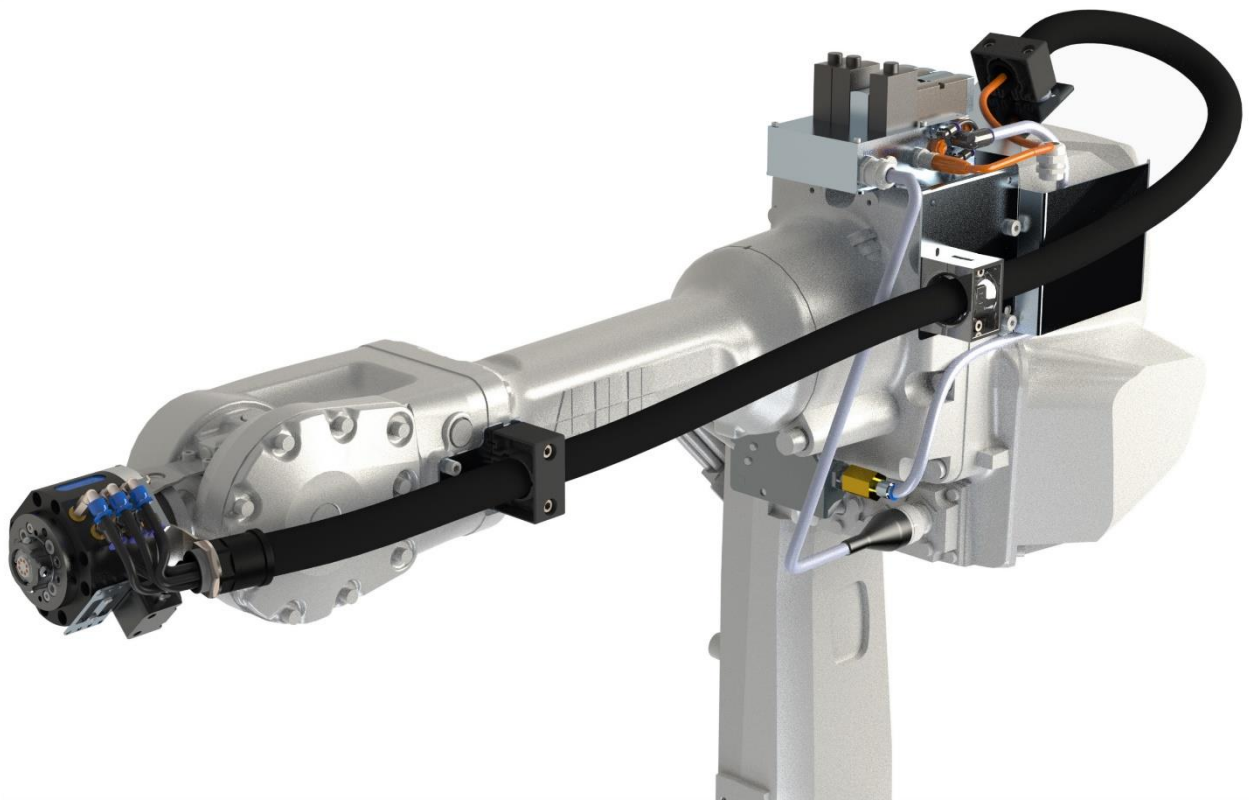


Technical description

Tool system TS20/10 for ABB IRB

M0114-1

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



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ROBOT AND FUNCTIONALITY GUIDE

Robot model	Tool system functionality and maximum load	Article number
ABB IRB 140	Swivel, 2 air channels, 20 kg Swivel, 2 air channels, 8 electric signals, 20 kg CiRo basic, 10 kg	TS101-203 (section 2.4.8) TS101-204 (section 2.4.12) TS101-210 (section 2.5.1)
ABB IRB 1600 1,2/1,45	Swivel, 2 air channels, 20 kg Swivel, 2 air channels, 8 electric signals, 20 kg CiRo basic, 10 kg CiRo, 4 air channels, 8 electric signals, 10 kg	TS102-203 (section 2.4.8) TS102-204 (section 2.4.12) TS102-210 (section 2.5.1) TS102-211 (section 2.5.2)
ABB IRB 1300 10/1,15 & 11/0,9	Swivel tool changing, 2 air channels, 20 kg Swivel tool changing, 2 air channels, 8 signals, 20 kg Swivel, 4 air channels, 20 kg Swivel, 4 air channels, 8 electric signals, 20 kg	TS103-201 (section 2.4.1) TS103-202 (section 2.4.3) TS103-205 (section 2.4.19) TS103-206 (section 2.4.21)
ABB IRB 1300 (All models)	Swivel, 2 air channels, 20 kg Swivel, 2 air channels, 8 electric signals, 20 kg CiRo basic, 10 kg	TS103-203 (section 2.4.8) TS103-204 (section 2.4.12) TS103-210 (section 2.5.1)
ABB IRB 2600 1.65/1.85	Swivel tool changing, 4 air channels, 20 kg Swivel tool changing, 4 air channels, 8 signals, 20 kg Swivel, 2 air channels, 20 kg Swivel, 2 air channels, 8 electric signals, 20 kg Swivel, 6 air channels, 20 kg Swivel, 6 air channels, 8 electric signals, 20 kg CiRo basic, 10 kg CiRo, 4 air channels, 8 electric signals, 10 kg	TS104-201 (section 2.4.1) TS104-202 (section 2.4.3) TS104-203 (section 2.4.8) TS104-204 (section 2.4.12) TS104-205 (section 2.4.19) TS104-206 (section 2.4.21) TS104-210 (section 2.5.1) TS104-211 (section 2.5.2)
ABB IRB 4600 20/2.5	Swivel tool changing, 4 air channels, 20 kg Swivel tool changing, 4 air channels, 8 signals, 20 kg Swivel, 2 air channels, 20 kg Swivel, 2 air channels, 8 electric signals, 20 kg Swivel, 6 air channels, 20 kg Swivel, 6 air channels, 8 electric signals, 20 kg CiRo basic, 10 kg CiRo, 4 air channels, 8 electric signals, 10 kg	TS106-201 (section 2.4.1) TS106-202 (section 2.4.3) TS106-203 (section 2.4.8) TS106-204 (section 2.4.12) TS106-205 (section 2.4.19) TS106-206 (section 2.4.21) TS106-210 (section 2.5.1) TS106-211 (section 2.5.2)

1. INTRODUCTION

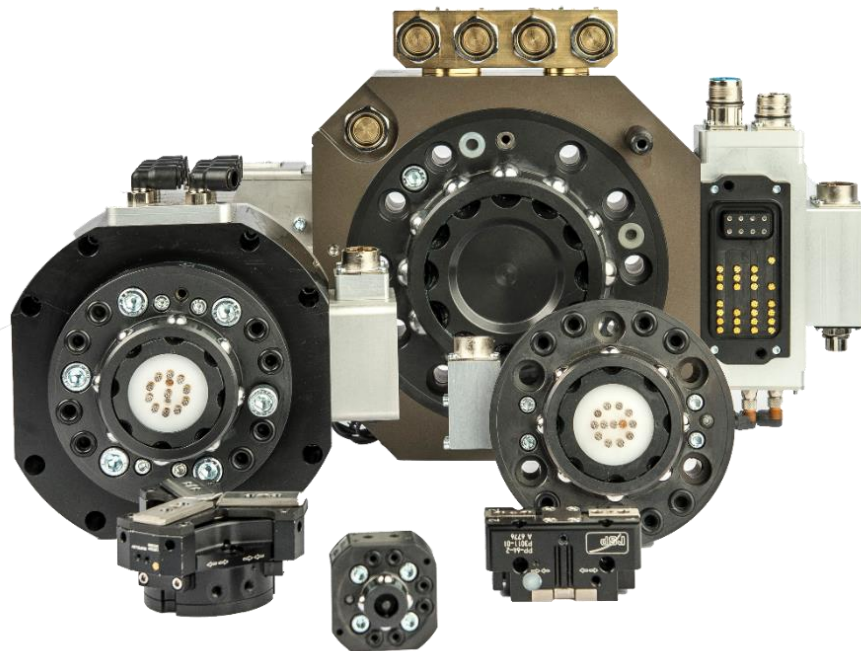
Robot System Products is a front-rank provider of peripheral products for high performance robot applications. We provide complete system solutions for your robot installations, aiming to improve your productivity with the most reliable and cost-effective tooling on the market. Continuously we explore 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 RSP's cost-effective CiRo, cables and hoses can be freely selected with high robot flexibility maintained, and space requirements reduced. Our 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 system must follow the safety demands stated in standards and provisions applicable in the country where the tool system is to be installed. The products are all prepared for CE-certification.

The user of the Robot System Products tool system is responsible that law and directives applicable in respective countries, with regards to safety, are followed. 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 tools attached to the swivel, swivel tool changer or CiRo if the air pressure is safely switched off.



WARNING!

Be aware that the swivel, swivel tool changer, tool attachment and CiRo are heavy and may cause personal injury and equipment damage if dropped.



NOTE!

A swivel tool changer shall always be in locked position, also when empty, to avoid unexpected locking if air pressure is lost.



WARNING!

Electric signals and power must be disconnected/switched off when docking the tool attachment to the swivel tool changer. This is to prevent sparking between signal pins and tool attachment.

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.

1.2 Description of tool system TS20/10

Tool systems from Robot System Products are complete plug-and-play solutions designed for quick and easy installation. With our tool systems, compressed air and electrical signals are supplied to the tool with a minimum of limitations on the robot's working range. An RSP tool system is based on a swivel, a swivel tool changer (STC) or a CiRo and includes hose package, valve unit and a complete set of cables, hoses and connectors for signals and air – all delivered as a ready-mounted package. CiRo Basic is, however, delivered with adaptation kit and hose package only (valve units, connections, cabling and air hoses shall be selected separately).

RSP tool systems simplify and reduce required design time, as the components all are matched, and the media supply is already fully adapted to the specific robot and its functions. When using a swivel or STC based tool system compressed air and electric signals are made available directly at the tool without limiting axis 6 rotation or the robot's working range. For CiRo based tool systems the axis 6 rotation will be limited to $\pm 250^\circ$. Using RSP tool systems there are no need of considering loose, hanging cables and hoses during programming, concentration can be given to the tool path.

3D-models are available in RobotStudio and STEP-format.

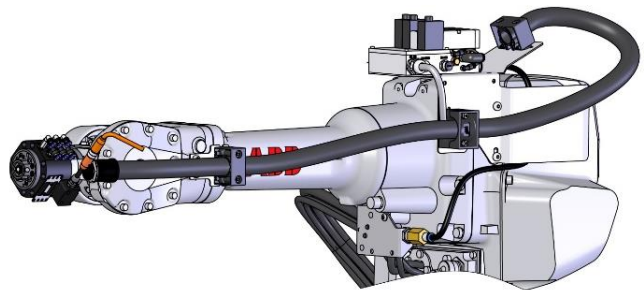
1.2.1 Swivels, swivel tool changers and CiRo

When using an RSP swivel, compressed air and electric signals will be made directly available at the tool without limiting the axis 6 rotation. RSP's tool changer technology enables robots to switch between multiple tools. Our swivel tool changers integrate the advantages of swivels and tool changers into a single unit. The principle behind the patented locking device TrueConnect™ is that load is distributed uniformly through pressing locking balls into spherical grooves, the play is a minimum and the position repeatability is practically absolute throughout the lifespan.

With a swivel tool changer, the air supply to the tool is shut off automatically during tool change, no on/off-program instructions are required. As the solution is fully integrated with the robot, the reliability is improved, and the operational life extended as compared with traditional solutions. In addition, the system can with ease be reconfigured with changing requirements, or when additional functions are needed.

The swivels S20-2 and S20-6, and the swivel tool changer STC20-4 transfer compressed air to the tool. Electrical versions, designated with an 'E', is in addition equipped with transfer of electrical signals to the tool.

With a CiRo, cables and hoses can be connected to tools or tool changers similarly to robots with internal dressing. The robots working range and ability to move freely, independent of transferred media, is maximised. For the tool system CiRo Complete hoses and cables for air, signals and power are included. For CiRo Basic they shall be selected separately according to the requirements of the application. With CiRo the axis 6 can rotate up to 500 degrees, only limited by the flexibility of hoses and cables.



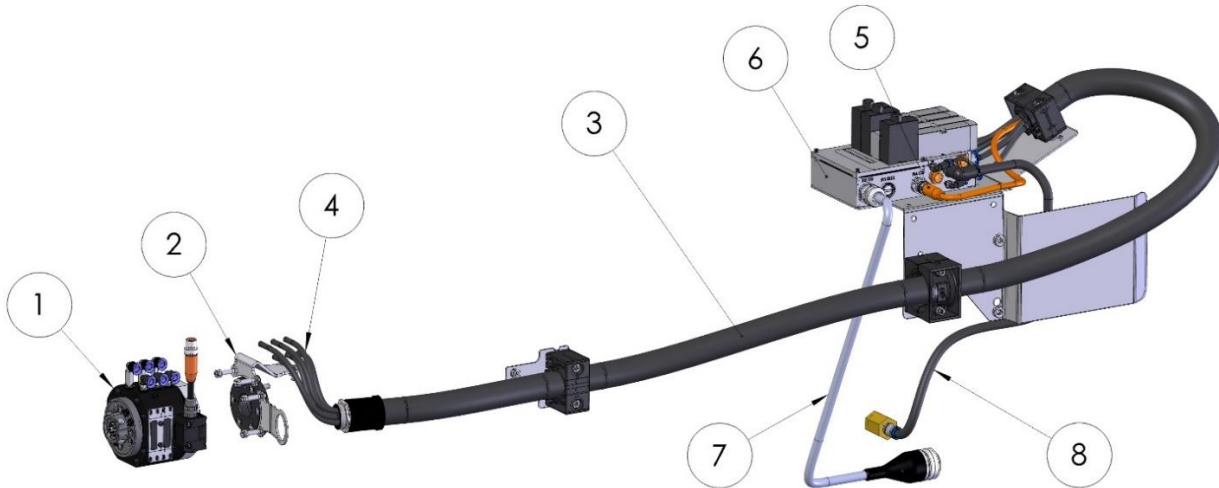
2. TOOL SYSTEM SPECIFICATIONS

An RSP tool system includes all components for implementing swivel tool changers, swivels and CiRo:s on specified robots. A tool system is complete (with the exception of CiRo basic) and includes valve unit, cabling, hoses, fittings as well as all screws, nuts and washers needed. It is delivered as a single unit ready for mounting on the robot. Tool systems equipped with tool changing capability shall be complemented with tool attachments.

2.1 Tool system overview, swivels with and without tool changers

A swivel based TS20/10 tool system consists of the following components:

- (1) A swivel for direct mounting of tools, with or without electrical connections, or alternatively a swivel with integrated tool changer (STC) combined with tool attachments, which likewise can be with or without electrical connections.
- (2) An adaptation kit which prohibits the swivel or STC to rotate in relation to the robot and, when applicable, as well includes an adaptation plate for the bolt circle of the robot.
- (3) A hose package to be mounted on the upper arm between the swivel or STC and the valve unit. All screws, bolts, and mounting plates needed are included.
- (4) Air hoses connecting the swivel or STC with the valve unit.
- (5) A signal cable between swivel or STC and the connection box on the valve unit, which is included when electrical signals are incorporated in the swivel.
- (6) A valve unit integrating air and electrical connections into one compact unit. The integrated tool changing function closes the air supply to the tool during tool change.
- (7) A signal cable connecting the valve unit with the application interface of the robot.
- (8) Air supply hose connecting the valve unit with the application interface of the robot.



Item	Description	Article number
1	Swivel tool changer STC20-4 Tool attachment TA20-4 Tool attachment TA20-4 steel	P0106A P0102 P0123
1	Swivel tool changer STC20-4E Swivel tool changer STC20-4E M12 12P Tool attachment TA20-4E Tool attachment TA20-4E steel	P0108A P1157 P0109 P0125

1	Swivel S20-2 Swivel S20-6 Swivel S20-2E Swivel S20-2E M12 12P Swivel S20-6E Swivel S20-6E M12 12P	P0110A P0112A P0111A P1158 P0113A P1159
2	Adaptation kit for IRB 140 and IRB1600 Adaptation kit for IRB 1300 Adaptation kit for IRB 2600 and IRB 4600	P1147 P4213 P0118
3	Hose package for IRB 140 Hose package for IRB 1600 Hose Package for IRB 1300 Hose package for IRB 2600/12-20 Hose package for IRB 4600 20/2.5	P0030 P0034 P2178 P0033 P2174
4	Air hose kit for IRB 140 Air hose kit for IRB 1600 Air hose kit for IRB 1300 Air hose kit for IRB 2600 Air hose kit for IRB 4600	P2050-28 P2050-24 P2050-32 P2050-36 P2050-21
5	Upper arm cable for IRB 140, IRB 1600 and IRB 2600 Upper arm cable for ABB IRB 4600	P0025 P0025-30
6	Valve unit with three valves for tool changer Valve unit with one valve Valve unit with three valves	P0011A P0012A P0013A
7	Robot cable for IRB 140 Robot cable for IRB 1600 Robot cable for IRB 2600 Robot cable for IRB 4600	P0020 P0023 P8119 P8119-8
8	Air supply kit for IRB 140 and IRB 2600 Air supply kit for IRB 1600 Air supply kit for IRB 4600-20	P2050-13 P2050-23 P2050-9

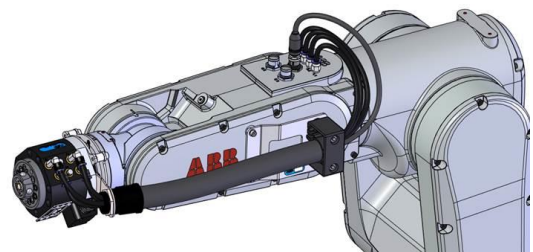


NOTE!

For spare parts and wear parts see manuals and technical description of each component.



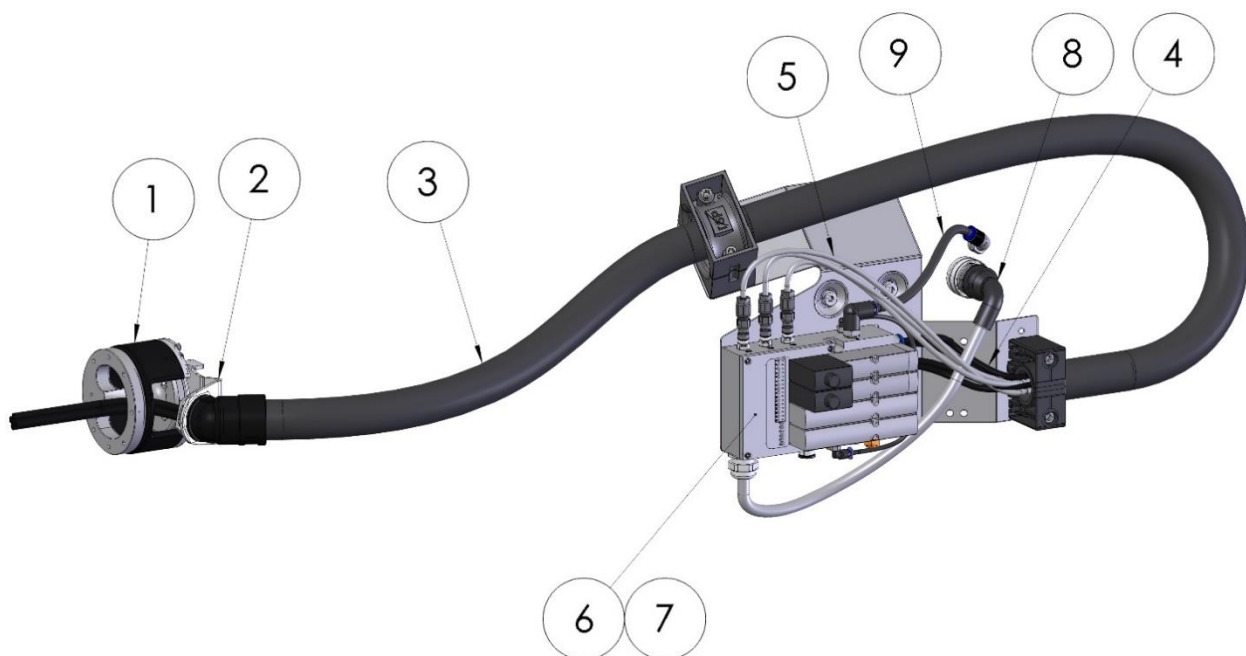
NOTE! Tool systems TS103-xx (for IRB 1300) do not include valve unit and robot cable. The pneumatic air is connected directly to the robot.



2.2 Tool system overview, CiRo

A CiRo based TS20/10 tool system consists of the following components:

- (1) A CiRo for mounting of tools, direct or using tool adapter kit (optional).
- (2) An adaptation kit which prohibits the CiRo to rotate in relation to the robot.
- (3) A hose package to be mounted on the upper arm between the CiRo and the valve unit.
All screws, bolts, and mounting plates needed are included.
- (4) Air hoses connecting the tool, mounted through the CiRo, with the connection box on the valve unit.
- (5) Signal cables connecting the tool, mounted on the CiRo, and the connection box on the valve unit.
- (6) A valve unit integrating air and electrical connections into one compact unit.
- (7) Interface with three M8-connectors mounted on the valve unit for connecting signal cables.
- (8) A signal cable connecting the valve unit with the application interface of the robot.
- (9) An air supply kit connecting the connection box on the valve unit with the application interface of the robot.



Item	Description	Article number
1	CiRo S2 CiRo S1	P5132 P5131
2	Adaptation kit for IRB 140, IRB1600 Adaptation kit for IRB 1300 Adaptation kit for IRB 2600 and IRB 4600	P5302 P5321 P5301
3	Hose package for IRB 1600 Hose package for IRB 1300 Hose package for IRB 2600 Hose package for IRB 4600-20/2.50	P2162 P2176 P2160-2 P2172
4	Air hose kit for IRB 1600 Air hose kit for IRB 2600 Air hose kit for IRB 4600	P2050-17 P2050-12 P2050-15

5	Upper arm cables, IRB 1600 Upper arm cables, IRB 2600 Upper arm cables, IRB 4600	P8434-30 P8434-35 P8434-45
6	Valve unit with connection box	P1006
7	Interface 3xM8	P1018
8	Robot cable for IRB 1600 Robot cable for IRB 2600, IRB 4600	P0023 P8119-8
9	Air supply kit for IRB 1600 Air supply kit for IRB 2600 Air supply kit for IRB 4600	P2050-4 P2050-13 P2050-9

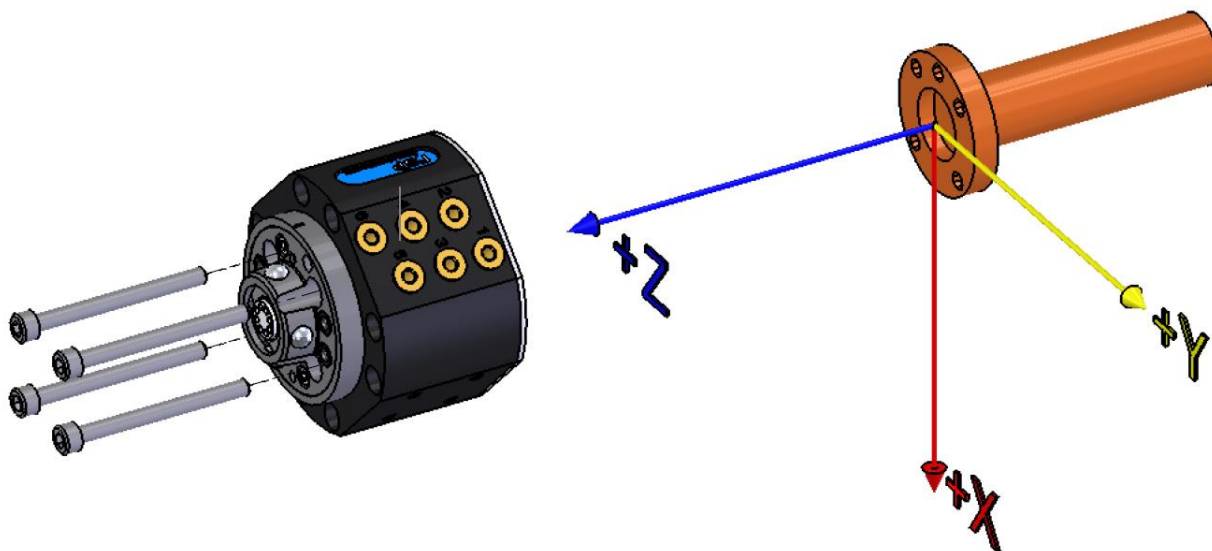


NOTE!

For spare parts and wear parts see the manuals and technical description of each component.

2.3 Coordinate System Definition

A swivel, swivel tool changer or CiRo adds load to the robot. If the arm and tool loads are not stated correctly during programming the behaviour of the robot and the wear of the equipment will be affected. Information about weight and centre of gravity can, in accordance with the coordinate system stated below, be found in the technical specification tables of the swivel, swivel tool changer and CiRo.



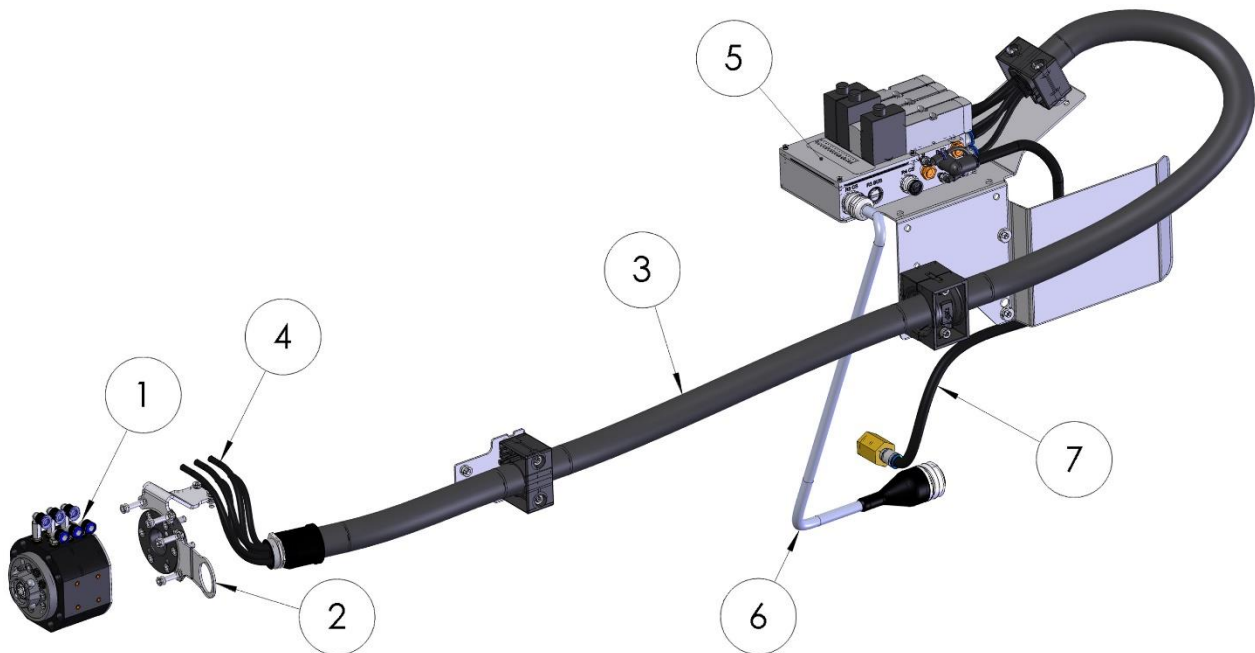
NOTE!

For the swivel, swivel tool changer and CiRo the origo is situated on the surface in the centre of the robot mounting flange.

2.4 Swivel based tool system configurations

2.4.1 Swivel tool changing with 4 air channels.

Articles: TS103-201, TS104-201, TS106-201



This tool system is used when tool changing capability and 4 pneumatic channels are required. It consists of a swivel tool changer, adaptation kit, hose package, valve unit and cabling. The valve unit has three monostable 5/2 valves and the hose package contains 6 air hoses.

Robot model	Article number	Pneumatic diagram	Circuit diagram
ABB IRB 1300 10/1,15 & 11/0,9	TS103-201	Pne0251-062 (section 2.4.6)	-
ABB IRB 2600 1.65/1.85	TS104-201	Pne0214-001 (section 2.4.7)	E0251-007 (section 2.4.2)
ABB IRB 4600 20/2.50	TS106-201	Pne0214-001 (section 2.4.7)	E0251-009 (section 2.4.2)

Components

Article number	STC (1)	Adapt-kit (2)	Hose p. (3)	Air hoses (4)	Upper cable	Valve unit (5)	Robot cable (6)	Air supply hose (7)
TS103-201	P0106A	P4213	P2178	P2050-32	-	-	-	-
TS104-201	P0106A	P0118	P0033	P2050-36	-	P0011A	P8119	P2050-13
TS106-201	P0106A	P0118	P2174	P2050-21	-	P0011A	P8119-8	P2050-9



NOTE! TS103-201 has capabilities for tool changing and 2 pneumatic channels.

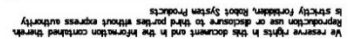


NOTE! The swivel tool changers are each delivered with three push-in couplings I0327 and three push-in couplings 3HXG111-3.



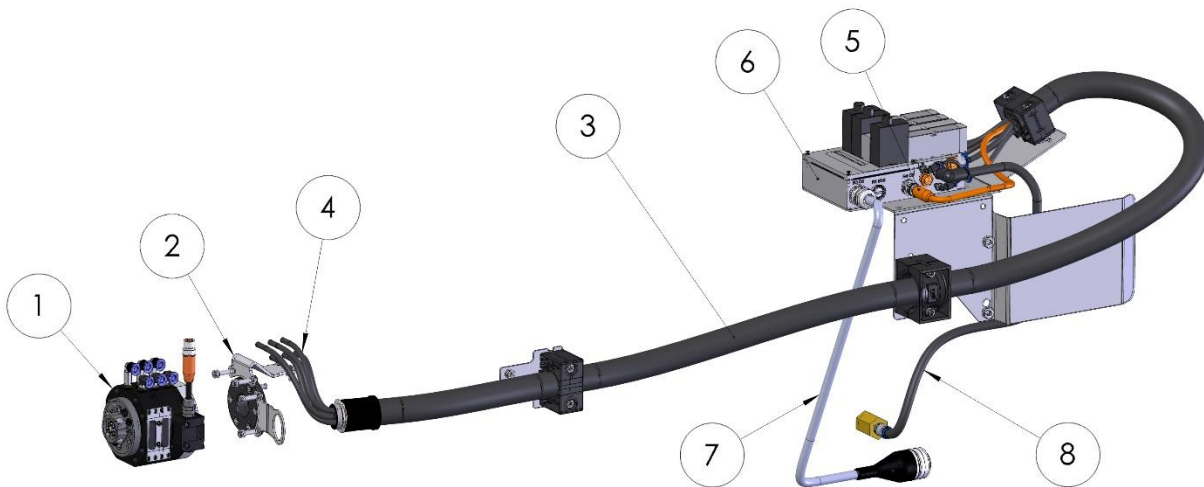
NOTE! Suitable tool attachments (P0102 and P0123) are described in sections 3.1.2 and 3.1.3.

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2.4.3 Swivel tool changing with 4 air channels and 8 electric signals.

Articles: TS103-202, TS104-202, TS106-202



This tool system is used when tool changing capability, 4 pneumatic channels and 8 electric signals are required. It consists of a swivel tool changer, adaptation kit, hose package, valve unit and cabling. The valve unit has three monostable 5/2 valves and the hose package contains 4 air hoses.

Robot model	Article number	Pneumatic diagram	Circuit diagram
ABB IRB 1300 10/1,15 & 11/0,9	TS103-202	Pne0251-062 (section 2.4.6)	E0251-062 (section 2.4.4)
ABB IRB 2600 1.65/1.85	TS104-202	Pne0214-001 (section 2.4.7)	E0251-001 (section 2.4.5)
ABB IRB 4600 20/2.5	TS106-202	Pne0214-001 (section 2.4.7)	E0251-008 (section 2.4.5)

Components

Article number	STC (1)	Adapt. kit (2)	Hose p. (3)	Air hoses (4)	Upper cable (5)	Valve unit (6)	Robot cable (7)	Air supply hose (8)
TS103-202	P1157	P4213	P2178	P2050-32	-	-	-	-
TS104-202	P0108A	P0118	P0033	P2050-36	P0025	P0011A	P8119	P2050-13
TS106-202	P0108A	P0118	P2174	P2050-21	P0025-30	P0011A	P8119-8	P2050-9



NOTE! TS103-202 has capabilities for tool changing and 2 pneumatic channels. STC P1157 is connected directly to the robot, no upper arm cable is needed.

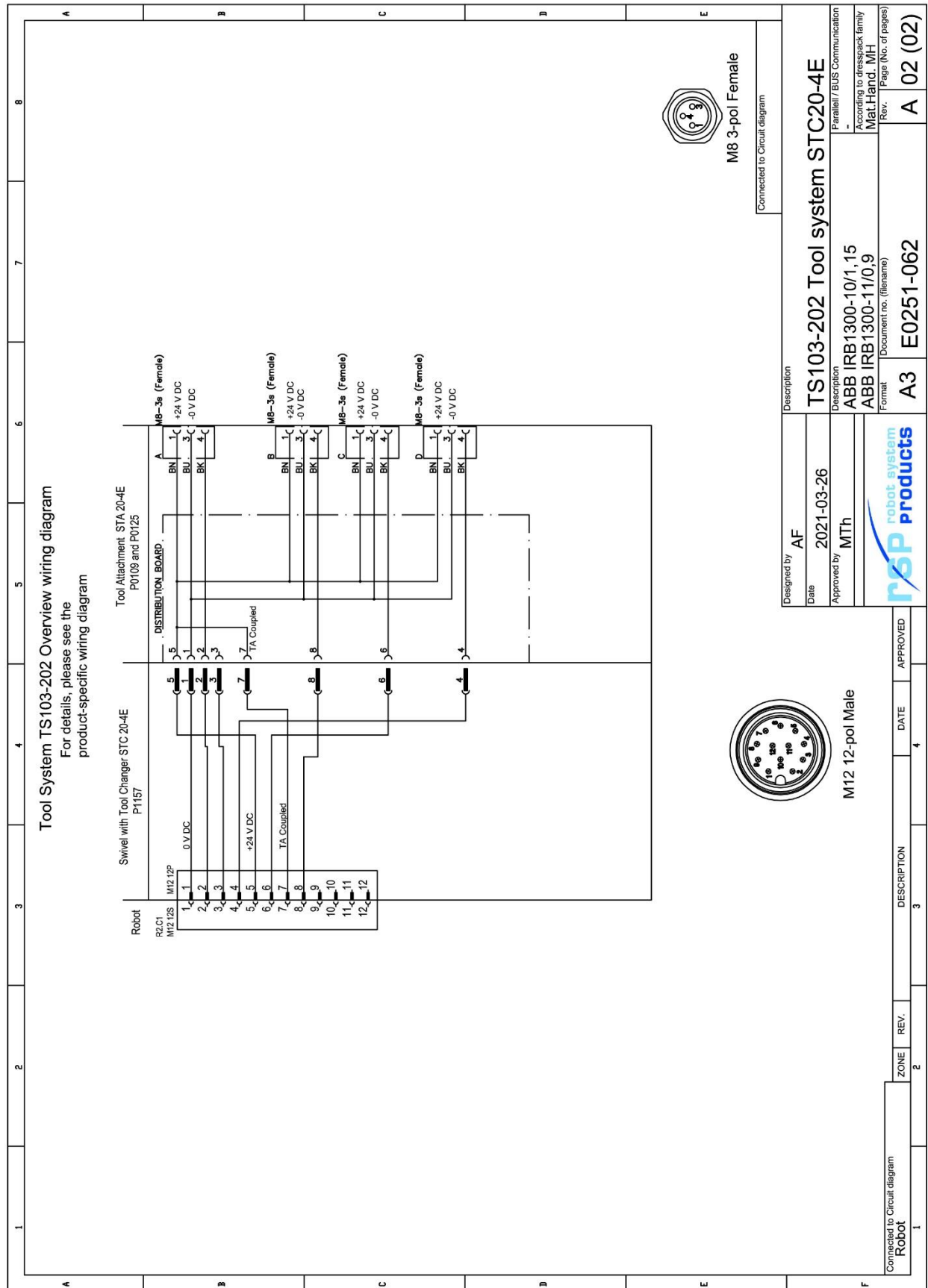


NOTE! The swivel tool changers are each delivered with three push-in couplings I0327 and three push-in couplings 3HXG111-3.

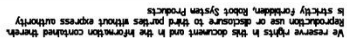


NOTE! Suitable tool attachments (P0109 and P0125) are described in sections 3.1.5 and 3.1.6.

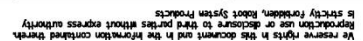
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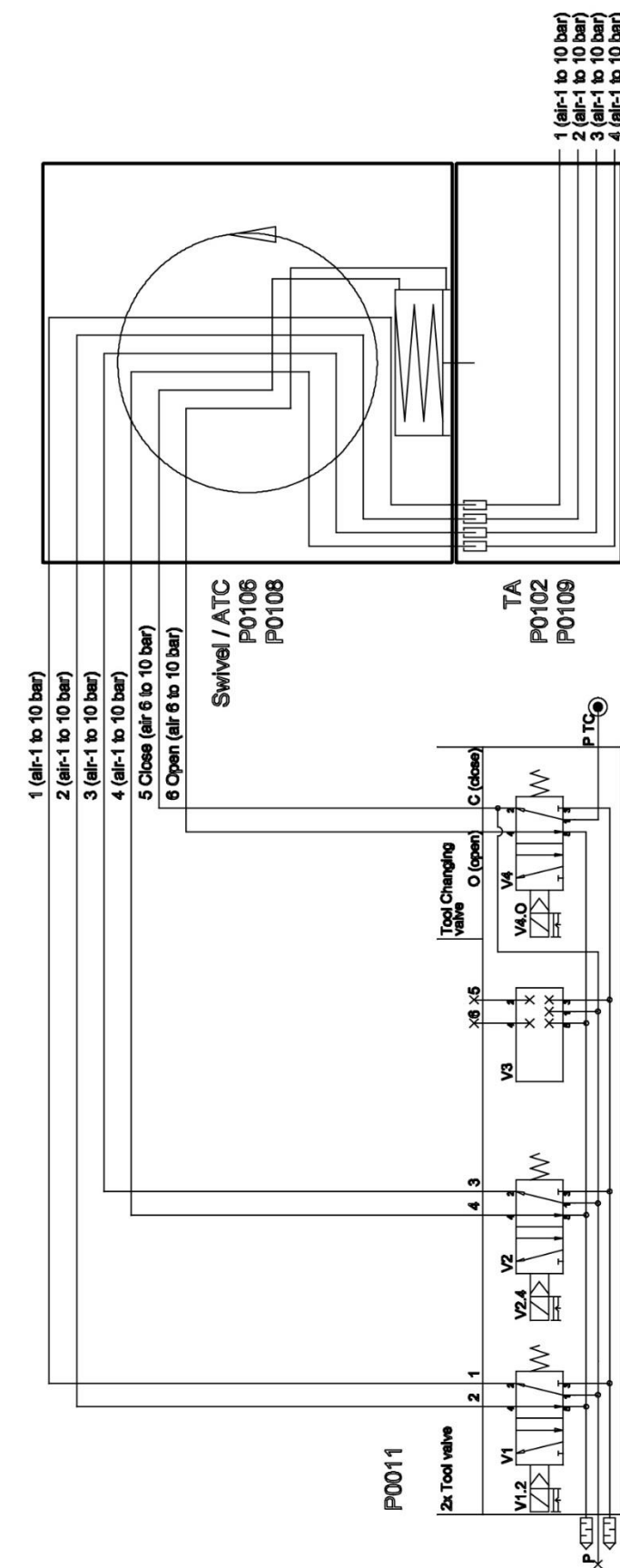
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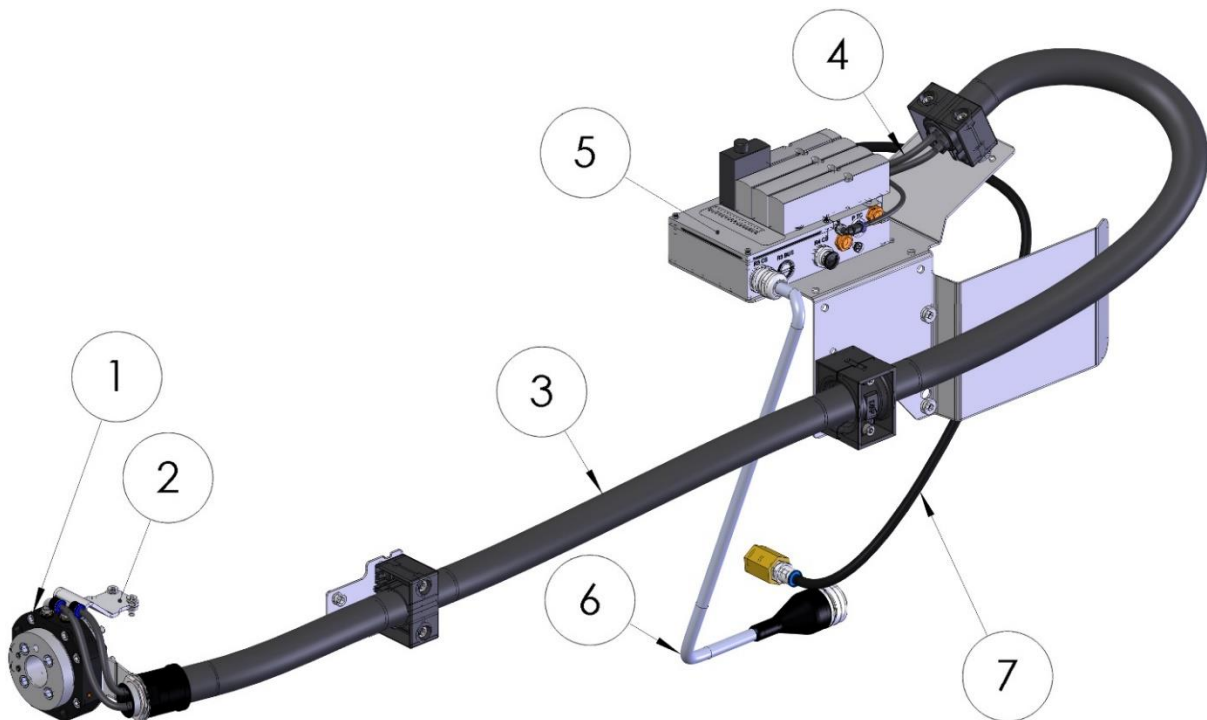


2.4.7 Pneumatic diagram Pne0214-001 STC



2.4.8 Swivel with 2 air channels.

Articles: TS101-203, TS102-203, TS103-203, TS104-203, TS106-203



This tool system is used when 2 pneumatic channels are required. It consists of a swivel, adaptation kit, hose package, valve unit and cabling. The valve unit has one monostable 5/2 valve and the hose package contains 2 air hoses.

Robot model	Article number	Pneumatic diagram	Circuit diagram
ABB IRB 140	TS101-203	Pne0214-001 (section 2.4.17)	E0251-014 (section 2.4.9)
ABB IRB 1600 1,2/1,45	TS102-203	Pne0214-001 (section 2.4.17)	E0251-016 (section 2.4.10)
ABB IRB 1300	TS103-203	Pne0251-066 (section 2.4.18)	-
ABB IRB 2600 1.65/1.85	TS104-203	Pne0214-001 (section 2.4.17)	E0251-006 (section 2.4.11)
ABB IRB 4600 20/2.5	TS106-203	Pne0214-001 (section 2.4.17)	E0251-015 (section 2.4.11)

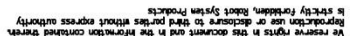
Components

Article number	Swivel (1)	Adapt-kit (2)	Hose p. (3)	Air hoses (4)	Upper cable	Valve unit (5)	Robot cable (6)	Air supply hose (7)
TS101-203	P0110A	P1147	P0030	P2050-28	-	P0012A	P0020	P2050-13
TS102-203	P0110A	P1147	P0034	P2050-24	-	P0012A	P0023	P2050-23
TS103-203	P0110A	P4213	P2178	P2050-32	-	-	-	-
TS104-203	P0110A	P0118	P0033	P2050-36	-	P0012A	P8119	P2050-13
TS106-203	P0110A	P0118	P2174	P2050-21	-	P0012A	P8119-8	P2050-9

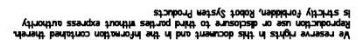


NOTE! The swivels are each delivered with two push-in couplings 3HXG111-3.

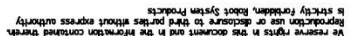
22



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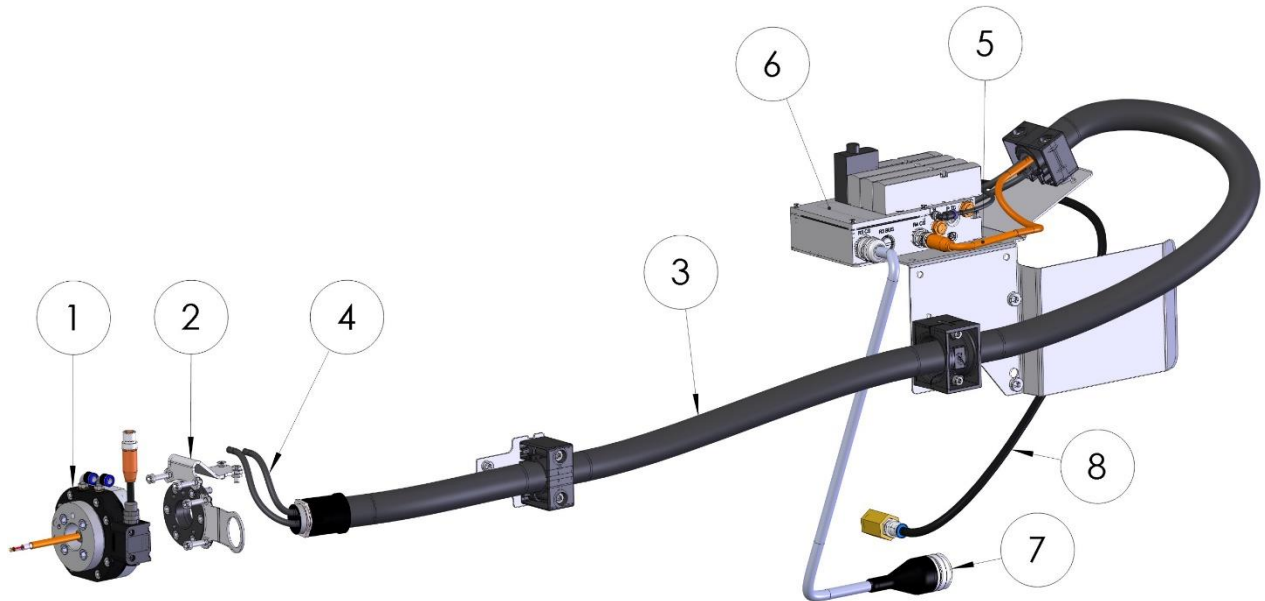


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2.4.12 Swivel with 2 air channels and 8 electric signals.

Articles: TS101-204, TS102-204, **TS103-204**, TS104-204, TS106-204



This tool system is used when 2 pneumatic channels and 8 electric signals are required. It consists of a swivel, adaptation kit, hose package, valve unit and cabling. The valve unit has one monostable 5/2 valve and the hose package contains 2 air hoses.

Robot model	Article number	Pneumatic diagram	Circuit diagram
ABB IRB 140	TS101-204	Pne0214-001 (section 2.4.17)	E0251-013 (section 2.4.13)
ABB IRB 1600 1,2/1,45	TS102-204	Pne0214-001 (section 2.4.17)	E0251-017 (section 2.4.14)
ABB IRB 1300	TS103-204	Pne0251-066 (section 2.4.18)	E0251-067 (section 2.4.15)
ABB IRB 2600 1.65/1.85	TS104-204	Pne0214-001 (section 2.4.17)	E0251-004 (section 2.4.16)
ABB IRB 4600 20/2.5	TS106-204	Pne0214-001 (section 2.4.17)	E0251-010 (section 2.4.16)

Components

Article number	Swivel (1)	Adapt. kit (2)	Hose p. (3)	Air hoses (4)	Upper cable (5)	Valve unit (6)	Robot cable (7)	Air supply hose (8)
TS101-204	P0111A	P1147	P0030	P2050-28	P0025	P0012A	P0020	P2050-13
TS102-204	P0111A	P1147	P0034	P2050-24	P0025	P0012A	P0023	P2050-23
TS103-204	P1158	P4213	P2178	P2050-32	-	-	-	-
TS104-204	P0111A	P0118	P0033	P2050-36	P0025	P0012A	P8119	P2050-13
TS106-204	P0111A	P0118	P2174	P2050-21	P0025-30	P0012A	P8119-8	P2050-9

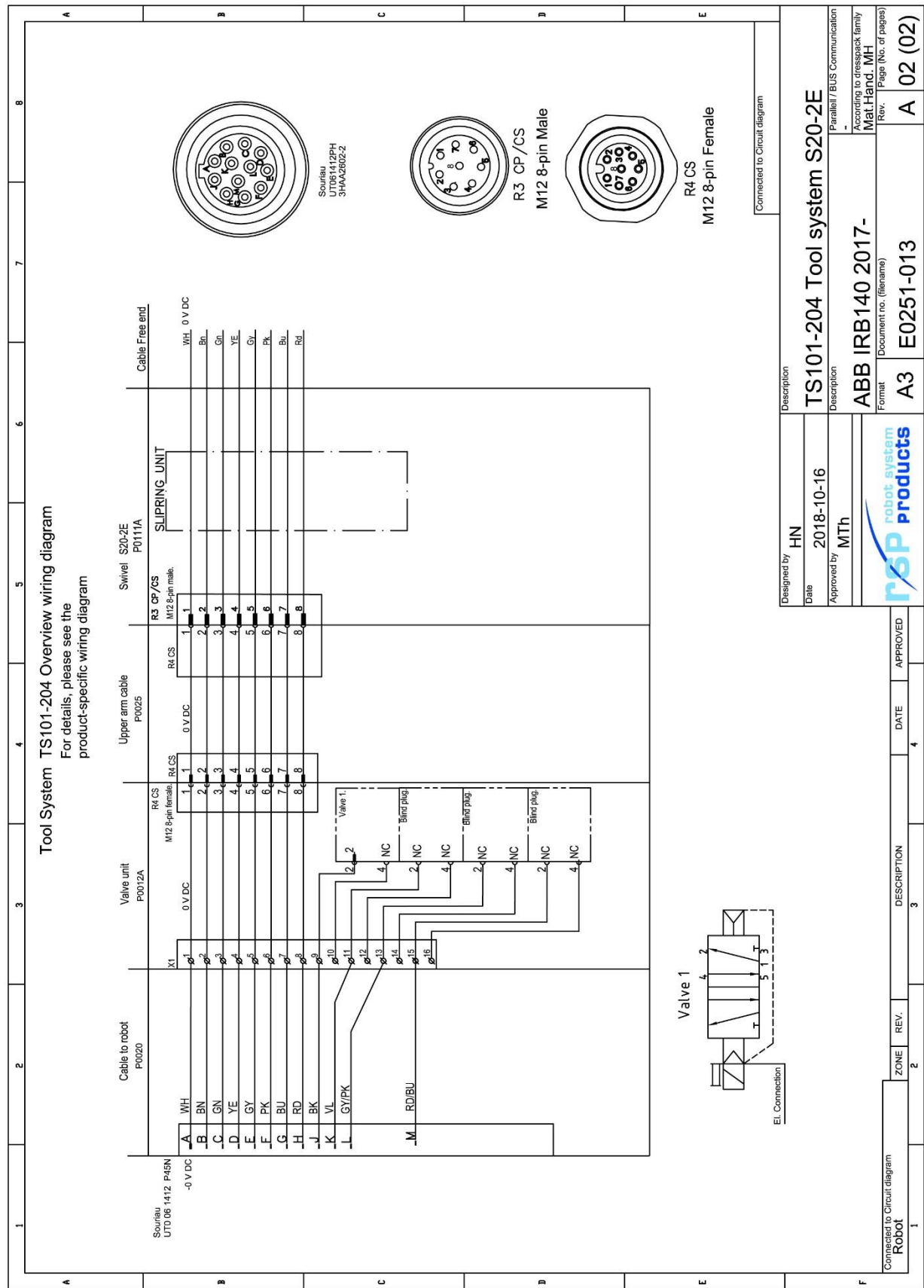


NOTE! Upper arm cable is part of the STC P1158.

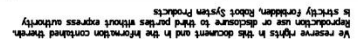


NOTE! The swivels are each delivered with two push-in couplings 3HXG111-3.

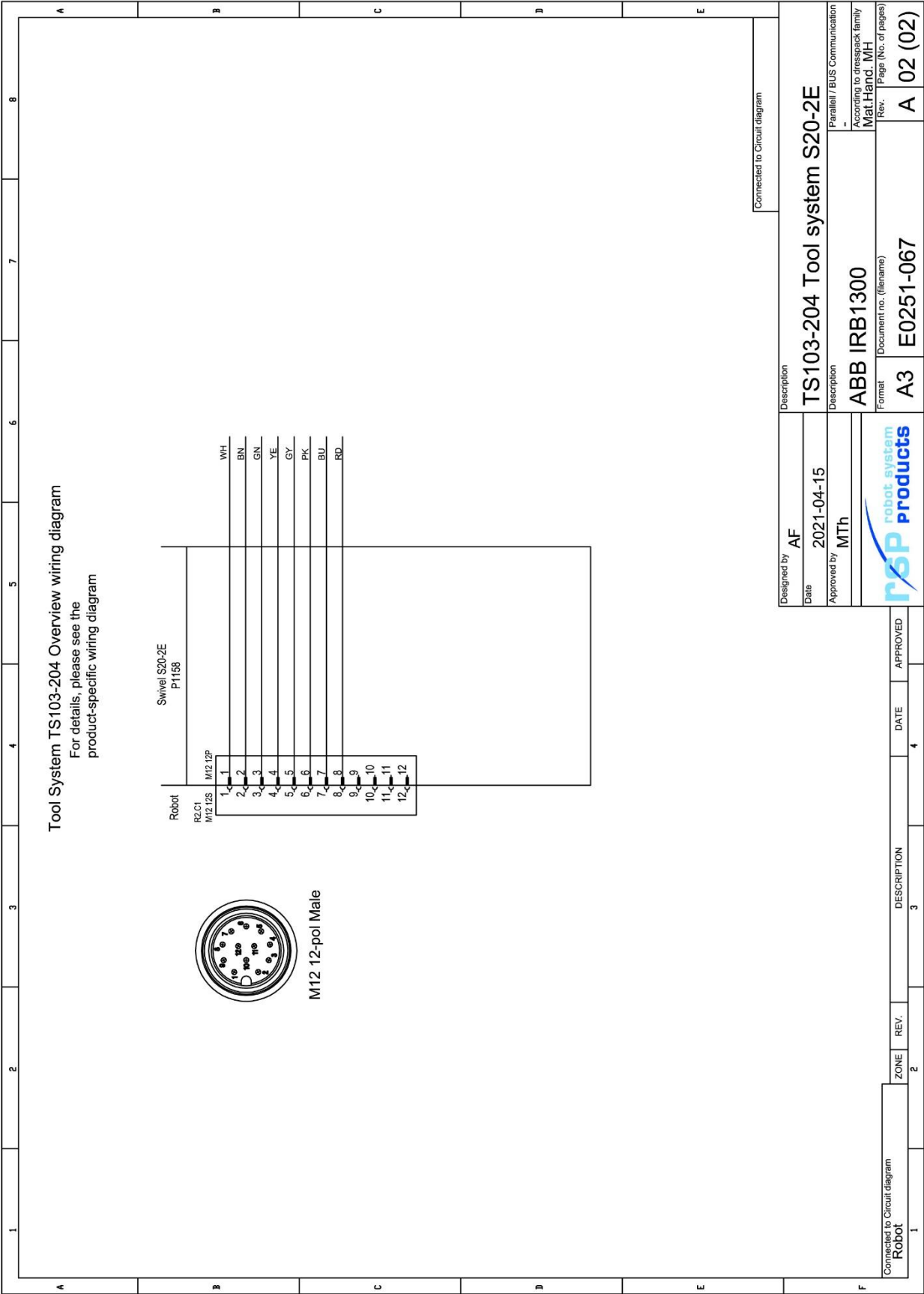
2.4.13 Circuit diagram E0251-013-2 for TS101-204



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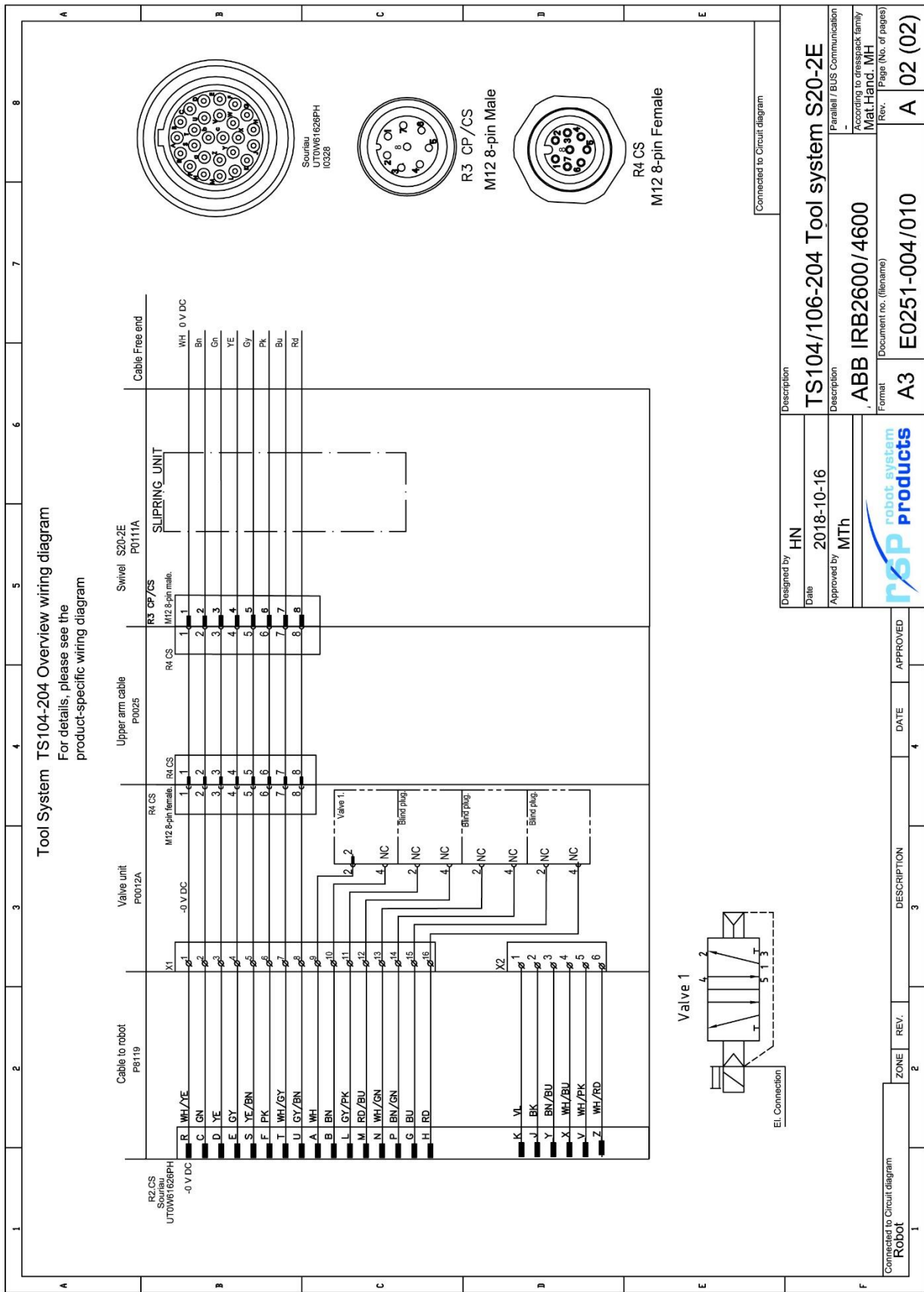


2.4.15 Circuit diagram E0251-067-2 for TS103-204

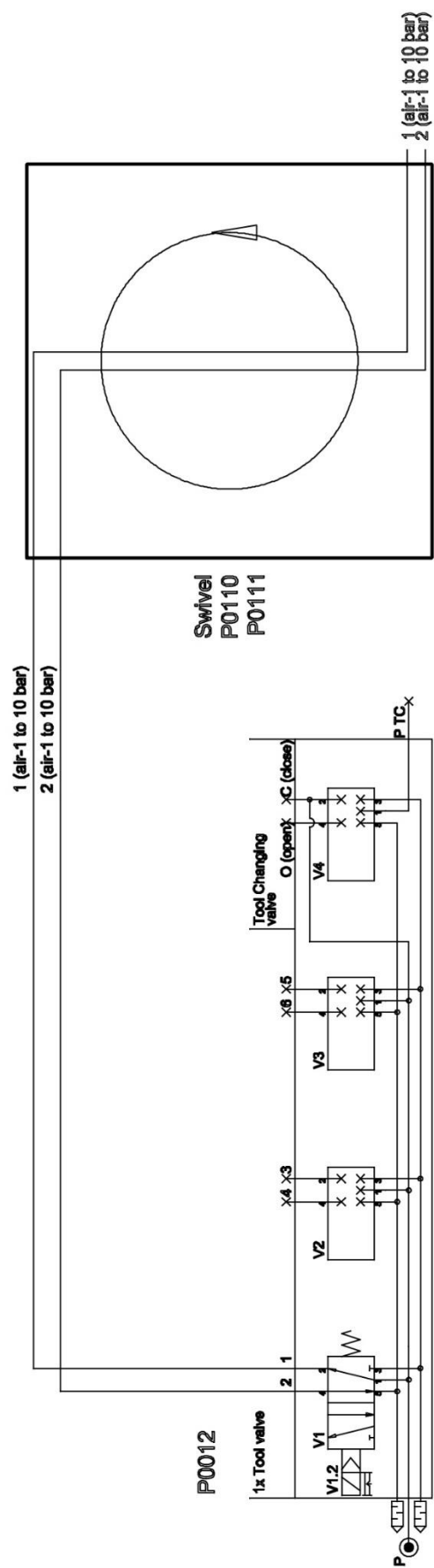


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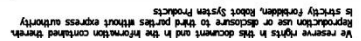
2.4.16 Circuit diagram E0251-004/010-2 for TS104-204 and TS106-204



2.4.17 Pneumatic diagram Pne0214-001 2 channels

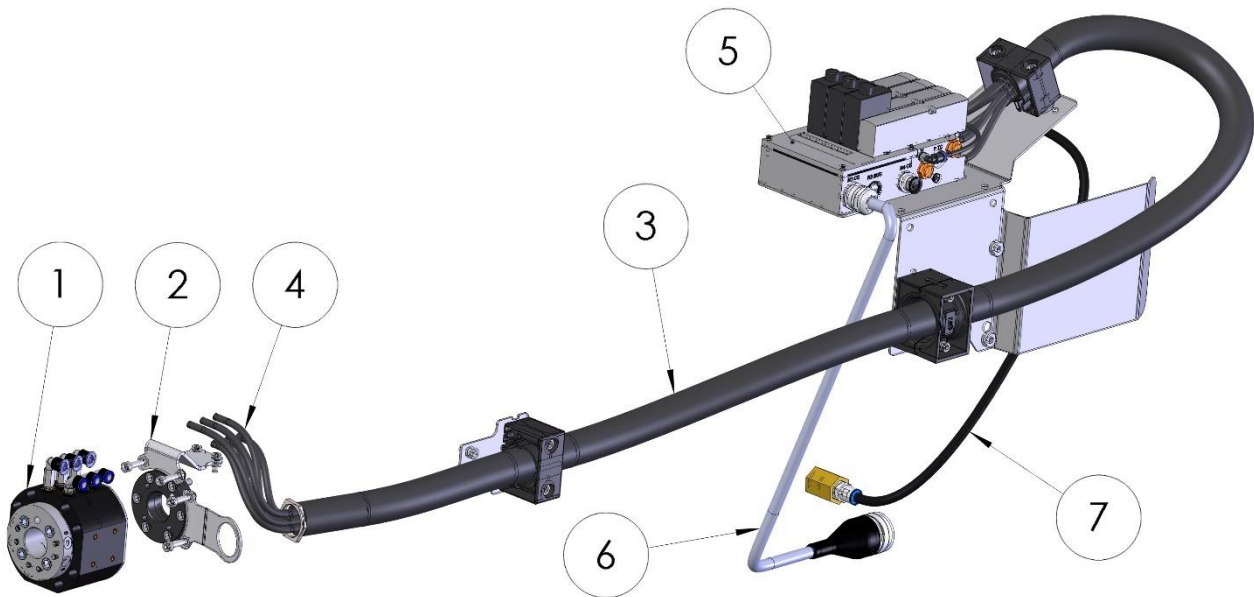


M0114-1 version 3.7



2.4.19 Swivel with 6 air channels.

Articles: TS103-205, TS104-205, TS106-205



This tool system is used when 6 pneumatic channels are required. It consists of a swivel, adaptation kit, hose package, valve unit and cabling. The valve unit has 3 monostable 5/2 valves and the hose package contains 6 air hoses.

Robot model	Article number	Pneumatic diagram	Circuit diagram
ABB IRB 1300 10/1,15 & 11/0,9	TS103-205	Pne0251-064 (section 2.4.24)	-
ABB IRB 2600 1.65/1.85	TS104-205	Pne0214-001 (section 2.4.25)	E0251-005 (section 2.4.20)
ABB IRB 4600 20/2.5	TS106-205	Pne0214-001 (section 2.4.25)	E0251-012 (section 2.4.20)

Components

Article number	Swivel (1)	Adapt-kit (2)	Hose p. (3)	Air hoses (4)	Upper cable	Valve unit (5)	Robot cable (6)	Air supply hose (7)
TS103-205	P0112A	P4213	P2178	P2050-32	-	-	-	-
TS104-205	P0112A	P0118	P0033	P2050-36	-	P0013A	P8119	P2050-13
TS106-205	P0112A	P0118	P2174	P2050-21	-	P0013A	P8119-8	P2050-9

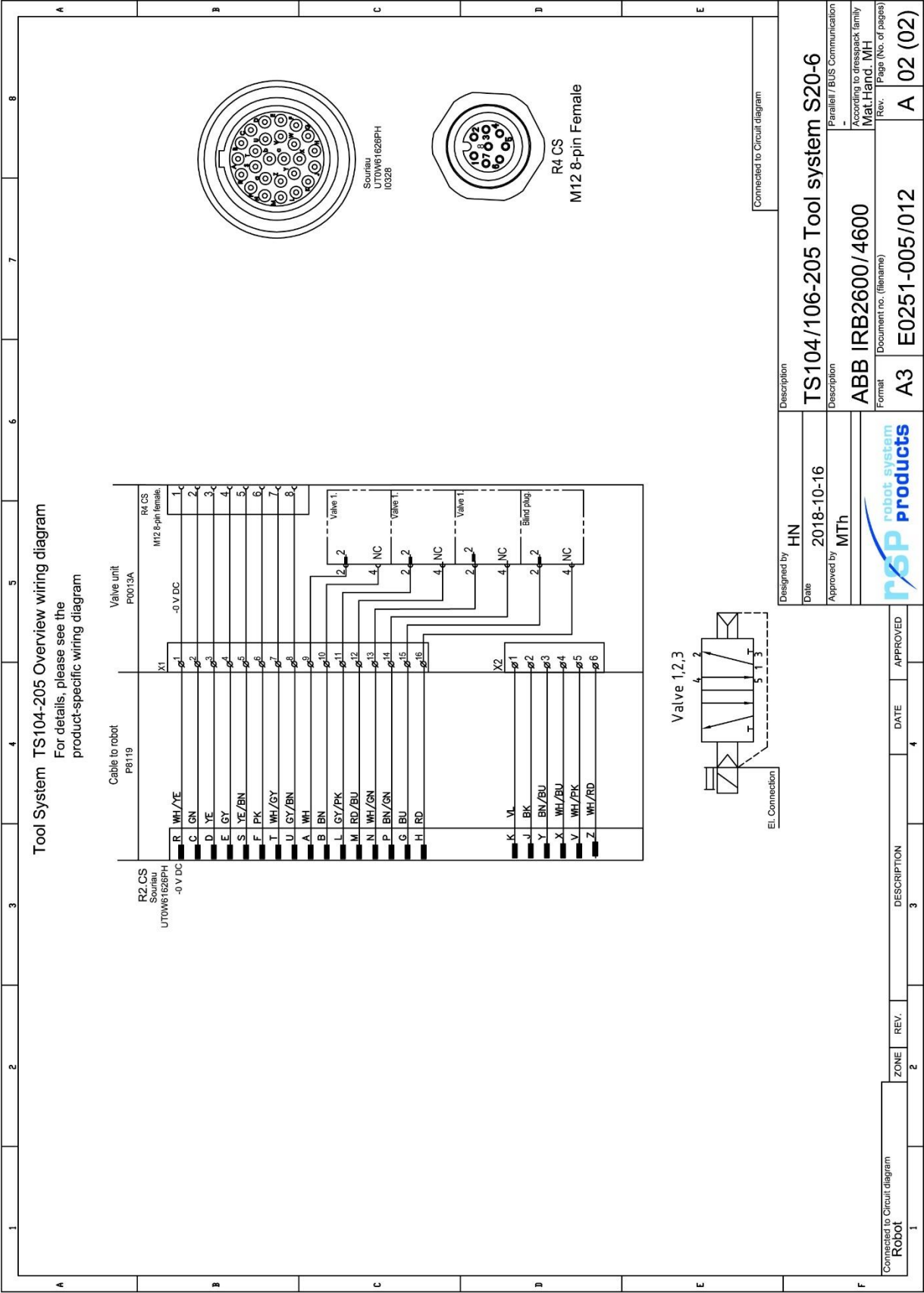


NOTE! TS103-205 has capabilities for 4 pneumatic channels.



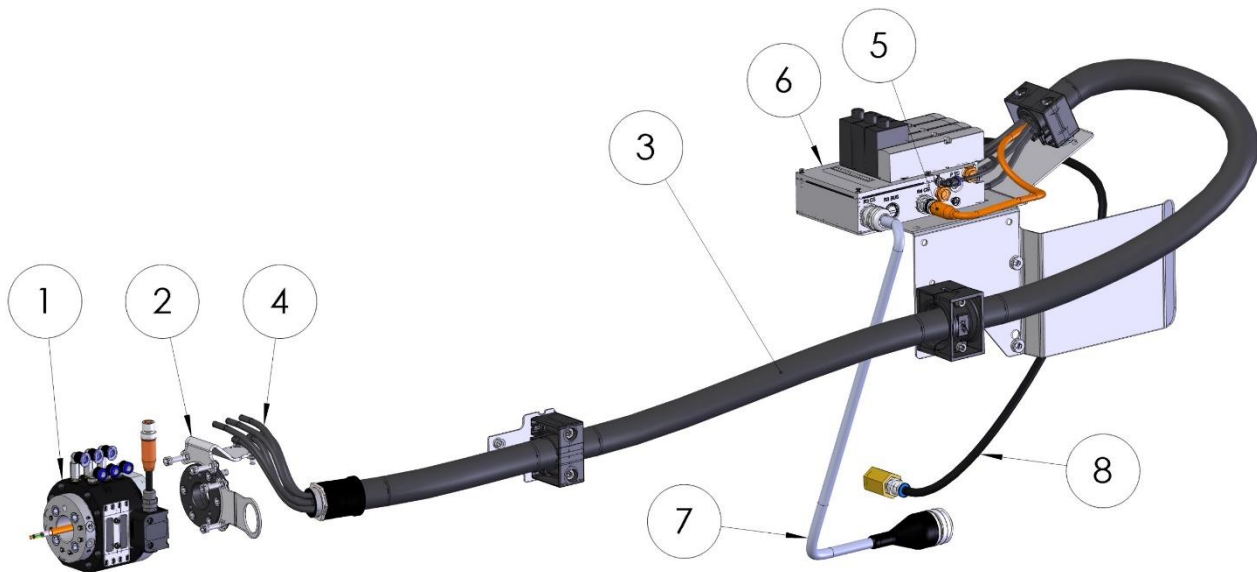
NOTE! The swivels are each delivered with three push-in couplings I0327 and three push-in couplings 3HXG111-3.

2.4.20 Circuit diagram E0251-005/012-2 for TS104-205 and TS106-205



2.4.21 Swivel with 6 air channels and 8 electric signals.

Articles: TS103-206, TS104-206, TS106-206



This tool system is used when 6 pneumatic channels and 8 electric signals are required. It consists of a swivel, adaptation kit, hose package, valve unit and cabling. The valve unit has 3 monostable 5/2 valves and the hose package contains 6 air hoses.

Robot model	Article number	Pneumatic diagram	Circuit diagram
ABB IRB 1300 10/1,15 & 11/0,9	TS103-206	Pne0251-064 (section 2.4.24)	E0251-065 (section 2.4.22)
ABB IRB 2600 1.65/1.85	TS104-206	Pne0214-001 (section 2.4.25)	E0251-003 (section 2.4.23)
ABB IRB 4600 20/2.5	TS106-206	Pne0214-001 (section 2.4.25)	E0251-011 (section 2.4.23)

Components

Article number	Swivel (1)	Adapt. kit (2)	Hose p. (3)	Air hoses (4)	Upper cable (5)	Valve unit (6)	Robot cable (7)	Air supply hose (8)
TS103-206	P1159	P4213	P2178	P2050-32	-	-	-	-
TS104-206	P0113A	P0118	P0033	P2050-36	P0025	P0013A	P8119	P2050-13
TS106-206	P0113A	P0118	P2174	P2050-21	P0025-30	P0013A	P8119-8	P2050-9

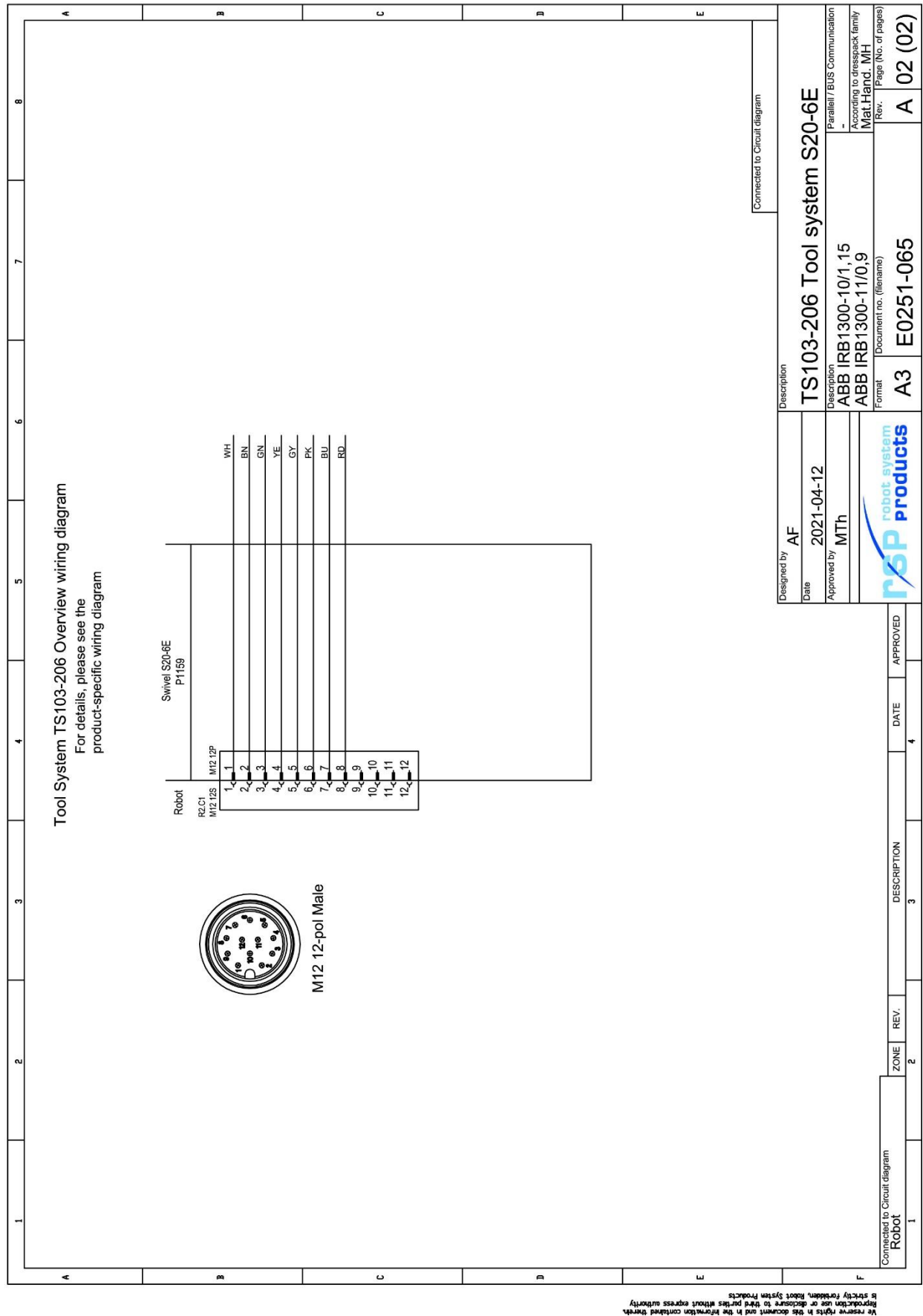


NOTE! TS103-206 has capabilities for 4 pneumatic channels. Upper arm cable is part of the STC P1159.

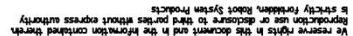


NOTE! The swivels are each delivered with three push-in couplings I0327 and three push-in couplings 3HXG111-3.

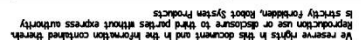
2.4.22 Circuit diagram E0251-065 for TS103-206



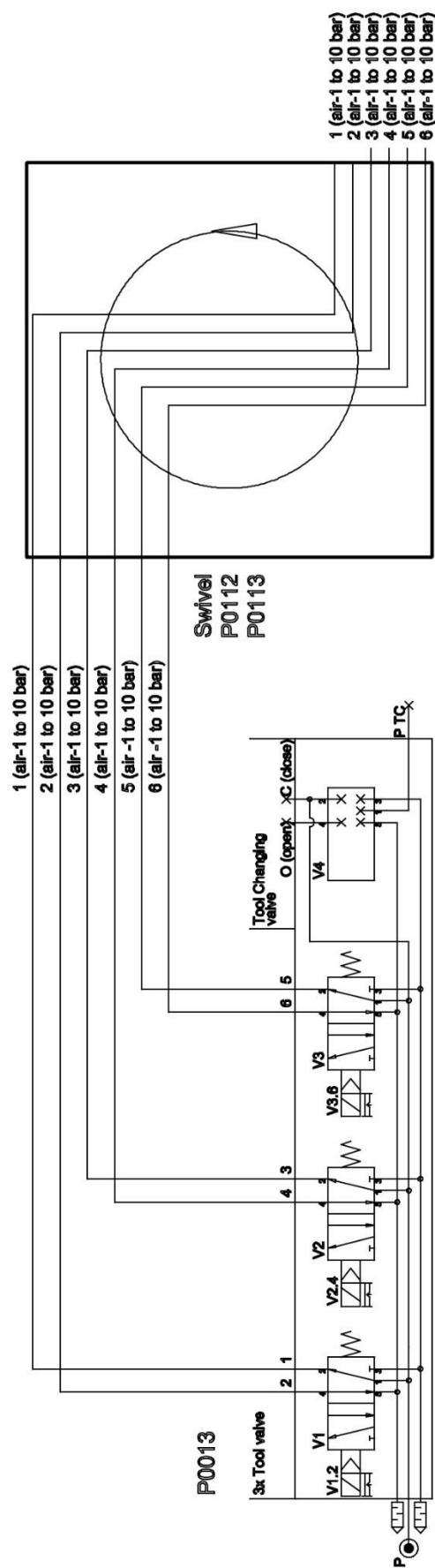
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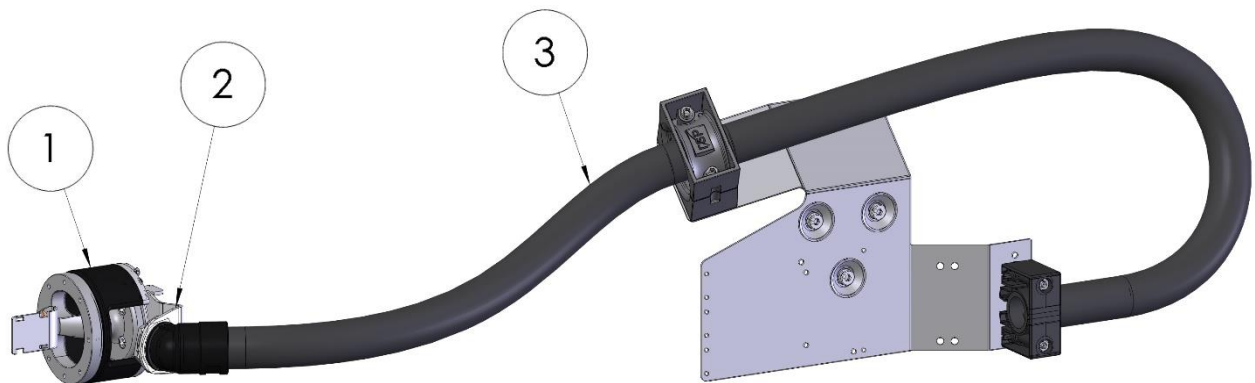


2.4.25 Pneumatic diagram Pne0214-001 6 channels



2.5 CiRo based tool system configurations

2.5.1 CiRo Basic. Articles: TS101-210, TS102-210, TS104-210, TS106-210



This tool system is used when valve units, connections, cabling and hoses are separately supplied and consists of CiRo, adaptation kit and hose package.

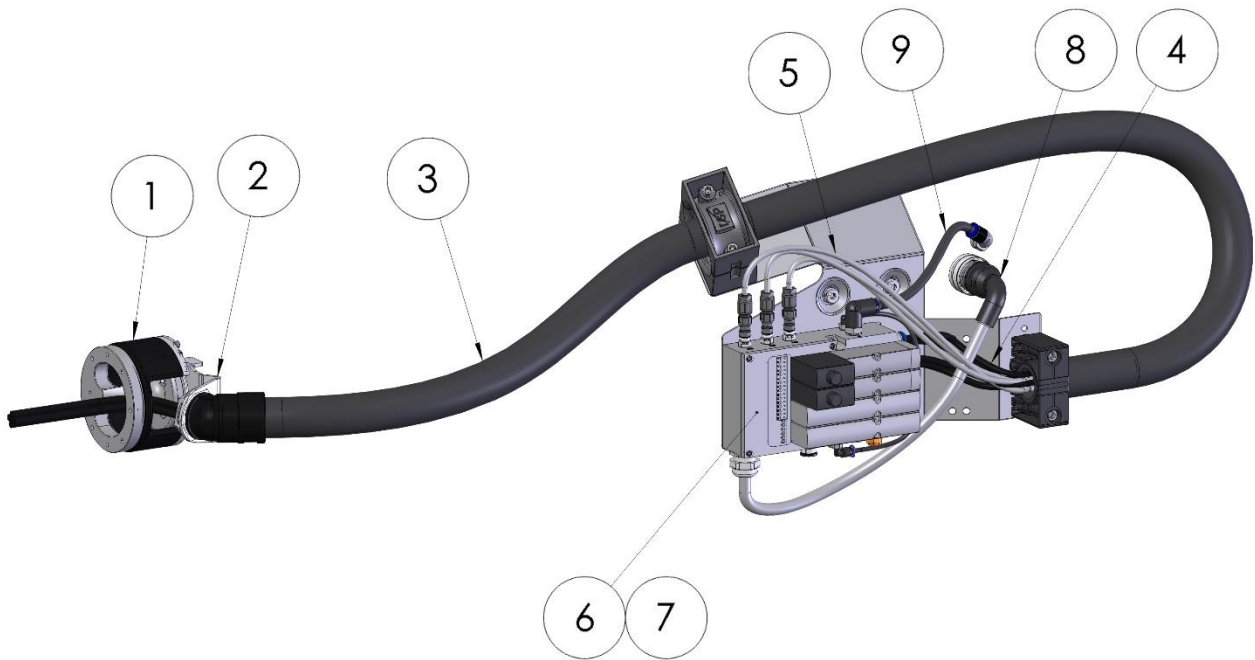
Robot model	Article number	Pneumatic diagram	Circuit diagram
ABB IRB 140	TS101-210	-	-
ABB IRB 1600 1,2/1,45	TS102-210	-	-
ABB IRB 1300	TS103-210	-	-
ABB IRB 2600 1.65/1.85	TS104-210	-	-
ABB IRB 4600 20/2.50	TS106-210	-	-

Components

Article number	CiRo (1)	Adaptation kit (2)	Hose package (3)
TS101-210	P5132	P5302	P2161
TS102-210	P5132	P5302	P2162
TS103-210	P5132	P5321	P2176
TS104-210	P5131	P5301	P2160-2
TS106-210	P5131	P5301	P2172

2.5.2 CiRo with 4 air channels and 8 electric signals.

Articles: TS102-211, TS104-211, TS106-211



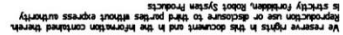
This tool system is used when 4 pneumatic channels and 8 electric signals are required. It consists of a CiRo, adaptation kit, hose package, valve units, connectors, cabling and hoses. The valve unit has 2 monostable 5/2 valves.

Robot model	Article	Pneumatic diagram	Circuit diagram
ABB IRB 1600 1,2/1,45	TS102-211	Pne0251-020 (section 2.5.5)	E0251-020 (section 2.5.3)
ABB IRB 2600 1.65/1.85	TS104-211	Pne0251-020 (section 2.5.5)	E0251-021 (section 2.5.4)
ABB IRB 4600 20/2.50	TS106-211	Pne0251-020 (section 2.5.5)	E0251-021 (section 2.5.4)

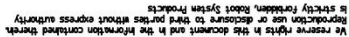
Components

Article number	CiRo (1)	Adapt. kit (2)	Hose p. (3)	Air hoses (4)	Upper cable (5)	Valve (6)	Interf. (7)	Cable (8)	Air suppl. (9)
TS102-211	P5132	P5302	P2162	P2050-17	P8434-30	P1006	P1018	P0023	P2050-4
TS104-211	P5131	P5301	P2160-2	P2050-12	P8434-35	P1006	P1018	P8119-8	P2050-13
TS106-211	P5131	P5301	P2172	P2050-15	P8434-45	P1006	P1018	P8119-8	P2050-9

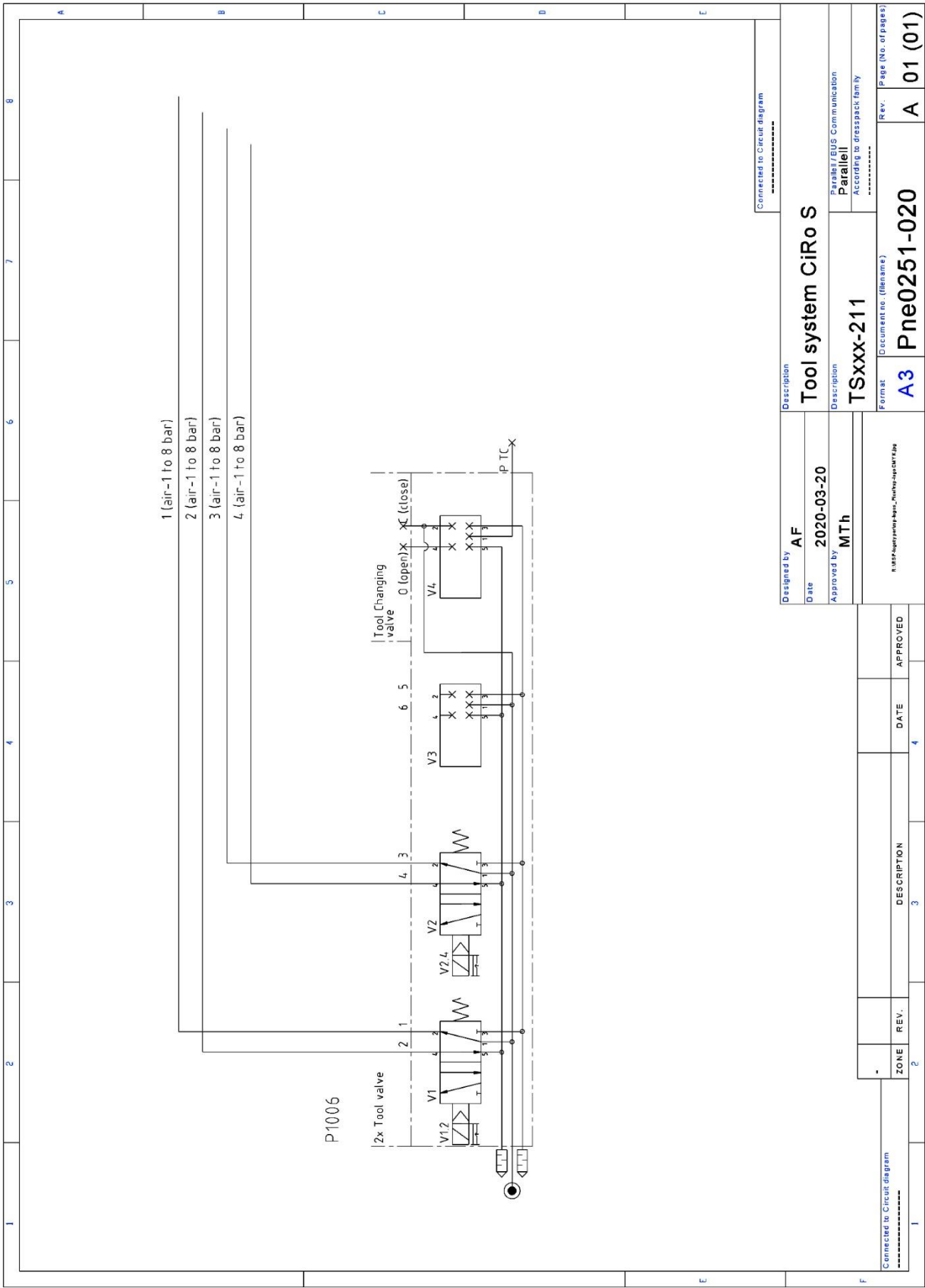
M0114-1 version 3.7



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2.5.5 Pneumatic diagram (Pne0251-020) for tool system with CiRo S

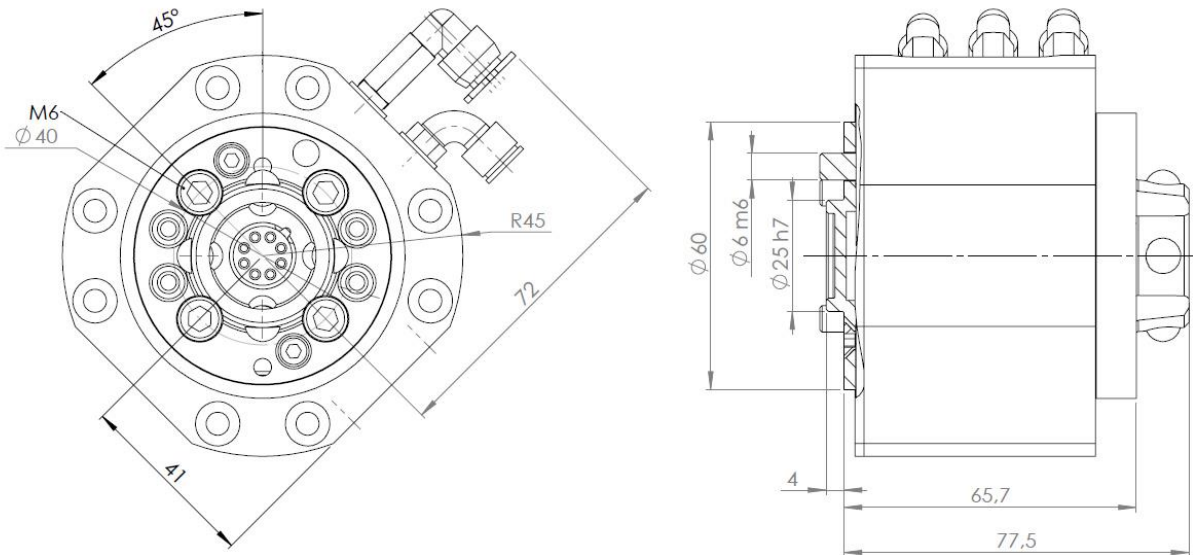


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3. SPECIFICATIONS OF PARTS AND OPTIONS

3.1 Swivel tool changers and tool attachments

3.1.1 Swivel tool changer STC20-4. Article: P0106A

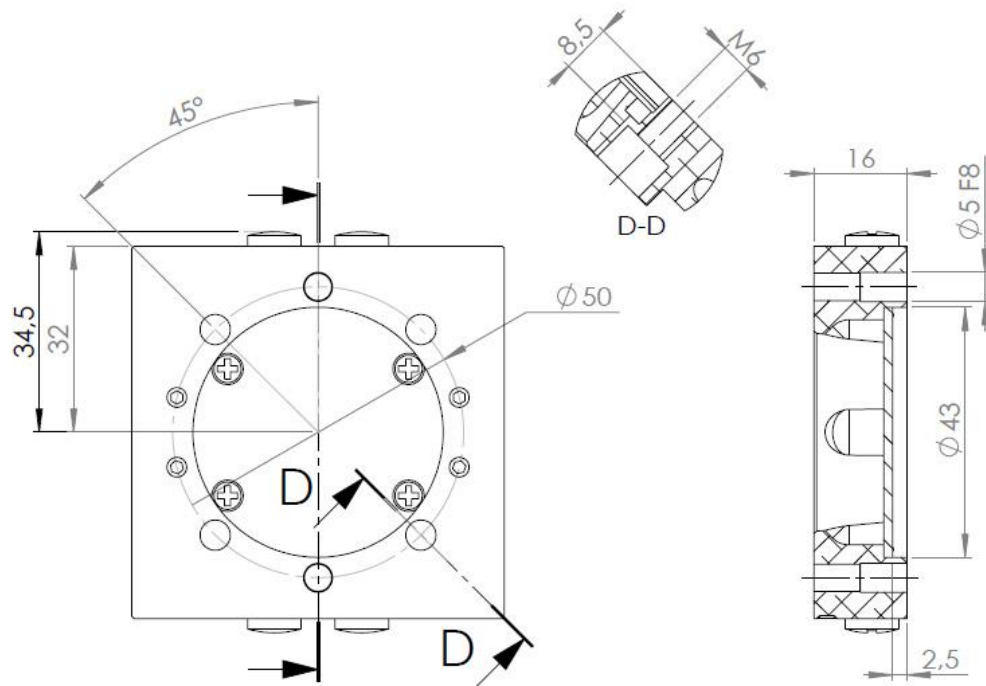


Swivel tool changer STC20-4 transfers 4 pneumatic channels to the tool attachment. To be used together with tool attachments P0102 and P0123.

Technical data

Working temperature		+10°C--+50°C
Bolt pattern		ISO 9409-1-40-4-M6
Maximum tool load	Fz (static)	± 200 N
	Mx/My (dynamic)	± 100 Nm
	Mz (dynamic)	± 100 Nm
Weight and centre of gravity (Z)		
P0106A		0.8 kg / 39 mm
P0106A+P0102		0.9 kg / 44 mm
P0106A+ P0123		1.1 kg / 48 mm
Air channels	User channels, robot side	4 x M5 (150 l/min, max 10 bar)
	Dedicated channels	Open TC marked 6, Close TC marked 5 (6-10 bar)
	Air quality	Oil-clean and waterless filtered air, with max 25µm particle content

3.1.2 Tool attachment TA20-4. Article: P0102



Tool attachment TA20-4 transfers 4 pneumatic channels to the tool.

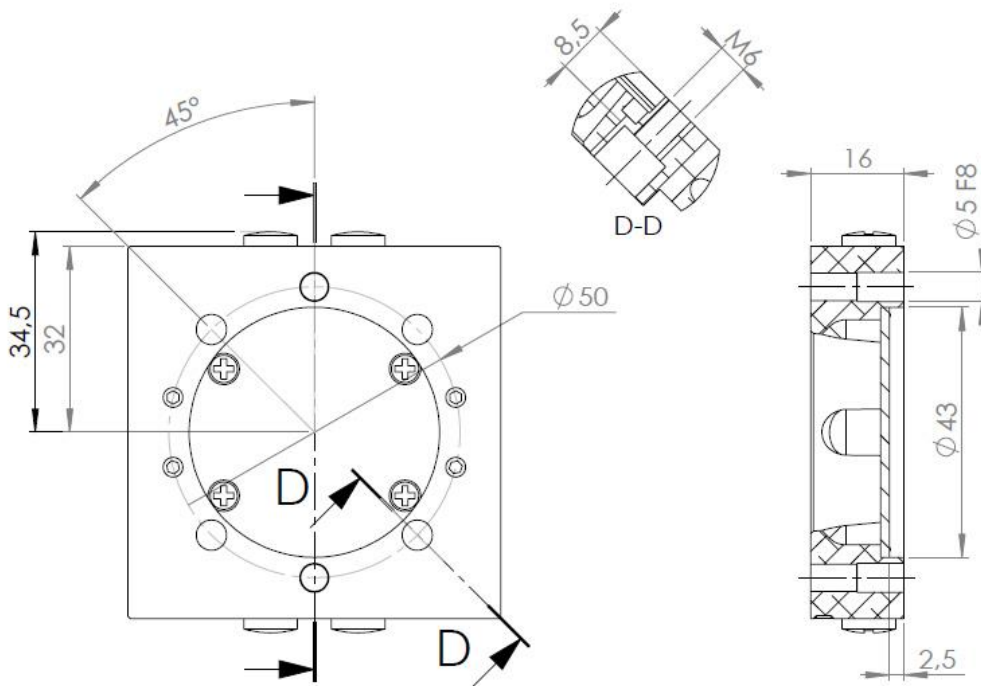
Technical data

Working temperature		+10°C–+50°C
Bolt pattern		ISO 9409-1-50-4-M6
Weight		0.1 kg
Maximum tool load (M6-screws)	Fz (static)	±200 N
	Mx/My (dynamic)	±100 Nm
	Mz (dynamic)	±100 Nm
Maximum tool load (M5-screws)	Fz (static)	±200 N
	Mx/My (dynamic)	±100 Nm
	Mz (dynamic)	±75 Nm
Air channels	Number of air ducts	4
	Connections, tool side	M5



Note! Tools can be mounted to the tool attachment using four M6-screws, alternatively the tool attachment can be mounted to the tool using four M5-screws.

3.1.3 Tool attachment TA20-4 steel. Article: P0123



Tool attachment TA20-4 transfers 4 pneumatic channels to the tool.

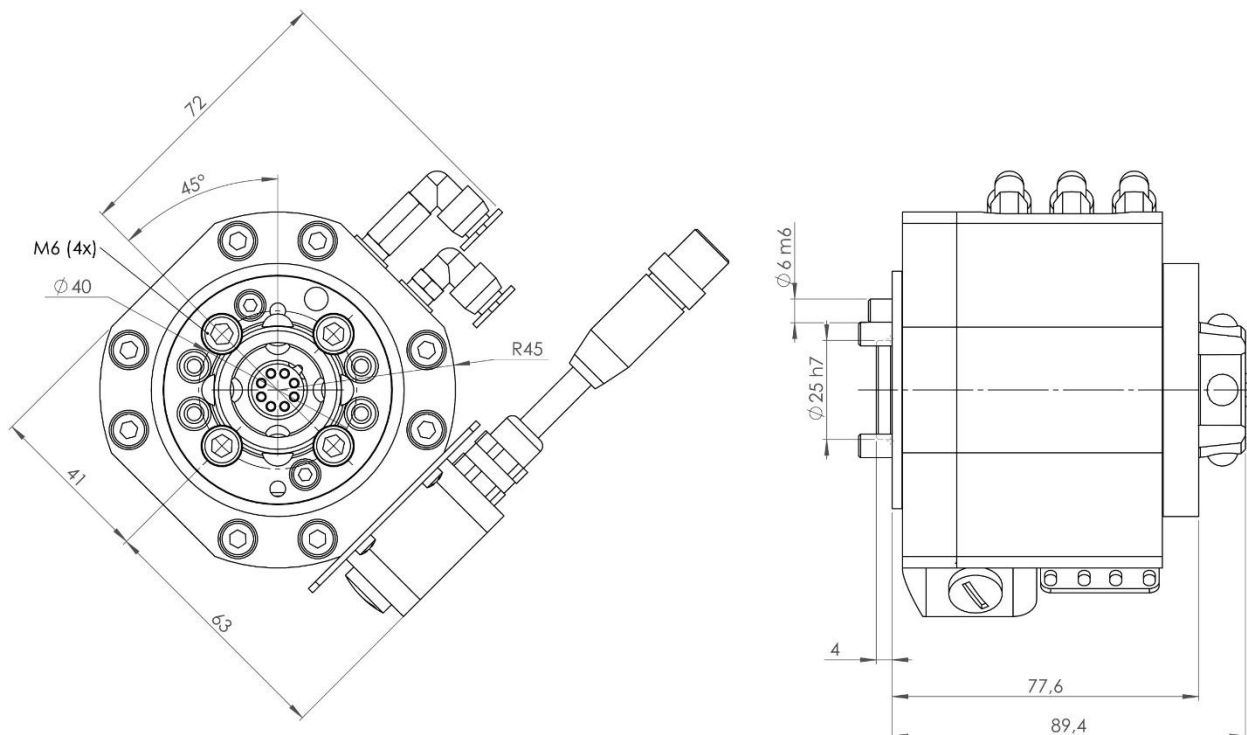
Technical data

Working temperature		+10°C–+50°C
Bolt pattern		ISO 9409-1-50-4-M6
Weight		0.3 kg
Maximum tool load (M6-screws)	Fz (static)	±200 N
	Mx/My (dynamic)	±200 Nm
	Mz (dynamic)	±100 Nm
Maximum tool load (M5-screws)	Fz (static)	±200 N
	Mx/My (dynamic)	±200 Nm
	Mz (dynamic)	±75 Nm
Air channels	Number of air ducts	4
	Connections, tool side	M5



Note! Tools can be mounted to the tool attachment using four M6-screws, alternatively the tool attachment can be mounted to the tool using four M5-screws.

3.1.4 Swivel tool changer STC20-4E. Articles: P0108A and P1157

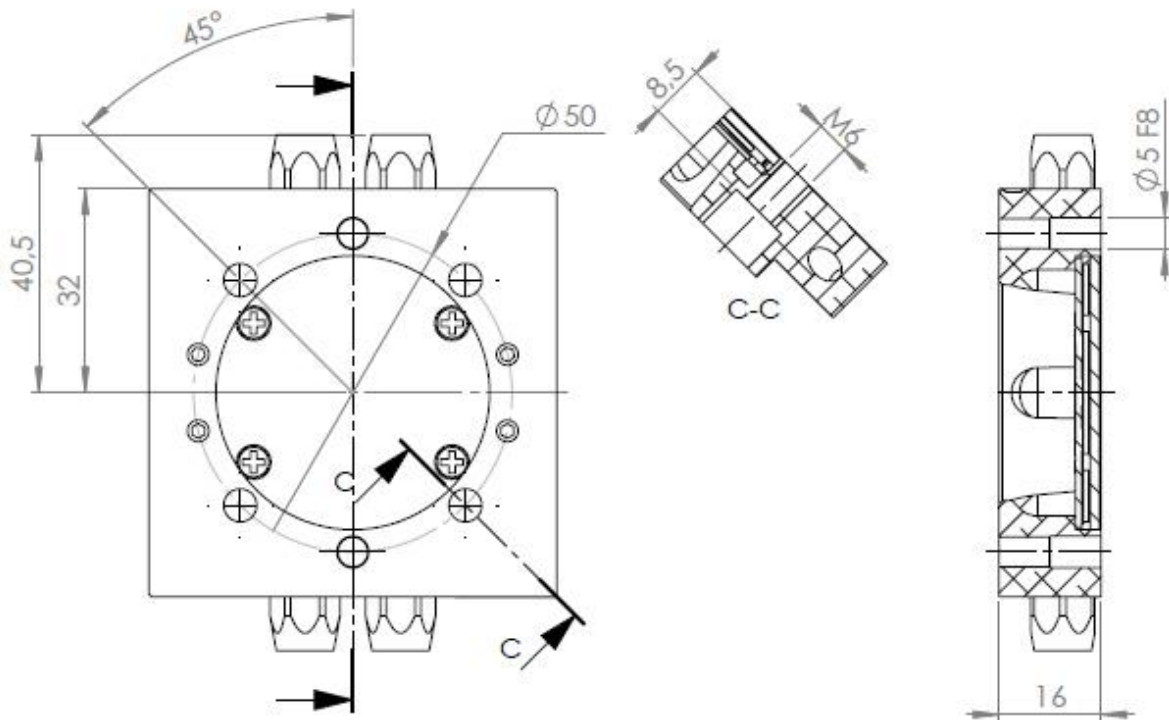


Swivel tool changer STC20-4E transfers 4 pneumatic channels and 8 electrical signals to the tool attachment. To be used together with tool attachments P0109 and P0125.

Technical data

Working temperature		+10°C–+50°C
Bolt pattern		ISO 9409-1-40-4-M6
Maximum tool load	Fz (static)	± 200 N
	Mx/My (dynamic)	± 100 Nm
	Mz (dynamic)	± 100 Nm
Weight and centre of gravity (Z)		
P0108A/P1157		1.1 kg / 42 mm
P0108A/P1157+ P0109		1.2 kg / 46 mm
P0108A/P1157+ P0125		1.4 kg / 52 mm
Air channels	User channels, robot side	4 x M5 (150 l/min, max 10 bar)
	Dedicated channels, M5	Open TC marked 6, Close TC marked 5 (6-10 bar)
	Air quality	Oil-clean and waterless filtered air, with max 25µm particle content
Electrical signals P0108A	Circuit diagram	E0208-001 (section 3.1.7)
	Total signals	8 x (0.5 A, 30V)
	Dedicated signals	24V, 0V, TC Coupled
	Connection, robot side	M12 8P
Electrical signals P1157 (M12 12P)	Circuit diagram	E0208-073 (section 3.1.8)
	Total signals	8 x (0.5 A, 30V)
	Dedicated signals	24V, 0V, TC Coupled
	Connection, robot side	M12 12P

3.1.5 Tool attachment TA20-4E. Article: P0109



Tool attachment TA20-4E transfers 4 pneumatic channels and 12 electrical signals to the tool.

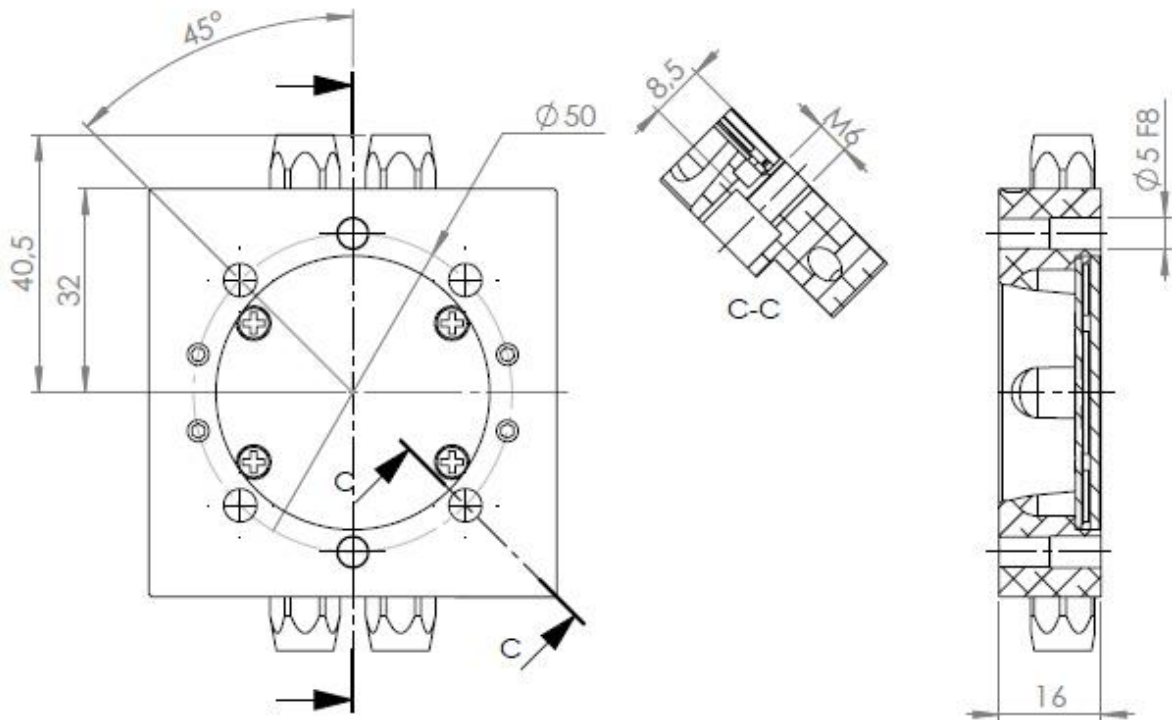
Technical data

Working temperature		+10°C–+50°C
Bolt pattern		ISO 9409-1-50-4-M6
Weight		0.1 kg
Maximum tool load (M6-screws)	Fz (static)	±200 N
	Mx/My (dynamic)	±100 Nm
	Mz (dynamic)	±100 Nm
Maximum tool load (M5-screws)	Fz (static)	±200 N
	Mx/My (dynamic)	±100 Nm
	Mz (dynamic)	±75 Nm
Air channels	Number of air ducts	4
	Connections, tool side	M5
Electrical signals	Circuit diagram	E0208-001 (section 3.1.7)
	Connections	4 x M8 3S



Note! Tools can be mounted to the tool attachment using four M6-screws, alternatively the tool attachment can be mounted to the tool using four M5-screws.

3.1.6 Tool attachment TA20-4E steel. Article: P0125



Tool attachment TA20-4E transfers 4 pneumatic channels and 12 electrical signals to the tool.

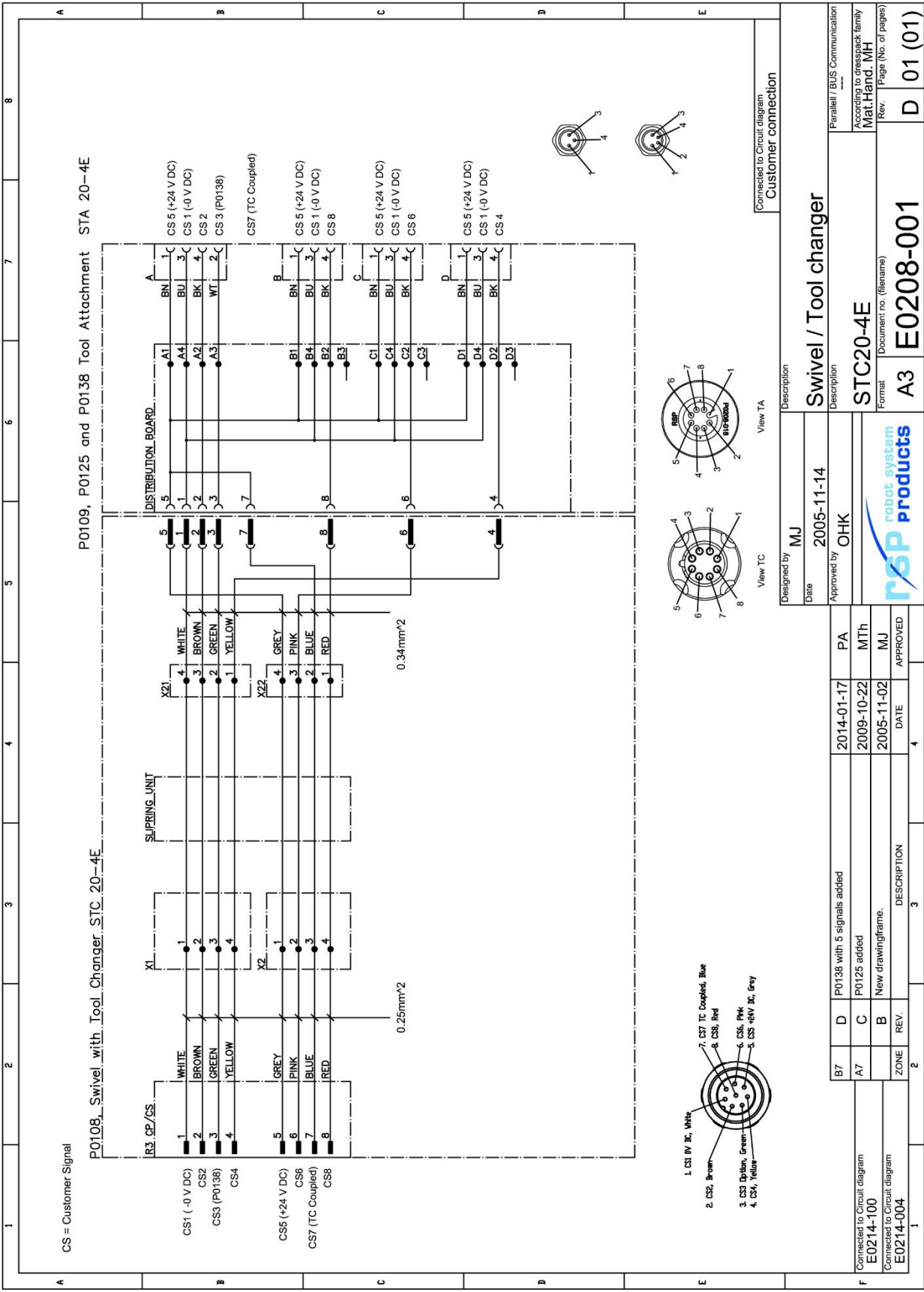
Technical data

Working temperature		+10°C–+50°C
Bolt pattern		ISO 9409-1-50-4-M6
Weight		0.3 kg
Maximum tool load (M6-screws)	Fz (static)	±200 N
	Mx/My (dynamic)	±100 Nm
	Mz (dynamic)	±100 Nm
Maximum tool load (M5-screws)	Fz (static)	±200 N
	Mx/My (dynamic)	±100 Nm
	Mz (dynamic)	±75 Nm
Air channels	Number of air ducts	4
	Connections, tool side	M5
Electrical signals	Circuit diagram	E0208-001 (section 3.1.7)
	Connections	4 x M8 3S

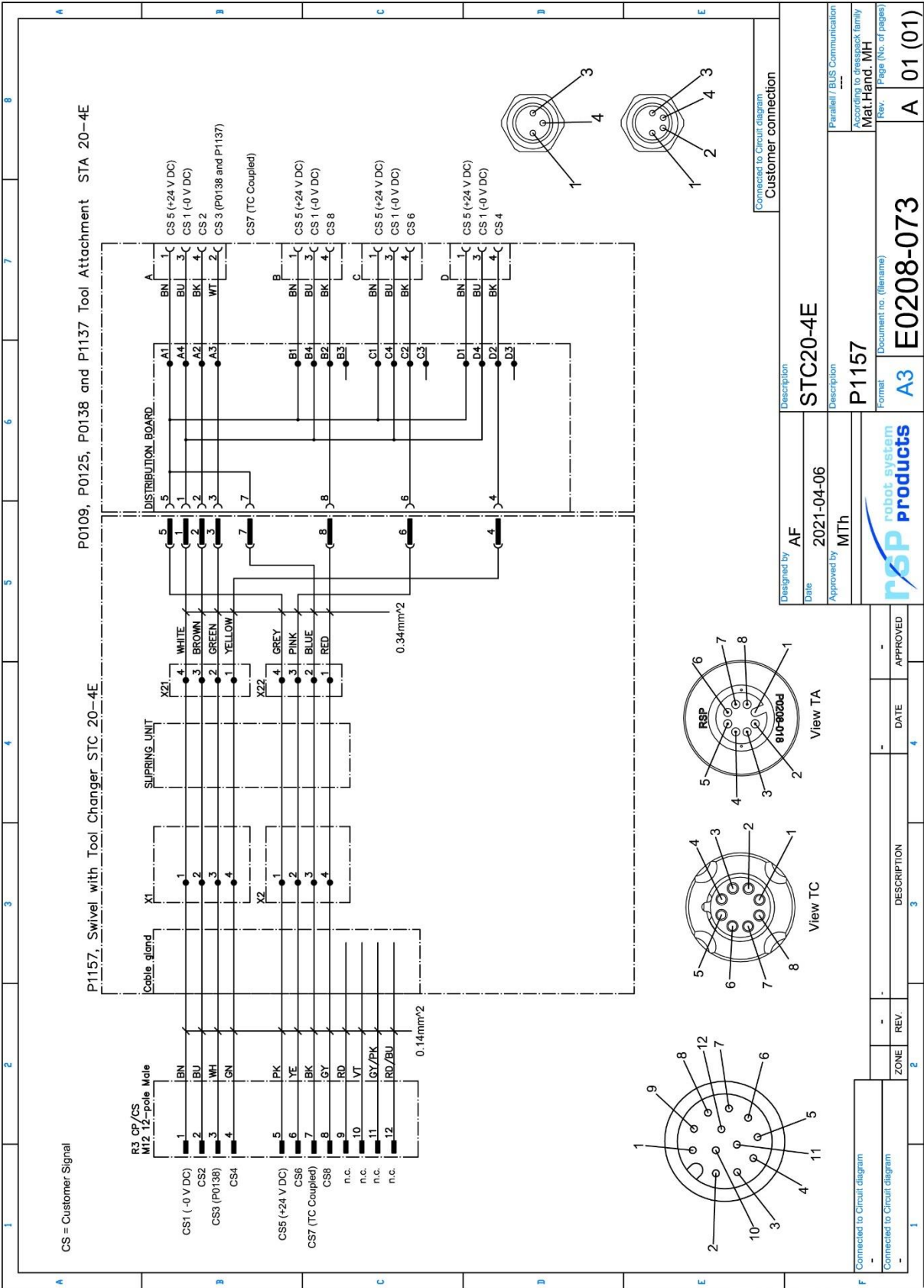


Note! Tools can be mounted to the tool attachment using four M6-screws, alternatively the tool attachment can be mounted to the tool using four M5-screws.

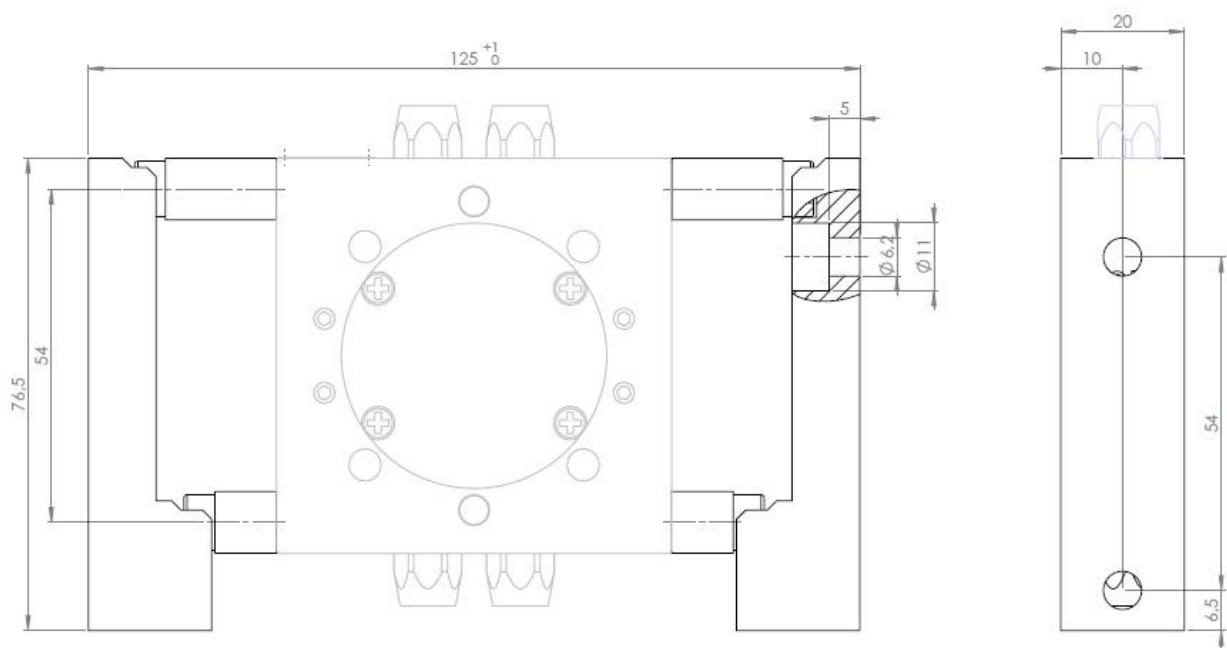
3.1.7 Circuit diagram E0208-001 for P0108A with P0109/P0125



3.1.8 Circuit diagram E0208-073 for P1157 with P0109/P0125



3.1.9 Option tool stand kit 20. Article: P0142



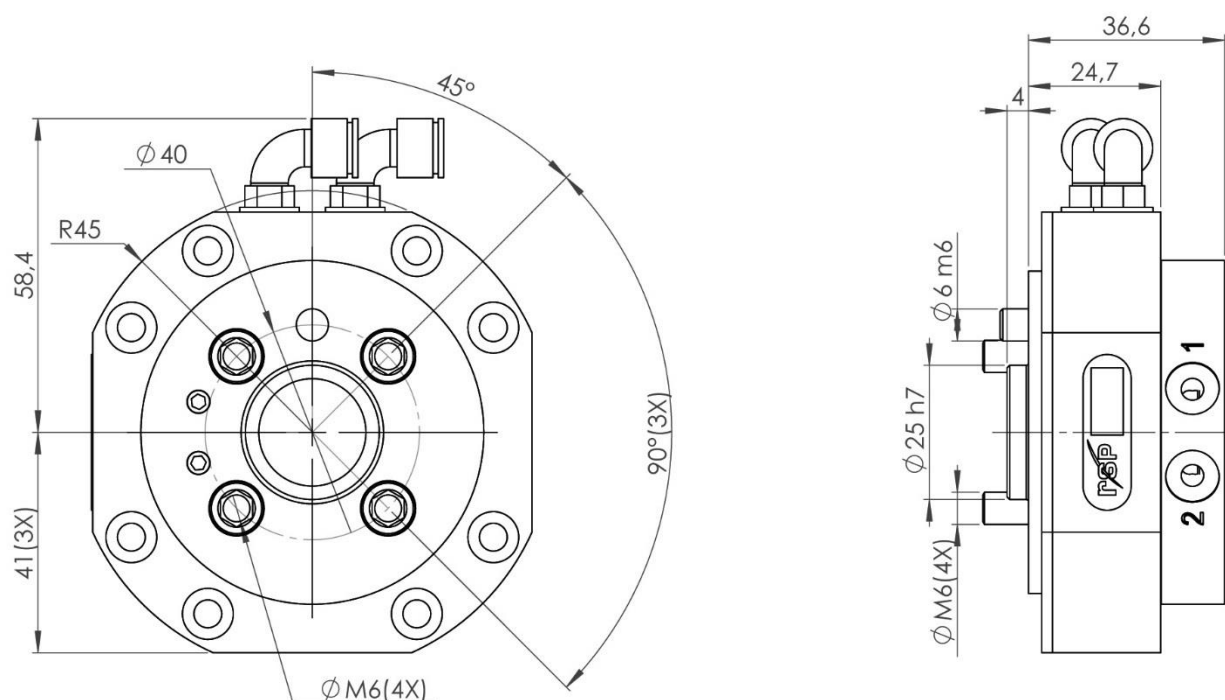
This parking bracket kit, mounted on the tool stand, gives together with tool attachments P0109 or P0125 a stable tool stand for easy tool changing.

Technical data

Weight	0.3 kg
Maximum load	20 kg

3.2 Swivels

3.2.1 Swivel S20-2. Article: P0110A

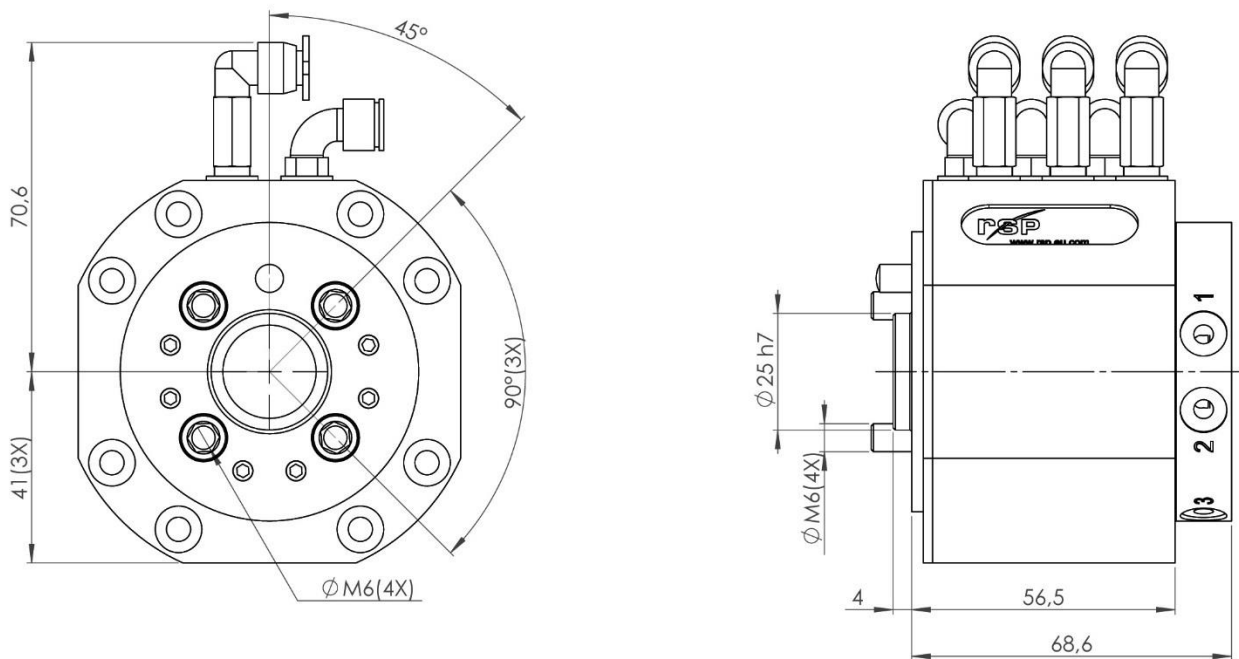


Swivel S20-2 transfers 2 pneumatic channels to the tool.

Technical data

Working temperature		+10°C–+50°C
Bolt pattern		ISO 9409-1-40-4-M6
Maximum tool load	Fz (static)	± 200 N
	Mx/My (dynamic)	± 100 Nm
	Mz (dynamic)	± 100 Nm
Weight and centre of gravity (Z)		0.35 kg / 17 mm
Air channels	Connections, robot side	2 x M5 (150 l/min, max 10 bar)
	Connections, tool side	2 x M5
	Air quality	Oil-clean and waterless filtered air, with max 25µm particle content

3.2.2 Swivel S20-6. Article: P0112A

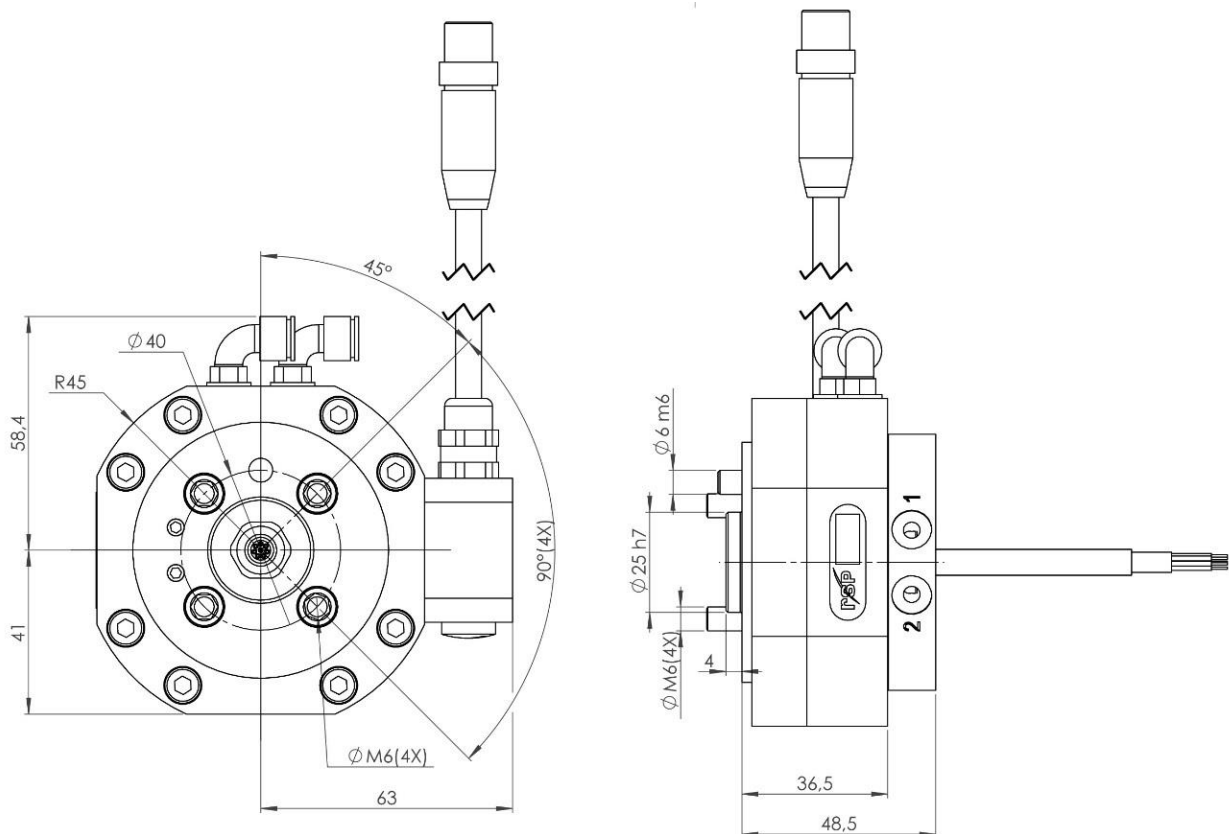


Swivel S20-6 transfers 6 pneumatic channels to the tool.

Technical data

Working temperature		+10°C–+50°C
Bolt pattern		ISO 9409-1-40-4-M6
Maximum tool load	Fz (static)	± 200 N
	Mx/My (dynamic)	± 100 Nm
	Mz (dynamic)	± 100 Nm
Weight and centre of gravity (Z)		0.65 kg / 33 mm
Air channels	Connections, robot side	6 x M5 (150 l/min, max 10 bar)
	Connections, tool side	6 x M5
	Air quality	Oil-clean and waterless filtered air, with max 25µm particle content

3.2.3 Swivel S20-2E. Articles: P0111A and P1158

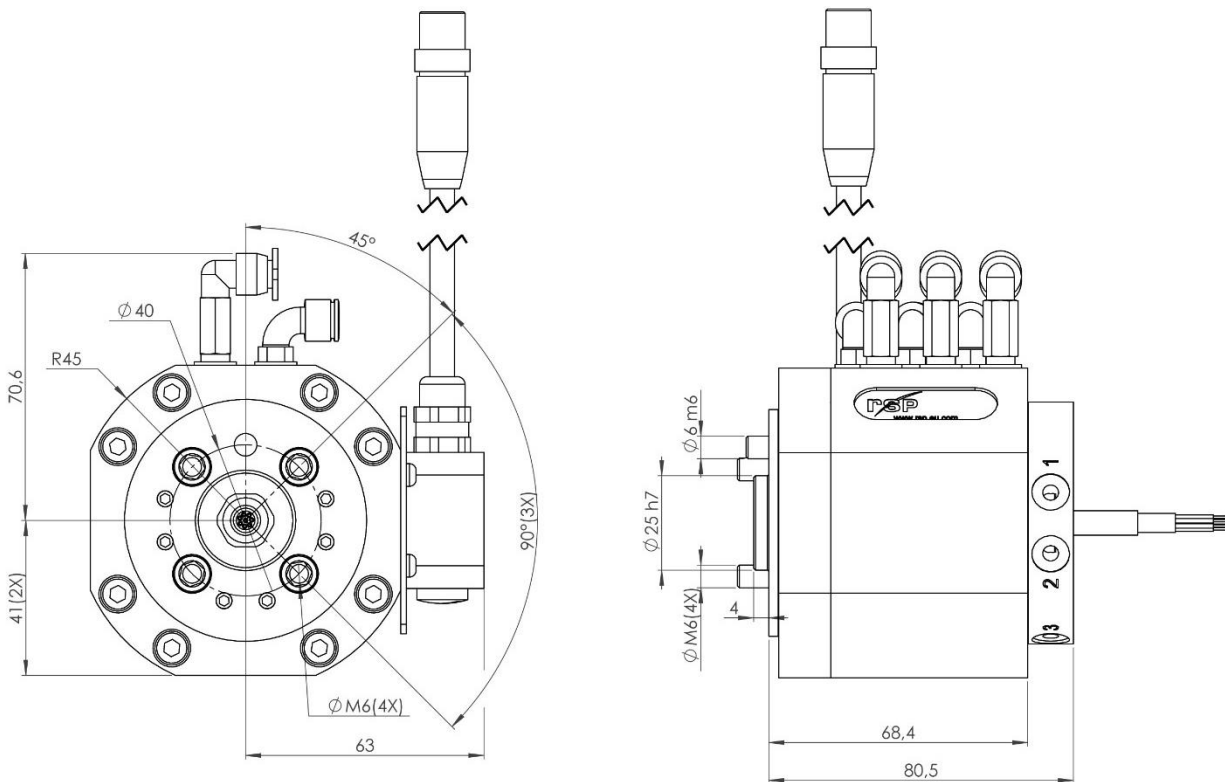


Swivel S20-2E transfers 2 pneumatic channels and 8 electrical signals to the tool.

Technical data

Working temperature		+10°C--+50°C
Bolt pattern		ISO 9409-1-40-4-M6
Maximum tool load	Fz (static)	± 200 N
	Mx/My (dynamic)	± 100 Nm
	Mz (dynamic)	± 100 Nm
Weight and centre of gravity (Z)		0,6 kg / 22 mm
Air channels	Connections, robot side	2 x M5 (150 l/min, max 10 bar)
	Connections, tool side	2 x M5
	Air quality	Oil-clean and waterless filtered air, with max 25µm particle content
Electrical signals P0111A	Circuit diagram	E0173-001 (section 3.2.5)
	Total signals	8 x (0.5 A, 30V)
	Connection, robot side	M12 8P
	Connection, tool side	0.5 m, 8 x 0.25 mm ² cable, free end
Electrical signals P1158 (M12 12P)	Circuit diagram	E0173-042 (section 3.2.6)
	Total signals	8 x (0.5 A, 30V)
	Connection, robot side	M12 12P
	Connection, tool side	0.5 m, 8 x 0.25 mm ² cable, free end

3.2.4 Swivel S20-6E. Article: P0113A and P1159

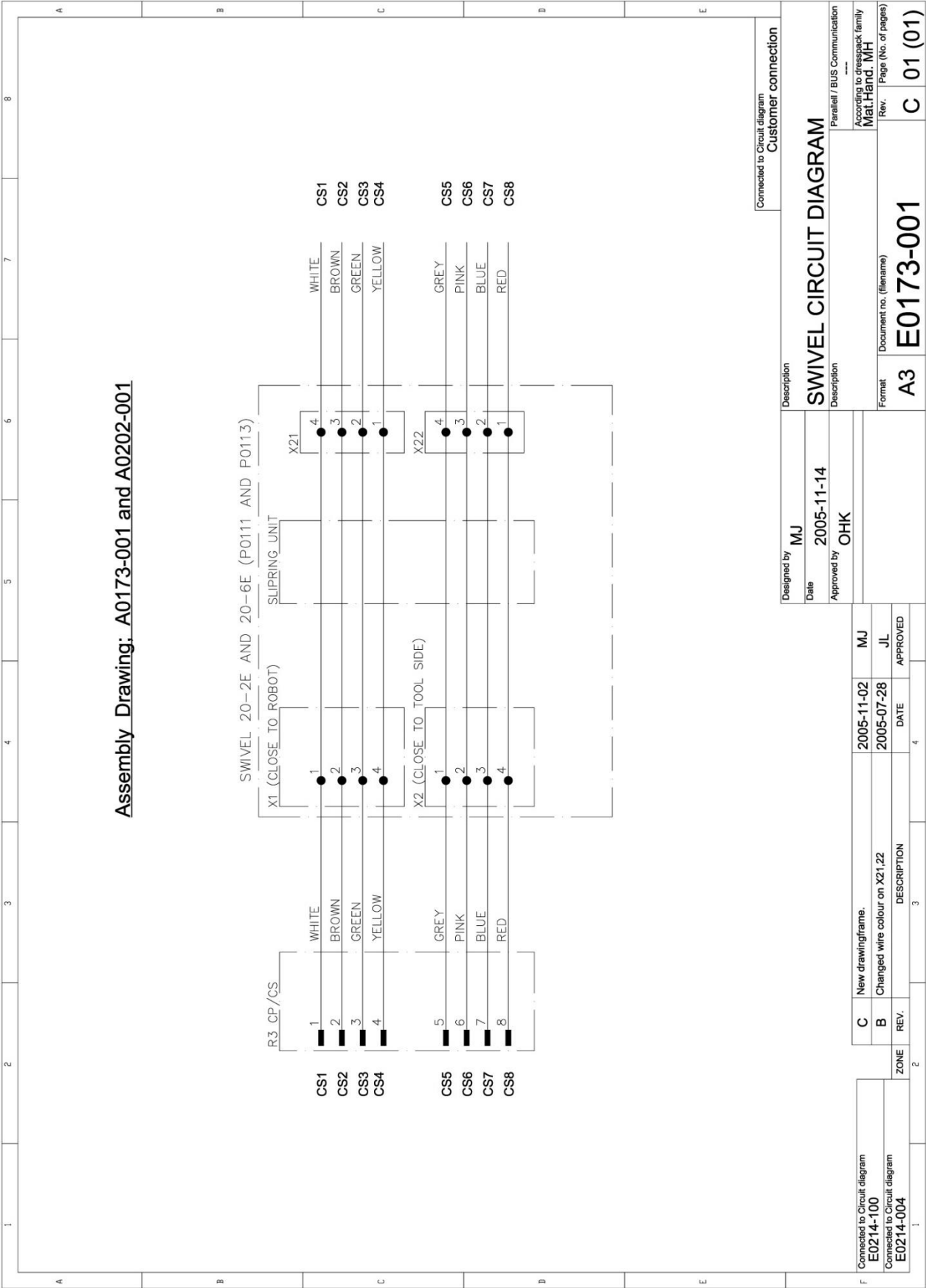


Swivel S20-6E transfers 6 pneumatic channels and 8 electrical signals to the tool.

Technical data

Working temperature		+10°C–+50°C
Bolt pattern		ISO 9409-1-40-4-M6
Maximum tool load	Fz (static)	± 200 N
	Mx/My (dynamic)	± 100 Nm
	Mz (dynamic)	± 100 Nm
Weight and centre of gravity (Z)		1,0 kg / 36 mm
Air channels	Pneumatic diagram	6 x M5 (150 l/min, max 10 bar)
	Connections, robot side	6 x M5
	Connections, tool side	Oil-clean and waterless filtered air, with max 25µm particle content
	Air quality	
Electrical signals	Circuit diagram	E0173-001 (section 3.2.5)
	Total signals	8 x (0.5 A, 30V)
	Connection, robot side	M12 8P
	Connection, tool side	0.5 m, 8 x 0.25 mm ² cable, free end
Electrical signals P1159 (M12 12P)	Circuit diagram	E0173-042 (section 3.2.6)
	Total signals	8 x (0.5 A, 30V)
	Connection, robot side	M12 12P
	Connection, tool side	0.5 m, 8 x 0.25 mm ² cable, free end

3.2.5 Circuit diagram E0173-001 for P0111A and P0113A

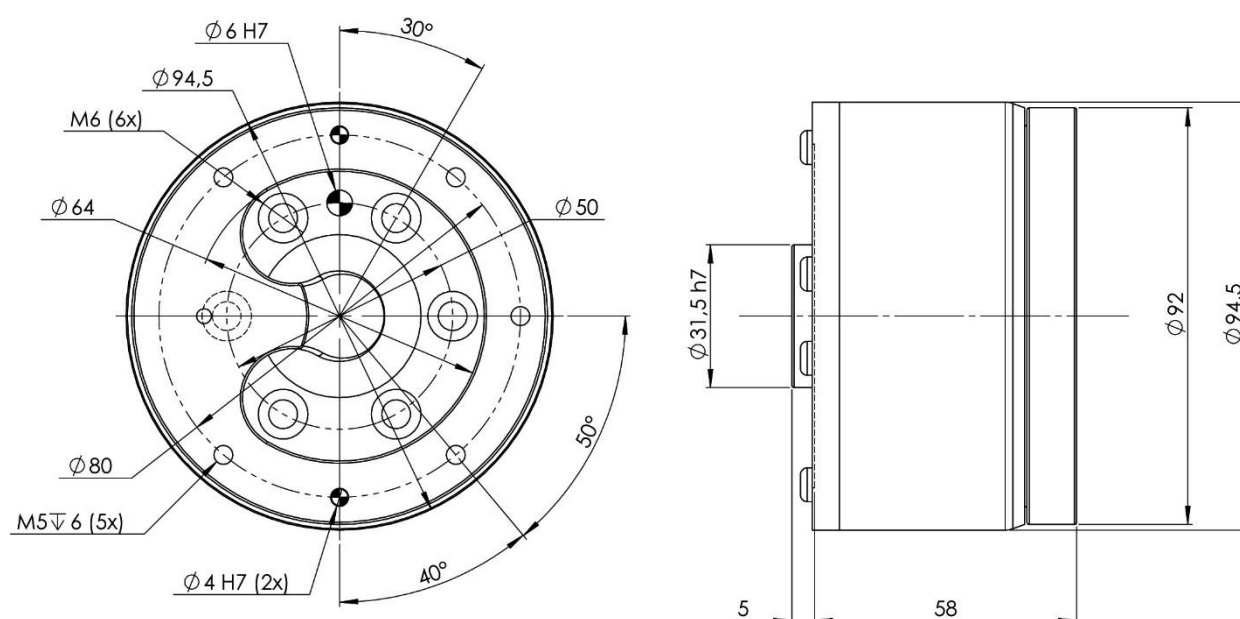


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3.3 CiRo:s

3.3.1 CiRo S1, Article no: P5131



CiRo S1 supports and holds cables and hoses and is allowing rotation of the 6th axis.

Technical data

Working temperature		+10°C–+50°C
Bolt pattern	Robot side	ISO 9409-1 50-6-M6
	Tool side	80-5-M5 (see note below)
Maximum tool load	Fz (static)	± 100 N
	Mx/My (dynamic)	± 100 Nm
	Mz (dynamic)	± 100 Nm
Weight and centre of gravity (Z)		1.2 kg / 32 mm
Hoses and cables	Maximum rotation	± 250°
	Maximum bundle size	7 x Ø6 mm

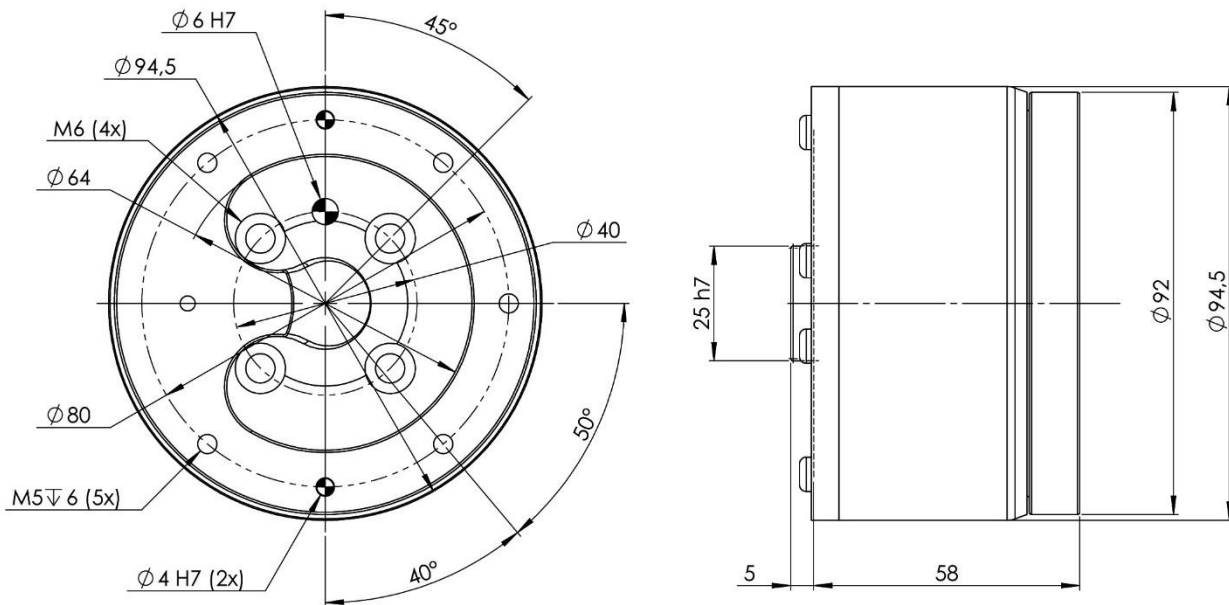


NOTE! Hoses and cables should be specifically designed for applications with high torsional and bending stresses. Such hose packages, cables and air hoses are available from Robot System Products.



NOTE! The tool adapter kit P5305 (section 3.3.3) is designated for mounting on CiRo S1 and S2.

3.3.2 CiRo S2. Article no: P5132



CiRo S2 supports and holds cables and hoses and is allowing rotation of the 6th axis.

Technical data

Working temperature		+10°C–+50°C
Bolt pattern	Robot side	ISO 9409-1 40-4-M6
	Tool side	80-5-M5 (see note below)
Maximum tool load	Fz (static)	± 100 N
	Mx/My (dynamic)	± 100 Nm
	Mz (dynamic)	± 80 Nm
Weight and centre of gravity (Z)		1.2 kg / 32 mm
Hoses and cables	Maximum rotation	± 250°
	Maximum bundle size	7 x Ø6 mm

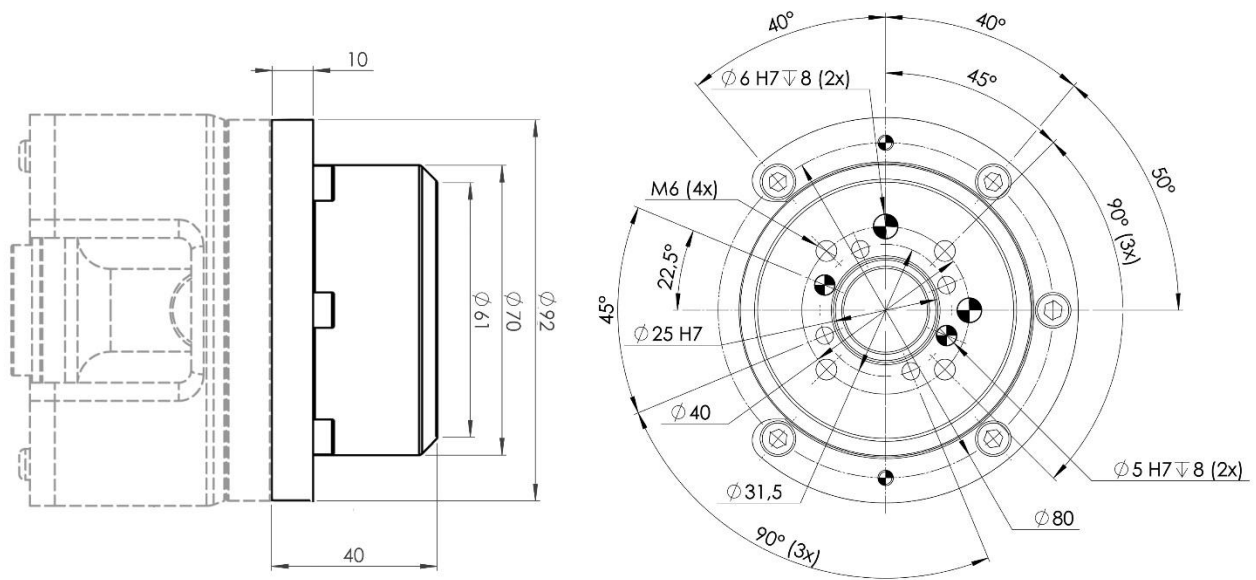


NOTE! Hoses and cables should be specifically designed for applications with high torsional and bending stresses. Such hose packages, cables and air hoses are available from Robot System Products.



NOTE! The tool adapter kit P5305 (section 3.3.3) is designated for mounting on CiRo S1 and S2.

3.3.3 Option tool adapter kit CiRo S, Article no: P5305



The tool adapter kit P5305 shall be mounted on on CiRo S1 and S2, S3 or S4 and used for mounting of tool or tool changer with bolt pattern ISO 9409-1 40-4-M6 or ISO 9409-1 31,5-4-M5.

Technical data

Working temperature		+10°C–+50°C
Bolt pattern	Robot side	80-5-M5
	Tool side	ISO 9409-1 40-4-M6 ISO 9409-1 31,5-4-M5
Maximum tool load (on S1, S2 or S3)	Fz (static)	± 100 N
	Mx/My (dynamic)	± 80 Nm
	Mz (dynamic)	± 80 Nm
Maximum tool load (on S4)	Fz (static)	± 50 N
	Mx/My (dynamic)	± 40 Nm
	Mz (dynamic)	± 40 Nm
Weight and centre of gravity (Z) CiRo S + P5305 (see note!)		1.4 kg / 36 mm



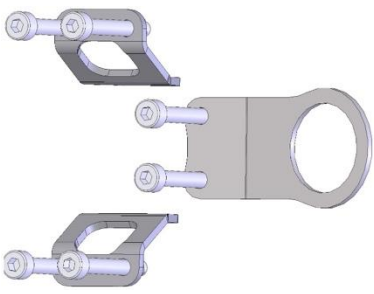
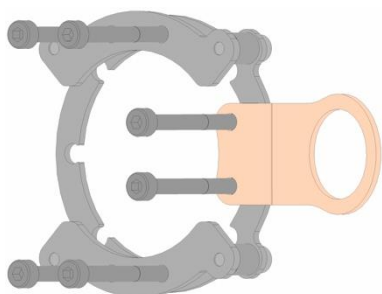
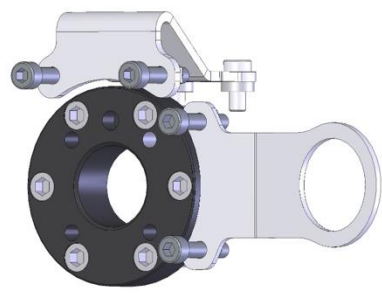
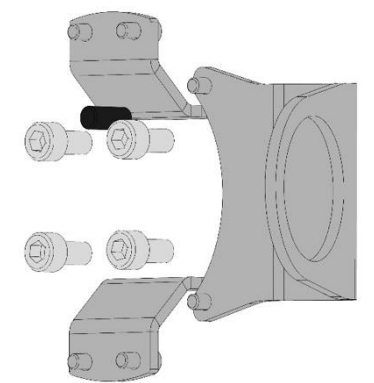
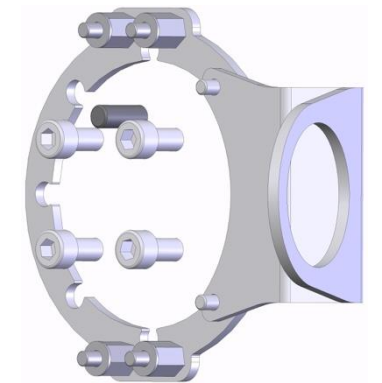
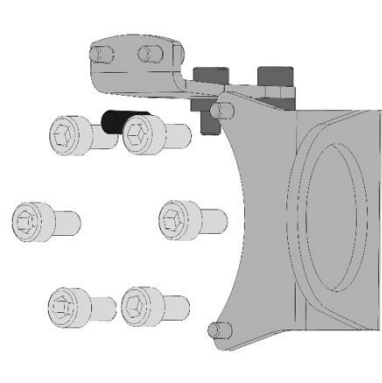
NOTE! Weight and centre of gravity is stated for the tool adapter kit (P5305) mounted on CiRo S1 or S2.

3.4 Robot adaptation kits.

Articles: P1147, P4213, P0118, P5302, P5321 and P5301

A rotation stop is a mandatory part of the robot adaptation kit and prohibits the swivel tool changer, swivel or CiRo to rotate in relation to the robot. Rotation stops are robot specific.

The flanges of the robot – and the robot side of the swivel, swivel tool changer or CiRo – have fastening holes in accordance with ISO 9409-1. In addition, dependent on robot model, adaptation plates for other bolt circles may be needed. Such adaptation plates are delivered as an integrated part of the robot adaptation kit.










Article number		
P1147	P4213	P0118
		
P5302	P5321	P5301
		

Technical data

Article number	Description	Weight	Adapter plate thickness
P1147	For Swivel and STC on IRB 140 and IRB1600	0.1 kg	-
P4213	For Swivel and STC on IRB 1300	0.2 kg	-
P0118	For Swivel and STC on IRB 2600 and IRB 4600	0.3 kg	12 mm
P5302	For CiRo on IRB 140 and IRB1600	0.2 kg	-
P5321	For CiRo on IRB 1300	0.2 kg	-
P5301	For CiRo on IRB 2600 and IRB 4600	0.2 kg	-

3.5 Hose packages and air hoses

Hose packages are mounted along the robot's upper arm to protect hoses and cables and make cable slack end up where it is out of the way for transfer of air and electrical signals. All hoses for air supply are included. The protective hose is a wear part.

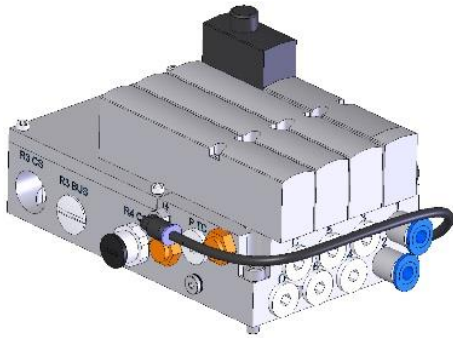
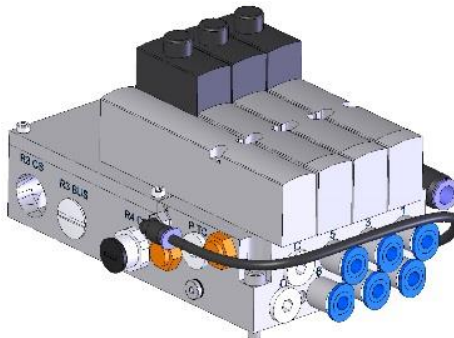
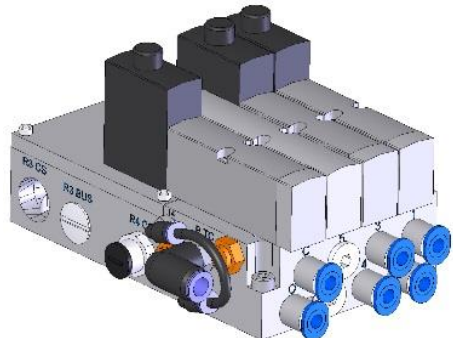
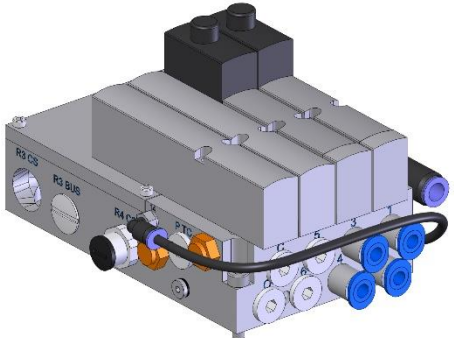
Article	Description	
P0030	Complete hose package for Swivel and STC on IRB 140	
P0034	Complete hose package for Swivel and STC on IRB 1600 1,2/1,45	
P2178	Complete hose package for Swivel and STC on IRB 1300	
P0033	Complete hose package for Swivel and STC on IRB 2600 1.65/1.85	
P2174	Complete hose package for Swivel and STC on IRB 4600 20/2,50	
P2162	Complete hose package for CiRo on IRB 1600 1,2/1,45.	
P2176	Complete hose package for CiRo on IRB 1300	
P2160-2	Complete hose package for CiRo on IRB 2600 1.65/1.85	
P2172	Complete hose package for CiRo on IRB 4600 20/2,50	

Technical data

Article	Total weight and hose length	Protective hose (inner/outer diameter)	Air hoses (for swivel, STC or tools)
P0030	0.8 kg, 0.95 m	21/28 mm	P2050-28
P0034	0.6 kg, 1.2 m	21/28 mm	P2050-24
P2178	0.35 kg, 0.33 m	21/28 mm	P2050-32
P0033	1.7 kg, 1.44 m	21/28 mm	P2050-36
P2174	5.2 kg, 2.6 m	21/28 mm	P2050-21
P2162	0.6 kg, 1.35 m	28/34 mm	P2050-17
P2176	0.4 kg, 0.35 m	28/34 mm	-
P2160-2	1.7 kg, 1.95 m	28/34 mm	P2050-12
P2172	4.7 kg, 3.1 m	28/34 mm	P2050-15

3.6 Valve units. Articles: P0011A, P0012A, P0013A and P1006

A valve unit integrates air and electrical connections into one single compact unit which controls air supply. Valve units shall be mounted on the mounting plate at axis 3 at the rear part of the upper arm. A cable connects the valve unit to the robot application interface of the robot.

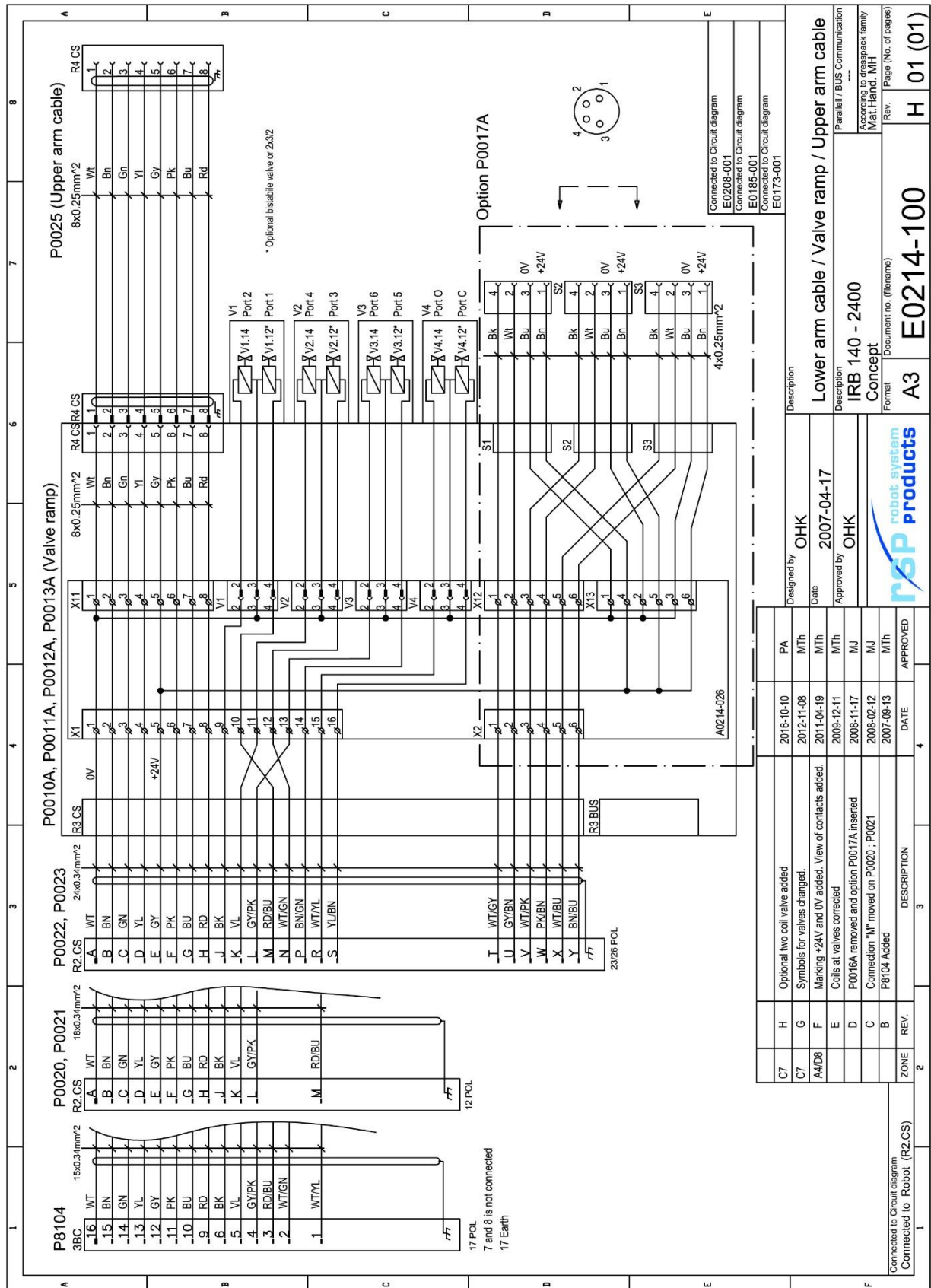
Article number	P0012A	P0013A
Description	Valve unit for swivel with 2 air channels	Valve unit for swivel with 6 air channels
		
Article number	P0011A	P1006
Description	Valve unit for STC with 4 air channels	Valve unit for CiRo with 4 air channels
		

Valve units for swivels without tool changing functions consists of one or three electrically controlled monostable 5/2 valves. With tool changer function the valve unit likewise consists of three electrically controlled monostable 5/2 valves, but with one of them dedicated for the tool change function. When the tool change valve is activated the other two valves are deactivated – this means that the air supply thereby is automatically turned off during tool change, which is simplifying the programming since no special program instructions are required for turning the air supply on or off. For circuit diagrams for valve units specifically related to swivels and STC's see sections 3.6.1 and 3.6.2.

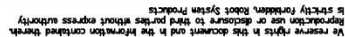
Technical data

Article number	Description	Tool change valves	Directional valves	Outlet air channels	Electrical interface	Max air flow
P0011A	Valve unit for tool changing	1	2	4	-	550 l/min totally
P0012A	Valve unit with one valve	-	1	2	-	550 l/min per channel
P0013A	Valve unit with three valves	-	3	6	-	550 l/min per channel
P1006	Valve unit with two valves	-	2	4	3xM8 (P1018)	550 l/min per channel

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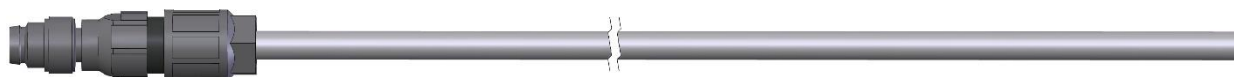
3.7 Upper arm cables. Articles: P0025 and P8434

The upper arm cable connects the STC or swivel and the connection box on the valve unit and is mounted through the protective hose.

Article number (STC and Swivels)	Number and Length	Connection, valve	Connection, robot side
P0025	1 x 2.0 m	M12 8P male	M12 8P female
P0025-30	1 x 3.0 m	M12 8P male	M12 8P female



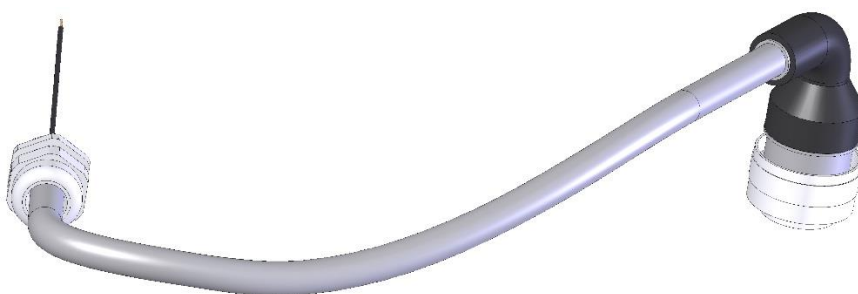
Article number (CiRo)	Number and Length	Connection, valve	Connection, robot side (see note below)
P8434-30	4 x 3.0 m	M8 4P male	Cable, open end
P8434-35	4 x 3.5 m	M8 4P male	Cable, open end
P8434-45	4 x 4.5 m	M8 4P male	Cable, open end



NOTE! The open-ended cables P8434-xx all have an extra length, after the CiRo, of one meter free cable for connections to the tools.

3.8 Robot cables, Articles: P0020 P0023, P8119

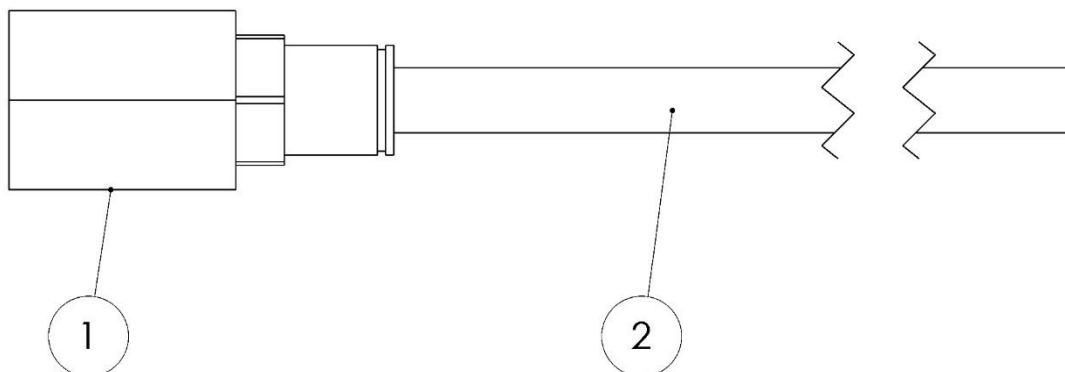
The robot cable connects the connection box on the valve with the application interface of the robot.



Article number	Robot	Connection to robot
P0020	ABB IRB 140	Souriau 12P (UT061412P45N)
P0023	ABB IRB 1600	Souriau 26P (UT0W61626PH)
P8119	ABB IRB 2600 and IRB 4600 (for CiRo)	Souriau 26P (UT0W61626PH)
P8119-8	ABB IRB 4600	Souriau 26P (UT0W61626PH)

3.9 Air supply hoses. Articles: P2050-23, -13, -9, and -4

The air supply hose connects the valve unit air with the air supply on the robot.



Article number	Robot model	Hose coupling (1)	Air hose length / diameter (2)
P2050-23 (for S and STC)	IRB 1600	M16x1,5 (P0214-146)	1.0 m / 8 mm
P2050-13 (for S and STC)	IRB 2600 and IRB 140	G ¼" (I0327)	1.0 m / 8 mm
P2050-9 (for S and STC)	IRB 4600	M16x1,5 (I0196)	1.0 m / 8 mm
P2050-4 (for CiRo)	IRB 1600	G ¼" (I0327)	0.5 m / 8 mm
P2050-13 (for CiRo)	IRB 2600	M16x1,5 (P0214-146)	1.0 m / 8 mm
P2050-9 (for CiRo)	IRB 4600	M16x1,5 (I0196)	1.0 m / 8 mm

4. ROBOT PROGRAMMING DATA

Data to be used primarily for off-line robot programming.

Robot model (article no. prefix)	Functionality (article no. suffix)	Weight (see Note! below)	Centre of gravity (Z-direction)	Extension from robot flange
ABB IRB 140 (TS101)	S20-2 (-203)	0.5 kg	13 mm	36.6 mm
	S20-2E (-204)	0.8 kg	20 mm	48.5 mm
	CiRo S2 (-211)	1.3 kg / 1.5 kg	25 mm / 32 mm	58 mm / 98 mm
ABB IRB 1600 (TS102)	S20-2 (-203)	0.5 kg	13 mm	36.6 mm
	S20-2E (-204)	0.8 kg	20 mm	48.5 mm
	S20-2E (-204)	1.3 kg / 1.5 kg	25 mm / 32 mm	58 mm / 98 mm
ABB IRB 1300 (TS103)	STC20-2 (-201) + P0102	1.1 kg	36 mm	81.7 mm
	STC20-2 (-201) + P0123	1.3 kg	42 mm	81.7 mm
	STC20-4E (-202) + P0109	1.5 kg	39 mm	93.6 mm
	STC20-4E (-202) + P0125	1.7 kg	44 mm	93.6 mm
	S20-2 (-203)	0.6 kg	11 mm	36.6 mm
	S20-2E (-204)	1.0 kg	18 mm	48.5 mm
	S20-6 (-205)	0.9 kg	26 mm	68.6 mm
	S20-6E (-206)	1.3 kg	30 mm	80.5 mm
	CiRo S1 (-211)	1.3 kg / 1.5 kg	23 mm / 31 mm	58 mm / 98 mm
ABB IRB 2600 (TS104)	STC20-2 (-201) + P0102	1.3 kg	41 mm	97.3 mm
	STC20-2 (-201) + P0123	1.5 kg	47 mm	97.3 mm
	STC20-4E (-202) + P0109	1.6 kg	45 mm	105.6 mm
	STC20-4E (-202) + P0125	1.8 kg	51 mm	105.6 mm
	S20-2 (-203)	0.8 kg	17 mm	48.6 mm
	S20-2E (-204)	1.1 kg	24 mm	60.5 mm
	S20-6 (-205)	1.1 kg	30 mm	80.6 mm
	S20-6E (-206)	1.4 kg	36 mm	92.5 mm
	CiRo S1 (-211)	1.3 kg / 1.5 kg	24 mm / 32 mm	58 mm / 98 mm
ABB IRB 4600 20/2.5 (TS106)	STC20-2 (-201) + P0102	1.3 kg	41 mm	97.3 mm
	STC20-2 (-201) + P0123	1.5 kg	47 mm	97.3 mm
	STC20-4E (-202) + P0109	1.6 kg	45 mm	105.6 mm
	STC20-4E (-202) + P0125	1.8 kg	51 mm	105.6 mm
	S20-2 (-203)	0.8 kg	17 mm	48.6 mm
	S20-2E (-204)	1.1 kg	24 mm	60.5 mm
	S20-6 (-205)	1.1 kg	30 mm	80.6 mm
	S20-6E (-206)	1.4 kg	36 mm	92.5 mm
	CiRo S1 (-211)	1.3 kg / 1.5 kg	24 mm / 32 mm	58 mm / 98 mm



NOTE! Weight, centre of gravity and total extension from robot flange, including respective adaptation kit. For STC also tool attachments (P0102 / P0123/ P0109 P0125) are included in the data. Data for CiRo is given without and with tool adapter P5305, respectively.

5. 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 of steel and aluminium are substantial in size and easy to identify. Copper is primarily used in transmission of power for spot welding. Silver or gold plating of contact surfaces may occur.

Plastics

Thermoplastics can, in general, be re-heated and 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.

