FAST MOVING TECHNOLOGY

STÄUBLI

MPS 020/032
Robotic tool changing systems

Productivity for all industrial sectors | Payload up to 32 kg

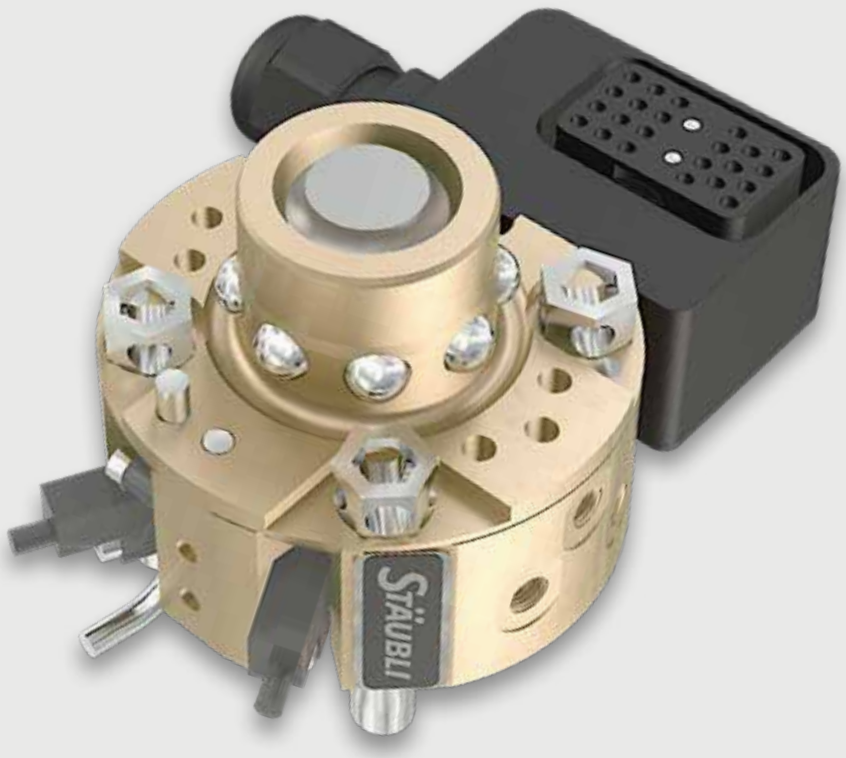


Table of contents

R **Base unit robot side**

T **Base unit tool side**

Process safety
Maximum process safety for equipment and personnel

Flexibility
for maximum function diversity in robotic manufacturing processes

Economic efficiency
for cost-effective and sustainable production processes

Productivity
for innovative and quality-optimised production processes

TWO SOLUTIONS

Our systems are just as flexible as your processes

Stäubli robotic tool changing systems are designed according to a modular product concept that guarantees variable multi-functionality and optimum integration into all industrial robot manufacturing processes.
Payload-specific base units on the robot and tool side are the basis for the two Stäubli tool changing system solutions.

MPS COMPLETE
Ready-to-use application solutions

Our preconfigured complete solutions provide you with ready-to-use robotic tool changing systems:

- The transfer modules are selected on the basis of the most frequently configured robotic tool changing systems.
- The products in this range can be delivered with very short lead times.
- Additional transfer modules can be added at any time.

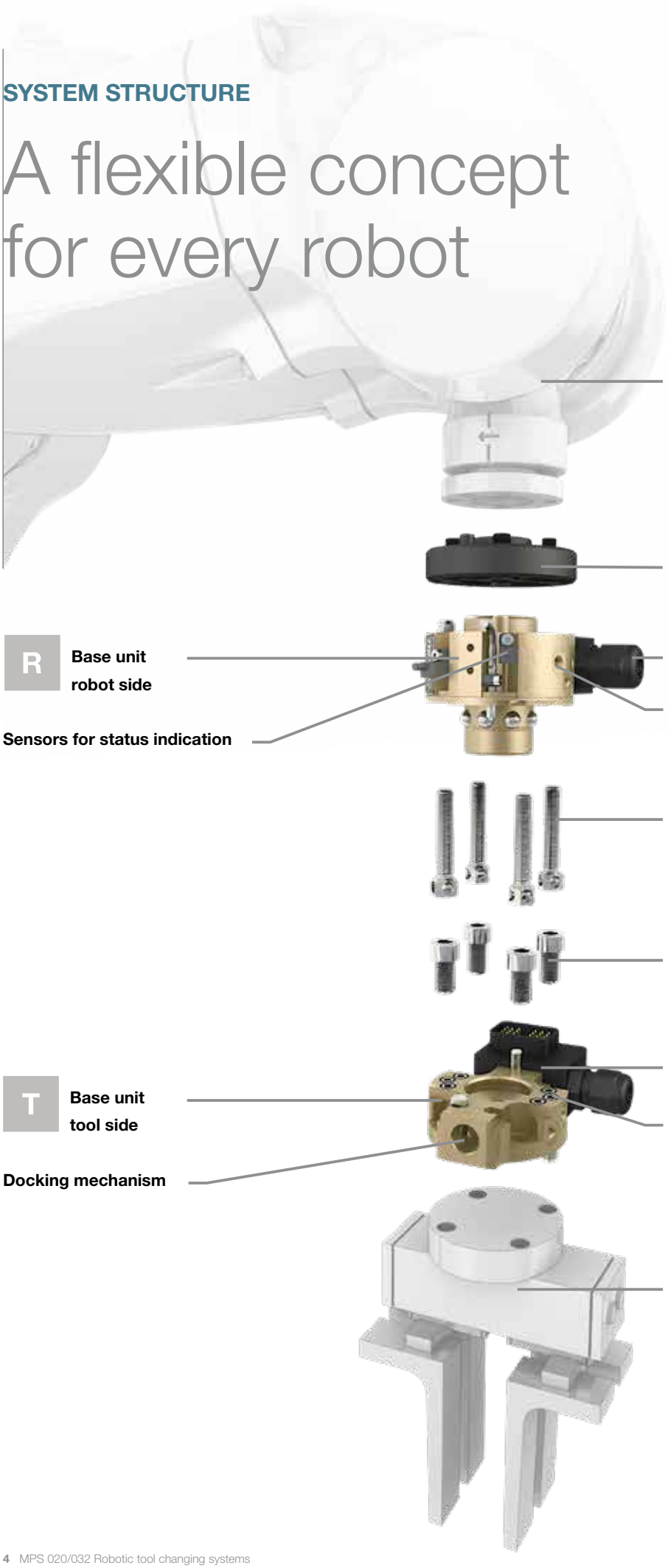
MPS CUSTOMIZED
Customized designs

We produce customized tool changing systems for complex applications requiring special base units or extra equipment:

- The basic units on the robot and tool side, as well as the transfer and safety modules, are adapted to the applications.
- You get a system that is perfectly tailored to all your performance data, material quality and connection requirements.
- Individual tool stands enable the optimum integration of the system into your robot line.

SYSTEM STRUCTURE

A flexible concept for every robot



Robot
Mounting on the flange suitable for all makes of robot

Robot adapter flange*

Electrical module for signal transmission

Media feed-through for pneumatics and vacuum

R **Base unit robot side**

Sensors for status indication

Mounting kit robot side

Mounting kit tool side

Electrical module for signal transmission

Media feed-through for pneumatics and vacuum

T **Base unit tool side**

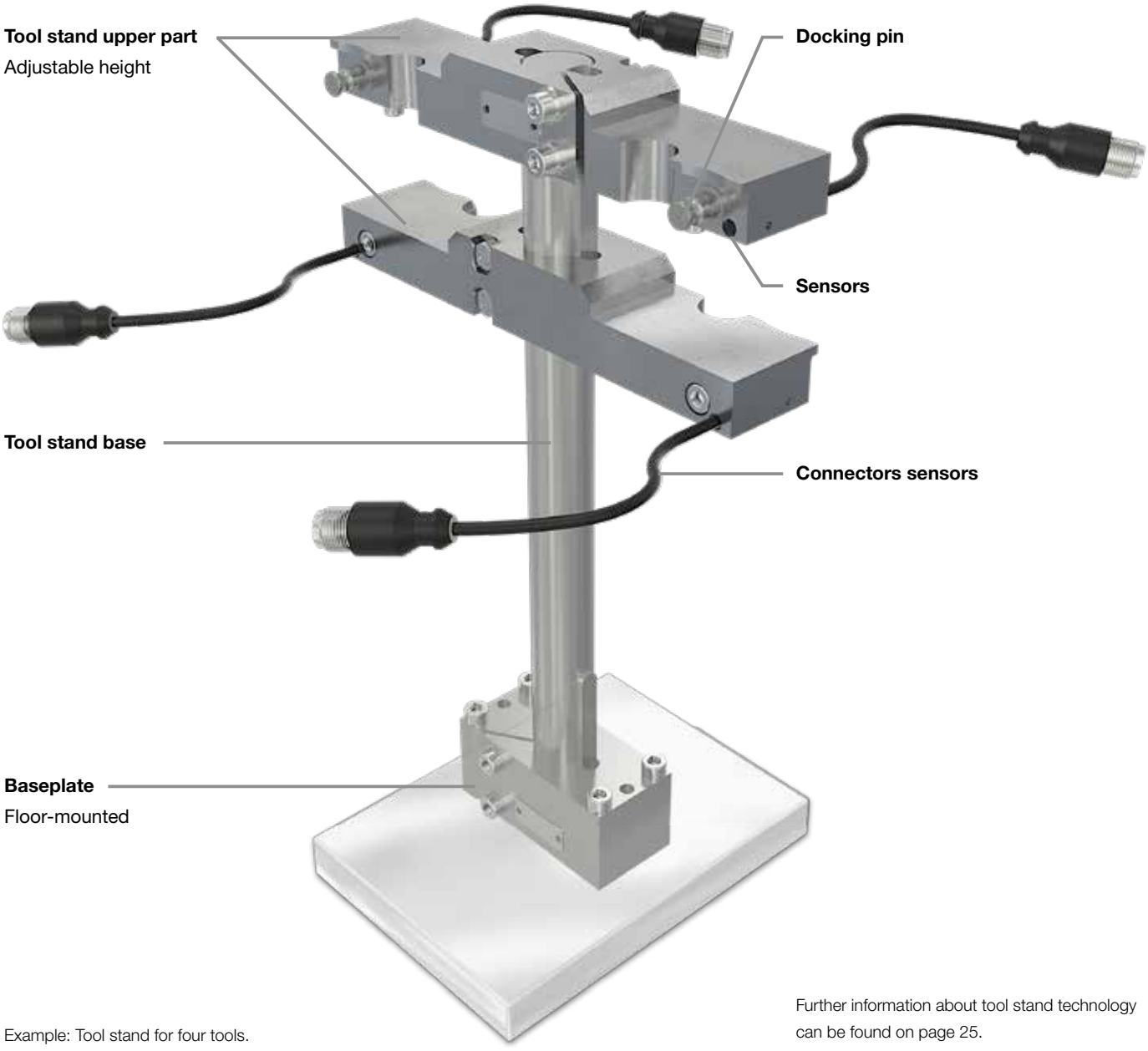
Docking mechanism

Tool
Signal, media and power supply of the tool through transmission modules

* Including mounting materials.

TOOL STAND TECHNOLOGY

Optimal system integration for maximum efficiency



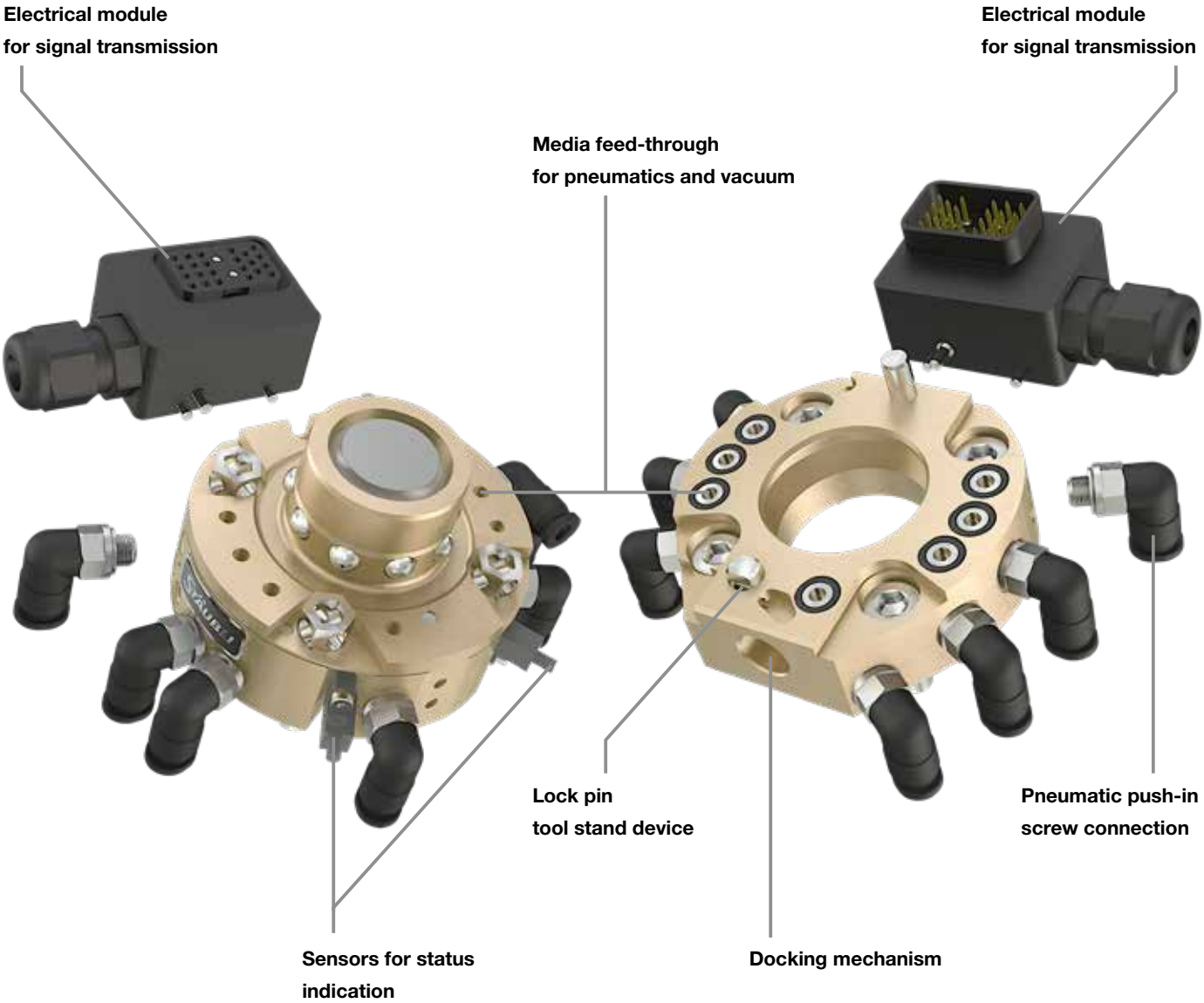
Example: Tool stand for four tools.

Further information about tool stand technology can be found on page 25.

Tool changing system – robot and tool side

R Base unit
robot side

T Base unit
tool side



MPS SOLUTION COMPETENCE

Backlash-free locking and perfect connections

The powerful locking of the base unit and the docking mechanism ensure reliable processes

The backlash-free connection between the robot and tool sides, as well as the transmission modules, with no errors guaranteed and a precise tool change. MPS is designed for long-term reliability, low wear and a long service life.

The powerful locking of the base unit and the exceptionally high repeatability of the changing system, ensure that the tools are precisely positioned for use. Conically shaped locking surfaces and high-strength locking balls provide the optimal connection.

The high quality coupling technology guarantees continually reliable and stable media, data and energy transmission. Both the fluid and electrical connections have intelligent design concepts. Minimal contact resistance and high contact intensity during the transmission of electrical signals are the hallmarks of the patented MULTILAM technology.

Process safety

The base unit locking mechanism is designed to cope with an extremely high number of tool change and mating cycles.

Economic efficiency

Precise tool positioning and a constant high transfer of media and energy are guaranteed over a long service life.

Productivity

A flexible tool stand is an integral part of the overall system.

MPS SOLUTION COMPETENCE

Consistent precision for millions of docking cycles

The practically wear-free locking technology of the MPS 020/032 robot tool changing system will ensure high manufacturing quality in your production environment. The precise positioning of the tools in the production process is 100% guaranteed, even after millions of docking cycles. High quality, hardened materials with an accurately positioned pneumatic ball locking system prevent any tolerance changes between the coupled base units. This gives you an absolutely backlash-free system that delivers optimal quality and a long service life.

Friction contacts and the resulting material wear are prevented in the base unit coupling process. A pneumatically driven, conical piston powerfully pushes the locking balls into an internal collar. The result is a perfect and million-fold repeatable form fit.

Process safety

The MPS 020/032 robot tool changing system is optimally designed for gripper applications, and therefore for robots that are used in highly automated processes. The precise tool positioning within the manufacturing process is guaranteed by Stäubli locking technology.

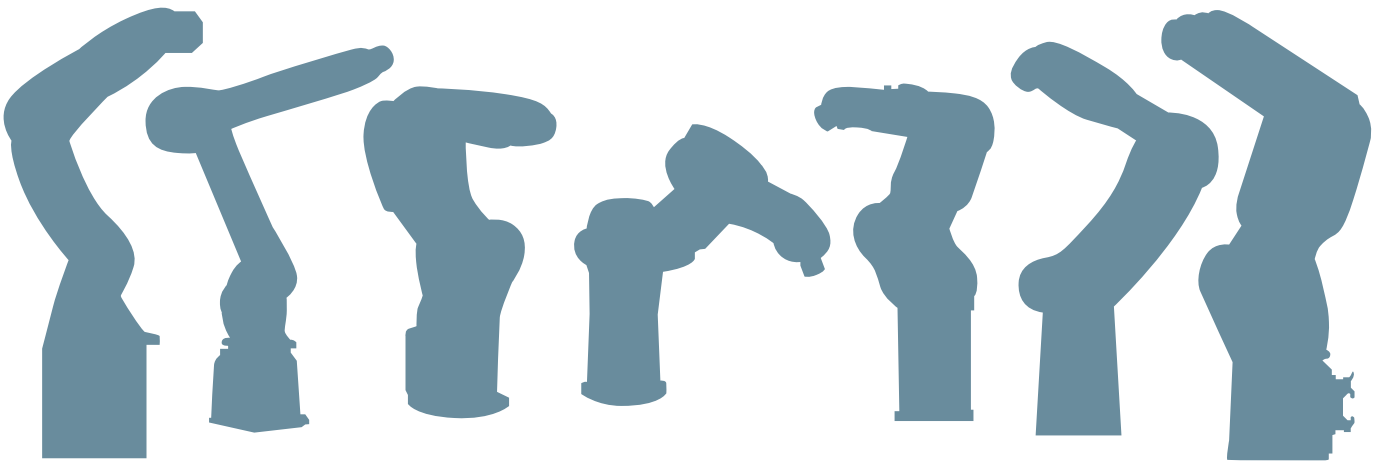
Economic efficiency

The change system operates with practically no wear, even after millions of docking cycles. This guarantees the long service life of the tool changing system, minimises maintenance requirements and reduces unproductive downtime.

One system for all robots

Stäubli's competence in all aspects of robotic tool changing systems draws on its decades of experience as a robot and coupling manufacturer. Based on its in-depth technical know-how of the industrial requirements of robotic production lines, it has developed versatile tool changer solutions that are suitable for robots supplied from any manufacturer.

The MPS systems developed by Stäubli can be installed on any robotic arm anywhere in the world, whatever its type, make or year of production. The changer mounting flanges are based on ISO-standard drilling patterns, but can easily be adapted to other robot flange patterns. The height of the tool changing system in the coupled state is restricted to the minimum so that its full load bearing capacity can be exploited.



MPS SOLUTION COMPETENCE

Stäubli's global competence and local presence

Stäubli has subsidiaries at major industrial hubs around the world. Their experienced engineers have detailed, product-specific know-how and application expertise to provide the highest quality of advice to customers and to guarantee fast response times worldwide.

Robotic tool changers are variable systems that have to be efficiently integrated into production processes, therefore advice to customers on the correct basic and special configurations, adaptations and optimisations is essential. Our global warehousing concept ensures that components and spare parts are quickly delivered to customers around the world.

Flexibility

Users receive solutions that comply with all country-specific guidelines and standards. The robotic tool changing systems are adapted to national industrial norms, such as thread standards or information retrieval technologies in sensor systems. Thanks to our global network customers can easily implement cross-national production concepts.

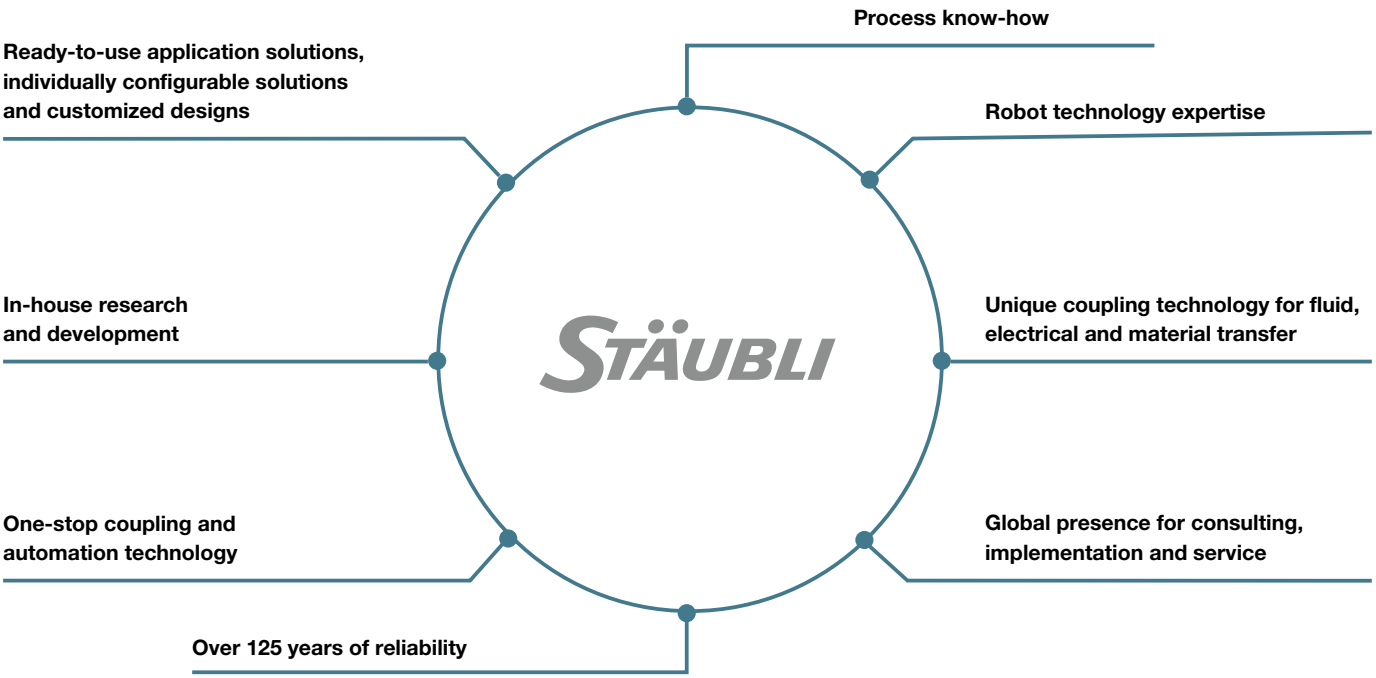
Productivity

Wherever in the world, users receive specialist advice on applications. This guarantees the best possible implementation of the tool changing processes on robot lines at any production site. Customers have access to our global know-how so that you can maximise the productivity of new plants and achieve optimum results in retrofit and maintenance situations.

Economic efficiency

Single point of contact: we designate one customer consultant to you for the entire duration of your project. This makes the cooperation more efficient and reduces the complexity of project coordination and implementation. Customers also benefit from our consulting expertise directly at your premises when you implement tool changing systems.

100 % Stäubli performance



All the components of the Stäubli MPS systems come from a single source and are perfectly harmonised. Stäubli performance is 100% based on a combination of products, expertise and know-how.

All individual components – from base unit to transfer module – are developed and manufactured by Stäubli. As your single contact we are responsible for the entire MPS system. Our customers can count on us supporting them with our expertise and experience.

Process safety

You have the assurance of integrating well-engineered and comprehensively tested robotic tool changers into your production line. All systems and components are designed and manufactured by Stäubli to the highest industrial standards, supporting you with our process analysis and optimisation know-how.

Flexibility

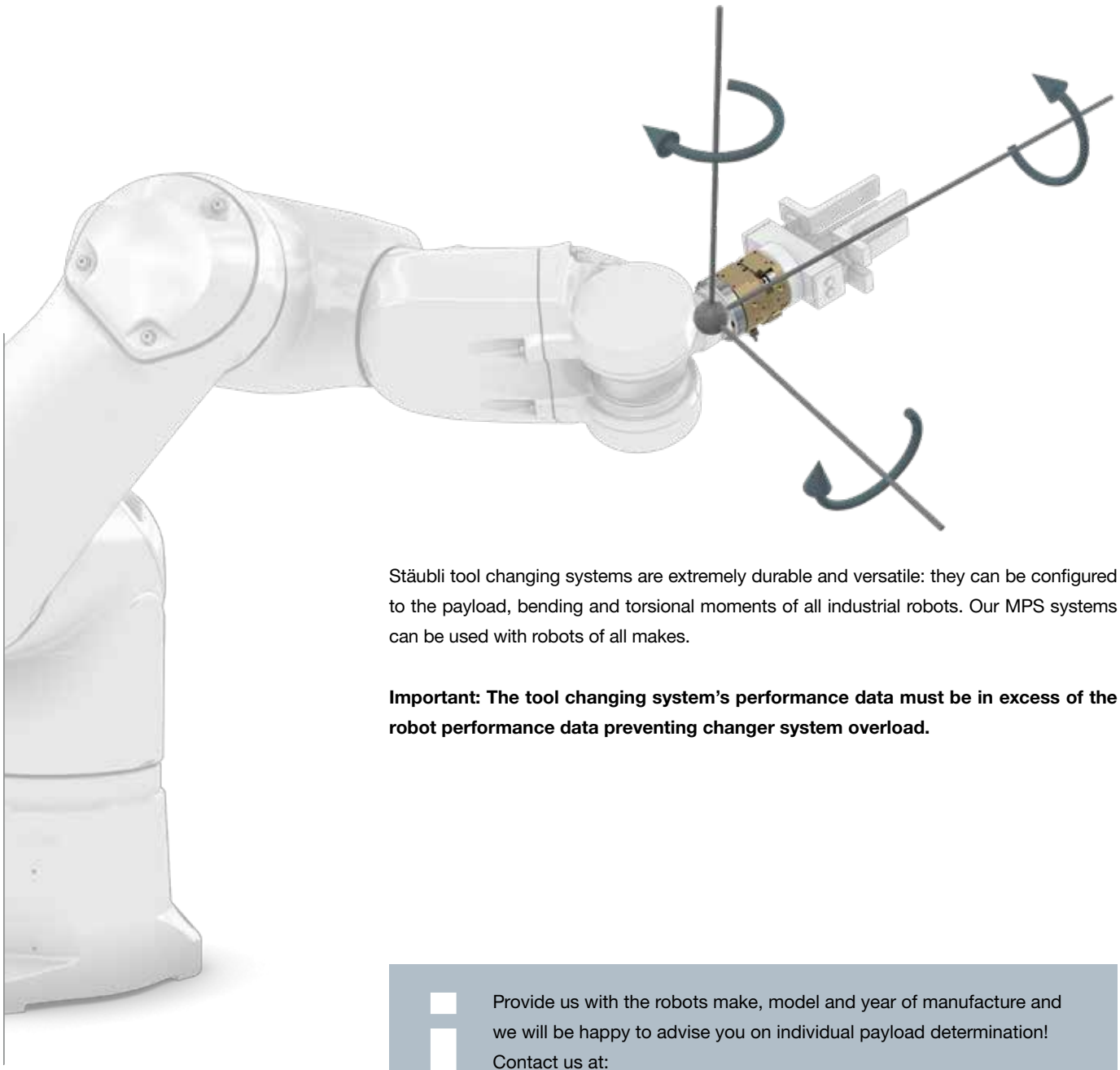
Stäubli's robotic tool changing systems are designed for application-specific module and component configuration. The product concept makes complete ready-to-use systems (MPS - COMPLETE) and customized designs (MPS - CUSTOMIZED) possible.

Economic efficiency

With over 60 years of experience as a global manufacturer in coupling technology for media and power connections, Stäubli delivers unprecedented performance and longevity. Component compatibility is guaranteed – ensuring risk free investment.

MPS SOLUTION COMPETENCE

From robot performance data to system selection



Stäubli tool changing systems are extremely durable and versatile: they can be configured to the payload, bending and torsional moments of all industrial robots. Our MPS systems can be used with robots of all makes.

Important: The tool changing system's performance data must be in excess of the robot performance data preventing changer system overload.

Provide us with the robots make, model and year of manufacture and we will be happy to advise you on individual payload determination! Contact us at:

www.staubli.com

PAYLOAD OVERVIEW

	MPS 020	MPS 032
max. bending moment (static)	30 Nm	75 Nm
max. torsional moment (static)	30 Nm	75 Nm
max. bending moment (dynamic)	105 Nm	262.5 Nm
max. torsional moment (dynamic)	105 Nm	262.5 Nm
max. payload	20 kg	32 kg
max. repulsion force	2.5 kN	5 kN
max. connection force	5 kN	10 kN
max. lateral force	5 kN	10 kN
max. permissible acceleration	50 m/s^2	50 m/s^2
Pitch circle diameter (PCD) robot adapter flange	ISO 9409-1-40-4-M6	ISO 9409-1-50-4-M6
Height (coupled)	40 mm	40 mm
Weight - robot side	0.26 kg	0.4 kg
Weight - tool side	0.12 kg	0.3 kg
Compressed air connection	Inner thread M5	Inner thread M5
Pneumatic ball locking	0.5 - 1.0 MPa 0.05 Nl/cycle at 0.6 MPa	0.5 - 1.0 MPa 0.10 Nl/cycle at 0.6 MPa
Repeatability at same base unit	Position: +/- 0.025 mm Angle: +/-0.125°	Position: +/- 0.04 mm Angle: +/-0.125°
Repeatability at different base unit	Position: +/- 0.05 mm Angle: +/-0.25°	Position: +/- 0.06 mm Angle: +/-0.25°
Query	Optional locked/unlocked/coupled	Optional locked/unlocked/coupled
Emergency release	yes	yes
Safety in case of drive medium failure	yes, by compression spring	yes, by compression spring

Check out our comprehensive MPS range.
Contact us for other **payloads** and **special designs.**

www.staubli.com

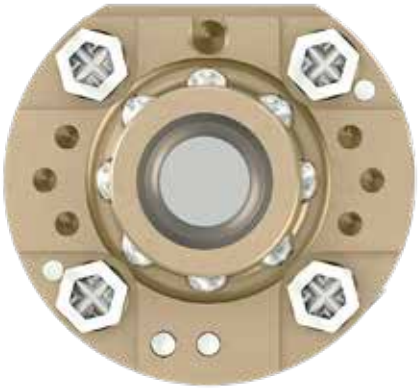
MPS 020 COMPLETE

MPS 020/1

For handling, gripping and vacuum applications

R

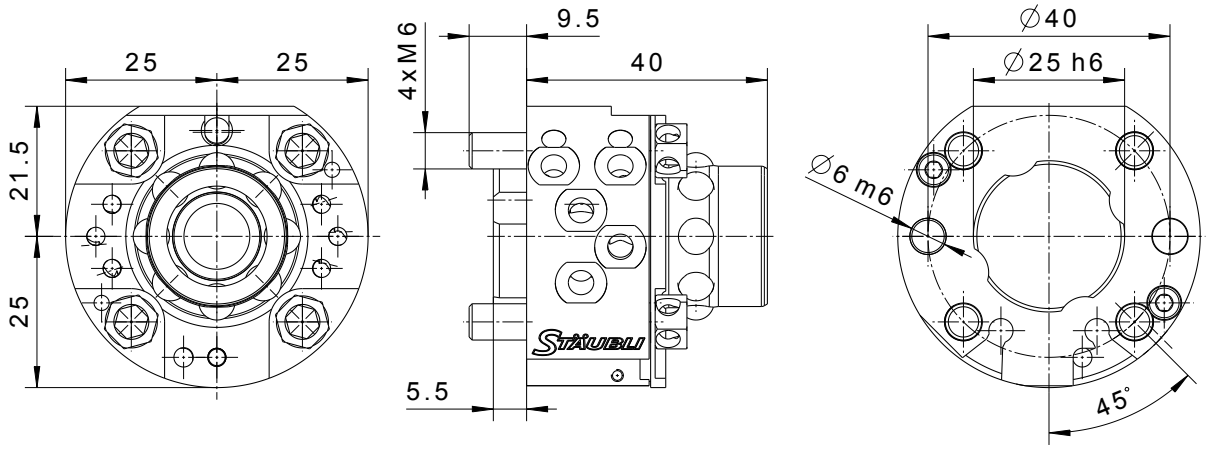
T



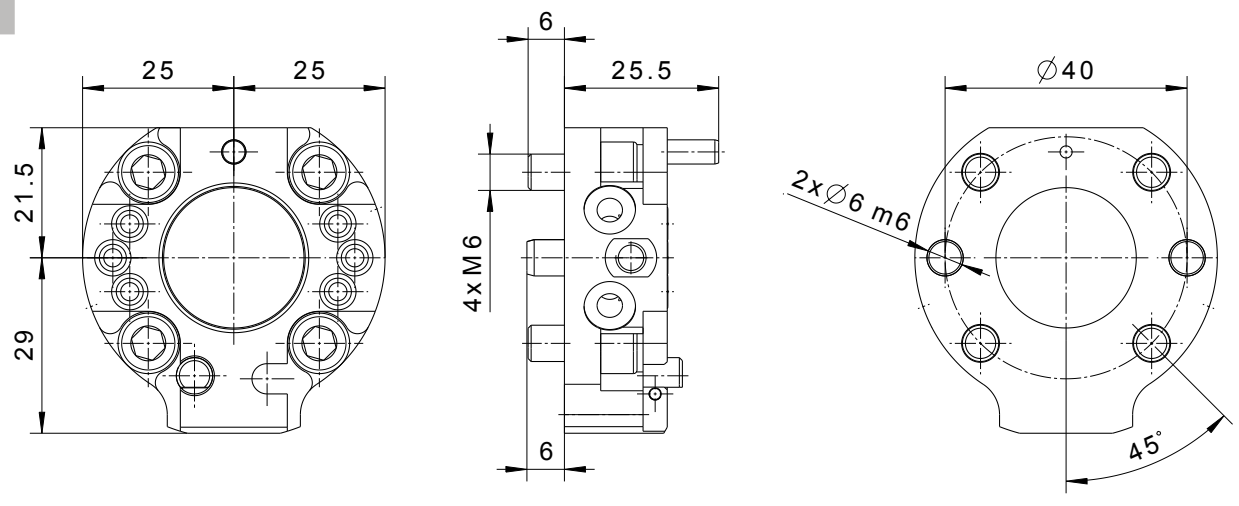
Application		Sensors/ connection	Connection transfer modules*	Order no.**
			Pneumatic	
Gripping/handling/vacuum	R	–	6x M5	K85560743
Gripping/handling/vacuum	R	3x PNP/ 3x M8		K85560742
Gripping/handling/vacuum	R	3x NPN/ 3x M8		K85560746
Gripping/handling/vacuum	T	–		K85560768

* Technical data for all transfer modules can be found from page 22 onwards.
** Including robot and tool side mounting kit.

R


25
25
21.5
25
4xM6
9.5
40
5.5
∅40
∅25 h6
∅6 m6
45°

T


25
25
21.5
29
6
25.5
4xM6
6
∅40
2x∅6 m6
45°

MPS 020 COMPLETE

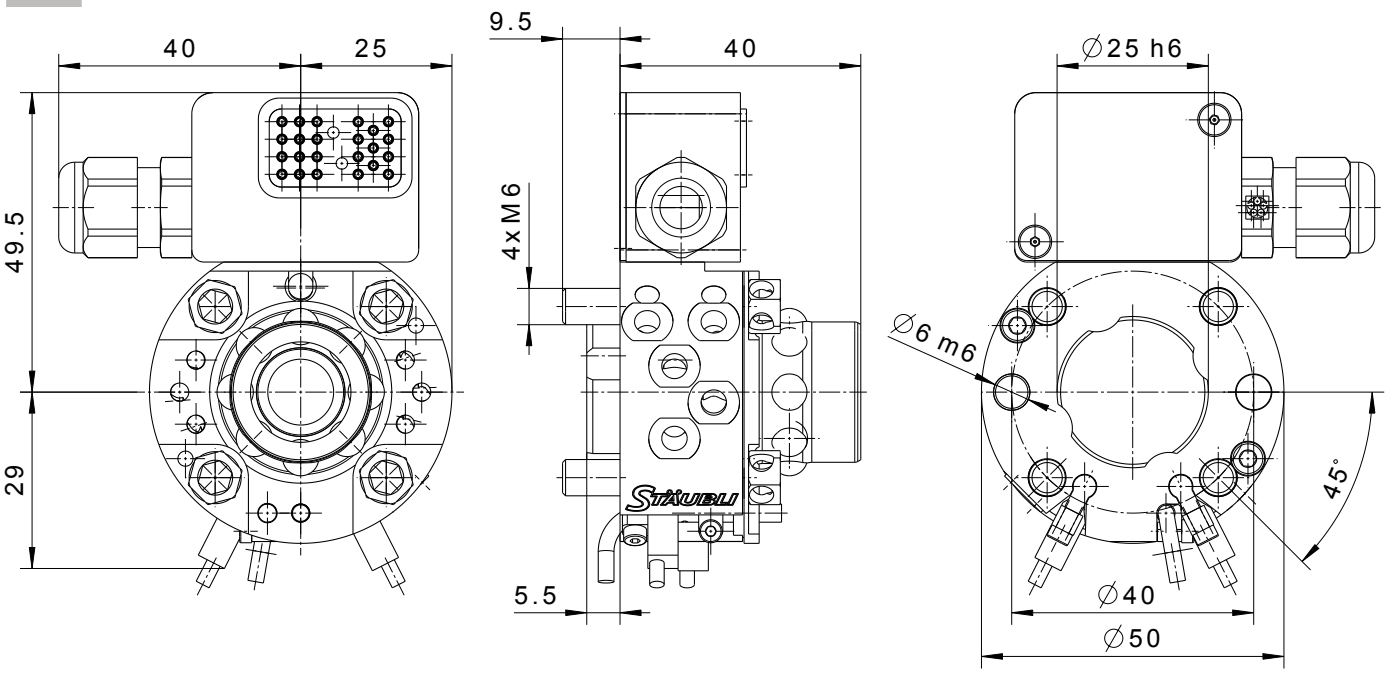
MPS 020/2

For handling, gripping and vacuum applications

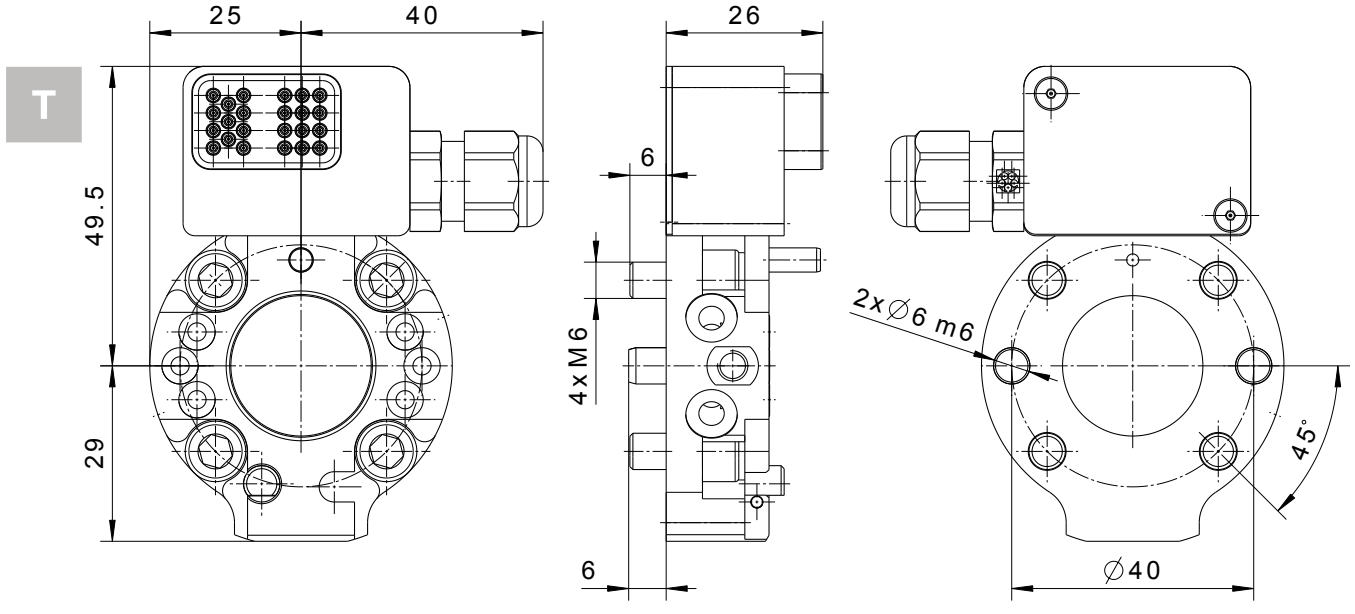
Application		Sensors/ connection	Connection transfer modules*			Order no.**
			Pneumatic	Signal		
Gripping/handling/vacuum	R	3x PNP/ 3x M8	6x M5	23x contacts	For self-assembly including crimp contacts	K85560741
Gripping/handling/vacuum	R	3x NPN/ 3x M8				K85560748
Gripping/handling/vacuum	R	3x PNP/ 3x M8		21x contacts	Connected with 1m cable and open conductor ends	K85560740
Gripping/handling/vacuum	R	3x NPN/ 3x M8				K85560747
Gripping/handling/vacuum	T	–		23x contacts	For self-assembly including crimp contacts	K85560767
Gripping/handling/vacuum	T	–		21x contacts	Connected with 1m cable and open conductor ends	K85560766

* Technical data for all transfer modules can be found from page 22 onwards.
** Including robot and tool side mounting kit.

R


40
25
49.5
29
9.5
40
4x M6
5.5
∅25 h6
∅6 m6
45°
∅40
∅50

T


25
40
49.5
29
26
6
4x M6
6
2x∅6 m6
45°
∅40

MPS 032 COMPLETE

MPS 032/1

For handling, gripping and vacuum applications

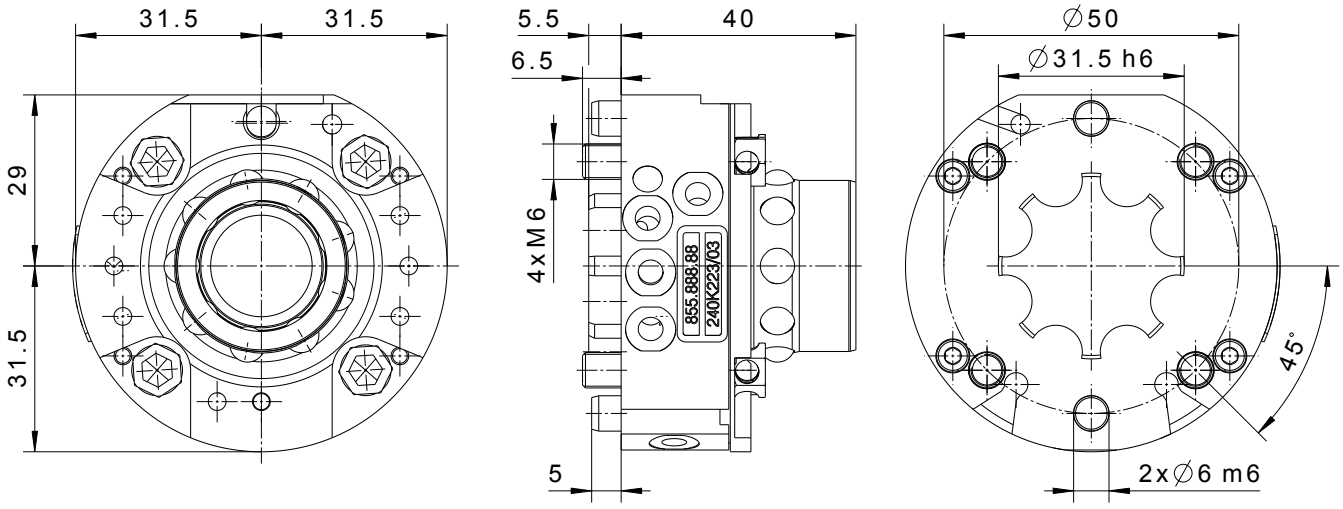
R

T

Application		Sensors/ connection	Connection transfer modules*	Order no.**
			Pneumatic	
Gripping/handling/vacuum	R	–	7x M5	K85561328
Gripping/handling/vacuum	R	3x PNP/ 3x M8		K85561327
Gripping/handling/vacuum	R	3x NPN/ 3x M8		K85561330
Gripping/handling/vacuum	T	–		K85561353

* Technical data for all transfer modules can be found from page 22 onwards.
** Including robot and tool side mounting kit.

R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5.5
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∅50
∅31.5 h6
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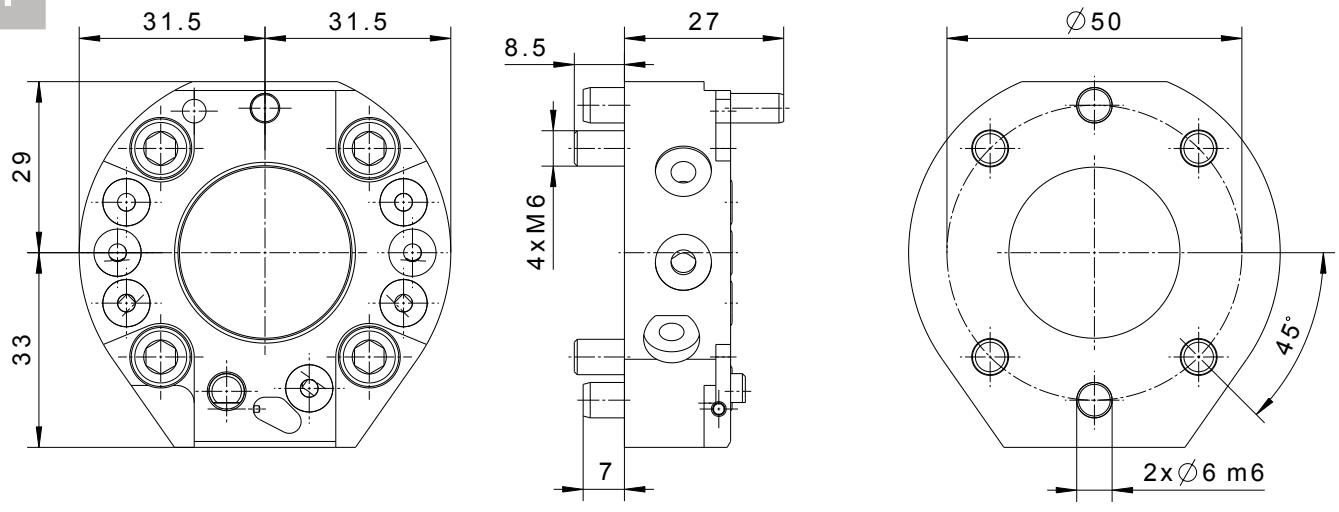
2x∅6 m6

T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29
33
8.5
27
4xM6
7
∅50
45°
2x∅6 m6

MPS 032 COMPLETE

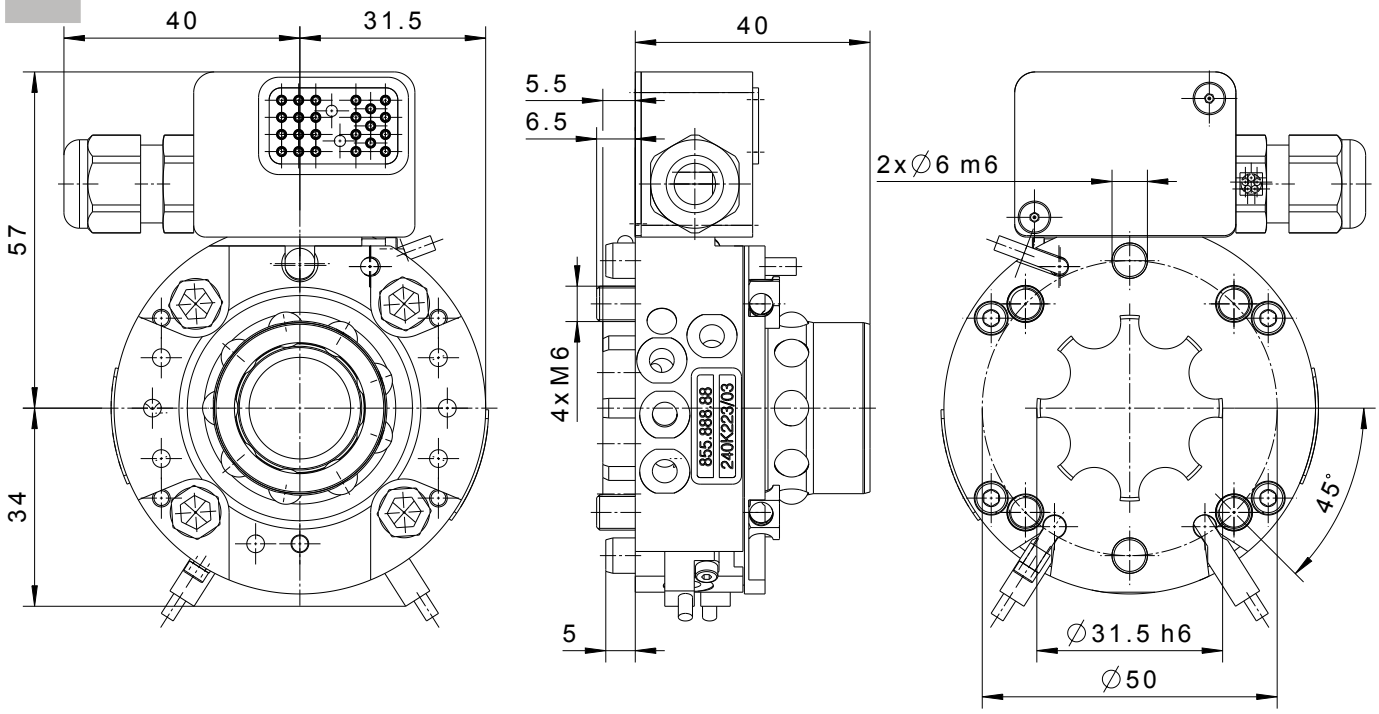
MPS 032/2

For handling, gripping and vacuum applications

Application		Sensors/ connection	Connection transfer modules*			Order no.**
			Pneumatic	Signal		
Gripping/handling/vacuum	R	3x PNP/ 3x M8	7x M5	23x contacts	For self-assembly including crimp contacts	K85561326
Gripping/handling/vacuum	R	3x NPN/ 3x M8				K85561332
Gripping/handling/vacuum	R	3x PNP/ 3x M8		21x contacts	Connected with 1m cable and open conductor ends	K85561325
Gripping/handling/vacuum	R	3x NPN/ 3x M8				K85561331
Gripping/handling/vacuum	T	–		23x contacts	For self-assembly including crimp contacts	K85561352
Gripping/handling/vacuum	T	–		21x contacts	Connected with 1m cable and open conductor ends	K85561351

* Technical data for all transfer modules can be found from page 22 onwards.
** Including robot and tool side mounting kit.

R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31.5
57
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6.5
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855.888.88
240K223/03
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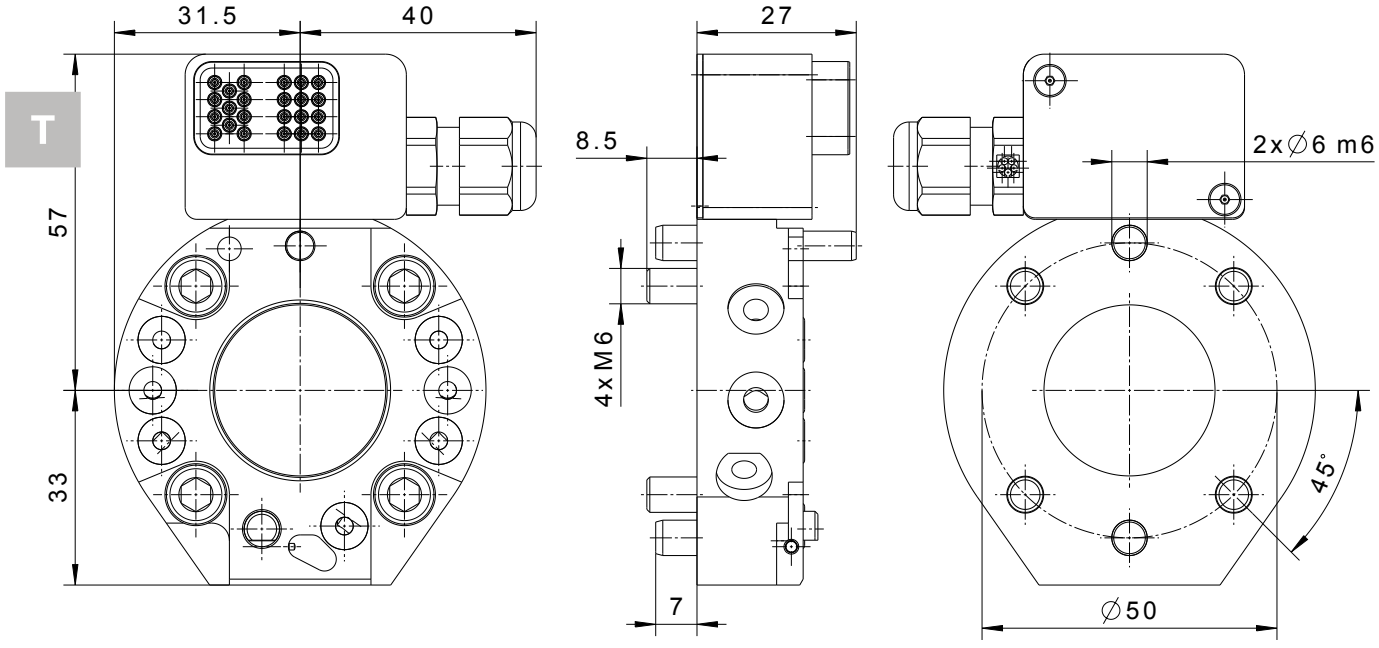
45°
∅31.5 h6
∅50

T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4xM6
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2x∅6 m6
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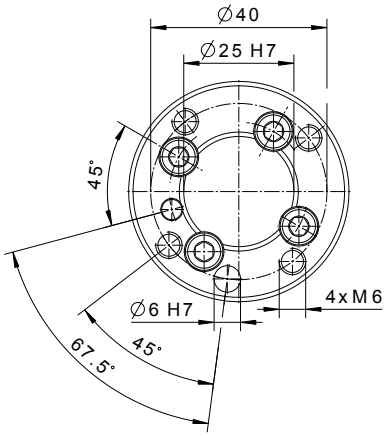
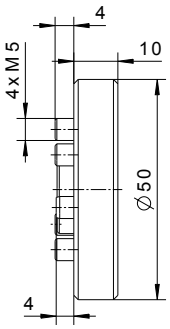
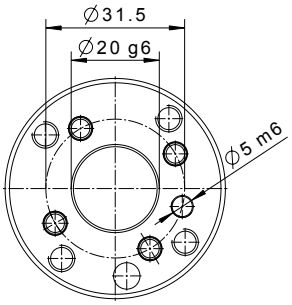
∅50

MPS 020/032 Accessories

Robot adapter flange MPS 020







R

	Order no.*	Adaption to	Zero offset
R	K81558109	ISO 9409-1-31.5-4-M5	67,5°

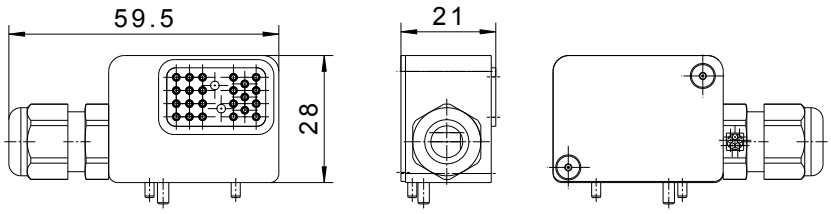
* including mounting material.

Pneumatic push-in screw connection

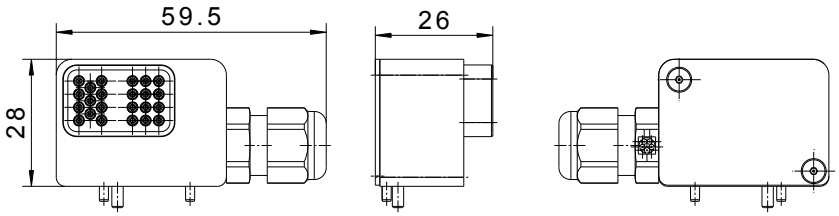
	Order no.	Type	Thread	Push-lock hose-Ø
	B16517075	90° angled	M5	4 mm

Electrical module for signal transmission

R



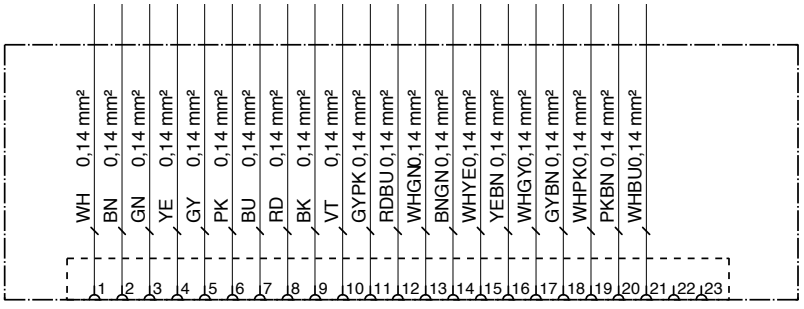
T



Wiring plan

ill.1

R



ill.2

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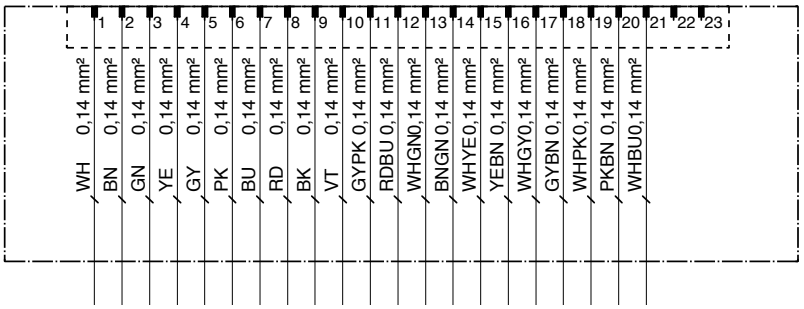


	Order no.	Signal	Voltage/ current (max.)	Screw	Clamping range	Protection class	Description	ill.
R	B27583951	23x contacts	40V/ 3A	M12x1.5	3,5-7 mm	IP2X	For self-assembly including crimp contacts	–
R	K81451277	21x contacts					Connected with 1 m cable and open conductor ends	1
T	B27583952	23x contacts					For self-assembly including crimp contacts	–
T	K81451278	21x contacts					Connected with 1 m cable and open conductor ends	2

MPS 020/032 Accessories

Teaching aid

Order no.	Description
K85560799	Teaching aid MPS 020 for the robot tool change system
K85561099	Teaching aid MPS 032 for the robot tool change system
K81557689	Storage case MPS 020 including teaching aid for the robot tool change system
K81557690	Storage case MPS 032 including teaching aid for the robot tool change system

MPS 020/032 – Tool stand

Flexibility and efficiency due to integrated tool storage

The tool stand is consistent with Stäubli's modular tool changer concept. Its individual components are designed to provide maximum scope for flexibility.

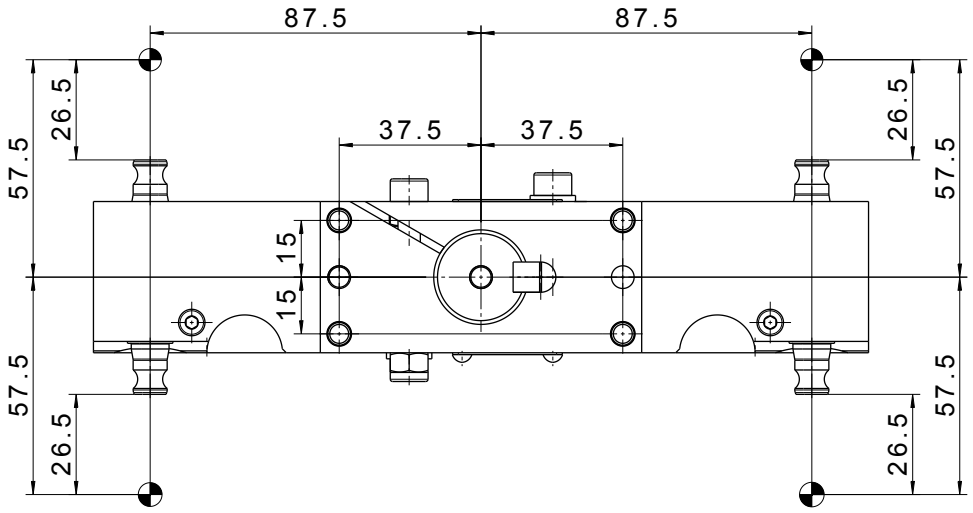
- Flexibility: the separate system components allow you to compile your own individual storage solutions.
- Optimisation: the complete systems are already dimensioned and calibrated for tool weights.
- Longevity: the floating bearing of the docking pin holds the tool in the vertical storage position and minimises the load on the components.
- The tool stand is suitable for both MPS 020 and MPS 032 providing maximum flexibility.

Contact us for **individual solutions** or **custom designs.**

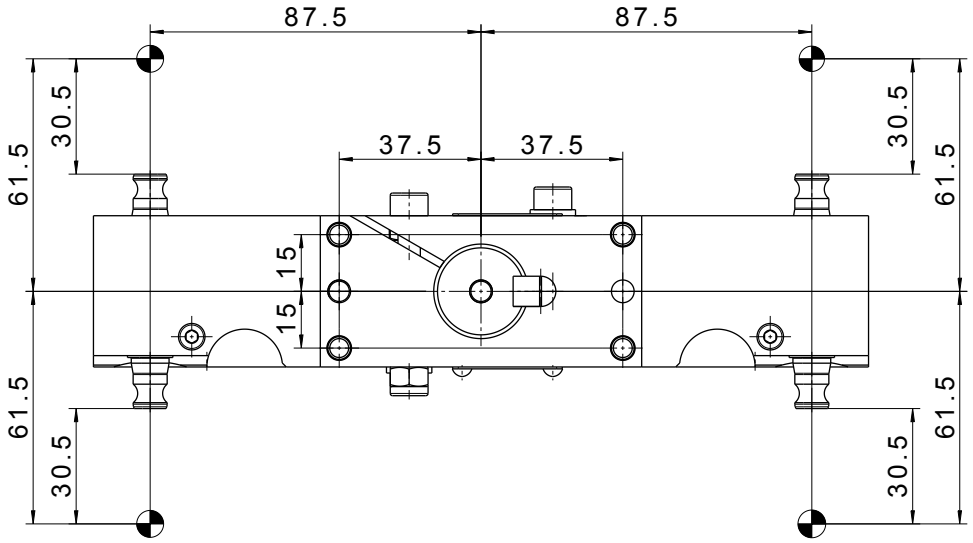
Order no.	Tool stand options	Sensors/ connection
K85561377	2 tools	–
K85561378	2 tools	2x PNP/ 2x M12
K85561385	2 tools	2x NPN/ 2x M12
K85561379	4 tools	–
K85561380	4 tools	4x PNP/ 4x M12
K85561386	4 tools	4x NPN/ 4x M12

MPS 020/032 TOOL STAND

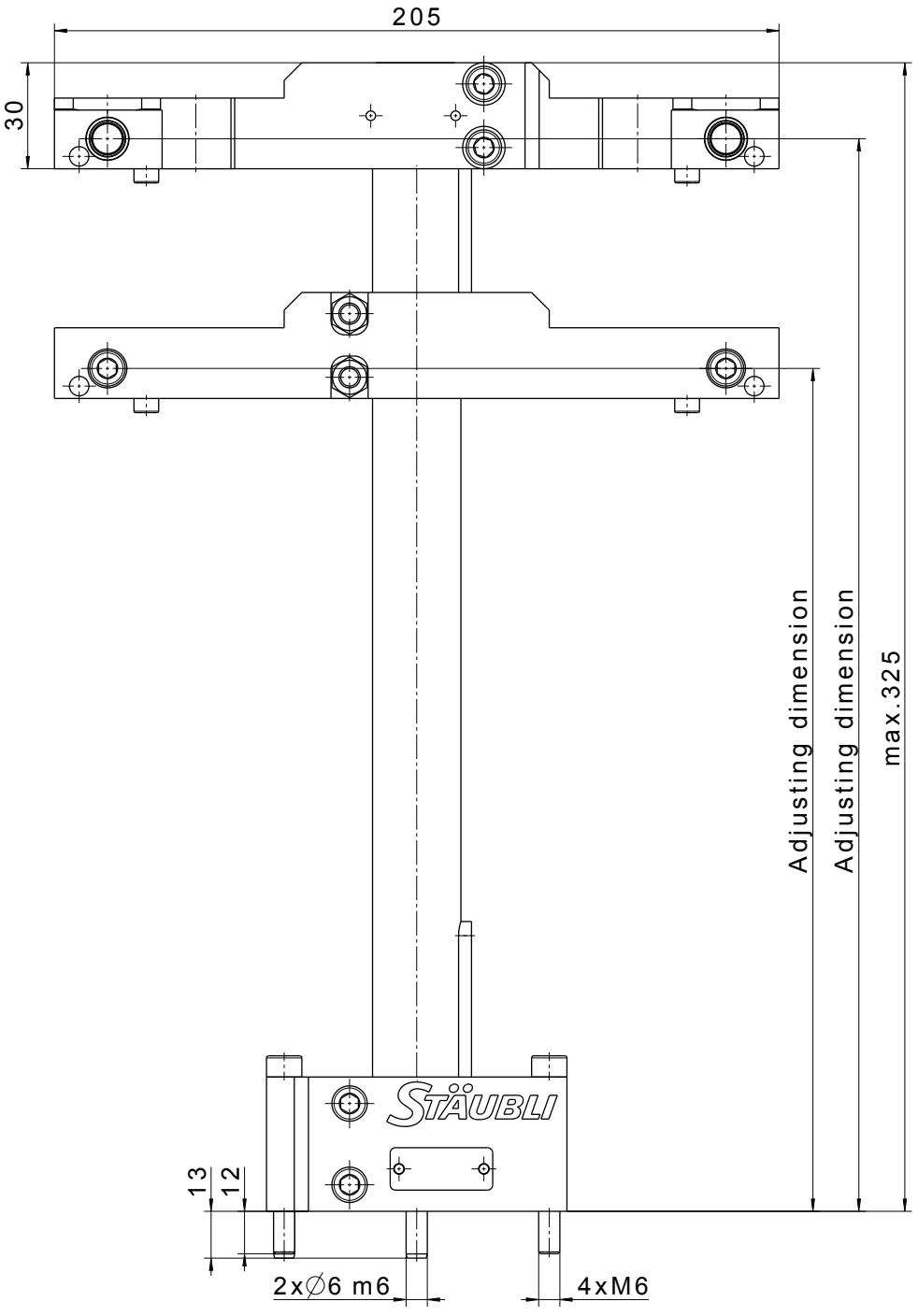
MPS 020



MPS 032



MPS 020/032

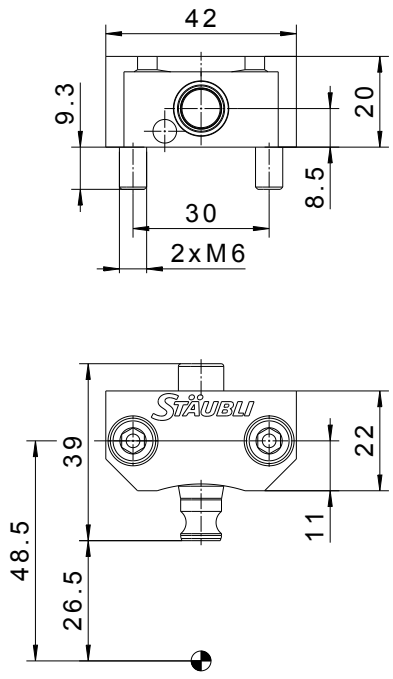

205
30
Adjusting dimension
Adjusting dimension
max.325
13
12
2x∅6 m6
4xM6
STÄUBLI

MPS 020/032 TOOL STAND

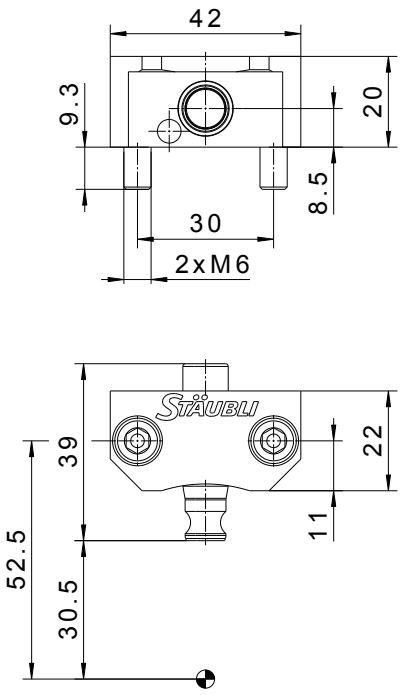
Tool stand upper part

- For mounting on existing fixtures to ensure maximum flexibility during integration

MPS 020



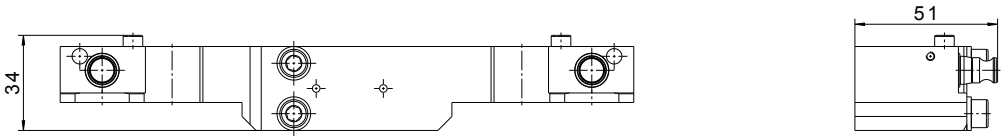
MPS 032

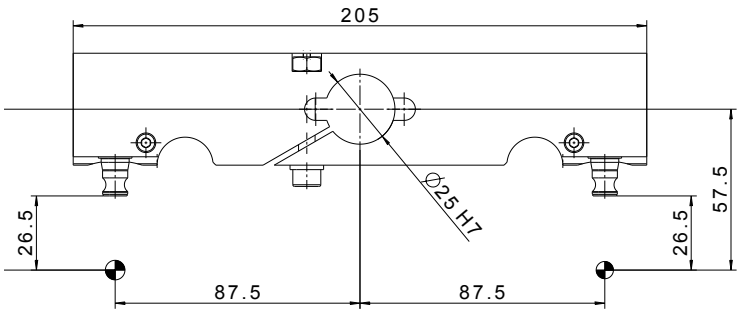


Order no.	Tool stand options	Sensors/ connection
K85561381	1 tool	–
K85561382	1 tool	1x PNP/ 1x M12
K85561383	1 tool	1x NPN/ 1x M12

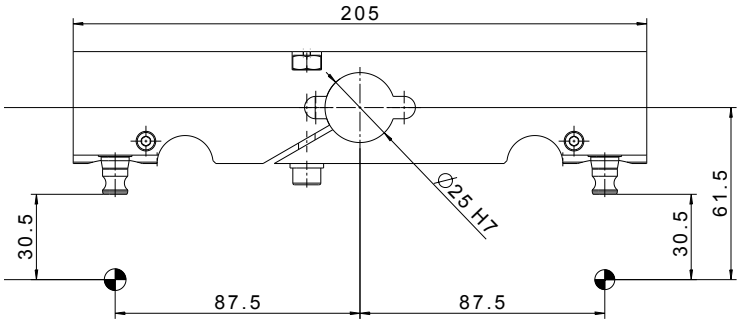
Tool stand upper part

- For extending an existing tool stand with two additional docking positions (a maximum of 4 tools can be accommodated per tool stand)





MPS 020



MPS 032

Order no.	Tool stand options	Sensors/ connection
K85561375	2 tools	–
K85561376	2 tools	2x PNP/ 2x M12
K85561384	2 tools	2x NPN/ 2x M12

MPS CUSTOMIZED

Customer-specific designs

Agile project management for maximum efficiency

Over 125 years of commitment to innovation and our extensive expertise in all industrial sectors are reflected in our individual solutions for customers around the world. We liaise closely with our customers to develop custom-made systems that are precisely and flexibly adapted to their requirements.

Over the decades, as a pioneer in the development of robotic tool changing systems, Stäubli has consistently implemented the highest precision and quality standards as well as maximum safety aspects with innovative, sustainable and variable technologies. Reflecting these high standards, the modular tool changers have an open architecture that makes the customer-specific design of perfectly matched systems possible.

Global cost efficiency and quality standards

Companies and corporations rely on standard global production processes ensuring they maintain their own quality standards. This optimises the costs along the entire production resource supply chain. Stäubli consistently supports this approach by developing its own standards for customers with robotic tool changing systems.

Design expertise from a single source

All components of the robotic tool changer systems are developed and manufactured by Stäubli:

- Only proven and certified technologies are used, based on decades of experience, for the comprehensive portfolio of transfer modules and electrical connectors.
- All design, production and quality inspection activities take place within Stäubli.

Know-how from design to finished product

Worldwide, individual, on-site advice

- Stäubli personnel are available for individual consultations from all their worldwide locations.
- Our technical consultants analyse the production and operating conditions with you at your site.
- Our project planning and design specialists configure the MPS system to your requirements.

Optimum system customisation for maximum productivity

Stäubli implements specific requirements, such as locking units for special payloads or new, process-dependent transfer modules, in optimally adapted and technologically sophisticated systems.

The individual adaptation of the transfer modules is possible with almost all product parameters:

- Faster transfer rates due to larger nominal diameters
- Customized additions to the plug & play product range
- Special media resistance and robustness is achieved through the use of highly resistant and premium quality materials
- Customer-specific wiring of electrical connectors with component testing and logging
- Development of new transfer modules for specific production technologies

Comprehensive payload range

Stäubli caters for a broad spectrum of payloads from 20 to 1530 kilogrammes and enabling a wide range of applications. Please contact us if the payloads listed in this brochure do not meet your needs.

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■ Stäubli Units ○ Agents

Global presence of the Stäubli Group

www.staubli.com

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