diagram (depending on option).

4	**Connect ground** 	**NOTE!** Four 9 mm holes are available. on the wings supporting the tool stand column, for ground connection. **NOTE!** The ground connection shall be mounted with a serrated washer, directly against the tool stand column, to ensure full contact with ground.

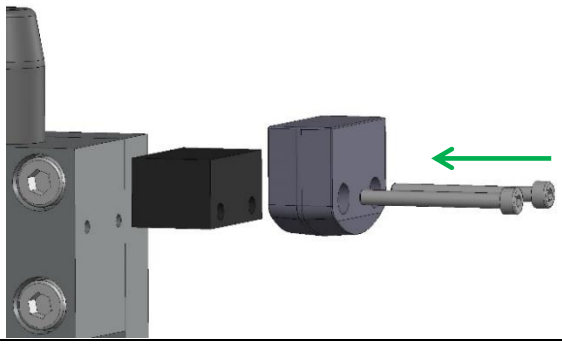
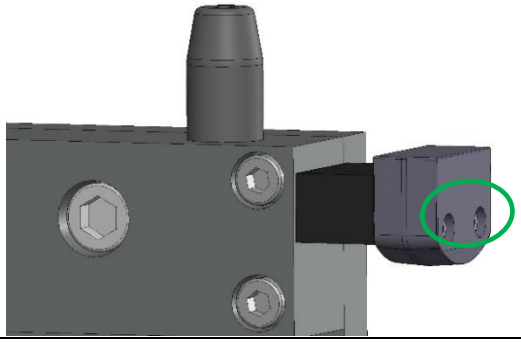
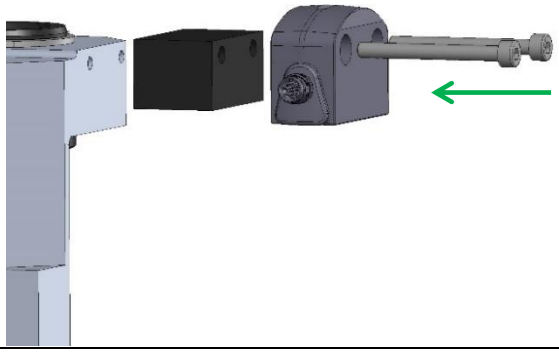
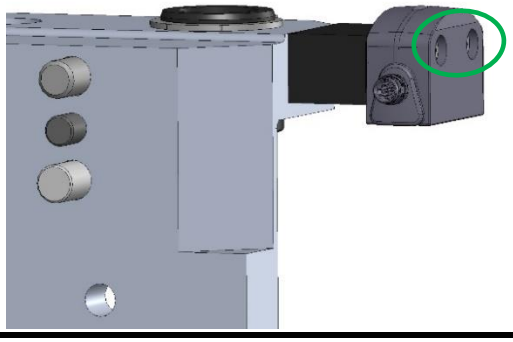
5.4.5 Mounting of valve unit for dust cover

	Action	Note
1	**Safety**	Read the safety section (1.1).
2	**Mount valve unit** 	Mount the valve unit for dust cover on the valve adapter. Fasten with the two enclosed M6x12 screws. See tightening torques in section 5.1.
3	**Connect air** 	Connect pneumatic air to the valve unit.

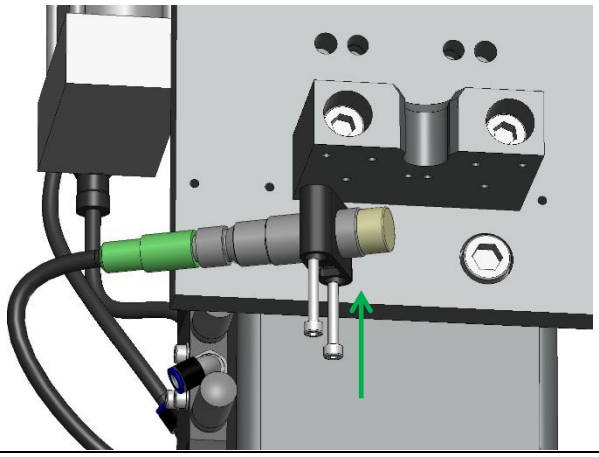
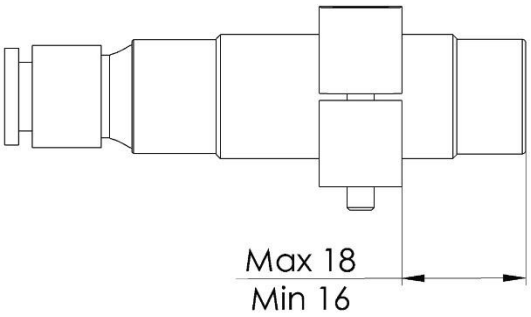
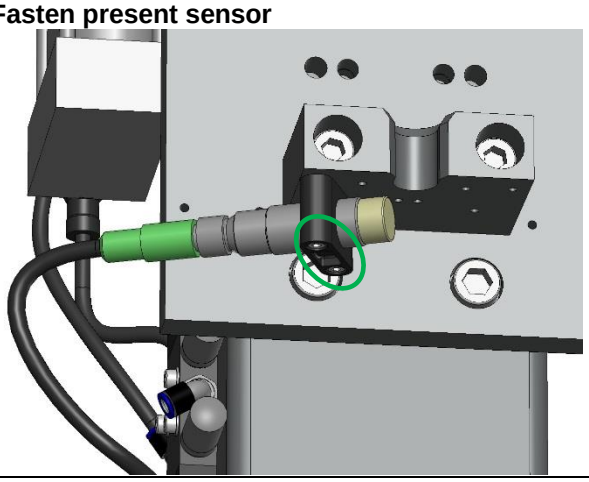
5.4.6 Mounting of tool plate on tool attachment

	Action	Note
1	**Safety**	Read the safety section (1.1).
2	**Mount guide pins** 	Press the enclosed guide pins into the tool attachment.
3	**Fit tool plate** 	Lift and fit the tool plate to tool attachment. **WARNING!** The tool plate is heavy and might cause personal injury and equipment damage if dropped.
4	**Mount tool plate** 	Mount the tool plate to the tool attachment with two M10x70 and two M10x25 screws using a torque wrench. See tightening torques in section 5.1.

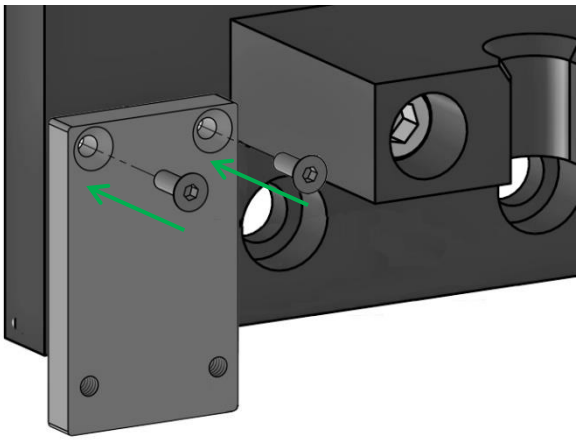
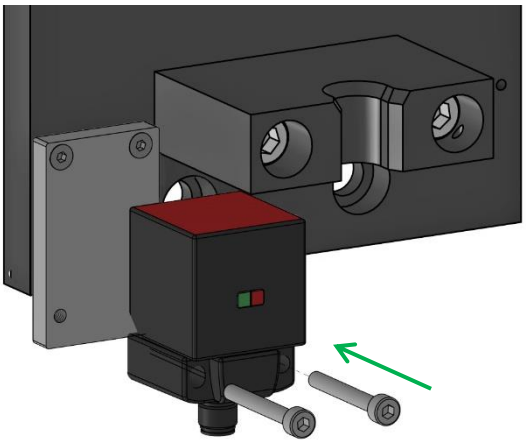
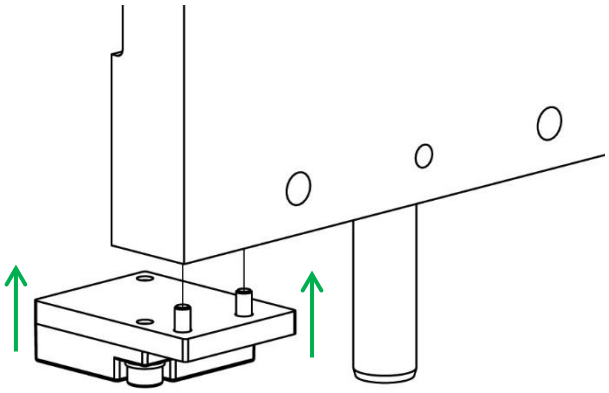
5.4.7 Mounting of tool-in-stand sensor with spacer (for TC720 with safety signal module P7501-xxx only)

	Action	Note
1	**Safety**	Read the safety section (1.1).
2	**Fit spacer and sensor on tool stand hanger** 	Fit the spacer, the tool-in-stand sensor and the two M4X40 screws to the tool stand hanger.
3	**Mount spacer and sensor on tool hanger** 	Mount the spacer and the tool-in-stand sensor to the to the tool stand hanger with the two M4X40 screws using a torque wrench. See tightening torques in section 5.1.
4	**Fit spacer and sensor on tool plate** 	Fit the spacer, the tool-in-stand sensor and the two M4X40 screws to the tool plate. **WARNING!** The tool plate is heavy and might cause personal injury and equipment damage if dropped.
5	**Mount spacer and sensor on tool plate** 	Mount the spacer and the tool-in-stand sensor to the to the tool plate with the two M4X40 screws using a torque wrench. See tightening torques in section 5.1.

5.4.8 Installation of tool present sensor inductive (option), P8312

	Action	Note
1	**Safety**	Read the safety section (1.1).
2	**Fit tool present sensor** 	Fit the tool present sensor to the tool stand hanger and fasten the two enclosed M4x25 screws lightly.
3	**Adjust tool present sensor** 	Adjust the tool present sensor. It shall protrude between 16 and 18 mm from the sensor holder. **NOTE!** IF present sensor protrudes more than 18 mm from the sensor holder It might be damaged during docking.
4	**Fasten present sensor** 	Fasten the tool present sensor with the M4x25 screws.
5	**Connect present sensor**	Connect the tool present sensor according to circuit diagram E0186-040 (section 4.3.7).

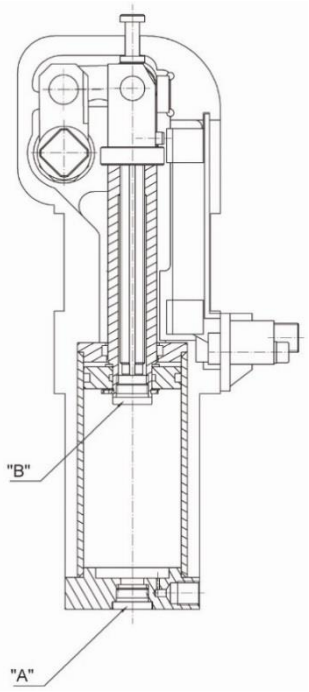
5.4.9 Mounting of tool present sensor P8530/P8531

	Action	Note
1	**Safety**	Read the safety section (1.1).
2	**Mount sensor bracket** 	Mount the sensor bracket on the tool stand hanger before mounting of the active tool present sensor. Fasten with the two enclosed M4x12 screws.
3	**Mount active sensor** 	Mount the active tool present sensor (P8530) on the sensor bracket. Fasten with the two enclosed M5x40 screws. **NOTE!** Maximum tightening torque is 1 Nm!
4	**Mount passive sensor** 	Mount the passive tool present sensor (P8531) directly on the tool plate. Fasten with the two enclosed M4x12 screws.
5	**Connect present sensor**	Connect the active tool present sensor (P8530) according to circuit diagram E0186-103 (section 4.4.3).

5.5 Adjustment of tilting angle

The tilting angle of the dust cover mounted on the pneumatic tilting clamp is seamlessly adjustable within 10°–135° using the adjustment screw. The default tilting angle is 135°. Set up of maximum allowed tilting angle is performed in the following way:

	Action	Note
1	**Air off!** 	**WARNING!** Only perform work on the pneumatic tilting clamp when the air pressure is safely switched off.
2	**Open position**	Bring the arm of the pneumatic tilting clamp to open position (see circuit diagram E0186-056 in section 2.7).
3	**Read angle**	Read the pre-adjusted angle at the scale.
4	**Release tilting clamp for adjustment**	Remove securing screw “A” in the cylinder bottom.
5	**Set new tilting angle**	Turn adjustment screw “B” with until desired angle has been reached, adjusting range 10°-135° (APH2 max 105), see scale at the housing.
6	**Lock tilting clamp for adjustment**	Remount securing screw “A” in the cylinder bottom.



WARNING! The pneumatic tilting clamp is not designed as a complete tool ready for independent applications and has not been supplied with safety features. Only when correctly installed, as a part of a production system and with a corresponding safety control system added, all safety requirements will be met.

Should any faults occur that place personnel at risk, the pneumatic tilting clamp shall be switched off immediately. Maintenance measures shall only be undertaken when the machine is at a complete standstill and by qualified specialists. After maintenance has been carried out, protection devices shall be refitted in the correct way.

6 MAINTENANCE AND SERVICE

The tool changer, tool attachment and tool stand must be maintained regularly to ensure proper function. The specified intervals are approximate and valid under normal conditions. Under extreme conditions, such as dirty environments or extreme robot movements, the intervals should be shortened.

Consider the table as a guide and update as your production experience of each system increases.

NOTE!
Only perform work on grippers or tools attached to the tool changer if the air pressure is safely switched off.

NOTE!
Equipment delivered by Robot System Products must only be dismantled and repaired by Robot System Products during the warranty period. Otherwise the warranty will not be valid.

6.1 Tools and required products

6.1.1 Recommended tools for maintenance

Tools	Applications
Complete set of Allen keys	For dismounting and mounting.
Torque wrench	For all socket head cap screws
Slide hammer	For dismounting guide pins
Plastic hammer	For mounting guide pins
Circlip plier	For dismounting and mounting circlips
Punch	For dismounting bushings

6.1.2 Required products

Product	Specification	Note
Grease	Renolit HLT2 (A0178-877)	For guide pins and tool plate bushings
Glue	Loctite 638	For guide pins at tool plate
Threadlocker	Loctite 2400	For securing screws
Cleaning agent	Denatured alcohol or similar	For tool stand hanger and tool plate
Cloth	Lint free cloth	For cleaning.

NOTE! Chemical resistance protective gloves are recommended when using grease or cleaning agents such as industrial alcohol. Safety goggles are recommended when working with cleaning agents such as industrial alcohol. Adequate ventilation should be provided when chemical substances are used.

6.2 Wear parts

Wear parts should be replaced before considerable damage occurs. The interval depends on the number of tool changes and its working environment. Generally, the more contaminated environment, the closer maintenance intervals.

The following parts are considered as wear parts:

- Tool stand hanger and tool plate guide pins
- Guide block
- Tool plate bushings

6.3 Inspection and cleaning

6.3.1 Visual inspection (monthly)

Visually check the following

Equipment	Description	Action
Guide pins on tool stand hanger and tool plate	Not worn, damaged or dirty.	Replace if worn or damaged. Clean when dirty.
Bushings on tool plate	Not worn, damaged or dirty.	Replace if worn or damaged. Clean when dirty.
Cables and connector	Not worn, damaged.	Replace if worn or damaged.
Tool stand column	Not damaged or dirty	Replace if damaged. Clean when dirty.
Tool stand hanger in general	Not damaged or dirty.	Clean when dirty. Replace damaged parts.

6.3.2 Cleaning (every third month)

Clean the following

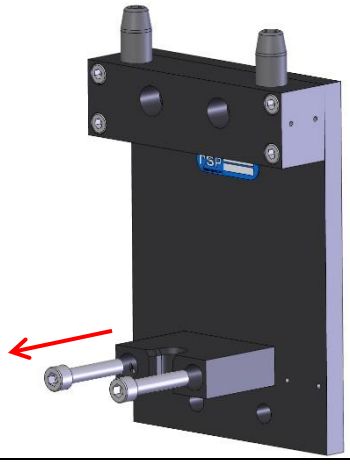
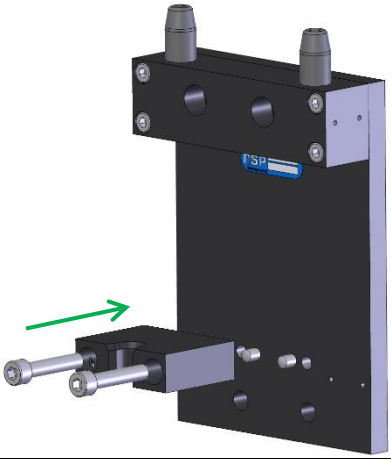
Equipment	Action
Guide pins on tool stand hanger and tool plate	Wipe clean with lint free cloth. Apply a small amount of grease (Molykote BR2Plus).
Bushings on tool plate	Wipe clean with lint free cloth. Apply a small amount of grease (Molykote BR2Plus).
Tool stand column	Wipe clean with lint free cloth.
Tool stand hanger in general	Wipe clean with lint free cloth.

6.4 Replacement of wear parts

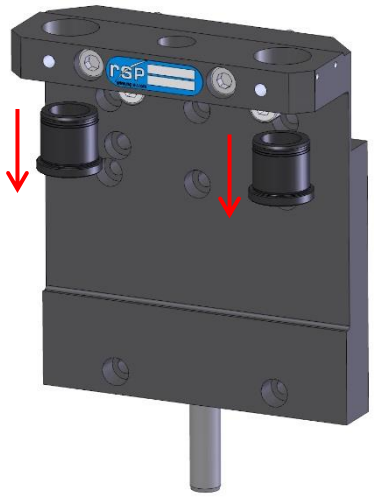
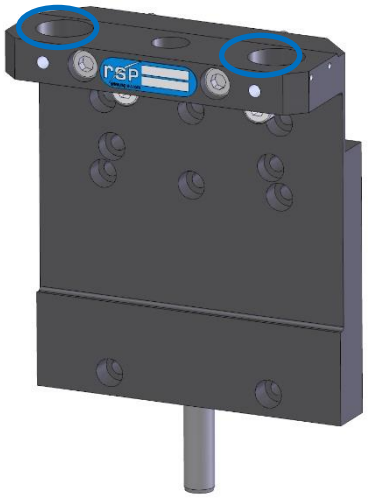
6.4.1 Replacement of guide pins on tool stand hanger

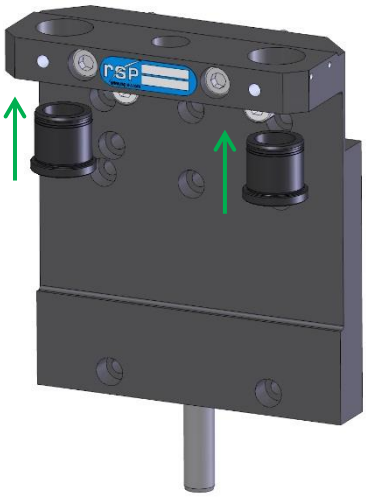
	Action	Note
1	**Dismount guide pins** 	Remove the guide pins with a slide hammer (M8-thread).
2	**Cleaning** 	Wipe clean guide pin holes seat with a cloth.
3	**Lubricate**	Apply a small amount of grease (Molykote BR2Plus) on guide pins and guide pin holes.
4	**Mount guide pins** 	Fit the new guide pins in the holes and use a plastic hammer to mount the guide pins.

6.4.2 Replacement of guide block on tool stand hanger

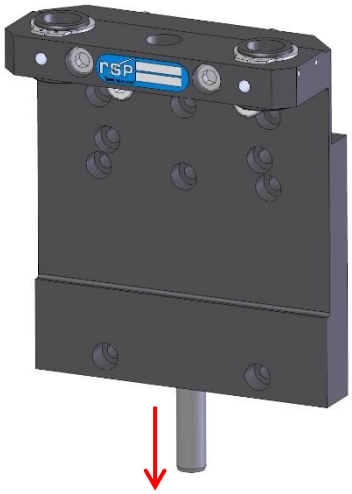
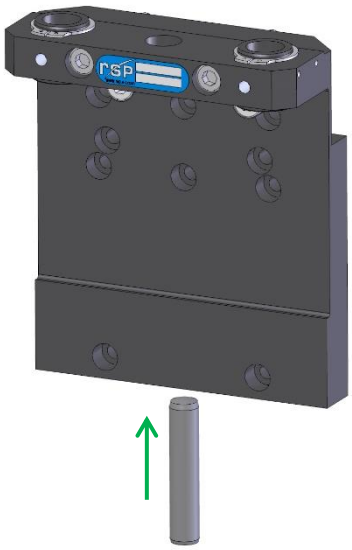
	Action	Note
1	**Remove guide block** 	Remove the guide block by loosening the M10 screws.
2	**Cleaning** 	Wipe clean the guide block seat with a cloth.
3	**Attach new guide block** 	Attach a new guide block using M10x50 screws. See tightening torques in section 5.1.

6.4.3 Replacement of bushings on tool plate

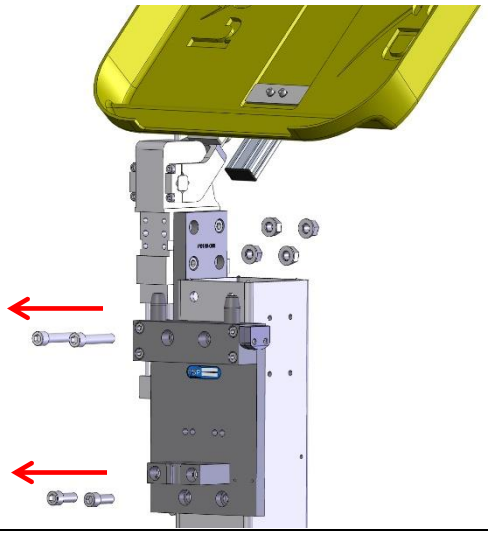
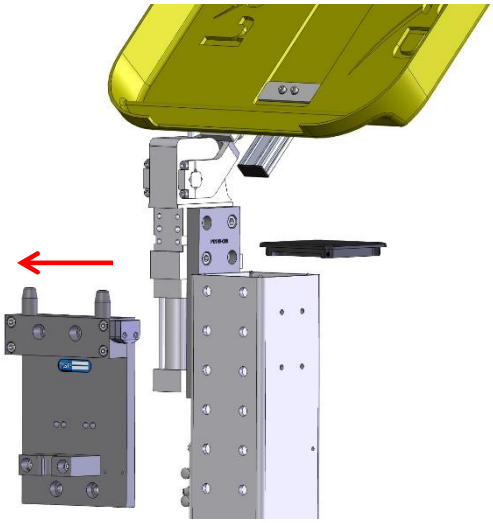
	Action	Note
1	**Dismount circlips** 	Dismount the two circlips with a circlip plier.
2	**Dismount bushings** 	Dismount the bushings with a punch.
3	**Cleaning** 	Wipe clean the bushing holes with a cloth.

4	**Mount new bushings** 	Apply a small amount of grease (Molykote BR2Plus) in the bushing holes. Fit the new bushings in the holes. Insert the bushings.
5	**Mount locking rings** 	Mount the two circlips with a circlip plier.

6.4.4 Replacement of guide pin on tool plate

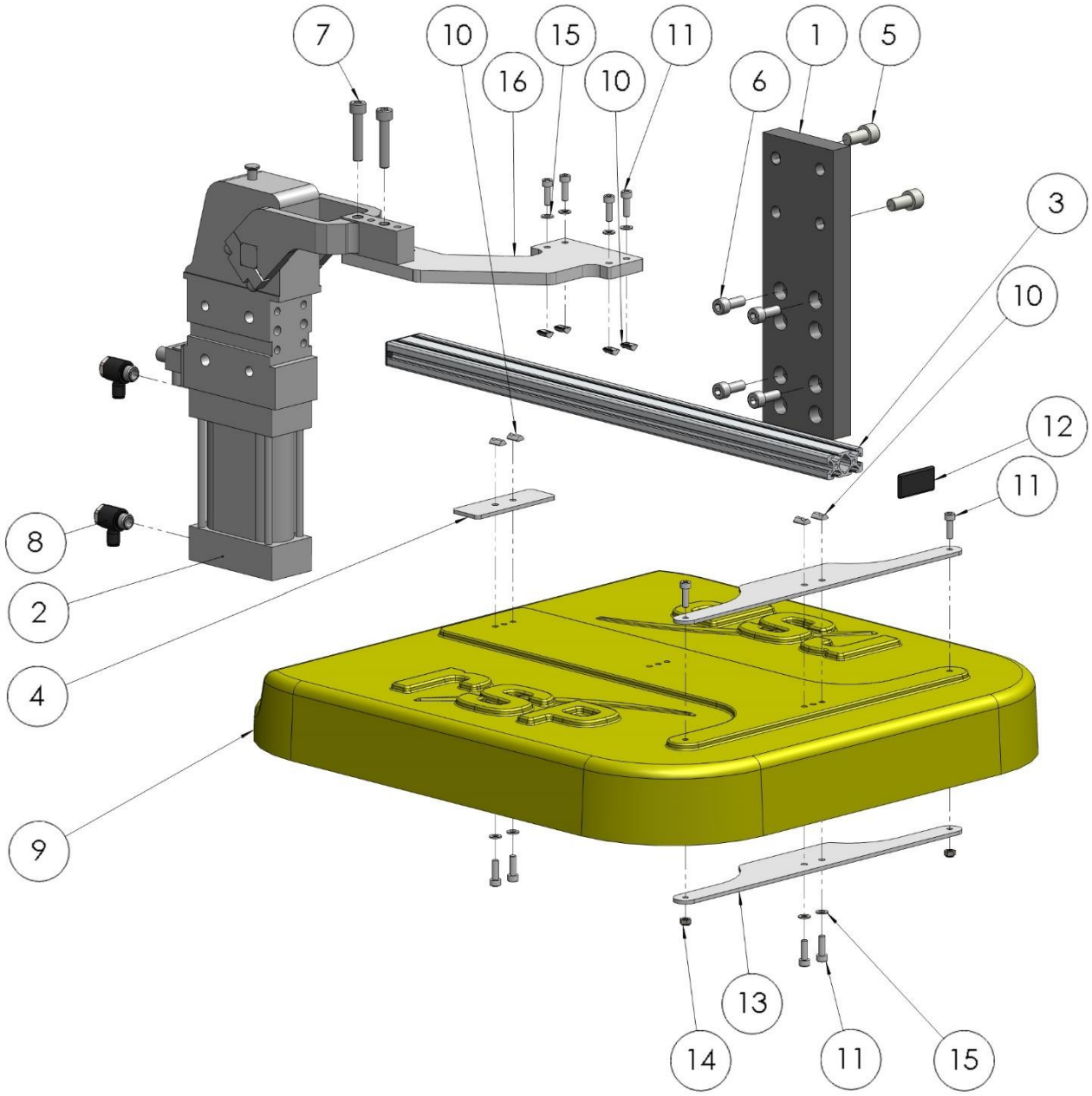
	Action	Note
1	**Dismount guide pin** 	Dismount the guide pin with a slide hammer (M8-thread).
2	**Cleaning** 	Wipe clean the guide pin hole with a cloth.
3	**Mount new guide pin** 	Apply a small amount of glue (Loctite 638) in the guide pin hole. Fit the new guide pin in the hole and use a plastic hammer to mount the guide pin.

6.4.5 Replacement of tool stand hanger

	Action	Note
1	**Safety**	Read the safety section (1.1).
2	**Dismount tool stand hanger** 	Dismount the tool stand hanger from the tool stand column using torque wrench for the two M12x60 and the two M12x30 screws. Disconnect sensor connector.
3	**Release tool stand hanger** 	Remove the tool stand hanger from the tool stand column. **WARNING!** The tool stand hanger is heavy and might cause personal injury and equipment damage if dropped.
4	**Mount new tool stand hanger**	See section 5.4.1 Mounting of tool stand hanger on the tool stand column.

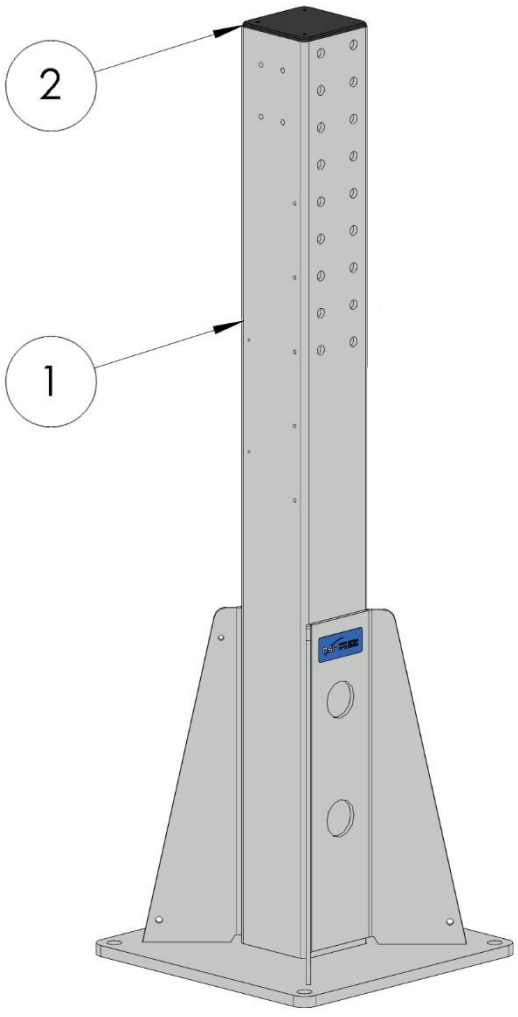
7 SPARE PARTS

7.1 Dust cover with pneumatic tilting clamp, P8517-1



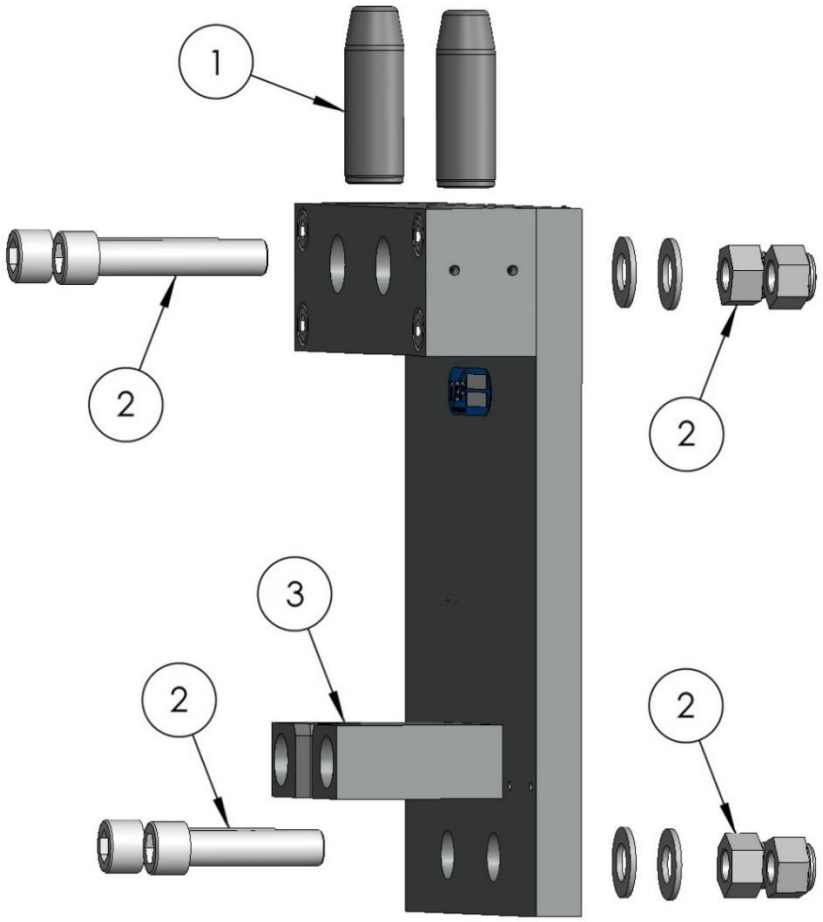
Item	Description	Part number	Wear parts	Pcs
1	Vario clamp bracket	P0186-095		1
2	Tilting clamp	I1085		1
3	Aluminium Profile 20x40	P8313-055		1
4	Support washer	P0186-051		2
5	Screws, M10x20	21212519-491		2
6	Screws, M8x20	21212519-451		4
7	Screws M8x40	21212519-459		2
8	Tube fitting	I1315		2
9	Dust cover, rectangular	P0186-050		1
10	T-slot nut M5	I1602		8
11	Screws, M5x16	21212519-329		10
12	Profile cap	I1593		2
13	Dust cover support	P0186-063		2
14	Locking nut	M6M M5		2
15	Spacer, 5.3x10x1	21512062-146		8
16	Dust cover bracket	P0186-110		1

7.2 Tool stand column P8380-XXX



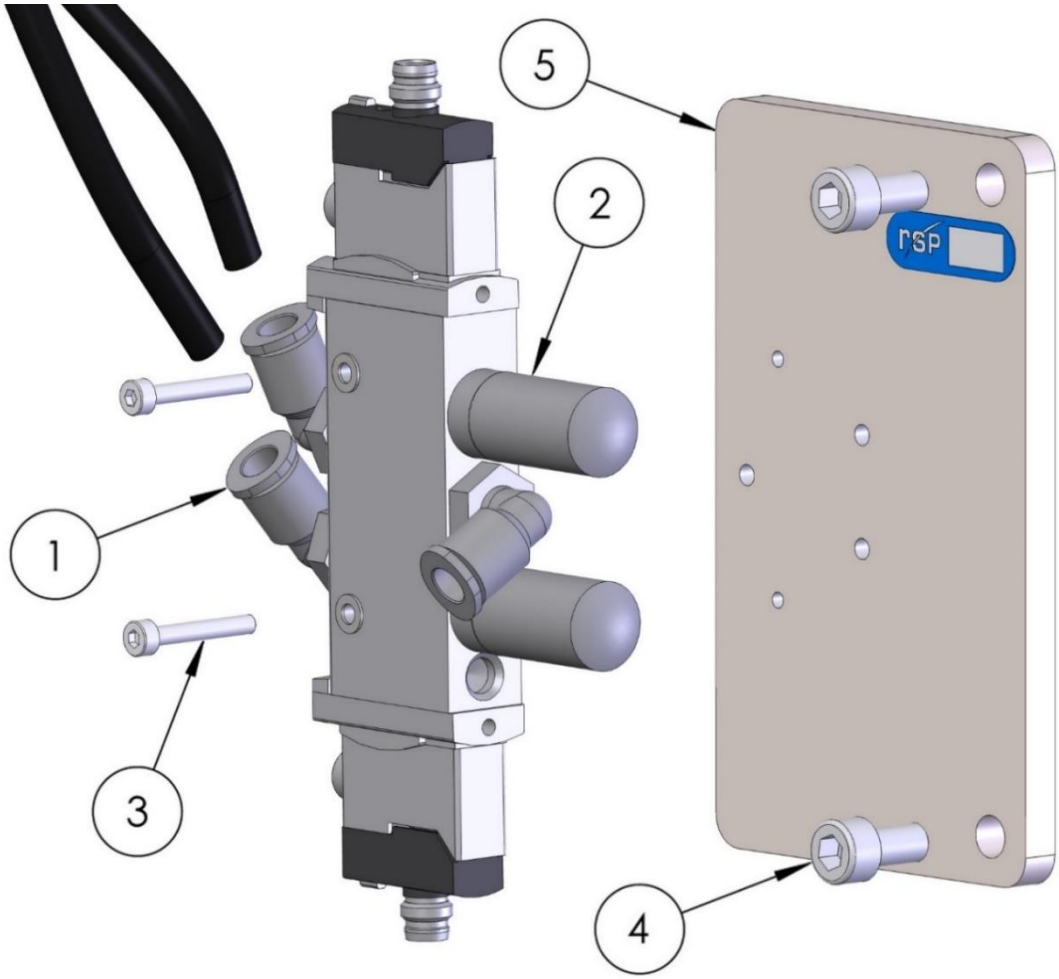
Item	Description	Part number	Wear parts	Pcs
1	Tool stand column (1 m height)	P8511-100		1
1	Tool stand column (1.25 m height)	P8511-125		1
1	Tool stand column (1.5 m height)	P8511-150		1
2	Cap for tool stand column	P8390		1

7.3 Tool stand hangers P8507, including mounting kit P8370



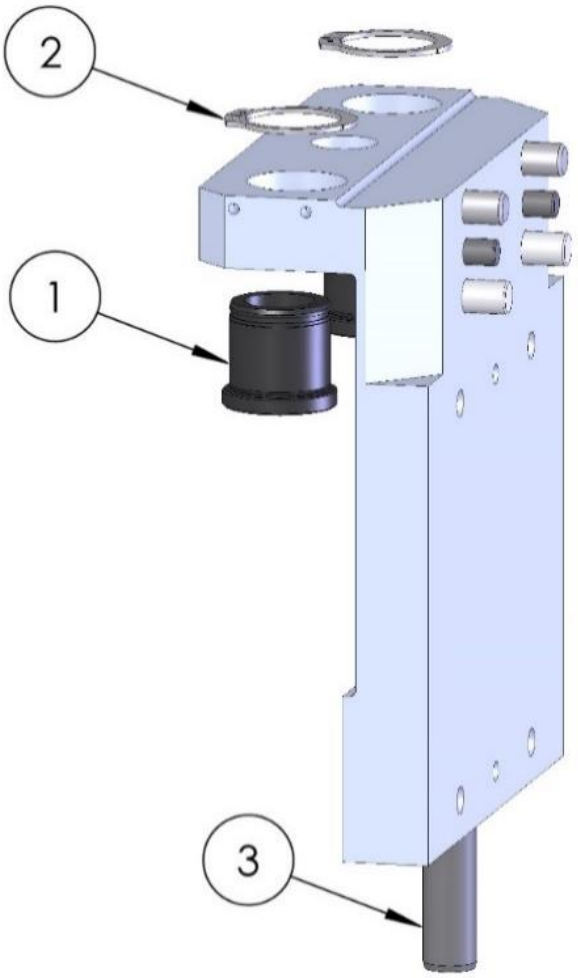
Item	Description	Part number	Wear parts	Pcs
1	Guide pin	P0186-027	X	2
2	Mounting kit	P8370		1
3	Guide block	P0186-094	X	1
3	Guide block screw, M10x50	MC6S 10x50		2

7.4 Valve unit for dust cover P8513A



Item	Description	Part number	Wear parts	Pcs
1	Tube fitting	I0904		3
2	Silencer	I0903		2
3	Screw M3x20	21212519-230		2
3	Washer 3,2x6x0	21512062-124		2
4	Screw M6x12	21212519-366		2
5	Valve unit adapter	P0186-099		2

7.5 Tool plate P8303A



Item	Description	Part number	Wear parts	Pcs
1	Bushings	P0186-045	X	2
2	Retaining clip	I1002		2
3	Guide pin	CPIG 16x80 m6	X	1

8 DISPOSAL AND RECYCLING

Taking care of spent equipment

Used equipment must be taken care of in an environmentally friendly way.

When disposed of, a major share of the material, or its energy content, can be recycled. The quantities possible to recycle vary depending on technical resources and practises in respective country. Non-recyclable components shall be handed over to an authorized environmental waste treatment facility for destruction or disposal.

Electronics

Electronic equipment shall be sent to an authorized recycling company or sorted into different component materials and treated as such.

Metals

Metals can, in general, be melted down, recycled, and used in new products. They shall be sorted according to type and surface coating and handed over to an authorized recycling facility.

Metal components made of steel, aluminium, and brass are substantial in size and easy to identify. Copper is primarily used in transmission of power for spot welding. Equipment for spot welding, specifically sliding contacts, may also contain small amounts of lead. Silver or gold plating of contact surfaces may occur.

Plastics

Thermoplastics can, in general, be re-heated an recycled without any major loss of quality. They shall be handed over to an authorized recycling facility. POM occurs in swivel housings, etc. PTFE in some sealings.

Rubber

Rubber shall be handed over to an authorized environmental waste treatment facility either for recycling, disposal or destruction. Rubber occurs in O-rings.

Other material

All other material shall be sorted and handed to an authorized environmental waste treatment facility in accordance with national legislation.