

# Rittal – The System.

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## ▶ Rittal Automation Systems – Automate your panel building and switchgear manufacturing



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# Rittal – The System.

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# Boosting efficiency through automation

Rittal can supply all your machines and devices – The Rittal Automation Systems division can supply everything you need to make enclosure assembly easier, faster, more accurate and more reproducible through automation. This allows you to link all work operations together into one highly efficient, digitally seamless, automated process. All machines and devices required for this purpose, including manual handling aids and a wide selection of hand tools, are available from a single source and can be ordered directly from Rittal.

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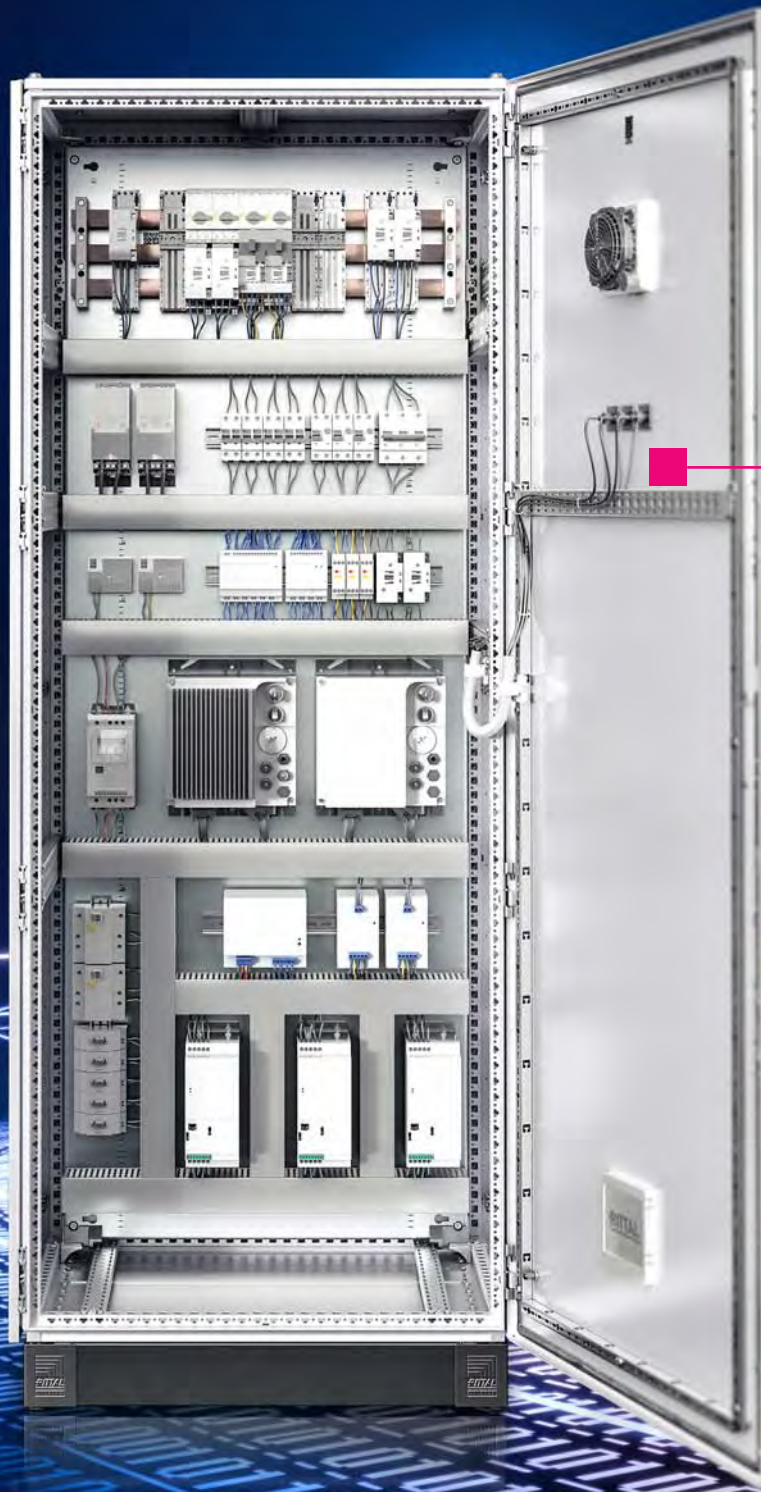
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# Improve the workflow in every sub-section

With Rittal Automation Systems – Engineering-generated digital data (e.g. from Eplan tools) allows the seamless automation of production processes. This is based on the virtual prototype. It carries all the relevant information, and in collaboration with the product spectrum from Rittal Automation Systems, ensures maximum possible efficiency at every point of the panel-building workflow.



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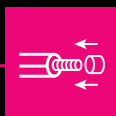
### **Automate machining**

Fully automated milling or laser machining, plus machining of cable ducts and busbars, from page 8



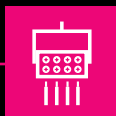
### **Make component mounting more flexible**

Automatic manufacturing and component mounting of terminal strips, from page 40



### **Systematise wire processing**

Professional, rational solutions for wire machining and processing, from page 42



### **Streamline wiring**

To complete the process chain, Rittal Automation Systems are involved in developing pioneering wiring solutions, right through to full automation.



### **Simplify handling**

Ergonomic, efficient handling systems for transport and lifting operations, from page 56



### **Perfecting the hand tool**

High-quality hand tools for professional use in industry and trade, from page 66

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# Boost productivity at every step

**With seamless optimisation of all process stages** – In panel building and switchgear manufacturing, efficiency relies on the quality of productivity, and on all automated and manual work stages. We achieve the ideal workflow with the aid of digitalization, from engineering right through to production.

## Machining

- Significant time saving with the milling centre Perforex BC
- High level of precision with the laser centre Perforex BC
- Less wastage with the cutting centre Secarex AC 18
- Efficient working with the copper workstations CW 120-S and CS 120-M

## Assembly

- Rapid throughput with the terminal block assembly centre Athex TC 80 CS

## Wire processing and wiring

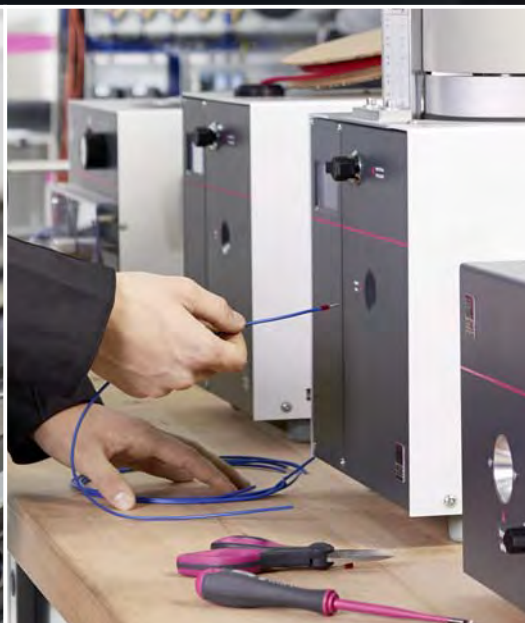
- Project-controlled cutting with the length-cutting machines C8+
- Quick insulation stripping with the stripping machines S22
- User-friendly wire processing with the crimping machines L8, R8, R8 E, RC
- Faster processes, thanks to fully automated wire processing with the Wire Terminal WT

## Handling

- Fatigue-free, ergonomic working with Rittal assembly frames
- Safe transportation of enclosure panels with the storage and transport trolley LT 1000
- Flexible work surface with the functional trolley for assembly and maintenance

## Hand tools

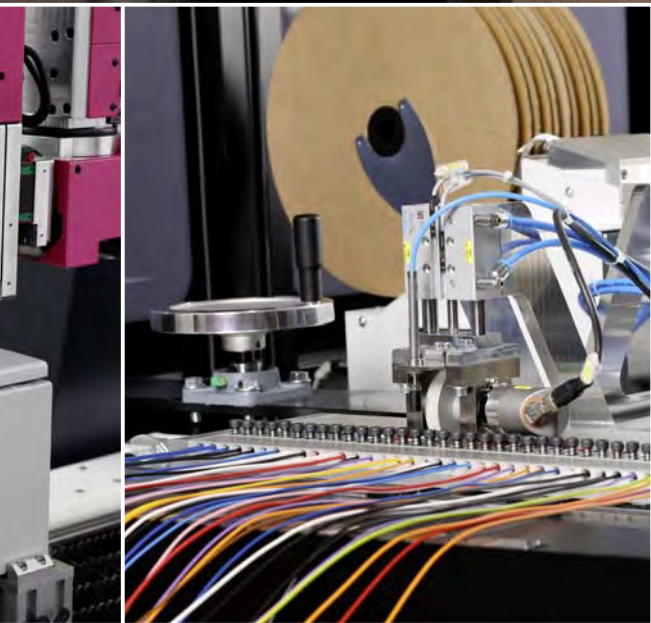
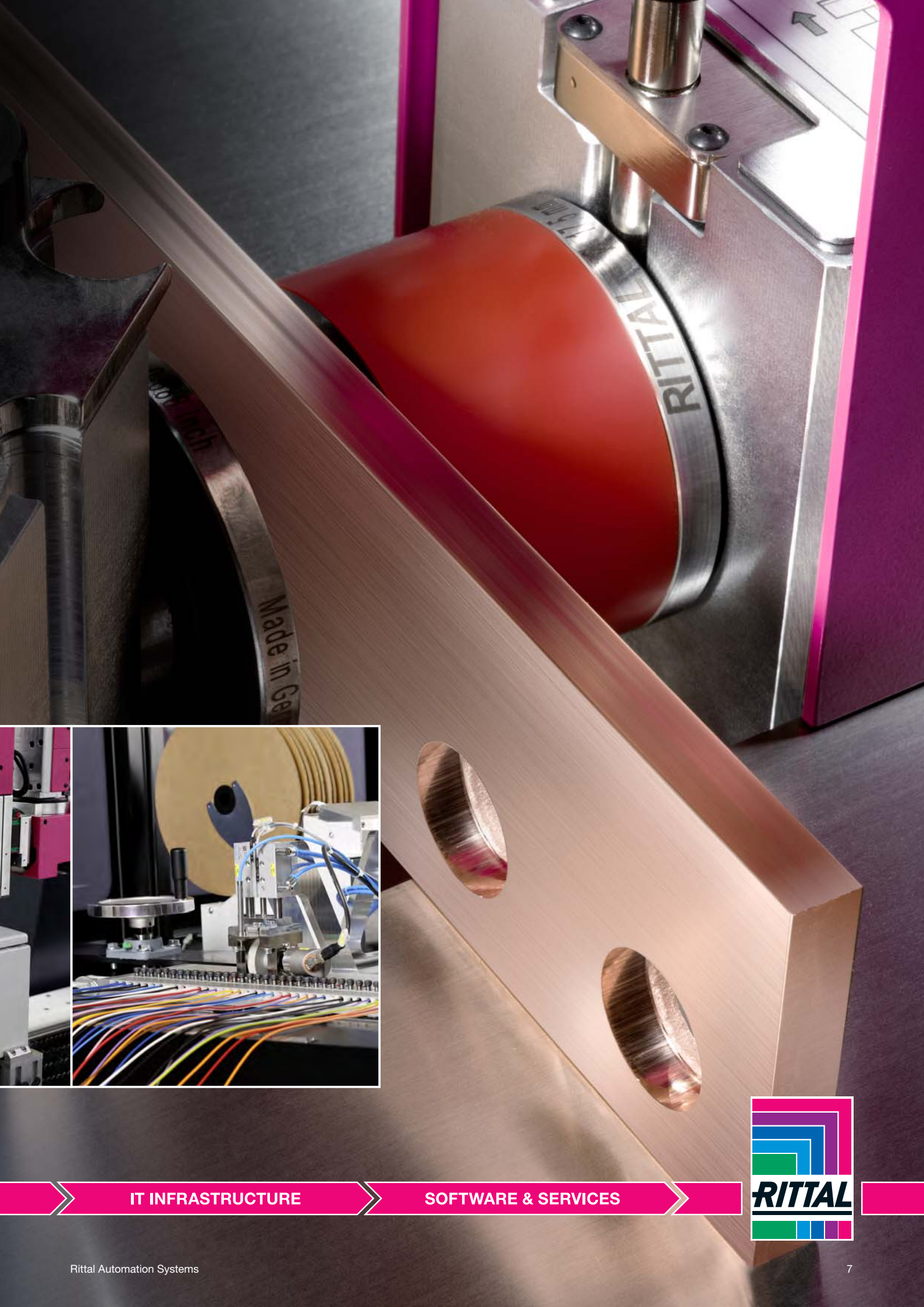
- Covers all manual processes in the workshop with high-quality hand tools



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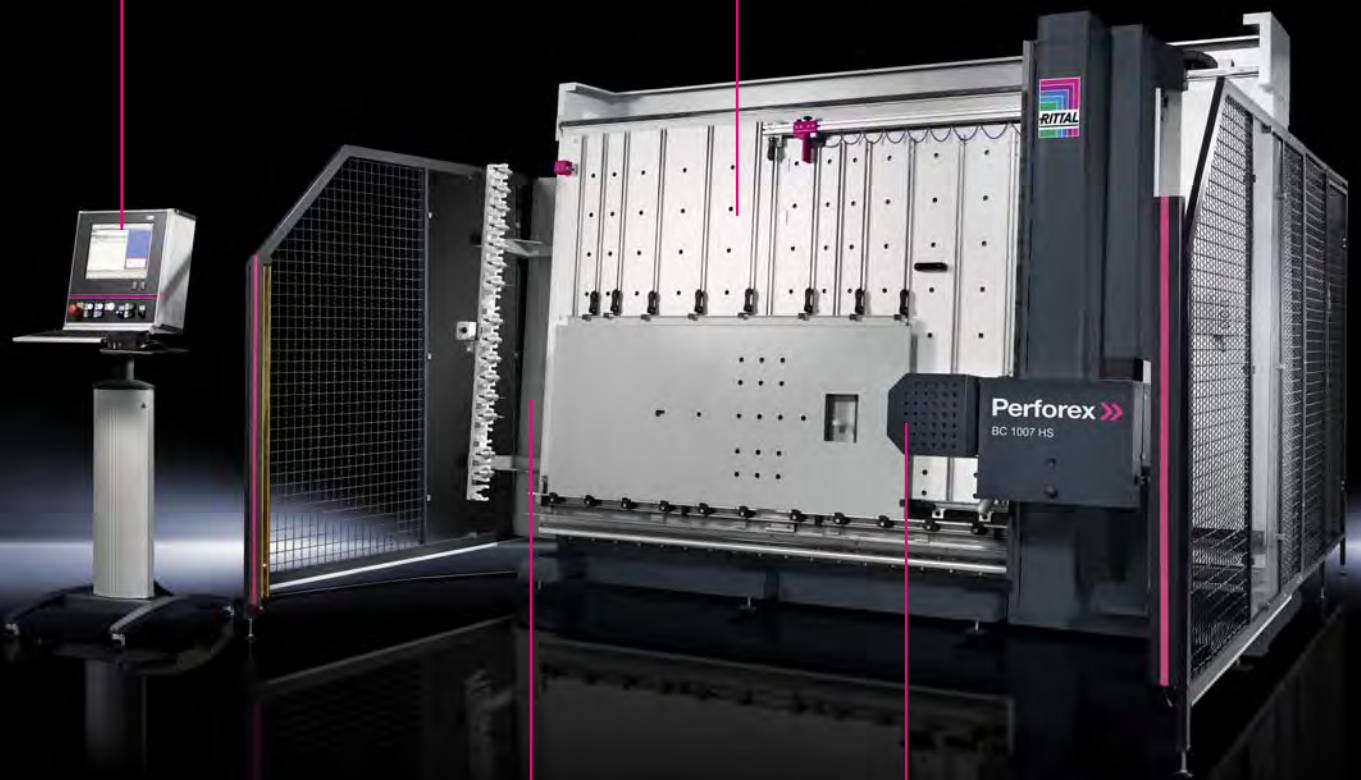
# Milling centre Perforex BC



Perforex machining centres accelerate your throughput times when machining anything from the smallest enclosures and enclosure panels, right through to large enclosures. The drilling and milling centres in the Perforex BC series allow you to machine any material, including spray-finished sheet and stainless steel as well as aluminium, copper and plastic. The machine is efficient even with a batch size of 1, and your investment will pay off in next to no time. No more tedious manual machining with hand tools.

- User-friendly workshop programming with interfaces to all standard CAD systems (DXF import), or direct transfer from EPLAN Pro Panel
- Transfer of configuration data from the Rittal Configuration System (RiCS)

- Performance package for fast, low-vibration, noise-optimised milling, comprised of brush strips and special milling cutters



- Patented plate with integral swarf extraction system
- High-performance spindle including minimal quantity lubrication for drilling, milling and thread tapping

- Automated tool testing and changing
- DIN tools
- Pneumatic clamping device



# Milling centre Perforex BC 1001 HS



**Consumables** Page 16 **Accessories** Page 20 **Machine options** Page 25

The Perforex BC 1001 HS is suitable for machining virtually all enclosures. This drilling/milling centre is the most compact, cost-efficient machine in the Perforex BC series.

#### Design:

- Enclosure panel machining
- Patented plate with integral extraction of the milling swarf
- High-performance spindle including minimal quantity lubrication
- Automatic tool testing
- DIN tools
- Pneumatic clamping device

#### Benefits:

- Fast return on investment (ROI) and significantly enhanced competitiveness
- Short throughput times with consistently high machining quality
- Fast, precise, reliable working
- Intuitive workshop programming, suitable for remote maintenance
- Networking-compatible software with central database
- Programmable workshop jobs are immediately available and can be reused

#### Machinable material:

- Aluminium
- Steel
- Stainless steel
- Plastic
- Copper

#### Machine controller:

- Workshop programming
- 4-axis CNC controller
- Rittal Optipanel with 15" monitor

#### Safety:

- Protective grille with visual safety device
- Protective fence, rear, for machine option of enclosure machining

#### Supply includes:

- The Perforex BC is configured on a project-specific basis

#### Note:

- We reserve the right to make technical modifications

Model No.	Packs of	4050.101	Page
Transport dimensions (W x H x D) mm		3500 x 2200 x 2450	
Footprint size (W x H x D) mm		3850 x 2200 x 3450	
Space requirements (W x H x D) mm		3850 x 2200 x 3450	
Electrical connection V, ~, Hz		400, 3~, 50	
Rated current (max.) A		32	
Control voltage (DC) V		24	
Dimensions of clampable enclosure panels (W x H) mm		2500 x 1500	
Maximum machinable area for enclosure panels (W x H) mm		2260 x 1500	
Dimensions of clampable cubic parts (W x H x D) mm		1200 x 1400 x 1400	
Maximum machinable area for cubic parts (W x H) mm		750 x 1400	
Tool holder (pick-up system)		■	
No. of tool slots		18	
Interfaces		Link to different CAD systems Transfer of DXF formats EPLAN Pro Panel Rittal Configuration System	
Machine options		Enclosure machining 4050.010	
Weight kg		1600.0	

Accessories			
Performance package	1 pc(s).	4050.041	20
Circular thread milling tool set	1 pc(s).	4050.050	23
Aluminium/plastic milling tool set	1 pc(s).	4050.051	23
Tool mounting aid	1 pc(s).	4050.030	20
Clamping frame	1 pc(s).	4050.060	24
Busbar clamber		see page	24
Magnetic rod	1 pc(s).	4050.067	22
Swivel stop	2 pc(s).	4050.066	21
Deburring blade	1 pc(s).	4050.720	21

# Milling centre Perforex BC 1007 HS



**Consumables** Page 16 **Accessories** Page 20 **Machine options** Page 25

The Perforex BC 1007 HS is used to modify all standard enclosures, from small to large. Within the Perforex BC series, this drilling/milling centre offers the greatest flexibility for individual configurations.

#### Design:

- Enclosure machining
- Enclosure panel machining
- Patented plate with integral extraction of the milling swarf
- High-performance spindle including minimal quantity lubrication
- Automatic tool testing
- DIN tools
- Pneumatic clamping device

#### Benefits:

- Fast return on investment (ROI) and significantly enhanced competitiveness
- Short throughput times with consistently high machining quality
- Fast, precise, reliable working
- Intuitive workshop programming, suitable for remote maintenance
- Networking-compatible software with central database
- Programmable workshop jobs are immediately available and can be reused
- Very quiet-running, thanks to fully welded machine frame

#### Machinable material:

- Aluminium
- Steel
- Stainless steel
- Plastic
- Copper

#### Machine controller:

- Workshop programming
- 4-axis CNC controller
- Rittal Optipanel with 15" monitor

#### Safety:

- Protective grille with visual safety device
- Protective fence, rear

#### Supply includes:

- The Perforex BC is configured on a project-specific basis

#### Note:

- We reserve the right to make technical modifications

Model No.	Packs of	4050.107	Page
Transport dimensions (W x H x D) mm		3800 x 2300 x 2500	
Footprint size (W x H x D) mm		4390 x 2410 x 2720	
Electrical connection V, ~, Hz		400, 3~, 50	
Rated current (max.) A		32	
Control voltage (DC) V		24	
Dimensions of clampable enclosure panels (W x H) mm		2450 x 1700	
Maximum machinable area for enclosure panels (W x H) mm		2200 x 1700	
Dimensions of clampable cubic parts (W x H x D) mm		1400 x 1600 x 1600	
Maximum machinable area for cubic parts (W x H) mm		1200 x 1600	
Option of extended carriage (W x H x D) mm		1400 x 1600 x 2000	
Tool holder (pick-up system)		■	
No. of tool slots		18	
Interfaces		Link to different CAD systems Transfer of DXF formats EPLAN Pro Panel Rittal Configuration System	
Machine options		Depth adjuster extension 4050.022 Motorised depth adjustment 4050.020	
Weight kg		2300.0	

#### Accessories

Accessories	Quantity	Part No.	Page
Performance package	1 pc(s).	4050.042	20
Circular thread milling tool set	1 pc(s).	4050.050	23
Aluminium/plastic milling tool set	1 pc(s).	4050.051	23
Clamping frame		see page	24
Busbar clammer		see page	24
Tool mounting aid	1 pc(s).	4050.030	20
Magnetic rod	1 pc(s).	4050.067	22
Swivel stop	2 pc(s).	4050.066	21

# Milling centre Perforex BC 1008 HS



**Consumables** Page 16 **Accessories** Page 20 **Machine options** Page 25

The drilling/milling centre Perforex BC 1008 HS is ideal for machining fully welded enclosures and those which cannot be dismantled. Two hinged doors in the machining zone mean that enclosures of up to 2300 x 1600 mm (W x H) can be effortlessly clamped.

#### Design:

- Motorised depth adjuster 2200 mm
- Enclosure machining
- Enclosure panel machining
- Two-door
- Patented plate with integral extraction of the milling swarf

- High-performance spindle including minimal quantity lubrication
- Automatic tool testing
- DIN tools
- Pneumatic clamping device

#### Benefits:

- Fast return on investment (ROI) and significantly enhanced competitiveness
- Short throughput times with consistently high machining quality
- Fast, precise, reliable working
- Intuitive workshop programming, suitable for remote maintenance

- Networking-compatible software with central database
- Programmable workshop jobs are immediately available and can be reused

#### Machinable material:

- Aluminium
- Steel
- Stainless steel
- Plastic
- Copper

#### Machine controller:

- Workshop programming
- 4-axis CNC controller
- Rittal Optipanel with 15" monitor

#### Safety:

- Protective grille with visual safety device
- Protective fence, rear

#### Supply includes:

- The Perforex BC is configured on a project-specific basis

#### Note:

- We reserve the right to make technical modifications

Model No.	Packs of	4050.108	Page
Transport dimensions (W x H x D) mm		4200 x 2350 x 2500	
Footprint size (W x H x D) mm		4600 x 2410 x 4600	
Electrical connection V, ~, Hz		400, 3~, 50	
Rated current (max.) A		32	
Control voltage (DC) V		24	
Dimensions of clampable enclosure panels (W x H) mm		2300 x 1550	
Maximum machinable area for enclosure panels (W x H) mm		2300 x 1700	
Dimensions of clampable cubic parts (W x H x D) mm		2300 x 1600 x 2200	
Maximum machinable area for cubic parts (W x H) mm		2300 x 1600	
Tool holder (pick-up system)		■	
No. of tool slots		20	
Interfaces		Link to different CAD systems Transfer of DXF formats EPLAN Pro Panel Rittal Configuration System	
Machine options		Clamping height extension 4050.035	
Weight kg		2700.0	

Accessories			
Performance package	1 pc(s).	4050.044	20
Circular thread milling tool set	1 pc(s).	4050.050	23
Aluminium/plastic milling tool set	1 pc(s).	4050.051	23
Clamping frame		see page	24
Busbar clamber		see page	24
Tool mounting aid	1 pc(s).	4050.030	20
Magnetic rod	1 pc(s).	4050.067	22
Swivel stop	2 pc(s).	4050.066	21

# Milling centre Perforex BC 2014 HS



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The Perforex BC 2014 HS is the largest variant among the Perforex BC machining centres. This milling centre is ideal for simultaneous machining of large enclosure panels or freestanding large enclosures with a height of up to 2300 mm. In this way, efficient, process-oriented machining can be achieved very quickly.

#### Design:

- Motorised depth adjuster 2200 mm
- Enclosure machining
- Enclosure panel machining
- Movable tool changer

- Patented plate with integral extraction of the milling swarf
- High-performance spindle including minimal quantity lubrication
- Automatic tool testing
- DIN tools
- Pneumatic clamping device
- Gantry drive for the X-axis (two synchronised axes)

#### Benefits:

- Fast return on investment (ROI) and significantly enhanced competitiveness
- Short throughput times with consistently high machining quality

- Fast, precise, reliable working
- Intuitive workshop programming, suitable for remote maintenance
- Networking-compatible software with central database
- Programmable workshop jobs are immediately available and can be reused

#### Machinable material:

- Aluminium
- Steel
- Stainless steel
- Plastic
- Copper

#### Machine controller:

- Workshop programming
- 4-axis CNC controller
- Rittal Optipanel with 15" monitor

#### Safety:

- Protective grille with visual safety device
- Protective fence, rear

#### Supply includes:

- The Perforex BC is configured on a project-specific basis

#### Note:

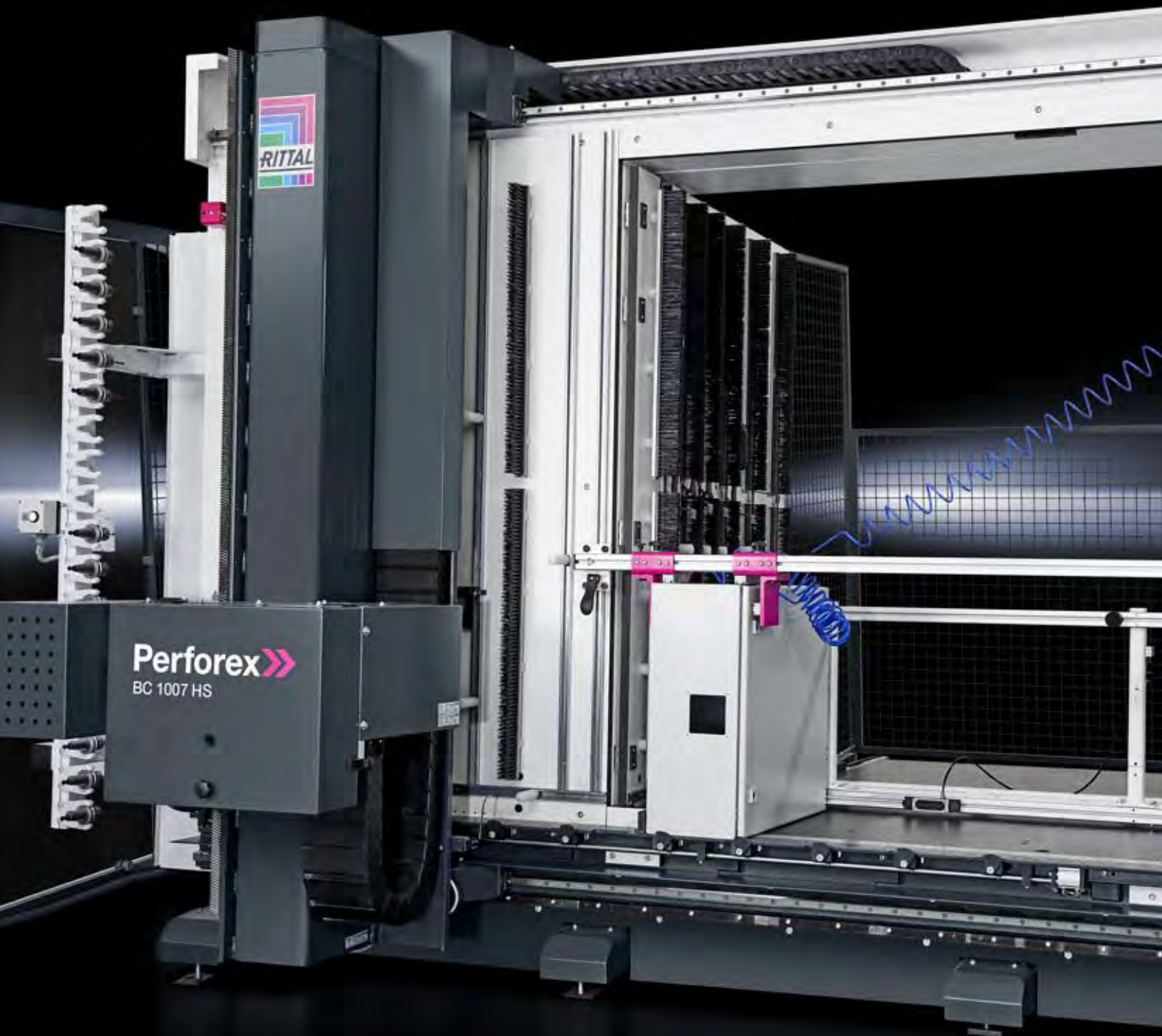
- We reserve the right to make technical modifications

Model No.	Packs of	4050.230	Page
Transport dimensions (W x H x D) mm		2400 x 3500 x 5250	
Footprint size (W x H x D) mm		5030 x 3140 x 4625	
Electrical connection V, ~, Hz		400, 3~, 50	
Rated current (max.) A		32	
Control voltage (DC) V		24	
Dimensions of clampable enclosure panels (W x H) mm		3600 x 2200	
Maximum machinable area for enclosure panels (W x H) mm		3600 x 2200	
Dimensions of clampable cubic parts (W x H x D) mm		1400 x 2200 x 2200	
Maximum machinable area for cubic parts (W x H) mm		1100 x 2200	
Two-door option (W x H) mm		2300 x 2200	
Tool holder (pick-up system)		■	
No. of tool slots		20	
Interfaces		Link to different CAD systems Transfer of DXF formats EPLAN Pro Panel Rittal Configuration System	
Machine options		Comfort clamp 4050.235	
Weight kg		4000.0	

Accessories			
Performance package	1 pc(s).	4050.045	20
Circular thread milling tool set	1 pc(s).	4050.050	23
Aluminium/plastic milling tool set	1 pc(s).	4050.051	23
Clamping frame		see page	24
Tool mounting aid	1 pc(s).	4050.030	20
Magnetic rod	1 pc(s).	4050.067	22
Swivel stop	2 pc(s).	4050.066	21

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**Perforex** >>  
BC 1007 HS

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# Laser centre Perforex LC



The 3D laser technology in the Perforex LC is ideally suited for machining stainless steel and sheet steel, as well as powder-coated metals such as enclosure doors, side panels etc. Spray-finished metal parts are cut without any visible paint damage or discolouration, even with delicate contours. What is more, there is no tarnishing of the cut edges when machining stainless steel. The Perforex LC is cost-effective from approximate volumes of just 150 stainless steel enclosures or 300 sheet steel enclosures per annum.

- User-friendly workshop programming with central database
- Machine operation with 3D visualisation
- Interfaces to EPLAN Pro Panel and processing of the neutral DXF format
- Transfer of configuration data from the Rittal Configuration System (RiCS)
- Simple attachment of enclosures
- Contactless, low-vibration manufacturing process
- Five sides may be machined simultaneously



- Clean, non-wearing cutting without coolant/lubricant
- Machining speed with stainless steel 20x faster than with conventional milling process

- Ergonomic design, thanks to the extendible support surface for enclosure and panel machining

3D laser machining

# Laser centre Perforex LC 3030



**Consumables** Page 16 **Accessories** Page 20 **Machine options** Page 25

Perforex laser centres are specially designed for the automated mechanical modification of standard enclosures. The Perforex LC specialises in 3D laser machining of cubes and contactless, low-vibration machining. Machining of mounting plates including tapped holes is also supported.

#### Benefits:

- 3D cube machining without repositioning the workpiece
- No tarnishing or discolouration of the cut edges when machining stainless steel
- Spray-finished metal parts, even those with delicate contours, can be cut without damaging the paint or causing discolouration
- Product spectrum from compact to large enclosures
- Contactless, low-vibration machining with no tool wear
- No need to clamp the workpieces
- Machining speed with stainless steel 20x faster than with conventional milling process
- Ergonomic working, thanks to the extendible support surface for enclosure and panel machining
- Simultaneous machining of 5 sides

#### Technical specifications:

- Laser pointer (auxiliary laser), beam power laser class 1
- Very narrow cutting width of just 0.3 mm (approx.)
- Class 4 laser

#### Machinable material:

- Stainless steel
- Sheet steel
- Aluminium
- The technical specification of the materials to be machined can be found on the Internet

#### Machine controller:

- Workshop programming

#### Safety:

- Protective housing to achieve laser class 1. May be operated by properly trained personnel, no need for a laser specialist
- Security door

#### Supply includes:

- Laser centre
- Compressor
- Machine housing
- Filter system
- Operating unit

#### Note:

- Safety roof (4050.317) for machine housing is mandatory if the machine can be viewed from above
- A site inspection by a Rittal specialist to select and define the laser version required is necessary
- We reserve the right to make technical modifications

Model No.	Packs of	4050.330	Page
Maximum machinable material thickness, sheet steel mm		5	
Maximum machinable material thickness, stainless steel mm		5	
Maximum machinable material thickness, aluminium mm		3	
Footprint size (W x H x D) mm		3900 x 3800 x 10500	
Power consumption kW		3	
Electrical connection V, ~, Hz		400, 3~, 50	
Control voltage (DC) V		24	
Beam power max.		300 W (CW) or 3000 W (pulse)	
Duration of pulse, max.		50 µs at 300 W output	
Pulse energy (max.) J		30	
Wavelength nm		1070	
Max. machinable area for cubic parts (W x H x D) mm		1270 x 2250 x 800	
Interfaces		EPLAN Pro Panel Transfer of DXF formats Rittal Configuration System	
<b>Accessories</b>			
Safety roof	1 pc(s).	4050.317	26
Thread tapping option	1 pc(s).	4050.318	27
Tool mounting aid	1 pc(s).	4050.030	20

# Consumables

## for Perforex



### Standard milling cutter

Diameter mm	Packs of	Model No.
6	10 pc(s).	<b>4050.818</b>

Steel/stainless steel milling cutter for Perforex machining centres BC.

**Design:**

- Triple flute
- HSS Co8
- TiAlN coating

**Machinable material:**

- Sheet steel
- Stainless steel

**Standards:**

- DIN 844



### End mill

Diameter mm	Packs of	Model No.
6	5 pc(s).	<b>4050.819</b>
4	5 pc(s).	<b>4050.820</b>

Aluminium/plastic milling cutter for Perforex machining centres BC.

**Design:**

- AIRline SH
- Double flute, right-hand cutting

**Benefits:**

- High level of wear resistance
- High cutting edge stability

**Material:**

- LW630

**Machinable material:**

- Aluminium
- Plastic

**Standards:**

- DIN 6527 A/B



### Performance milling tool

Diameter mm	Packs of	Model No.
6	5 pc(s).	<b>4050.891</b>

Spare milling cutter for Perforex machining centres BC.

**Design:**

- Quadruple flute
- HSS Co8
- TiAlN coating

**Benefits:**

- Faster feed rates of up to 1.5 m/min

**Machinable material:**

- Sheet steel
- Stainless steel

**Standards:**

- DIN 844



### Circular thread milling cutter

For threads	Packs of	Model No.
M16 - M64	1 pc(s).	4050.887

Milling cutter for cutting metric threads for the Perforex machining centre BC.

**Technical specifications:**

- Ø 12 x SL20 x 85
- Pitch 1.5 x 60° ISO

**Machinable material:**

- Steel
- Stainless steel
- Cast aluminium
- Plastic
- Copper

**Standards:**

- DIN 13-1 metric ISO thread



### Steel and stainless steel milling cutter

Design	Diameter mm	Packs of	Model No.
Triple flute	4	5 pc(s).	4050.885
Quadruple flute	6	5 pc(s).	4050.886

Roughing cutter especially for machining steel and stainless steel in powder-coated metal version for Perforex machining centres BC.

**Design:**

- HSS E-PM

**Material:**

- Powder metal edition (PM)

**Machinable material:**

- Steel
- Stainless steel



### Twist drill

Diameter mm	Packs of	Model No.
2.6	10 pc(s).	4050.801
3.3	10 pc(s).	4050.802
4.2	10 pc(s).	4050.803
5	10 pc(s).	4050.804
6	10 pc(s).	4050.805
6.8	10 pc(s).	4050.806
8.5	10 pc(s).	4050.807
8.5	5 pc(s).	4050.808
10.5	5 pc(s).	4050.809

Machine twist drill for Perforex machining centre BC.

**Design:**

- HSS
- TiN coating

**Machinable material:**

- Steel
- Stainless steel
- Aluminium
- Plastic
- Copper



# Consumables

## for Perforex



### Machine thread tap

Machine thread tap for Perforex machining centres BC and laser centres LC.

**Design:**

- HSSE-V3
- Vaporised
- For through-hole thread
- Form B with spiral point
- High-performance steel with vanadium portion

**Machinable material:**

- Steel
- Stainless steel
- Aluminium
- Plastic

Thread	Packs of	Model No.
M3	3 pc(s).	<b>4050.811</b>
M4	3 pc(s).	<b>4050.812</b>
M5	3 pc(s).	<b>4050.813</b>
M6	3 pc(s).	<b>4050.814</b>
M8	3 pc(s).	<b>4050.815</b>
M10	3 pc(s).	<b>4050.816</b>



### Support pegs

Spare support pegs for Perforex machining centres BC.



To fit Model No.	For	Length mm	Design	Packs of	Model No.
4050.101	BC 1001 HS BC 1001 S BC 2001 L	33	Internal thread	10 pc(s).	<b>4050.849</b>
4050.101	BC 1001 HS	54	Internal thread	10 pc(s).	<b>4050.847</b>
4050.107/ 4050.108	BC 1007 HS BC 1008 HS	57	Internal thread	10 pc(s).	<b>4050.843</b>
-	BC 1001 S BC 2001 L	66	plug-type	10 pc(s).	<b>4050.848</b>
4050.107/ 4050.108	BC 1007 HS BC 1008 HS	69	plug-type	10 pc(s).	<b>4050.846</b>
4050.845	BC 1007 HS BC 1008 HS BC 2007 HS BC 2014 HS	73	plug-type	10 pc(s).	<b>4050.844</b>
4050.107/ 4050.108/ 4050.207/ 4050.230	BC 1007 HS BC 1008 HS BC 2007 HS BC 2014 HS	73	adjustable	1 pc(s).	<b>4050.845</b>
4050.107/ 4050.108	BC 1007 HS BC 1008 HS	78	Internal thread	10 pc(s).	<b>4050.842</b>
4050.107/ 4050.108	BC 1007 HS BC 1008 HS	90	plug-type	10 pc(s).	<b>4050.841</b>



### Minimal quantity lubrication oil

Minimal quantity lubrication oil for tool lubrication in the Perforex machining centres BC and Perforex laser centres LC.

Oil type	Contents l	Packs of	Model No.
MK 150	3	1 pc(s).	<b>4050.894</b>

# Consumables

## for Perforex

### Special oil

Special oil for gear lubrication in Perforex machining centres BC.

**Standards:**

– DIN 51524-2 VG 32

Contents l	Packs of	Model No.
1	1 pc(s).	<b>4050.862</b>



### Lubricant

Lubricant for greasing the slideways in the Perforex machining centre BC.

**Standards:**

– DIN 51818

Oil type	Contents kg	Packs of	Model No.
KP2K-NLG12	5	1 pc(s).	<b>4050.863</b>



### Filter bag

Vacuum cleaner bags for swarf extraction while machining on Perforex BC machining centres.

Packs of	Model No.
5 pc(s).	<b>4050.860</b>



# Accessories

## for Perforex



### Performance package

For optimised workpiece machining on the Perforex machining centre BC.

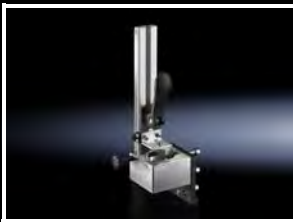
**Benefits:**

- Reduced vibration
- Faster feed rates of up to 1.5 m/min
- Lower noise emissions
- Extended tool life
- Optimised handling with workpiece clamping

**Supply includes:**

- Brush strips
- Performance milling tool Ø 6 mm

To fit Model No.	No. of milling cutters	No. of brush strips	Packs of	Model No.
4050.101	10	12	1 pc(s).	<b>4050.041</b>
4050.107	10	22	1 pc(s).	<b>4050.042</b>
4050.108	10	24	1 pc(s).	<b>4050.044</b>
4050.230	10	51	1 pc(s).	<b>4050.045</b>



### Tool mounting aid

For replacing and calibrating tools such as drill bits, milling cutters and thread taps in Perforex machining centres BC.

**Benefits:**

- Easy to use
- High level of measurement accuracy

**Supply includes:**

- Assembly aid including C-wrench

Packs of	Model No.
1 pc(s).	<b>4050.030</b>



### Webcam

For simple, fast support with remote maintenance of the Perforex machining centres BC and Perforex laser centres LC.

**Supply includes:**

- Power supply

Packs of	Model No.
1 pc(s).	<b>4050.072</b>



# Accessories

## for Perforex

### Deburring blade

Universal deburrer, for deburring holes and edges.

**Design:**

- Curved and rotating blade
- HSS B30

**Benefits:**

- Automatically assumes the optimum position
- Easy to use
- Effortless deburring
- Adjustable length

**Supply includes:**

- Handle and steel holder

Blade length mm	Blade dia. mm	Handle length mm	Handle dia. mm	Packs of	Model No.
47	3	110	25	1 pc(s).	4050.720



### Steel blade

Spare blade for deburrer. Rotating 360° blades for deburring.

**Design:**

- HSS B30

To fit Model No.	Packs of	Model No.
4050.720	10 pc(s).	4050.721



### Swivel stop

For multi-workpiece machining (multiple zero points) on Perforex machining centres BC.

Packs of	Model No.
2 pc(s).	4050.066



### Air-jet cone

Accessory nozzle for minimal quantity lubrication in Perforex machining centres BC.

**Material:**

- Aluminium

Packs of	Model No.
1 pc(s).	4050.888



### Suction hose

Metal hose for extracting milling swarf in the Perforex machining centre BC.

**Benefits:**

- Particularly resistant
- Heat-resistant

**Material:**

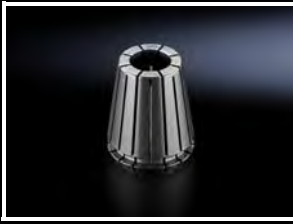
- Aluminium

Length m	Packs of	Model No.
13	1 pc(s).	4050.889



# Accessories

## for Perforex



### Collet, drills

Elastic clamping jaws to accommodate the drill bits for the Perforex machining centre BC.

**Design:**  
– ER 25

To fit Ø mm	Packs of	Model No.
3 - 2	1 pc(s).	<b>4050.822</b>
4 - 3	1 pc(s).	<b>4050.823</b>
5 - 4	1 pc(s).	<b>4050.824</b>
6 - 5	1 pc(s).	<b>4050.825</b>
7 - 6	1 pc(s).	<b>4050.826</b>
8 - 7	1 pc(s).	<b>4050.827</b>
9 - 8	1 pc(s).	<b>4050.828</b>
10 - 9	1 pc(s).	<b>4050.829</b>
11 - 10	1 pc(s).	<b>4050.830</b>
12 - 11	1 pc(s).	<b>4050.831</b>
13 - 12	1 pc(s).	<b>4050.839</b>



### Collet, taps

The elastic clamping jaws accommodate the taps for the Perforex machining centre BC.

**Design:**  
– ER 25

For threads	Packs of	Model No.
M3	1 pc(s).	<b>4050.832</b>
M4	1 pc(s).	<b>4050.833</b>
M5	1 pc(s).	<b>4050.834</b>
M6	1 pc(s).	<b>4050.835</b>
M8	1 pc(s).	<b>4050.836</b>
M10	1 pc(s).	<b>4050.837</b>
M12	1 pc(s).	<b>4050.838</b>



### Tool holder

To accommodate milling cutters, drill bits and other tools for the machining of enclosure panels and enclosures on Perforex machining centres BC.

**Design:**  
– SK30 ER25

**Standards:**  
– DIN 69871

Packs of	Model No.
1 pc(s).	<b>4050.821</b>



### Magnetic rod

Magnetic swarf wand with scraper ring to support and clean Perforex machining centres BC by removing magnetic swarf.

Packs of	Model No.
1 pc(s).	<b>4050.067</b>

# Accessories

## for Perforex

### Circular thread milling tool set

Diameter mm	Packs of	Model No.
10	1 pc(s).	4050.050

For cutting metric threads of all sizes. Additional tool for Perforex machining centres BC.

**Machinable material:**

- Sheet steel
- Stainless steel
- Aluminium

**Supply includes:**

- Circular thread milling cutter
- Collet
- Tool holder



### Aluminium/plastic milling tool set

Packs of	Model No.
1 pc(s).	4050.051

Milling tool set for machining with Perforex machining centres BC.

**Machinable material:**

- Aluminium
- Plastic

**Supply includes:**

- Tool holder
- Collet
- End mill 6 mm



### Machine thread tap set

**Machinable material:**

- Steel
- Stainless steel
- Aluminium
- Plastic

Tool set for incorporating tapped holes. Additional tool for Perforex machining centre BC.

Design	Product-specific scope of supply	Packs of	Model No.
Machine thread tap set M3	2 x tool holders SK30 ER25 1 x collet for thread tap M3 1 x collet for drill, to fit 3 - 2 mm 1 x twist drill 2.6 mm 1 x machine thread tap M3	1 pc(s).	4050.057
Machine thread tap set M10	2 x tool holders SK30 ER25 1 x collet for thread tap M10 1 x collet for drill, to fit 9 - 8 mm 1 x twist drill 8.5 mm 1 x machine thread tap M10	1 pc(s).	4050.058
Machine thread tap set M12	2 x tool holders SK30 ER25 1 x collet for thread tap M12 1 x collet for drill, to fit 11 - 10 mm 1 x twist drill 10.5 mm 1 x machine thread tap M12	1 pc(s).	4050.059



### Milling cutter extension with collet

To fit Model No.	Length mm	Packs of	Model No.
4050.101/ 4050.107/ 4050.108/ 4050.230	16	1 pc(s).	4050.056

Extension for standard 6 mm milling cutters with FRX 16 mm clamping jaw.



# Accessories

## for Perforex



### Clamping frame

Enables parallel cube machining of enclosures on the Perforex machining centre BC.

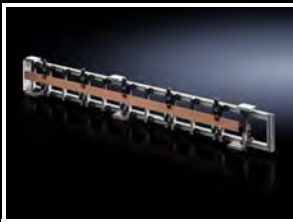
**Design:**

- Pneumatic clamping device

**Note:**

- Use of the clamping frame (Model No. 4050.080) in the machining centre BC (Model No. 4050.230) is only possible with the two-door variant.

To fit Model No.	Dimensions of clampable cubic parts min. (W x H x D) mm	Dimensions of clampable cubic parts max. (W x H x D) mm	Number of terminal boxes for parallel machining (max.)	Packs of	Model No.
4050.101	85 x 70 x 70	200 x 300 x 300	3	1 pc(s).	<b>4050.060</b>
4050.107/ 4050.108/ 4050.230	90 x 70 x 70	200 x 300 x 300	4	1 pc(s).	<b>4050.061</b>
4050.107/ 4050.108/ 4050.230	90 x 90 x 90	380 x 440 x 600	3	1 pc(s).	<b>4050.062</b>
4050.108/ 4050.230	80 x 100 x 80	510 x 510 x 600	3	1 pc(s).	<b>4050.080</b>
4050.108/ 4050.230	150 x 150 x 80	400 x 400 x 400	4	1 pc(s).	<b>4050.081</b>



### Busbar clammer

Busbar clammer for the Perforex machining centre BC, for simple machining of copper bars.



To fit Model No.	For	Machinable length with 5 mm thickness mm	Machinable length with 10 mm thickness mm	Machinable height (max.) mm	Simultaneous clamping of 3 copper bars	Packs of	Model No.
4050.107/ 4050.108/ 4050.230	BC 1007 HS BC 1008 HS BC 2014 HS single-door	150 - 300	150 - 1000	30 - 120	■	2 pc(s).	<b>4050.063</b>
4050.101	BC 1001 HS	100 - 2200	100 - 2200	10 - 100	–	1 pc(s).	<b>4050.064</b>
4050.107/ 4050.108	BC 1007 HS BC 1008 HS	100 - 2200	100 - 2200	10 - 100	–	1 pc(s).	<b>4050.065</b>
4050.101	BC 1001 HS	150 - 300	150 - 1000	30 - 120	■	2 pc(s).	<b>4050.082</b>





# Machine options

## for Perforex

### Enclosure machining

#### for Perforex BC 1001 HS

Machine equipped with door and pneumatic clamping device. The corresponding support surface enables the machining of cubes up to a maximum depth of 1400 mm. For additional machining of undismantable enclosures on Perforex machining centres BC.

#### Design:

- Machining surface with door
- Pneumatic clamping device
- Additional support surface
- Mechanical depth adjuster

#### Benefits:

- Depth-variable
- Use of the existing machine surface for the additional machining of cubes

#### Note:

- Not suitable for retrofitting

To fit Model No.	Dimensions of clampable cubic parts (W x H x D) mm	Maximum machinable area for cubic parts (W x H) mm	Packs of	Model No.
4050.101	1200 x 1400 x 1400	750 x 1400	1 pc(s).	<b>4050.010</b>

### Motorised depth adjuster

#### for Perforex BC 1007 HS

Upgrade your cube machining with an electrically powered depth adjuster for frequently changing enclosure sizes. For user-friendly operation of the Perforex machining centres BC.

#### Design:

- Motorised depth adjuster including membrane clamping system

#### Benefits:

- Motorised depth adjustment of the end stop with enclosure machining
- Ergonomic handling
- Efficient operation

#### Note:

- Not suitable for retrofitting

To fit Model No.	Length mm	Packs of	Model No.
4050.107	1600	1 pc(s).	<b>4050.020</b>

### Clamping height extension

#### for Perforex BC 1008 HS

Upgrade kit to extend the clamping height for Perforex machining centres BC.

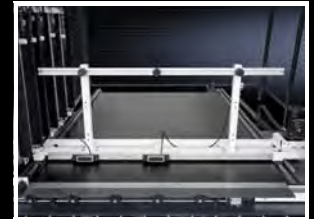
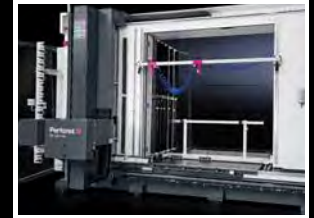
#### Supply includes:

- 3 clamping elements
- Assembly parts

#### Note:

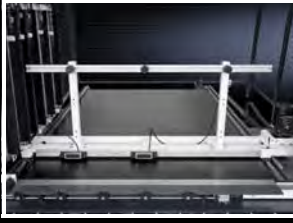
- May be retrofitted

To fit Model No.	Height mm	Packs of	Model No.
4050.108	1700	1 pc(s).	<b>4050.035</b>



# Machine options

## for Perforex



### Depth adjuster extension

#### for Perforex BC 1007 HS

Machine equipped with a support surface of 2000 mm instead of the standard 1600 mm support surface in Perforex machining centres BC.

#### Design:

- Motorised depth adjuster
- Membrane clamping system

#### Note:

- Not suitable for retrofitting
- The choice of motorised depth adjustment is a requirement for extended depth adjustment

To fit Model No.	Length mm	Packs of	Model No.
4050.107	2000	1 pc(s).	<b>4050.022</b>



### Comfort clamping

#### for Perforex BC 2014 HS

Clamping system for user-friendly clamping of enclosure panels from a size of 1700 mm on the Perforex machining centre BC.

#### Supply includes:

- Clamping unit
- Assembly parts

#### Note:

- Up to 3 clamping units may be retrofitted

To fit Model No.	Clampable height for enclosure panels (max.) mm	Packs of	Model No.
4050.230	2200	1 pc(s).	<b>4050.235</b>



### Safety roof

#### for Perforex LC 3030

Safety roof of the machine housing for Perforex laser centres LC. Mandatory for all machine installation locations that can be viewed from above and for reflective objects located above the laser, such as lights, cable ducts and others.

#### Note:

- A site inspection by a Rittal specialist to select and define the laser version required is necessary

To fit Model No.	Machine dimensions (W x H x D) mm	Packs of	Model No.
4050.330	3900 x 1100 x 5400	1 pc(s).	<b>4050.317</b>

# Machine options

## for Perforex

### Thread tapping option

#### for Perforex LC 3030

Thread tapping option for cutting threaded holes with the Perforex laser centre LC.

#### Design:

- Movable tool magazine with 6 magazine slots
- Tool holder
- Additional drive unit

#### Benefits:

- Machining of projects with tapped holes supported
- Fast, automatic changeover from laser function to thread-tapping function by accommodating an additional machine head

#### Machinable material:

- Steel
- Stainless steel
- Aluminium

#### Supply includes:

- Thread tapper
- Clamping units for M3 – M10

To fit Model No.	Machinable height (max.) mm	Material thickness (max.) mm	Packs of	Model No.
4050330	600	5	1 pc(s).	4050.318



# Cutting centre Secarex AC 18



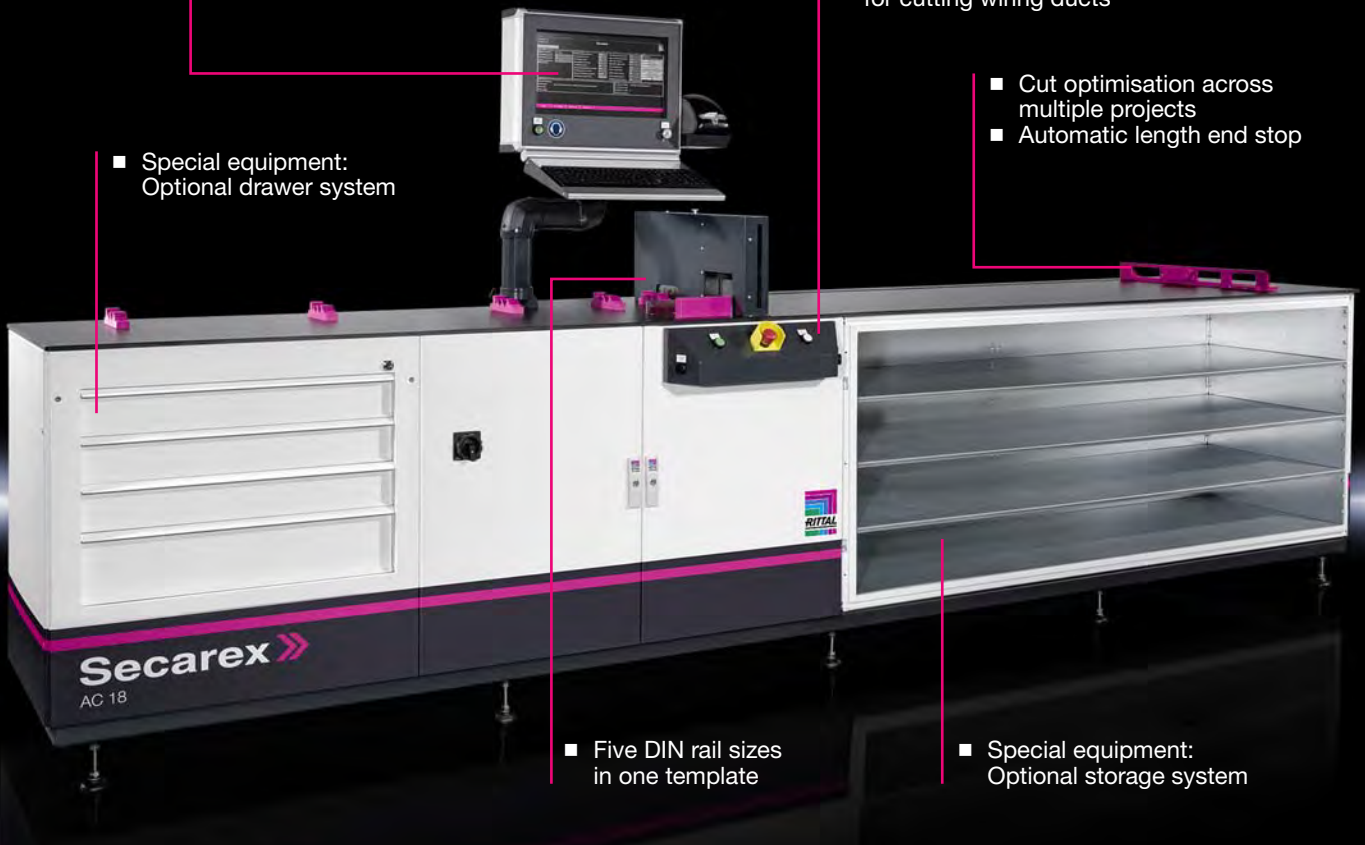
The Secarex cutting centre is convenient to use and cuts wiring ducts, cable duct covers and support rails to length quickly, precisely and reliably. The integral label printer provides project-specific labelling of the support rails and cable trunking. The cutting centre helps to improve quality, optimise cutting waste, lower costs and accelerate the overall process.

- Modern operating solution: 18.5" monitor, top-hat rail industrial PC with i3 processor, and keyboard with trackball
- Data is transferred directly from CAE systems (EPLAN Pro Panel) or Perforex workshop programming, or alternatively, dimensions may be entered manually by the operator
- USB interface

- Safe, two-handed operation for cutting wiring ducts

- Special equipment: Optional drawer system

- Cut optimisation across multiple projects
- Automatic length end stop

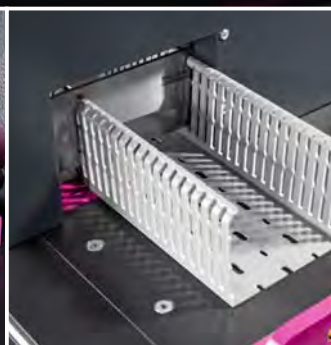


- Five DIN rail sizes in one template

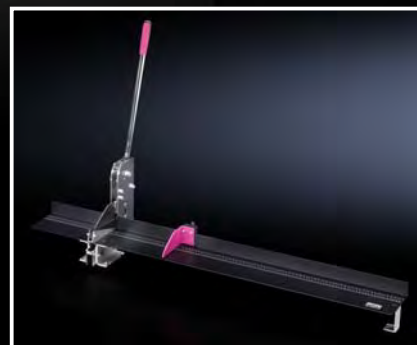
- Special equipment: Optional storage system



Cutting support rails



Cutting a cable duct



Manual wiring duct cutter MC125, see page 30



# Cutting centre Secarex AC 18



Partially automated cutting of wiring ducts, cable duct covers and support rails to the required size, especially for one-off and small-scale production. The Secarex AC 18 cutting centre may optionally be fitted with a drawer system on the left-hand side and/or a storage system on the right-hand side of the machine. If the machining of other support rails outside of the standard template is required, this may optionally be requested as a changing system (4050.491).

#### Design:

- Modern operating solution with 18.5" monitor, industrial PC with I3 processor, and keyboard with trackball

#### Benefits:

- Fast, precise, reliable working
- Easy to use
- User-friendly, reliable operation
- Very low costs for cutting waste thanks to optimisation of the cutting process
- Significant time savings compared to manual cutting
- Clean cuts with high-performance tools
- Automatic retraction of the end stop during the cutting process
- Cut controllable via viewing window
- Five DIN rail sizes in one template

#### Machinable material:

- Steel
- Stainless steel
- Plastic

#### Safety:

- Safe, two-handed operation

#### Supply includes:

- Secarex AC 18
- Label printer
- Operating unit

#### Support rail type:

- C rails 30/15 (to EN 60 715)
- Top-hat rails 15 (to EN 60 715)
- Top-hat rails 35/15 (to EN 60 715)
- Top-hat rails 35/7.5 (to EN 60 715)
- Busbars NLS-CU 3/10

#### Note:

- We reserve the right to make technical modifications

Model No.	Packs of	4050.418	Page
Footprint size (W x H x D) mm		4000 x 1610 x 875	
Space requirements (W x H x D) mm		4000 x 1610 x 875	
Power consumption kW		1.5	
Electrical connection V, ~, Hz		230, 1~, 50	
Control voltage (DC) V		24	
Min. machinable width of cable duct mm		15	
Max. machinable width of cable duct mm		125	
Max. machinable height of cable duct mm		100	
For wall thickness (max.) mm		2.5	
Interfaces		Link to different CAD systems Data import from EPLAN Pro Panel Perforex workshop programming	
Machine options		Drawer system 4050.441 Support system 4050.442	
Weight kg		400.0	

#### Accessories

Support for mousepad, vertically hinged	1 pc(s).	2383.020	Cat. 35, p. 834
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# Wiring duct cutter MC 125



For manual cutting of wiring ducts, with adjustable length end stop for the machined material. Anodised contact surface with laser-engraved calibration in millimetres and inches. Integral finger guard ensures safe machining. Intended for mounting on a workbench.

**Benefits:**

- Enables inexpensive manual cutting of wiring ducts
- Easier for cutting wiring ducts to length compared to sawing by hand

**Machinable material:**

- Plastic

Model No.	Packs of	4050.435	Page
Footprint size (W x H x D) mm		133 x 81 x 28	
Max. machinable width of cable duct mm		125	
Max. machinable wall thickness of cable duct mm		2.5	
Max. insertion height mm		28	
Weight kg		15.0	
<b>Accessories</b>			
Spare blade MC 125	1 pc(s).	4050.436	

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# Busbar machining, static CW 120-S



The units in the CW 120-S product series are ideal for bending, punching and cutting busbars. The integral precision laser facilitates the cutting and bending process.

## Electro-hydraulic pump

- To operate products in the CW 120-S product series

## Busbar cutting unit

- Time savings compared to manual cutting
- Precise marking of the cutting point

## Busbar bending and hole-punching unit

- Simple tool changes
- High level of bending and punching accuracy
- Independent busbar machining



Machining examples for the CW 120-S:



Punching



Cutting a busbar to length



Bending a busbar



# Busbar machining, mobile CW 120-M



The Copper Workstation CW 120-M is ideal for bending, punching and cutting busbars. It supports cutting and bending up to a maximum width of 120 mm and a maximum thickness of 12 mm. The integral precision laser facilitates the cutting and bending process. Generally speaking, round holes with a diameter of 6.6 to 21.5 mm and slots up to a maximum width of 18 mm and a length of 21 mm may be punched.



- Integral measurement system for all functions, with horizontally hinged end stop

- Punching and bending unit
- Integral precision laser

- Cutting unit
- Integral precision laser

- External hydraulic connection for almost infinitely extendible machining options

- Convenient height adjustment of the machining zone

Machining examples for the CW 120-M:



Cutting busbars to length with integral precision laser

Bending busbars

Punching busbars, pull-out measurement system

Making cut-outs in steel and stainless steel (accessories, hydraulic hose and cylinder, see page 39)

# Busbar bending and hole-punching unit CW 120-S



**Female dies** Page 37 **Male dies** Page 37 **Accessories** Page 37

The bending and hole-punching unit in the CW 120-S product series is ideal for bending and punching busbars. Round holes and slots may be punched. The bending and hole-punching unit is easily positioned on a workbench.

**Design:**

- Electric protractor
- Length stop
- Mandrel R10
- Bending die
- Laser pointer (auxiliary laser), beam power laser class 1

**Benefits:**

- High level of bending and punching accuracy
- Simple tool changes

**Machinable material:**

- Copper
- Aluminium

**Note:**

- With a Z bend, the length of the short side depends on the material thickness

Model No.	Packs of	4055.700	Page
Machine dimensions (W x H x D) mm		700 x 410 x 461	
Footprint size (W x H x D) mm		756 x 426 x 461	
Bending (max.) mm		120 x 12	
Bending angle (max.) °		90	
Bending/side length (min.) mm		50	
U-bending (min.) mm		100	
Z-bending (min.) mm		72	
Punching (max.) mm		6.6 x 21.5	
Punching/material thickness (max.) mm		12	
Punching/material width (max.) mm		120	
Weight kg		60.0	
<b>Also required</b>			
Electro-hydraulic pump	1 pc(s).	4055.720	38
Foot switch	1 pc(s).	4055.712	38

# Busbar cutting unit CW 120-S



## Accessories Page 37

The cutting unit in the CW 120-S product series is ideal for cutting busbars to length. The unit is easily mounted on a workbench.

### Design:

- Laser pointer (auxiliary laser), beam power laser class 1

### Benefits:

- Significant time savings compared to manual cutting

### Machinable material:

- Copper
- Aluminium

Model No.	Packs of	4055.710	Page
Machine dimensions (W x H x D) mm		335 x 370 x 275	
Footprint size (W x H x D) mm		283 x 318 x 372	
Cutting (max.) mm		120 x 12	
Weight kg		20.5	
<b>Also required</b>			
Electro-hydraulic pump	1 pc(s).	4055.720	38
Foot switch	1 pc(s).	4055.712	38
<b>Accessories</b>			
Ride-up roller	2 pc(s).	4055.714	39

# Busbar machining CW 120-M



**Female dies** Page 37 **Male dies** Page 37 **Accessories** Page 37

The CW 120-M mobile station is ideal for bending, punching and cutting busbars.

#### Design:

- Electric protractor
- Mandrel R10
- Bending die
- External 230 V power inlet
- Pull-out side support extension for long rails
- External hydraulic connection for almost all machining options
- 4 castors (2 lockable)
- Drawer pull-outs
- Integral hydraulic pump
- Laser pointer (auxiliary laser), beam power laser class 1
- Length end stop, pull-out

#### Benefits:

- High level of bending and punching accuracy
- Simple tool changes
- Flexible use in the workshop

#### Machinable material:

- Copper
- Aluminium

#### Supply includes:

- Busbar machining, mobile CW 120-M
- Foot switch

#### Note:

- With a Z bend, the length of the short side depends on the material thickness
- For punching, slots of up to a max. of 21 x 18 mm are also supported
- Slot tools available on request
- We reserve the right to make technical modifications

Model No.	Packs of	4055.800	Page
Machine dimensions (W x H x D) mm		1380 x 1270 x 945	
Support surface (W x D) mm		811 x 1211	
Working height mm		974	
Power consumption kW		2.2	
Electrical connection V, Hz		230, 50	
Permissible operating pressure (p. max.) bar		700	
Bending (max.) mm		120 x 12	
Bending angle (max.) °		90	
Bending/side length (min.) mm		50	
Z-bending (min.) mm		72	
Punching (max.) mm		6.6 x 21.5	
Punching/material thickness (max.) mm		12	
Cutting (max.) mm		120 x 12	
Length stop (max.) mm		1224	
Weight kg		390.0	
<b>Accessories</b>			
Hydraulic hose	1 pc(s).	4055.807	39
Hydraulic cylinder	1 pc(s).	4055.806	39
Male and female dies for slots	1 pc(s).	4055.791	38

# Accessories

## for busbar machining CW 120

### Male die

Male die for punching round holes in busbars.

**Machinable material:**

- Copper

Thread	Diameter mm	Material thickness (max.) mm	Packs of	Model No.
M6	6.6	5	1 pc(s).	<b>4055.740</b>
M8	9	6	1 pc(s).	<b>4055.741</b>
M8	9.5	6	1 pc(s).	<b>4055.742</b>
M10	11	12	1 pc(s).	<b>4055.743</b>
M10	11.5	12	1 pc(s).	<b>4055.744</b>
M12	13.5	12	1 pc(s).	<b>4055.745</b>
M12	14	12	1 pc(s).	<b>4055.746</b>
M16	17.5	12	1 pc(s).	<b>4055.747</b>
M16	18	12	1 pc(s).	<b>4055.748</b>
M20	21	12	1 pc(s).	<b>4055.749</b>
M20	21.5	12	1 pc(s).	<b>4055.750</b>



**Also required:**

- Busbar bending and hole-punching unit CW 120-S, see page 34
- Busbar machining CW 120-M, see page 36
- Female die, see page 37

### Female die

The female dies should be used in combination with the respective male die. This allows round holes to be punched in busbars.

**Machinable material:**

- Copper

Diameter mm	Material thickness (max.) mm	Packs of	Model No.
6.6	5	1 pc(s).	<b>4055.770</b>
9	6	1 pc(s).	<b>4055.771</b>
9.5	6	1 pc(s).	<b>4055.772</b>
11	12	1 pc(s).	<b>4055.773</b>
11.5	12	1 pc(s).	<b>4055.774</b>
13.5	12	1 pc(s).	<b>4055.775</b>
14	12	1 pc(s).	<b>4055.776</b>
17.5	12	1 pc(s).	<b>4055.777</b>
18	12	1 pc(s).	<b>4055.778</b>
21	12	1 pc(s).	<b>4055.779</b>
21.5	12	1 pc(s).	<b>4055.780</b>



**Also required:**

- Busbar bending and hole-punching unit CW 120-S, see page 34
- Male die, see page 37
- Busbar machining CW 120-M, see page 36

# Accessories

## for busbar machining CW 120



### Male and female dies for slots

For incorporating slots up to max. 21 x 18 mm into busbars.

**Machinable material:**

- Copper

**Supply includes:**

- Male and female dies for slots

**Note:**

- Slot tools available on request.

Packs of	<b>Model No.</b>
1 pc(s).	<b>4055.791</b>



**Also required:**

- Busbar bending and hole-punching unit CW 120-S, see page 34
- Busbar machining CW 120, see page 36



### Electro-hydraulic pump

The electro-hydraulic pump is used to drive products in the CW 120-S product series.

Oil type	HLP 32
Delivery rate (max.) l/min	1.1
Fill volume l	3.2
Work volume l	2.2
Permissible operating pressure (p. max.) bar	700
Machine dimensions (W x H x D) mm	400 x 325 x 335
Space requirements (W x H x D) mm	402 x 342 x 397
Electrical connection V, Hz	230, 50
Power consumption kW	1.3
Rated current A	5.65
Packs of	1 pc(s).
<b>Model No.</b>	<b>4055.720</b>



### Foot switch

Foot switch including connection cable, for using busbar machining equipment from the CW 120-S range.

Packs of	<b>Model No.</b>
1 pc(s).	<b>4055.712</b>

# Accessories

## for busbar machining CW 120

### Hydraulic cylinder

The hydraulic cylinder is ideal for making cut-outs in sheet steel and stainless steel. It is used in conjunction with the hydraulic pump or the CW 120-M.

**Design:**

- With quick-release coupling

**Benefits:**

- Flexible use in the workshop
- Ergonomic handling
- Allows you to create cut-outs without the application of force

**Machinable material:**

- Sheet steel
- Stainless steel

Punching force t	Packs of	Model No.
11	1 pc(s).	4055.806

**! Also required:**

- Hydraulic hose, see page 39



### Hydraulic hose

The AS hydraulic hose, in combination with the AS hydraulic cylinder, allows round, square and rectangular cut-outs to be punched in sheet steel and stainless steel. It is used in conjunction with the hydraulic pump or the CW 120-M.

**Design:**

- Double-walled

Length m	Packs of	Model No.
3	1 pc(s).	4055.807



### Ride-up roller for busbars

Ride-up roller for user-friendly handling when cutting busbars to size.

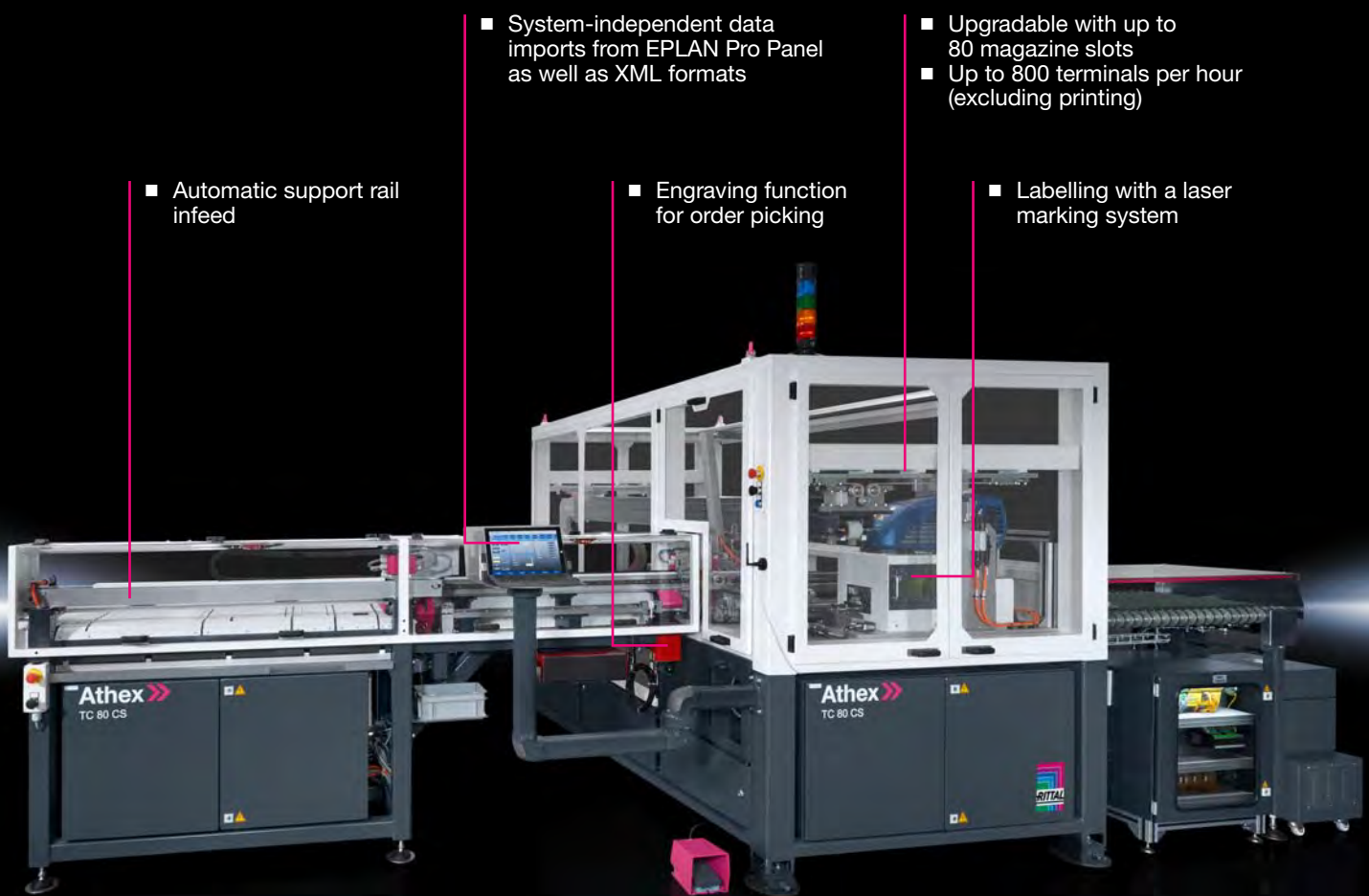
Packs of	Model No.
2 pc(s).	4055.714



# Terminal block assembly centre Athex TC 80 CS



The Athex TC 80 CS terminal block assembly centre handles data from EPLAN Pro Panel or manually configured XML formats. During machining, support rails from the buffer store are measured and automatically cut to size, then marked on the underside with a needle engraver for order-picking/project-planning. In a subsequent operation, the terminals required are either fitted directly on the terminal strip with a gripper system, or optionally labelled with the laser marking system prior to positioning. The finished terminal strip exits the machine via the sorting unit and can then be removed.



Sorting unit and buffer stores for machined terminal strips



Magazine and magazine support for terminal blocks



Automatic terminal block assembly



# Terminal block assembly centre Athex TC 80 CS



The Athex TC 80 CS terminal block assembly machine processes data from EPLAN Pro Panel or manually configured XML formats. During machining, support rails from the buffer store are measured and automatically cut to size, then marked on the underside for order picking / project planning with a needle engraver. In a subsequent operation, the terminals required are either fitted directly on the terminal strip with a gripper system, or optionally labelled with the laser marking system prior to positioning. The finished terminal strip is output from the machine via the sorting unit and can then be removed.

#### Design:

- Measurement device for bar cutting
- Automatic cutting of support rails 35/15 and 35/7.5 (to EN 60 715)
- Needle marking system for labelling the rail underside
- Sorting and buffer stores for machined terminal strips

#### Benefits:

- Optimum accessibility across the entire workspace
- Consistent quality, due to fully automated process
- Simple installation options for extending the terminal magazine
- Ideal cut optimisation, thanks to fully automated measurement of bar wastage

#### Technical specifications:

- Compressed air consumption: approx. 60 l/min (at full load), effective: 10 l/min

#### Note:

- Optionally upgradable with up to 80 magazine slots
- Individual design of the terminal magazines supported. Advance, project-specific completion of the terminals you are using is an essential requirement.

Model No.	Packs of	4050.505	Page
Machine dimensions (W x H x D) mm		6266 x 2354 x 3138	
Power consumption kW		11	
Compressed air connection bar		6	
Support rail type		DIN 35	
Capacity of rail magazine		28	
Type of bar labelling		Engraving	
Rail section mm		100 - 1200	
No. of levels		5	
No. of magazines per level		8	
Machinable terminal width mm		40 - 110	
Machinable terminal height mm		28 - 80	
Machinable terminal thickness mm		3.5 - 20	
Machinable support rail length mm		230 - 3000	
Interfaces		Data import from EPLAN Pro Panel RJ45 Data import in XML formats	
Weight kg		3000.0	
<b>Accessories</b>			
Magazine	1 pc(s).	4050.520	
Magazine support	1 pc(s).	4050.522	
Laser labelling system	1 pc(s).	4050.524	
Rotating device	1 pc(s).	4050.526	
Scanner	1 pc(s).	4050.528	
2-D scanner software	1 pc(s).	4050.530	

# Length-cutting machine C8+ and stripping machine S22

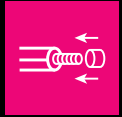


The length-cutting machine C8+ makes work processes more efficient by cutting wires up to 8 mm diameter or 10 mm<sup>2</sup> cross-section to individually set lengths. Cutting orders can also be managed, documented and transmitted to the length-cutting machine C8+ from a PC or CAE data interface (EPLAN Pro Panel) via USB. In this way, the C8+ length-cutting machine additionally supports the cable labelling and wiring process by displaying the source/target code.

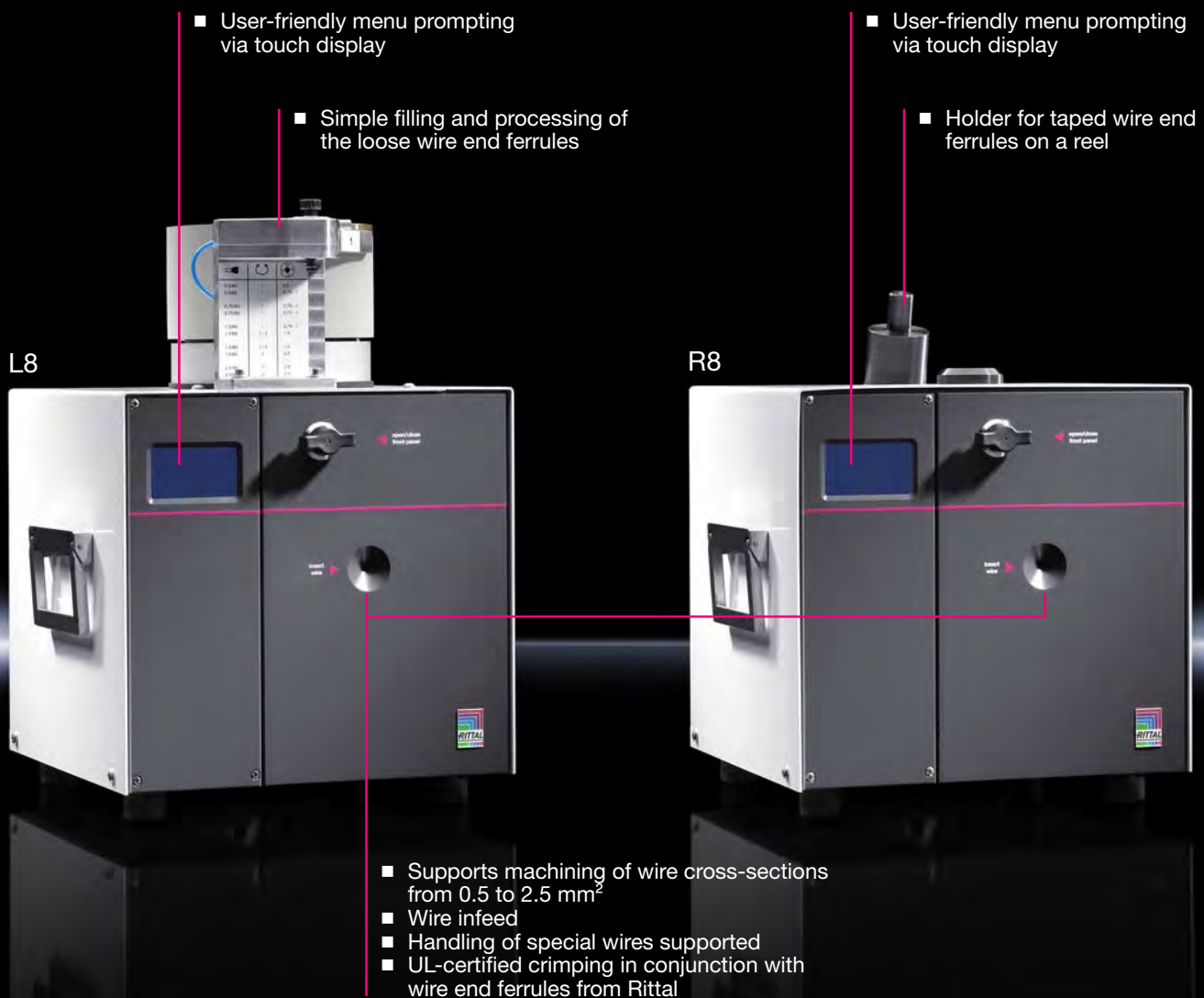
The stripping machine S22 is electrically powered for accurate, careful stripping of the insulation from your wires.



# Stripping and crimping machines L8 and R8



Electro-pneumatically driven wire-stripping and crimping machines for safe, fast processing of insulated wire end ferrules. The bonus feature of these electro-pneumatic crimping machines is fully automated detection of the wire cross-section and processing of the wire end ferrules. No tool changes are required. Linear adjustment of the blades and the high forces generated by the pneumatic crimping unit support the processing of all standard cables as well as special ferrules (AWG) in the application range from 0.5 to 2.5 mm<sup>2</sup> (AWG 20 – 14) with a crimping length of 8 mm. The integrated daily unit counter provides a continuous overview of your project quantities.



# Stripping and crimping machines RC and R8 E



The electro-pneumatically driven wire-stripping and crimping machine RC is suitable for processing wire end ferrules in 8 mm and 10 mm lengths with labelling on the underside. The 5-way holder eliminates the need to switch between wire end ferrules for different cross-sections.

The R8 E crimping machine processes insulated wire end ferrules and standard PVC cables in cross-sections ranging from 0.5 to 2.5 mm<sup>2</sup> (AWG 20 – 14) with a crimping length of 8 mm.

For flexible use in the workshop, all you need is a power connection. Both machines guarantee UL-certified crimping in conjunction with wire end ferrules from Rittal.



**Note:**  
The wire end ferrules shown here are not included with the supply.

# Length-cutting machine C8+



Semi-automated machine for cutting wires to an individually adjustable length.

#### Design:

- With command panel
- Stop & go function

#### Benefits:

- User-friendly operation
- Simple insertion of the wires
- Simple opening of the feed rollers
- PC compatible
- Length-cutting with interface to CAE data supported
- Supports the process of labeling cables by showing the connection point on the display
- Simply transmit projects and orders to length-cutting machine C8+

#### Technical specifications:

- Fine-wire strand 0.08 - 10 mm<sup>2</sup> (AWG 28 - 14)
- Single-wire strand 0.08 - 2.5 mm<sup>2</sup> (AWG 28 - 8)
- For wire lengths 1 - 99999 mm
- Feed rate 0 - 1.5 m/s
- Controllable pressing force of the feed rollers
- DC servo-drive
- Insertion length 27 mm (1.06 in.)

#### Supply includes:

- Length-cutting machine C8+
- Connection cable with connector
- Software connection, CAE data
- Installation CD

Model No.	Packs of	4050.455	Page
Machine dimensions (W x H x D) mm		380 x 470 x 360	
Cycle time s		< 2	
Electrical connection V, ~, Hz		100 - 240, 1~, 50	
Apparent power VA		240	
Interfaces		EPLAN Pro Panel CAE data	
Weight kg		20.0	
<b>Accessories</b>			
Wire dispenser	1 pc(s).	4050.463	51

# Stripping machine S22



Semi-automated machine for stripping wires of varying cross-section ranges.

#### Design:

- Touchscreen display
- Integral counter (total quantity)
- Integral counter (daily quantity)
- Linear adjustment of the wire stripping length

#### Benefits:

- Cross-section is easily set using the rotary knob
- Simple insertion of the wires
- User-friendly operation

#### Technical specifications:

- Electrically powered
- Wire stripping range 0.05 - 6 mm<sup>2</sup> (AWG 30 - 10)
- Insulation stripping length 3 - 20 mm (0.12 - 0.79 in.)
- Draw-off length 3 - 20 mm (0.12 - 0.79 in.)
- Insertion length 22 mm (0.87 in.)

#### Supply includes:

- Stripping machine S22
- Special funnel for inserting thin conductors
- Spare blade

Model No.	Packs of	4050.451	Page
Machine dimensions (W x H x D) mm		190 x 190 x 295	
Cycle time s		0.5	
Electrical connection V, ~, Hz		100 - 240, 1~, 50/60	
Apparent power VA		70	
Weight kg		7.5	

# Crimping machine L8



## Wire end ferrules Page 80

Electro-pneumatically driven wire stripping and crimping machine for loose, insulated wire end ferrules.

### Design:

- Touchscreen display

### Benefits:

- Easy to operate
- Secure, fast processing of insulated wire end ferrules
- No set-up time, thanks to automatic tool change
- Handling of special wires supported
- Simple, quick component mounting
- Automatic detection of cross-sections

### Technical specifications:

- Crimping range 0.5 - 2.5 mm<sup>2</sup> (AWG 20 - 14)
- Crimping length 8 mm (0.31 in.)
- Insertion length 35 mm (1.38 in.)
- Processing of wire end ferrules with plastic collars in special sizes supported

### Supply includes:

- Crimping machine L8
- 1 oscillating conveyor 0.5 - 1.5 mm<sup>2</sup>
- 1 oscillating conveyor 1.5 - 2.5 mm<sup>2</sup>

### Note:

- The standard crimping form is trapezoid – others available on request

Model No.	Packs of	4050.452	Page
Machine dimensions (W x H x D) mm		390 x 460 x 330	
Cycle time s		1.5	
Compression		Trapezoid crimp	
Electrical connection V, ~, Hz		100 - 240, 1~, 50/60	
Apparent power VA		110	
Compressed air connection bar		5.5	
Weight kg		31.0	
<b>Accessories</b>			
Oscillating conveyor		see page	51
Wire end ferrule		see page	80

# Crimping machine R8



## Wire end ferrules Page 80

Electro-pneumatically driven wire stripping and crimping machine for taped wire end ferrules on a reel.

### Design:

- Touchscreen display

### Benefits:

- Easy to operate
- Secure, fast processing of insulated wire end ferrules
- No set-up time, thanks to automatic tool change
- Convenient adjustment of the wire stripper
- Simple, quick component mounting
- Automatic detection of cross-sections
- Handling of special wires supported

### Technical specifications:

- Crimping range 0.5 - 2.5 mm<sup>2</sup> (AWG 20 - 14)
- Crimping length 8 mm (0.31 in.)
- Insertion length 35 mm (1.38 in.)
- Processing of wire end ferrules with plastic collars in special sizes supported

### Note:

- The standard crimping form is trapezoid - others available on request

Model No.	Packs of	4050.453	Page
Machine dimensions (W x H x D) mm		390 x 430 x 330	
Cycle time s		1.5	
Compression		Trapezoid crimp	
Electrical connection V, ~, Hz		100 - 240, 1~, 50/60	
Apparent power VA		25	
Compressed air connection bar		5.5	
Weight kg		23.0	
<b>Accessories</b>			
Wire end ferrule		see page	80



# Crimping machine R8 E



## Wire end ferrules Page 80

Electrically powered wire stripping and crimping machine for taped wire end ferrules on a reel.

### Design:

- Touchscreen display

### Benefits:

- Easy to operate
- Fast adjustment
- Flexible use in the workshop
- Rapid replacement of consumables

### Technical specifications:

- Crimping range 0.5 - 2.5 mm<sup>2</sup> (AWG 20 - 14)
- Crimping length 8 mm (0.31 in.)
- Insertion length 40 mm (1.57 in.)

### Note:

- The standard crimping form is trapezoid – others available on request

Model No.	Packs of	4050.454	Page
Machine dimensions (W x H x D) mm		288 x 230 x 345	
Cycle time s		1.8	
Compression		Trapezoid crimp	
Electrical connection V, ~, Hz		100 - 240, 1~, 50/60	
Apparent power VA		100	
Weight kg		16.0	
<b>Accessories</b>			
Wire end ferrule		see page	80

# Crimping machine RC



## Wire end ferrules Page 80

Electro-pneumatic crimping machine with 5-way magazine for processing insulated wire end ferrules on a reel.

### Design:

- Touchscreen display
- Select the wire cross-section via touchscreen
- Support may be fitted with a maximum of 23,000 wire end ferrules

### Benefits:

- Easy to operate
- Secure, fast processing of insulated wire end ferrules
- No set-up time, thanks to automatic tool change
- Simple, quick component mounting
- No changing of the wire end ferrules required due to 5-way magazine

### Technical specifications:

- Crimping range 0.5 - 2.5 mm<sup>2</sup> (AWG 20 - 14)
- Crimping length 8 and 10 mm
- Insertion length 27 mm (1.06 in.)

### Note:

- The standard crimping form is trapezoid – others available on request

Model No.	Packs of	4050.456	Page
Machine dimensions (W x H x D) mm		335 x 565 x 485	
Cycle time s		< 2	
Compression		Trapezoid crimp	
Electrical connection V, ~, Hz		100 - 240, 1~, 50/60	
Apparent power VA		16	
Compressed air connection bar		5.5	
Weight kg		22.0	
<b>Accessories</b>			
Wire end ferrule		see page	80

# Accessories

## for wire processing machines

### Oscillating conveyor

#### for crimping machine L8

Feed guide for loose wire end ferrules.

#### Benefits:

- Accurate, careful feeding of wire end ferrules

To fit Model No.	Application	Packs of	Model No.
4050.452	for loose wire end ferrules with cross-section 0.5 – 1.5 mm <sup>2</sup>	1 pc(s).	<b>4050.467</b>
4050.452	for loose wire end ferrules with cross-section 1.5 – 2.5 mm <sup>2</sup>	1 pc(s).	<b>4050.468</b>



### Wire dispenser

#### for length-cutting machine

Dispensing device for the infeed of conductors. Suitable for conductors on cable coils or from boxes.

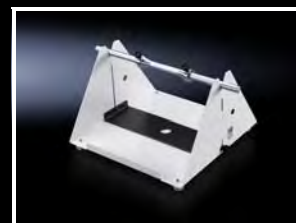
#### Benefits:

- Convenient removal and dispensing of cables and wires

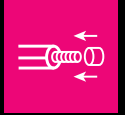
#### Technical specifications:

- Cable coil diameter  $\leq$  300 mm ( $\leq$  11.8 in.)
- Cable coil width  $\leq$  200 mm ( $\leq$  7.9 in.)
- Clamping cone 15 - 23 mm (0.59 - 0.91 in.)
- Box dimensions 240 x 250 x 150 mm (9.45 x 9.84 x 5.9 in.)

Packs of	Model No.
1 pc(s).	<b>4050.463</b>



# Wire Terminal WT fully automated wire processing machine



The compact Wire Terminal 24 or 36 fully automated wire processing machine ensures efficient, cost-effective wire processing. Up to 36 different wires in cross-sections ranging from 0.5 mm<sup>2</sup> to 2.5 mm<sup>2</sup> may be processed fully automatically without retooling. The optional print system prints the wires in black or white, then transfers them to downstream process stages via a controlled ordering system capable of accommodating up to 1300 processed wires. All production data can be read and processed via suitable interfaces. Manual logging of wire lists is likewise supported.



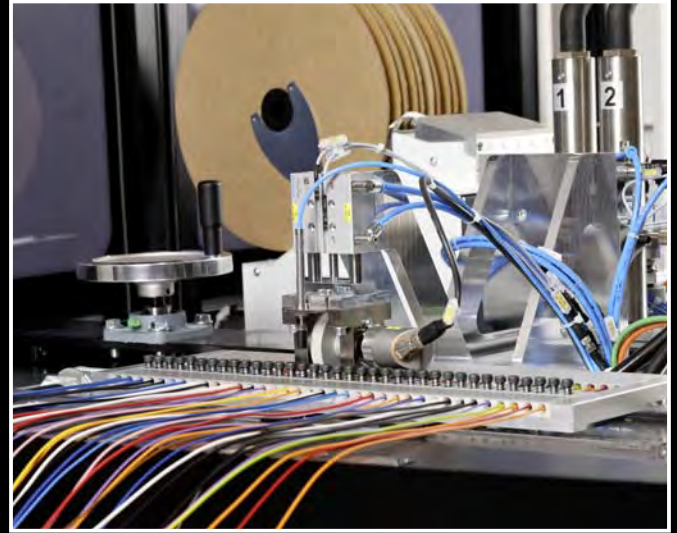
- Integral touch display for data processing

- Label printer for wire magazine identification



#### Wire storage

The modular, space-saving wire store and wire routing system for the Wire Terminal. Six wire drums are stored on each of the two levels in a space-saving design. Depending on the number of wires used, the fully automatic wire processing machine may be fitted with additional wire stores (central, left, right), each with space for 12 wire containers (see table on page 55 for selection).



#### 24 or 36 wires

The Wire Terminal may be fitted with wire guides for 24 or 36 wires. Wires are fed in via a 24-/36-wire feed magazine which is horizontally adjustable and controlled via a servo-motor NC axis. Wires are clamped by a spring-assisted clamp which is pneumatically released during the wire feed process.



#### Wire labelling and processing

To ensure optimum positioning of the origin/destination on the wires, the Wire Terminal may be fitted with black, white or both marking systems. Multiple insulation stripping and crimping machines may also be integrated via an optional lift.



#### Selection of wire magazines

The processed wires are sorted into their individual orders by the removal handling system in the removal unit, to which end up to 13 wire rails are inserted in the removal magazine. A servomotor-controlled linear guide monitored by a limit switch positions the removal magazine horizontally on the rail.

# Wire Terminal WT fully automated wire processing machine



The new, compact Wire Terminal WT fully automated wire processing machines produce up to 36 different wires in cross-sections ranging from 0.5 mm<sup>2</sup> to 2.5 mm<sup>2</sup> fully automatically, with zero manual intervention.

#### **Design:**

- For fully automatic processing of wire lists for wire assembly
- Optional management of 24 or 36 wires
- Suitable wire stores are selected depending on the number of wires
- When using multiple crimping machines for different cross-sections, the machine may be fitted with a lift option
- Without a lift option, the stripping and crimping machine RC is the ideal choice
- The machine configuration includes a 13-way storage system with wire magazines

#### **Benefits:**

- Faster processes thanks to fully automated wire processing with individual wire printing and order-picking
- Fully interlinked, from the E-CAD tool through to the production processes
- Make your wire assembly production process 8 times faster
- Continuous top quality
- Investment amortisation period of 2.5 years from a minimum of 300 enclosures per annum
- Assembled wires from the ordering system can be processed in the subsequent enclosure wiring process stage with the “Smart Wiring” tool from Eplan

#### **Supply includes:**

- Machine frame and encapsulation
- Integral display
- Wire clamp system
- Wire cutting module
- Locator for wire labelling unit
- Turntable and wire routing
- 26 wire magazines as per requirements
- Label printer for wire magazine identification

#### **Machinable material:**

- Fine-wire copper cables to DIN VDE 0295 Category 5

#### **Note:**

- Please talk to your Rittal sales consultant about a bespoke machine configuration.

# Wire Terminal WT fully automated wire processing machine

Model No.	P. of	4051.024	4051.036	Page
Version		Managing 24 wires	Managing 36 wires	
Machine dimensions (W x H x D) mm		1950 x 2220 x 1800	1950 x 2220 x 1800	
Footprint size including 2 wire stores (W x H x D) mm		1950 x 2250 x 4000	1950 x 2250 x 4000	
Footprint size including 3 wire stores (W x H x D) mm		3610 x 2250 x 4000	3610 x 2250 x 4000	
Wires per hour approx.		240	240	
Compressed air connection (bar)		6	6	
Power consumption (kW approx.)		1	1	
Electrical connection (V, ~, Hz)		400, 3~, 50	400, 3~, 50	
Frequency (Hz)		50	50	
Control voltage V (DC)		24	24	
Wire Terminal weight (kg)		1100	1100	
Weight per wire store, unloaded (kg)		130	130	
Eplan interfaces		Pro Panel Smart Wiring	Pro Panel Smart Wiring	
Safety devices		The machine interior is fully encapsulated. The machine zone allows access from 4 sides, monitored via contactless safety limit switches on the bifold doors.		

## Also required

Crimping machine R8-I	1 pc(s).	4051.021	4051.021	
Crimping machine RC-I	1 pc(s).	4051.020	4051.020	
Wire end ferrules	1 pc(s).	see page	see page	80
Wire store for WT, central unit	1 pc(s).	4051.026	4051.026	
Wire store for WT, additional module, left	1 pc(s).	4051.027	4051.027	
Wire store for WT, additional module, right	1 pc(s).	4051.028	4051.028	

## Machine option

Lift option	1 pc(s).	4051.025	4051.025	
Printer option, black	1 pc(s).	4051.029	4051.029	
Printer option, white	1 pc(s).	4051.030	4051.030	
Wire rail magazine 0.5 mm <sup>2</sup>	1 pc(s).	4051.040	4051.040	
Wire rail magazine 0.75 mm <sup>2</sup>	1 pc(s).	4051.041	4051.041	
Wire rail magazine 1.0 mm <sup>2</sup>	1 pc(s).	4051.042	4051.042	
Wire rail magazine 1.5 mm <sup>2</sup>	1 pc(s).	4051.043	4051.043	
Wire rail magazine 2.5 mm <sup>2</sup>	1 pc(s).	4051.044	4051.044	

# Assembly frames and LT 1000 storage and transport trolley



We have the perfect ergonomic solution for you, particularly when it comes to the automation and rationalisation of every stage of the enclosure machining, assembly, wiring and testing process. Our assembly frames are mobile, tiltable and (depending on the version) height-adjustable for machining mounting plates and enclosures. All types offer simple, variable fixing of mounting plates using quick-release fasteners, are independent from the mains power, and take up minimal space when not in use. For easier handling of enclosure panels, we also offer the storage and transport trolley LT 1000.

- Tilt-adjustable and optionally height-adjustable for ergonomic, effective, time-saving construction, wiring and testing of mounting plates or complete enclosures

Numerous adaptation options available:

- Widening to a maximum of 1900 mm
- Wire routing
- Wire reel holder

More options from page 58

- Individually adjustable thanks to height-adjustable fan supports



- Four castors including total lock function ensure simple handling



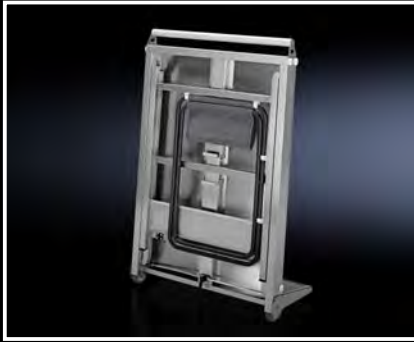
- Eight wide fan sections for effortless storage and transportation of enclosure panels
- User-friendly transportation through the workshop on castors



# Functional trolley



The functional trolley is a veritable multi-talent. Whether for transporting materials and tools to the installation site or for commissioning, the functional trolley is perfectly suited for assembly technicians and service personnel. The sophisticated fold-out concept is the ideal solution when you are on the road, and its compact dimensions mean that it can be conveniently transported by car.



Folds together for space-saving transportation

- Made from V2A stainless steel for robustness and durability
- Computer mouse-friendly surface
- Converts from a transport function to a practical desk by simply unfolding

The image shows the functional trolley in two states. On the left, it is folded into a vertical panel. The panel has text on it: "Rittal - Das System. Schneller - besser - überall." and "RITTAL". At the bottom, there is a QR code and the text "Visit: Rittal Automation Systems Funktionstisch" and "NO STEP". On the right, the trolley is unfolded into a desk. The desk has a flat top surface and four legs. A red line connects the text "Computer mouse-friendly surface" to the desk top. Another red line connects the text "Converts from a transport function to a practical desk by simply unfolding" to the legs of the desk.

# Assembly frame



## Accessories Page 59

The assembly frames are mobile, tiltable and (depending on the version) height-adjustable frames for assembling plates and enclosures.

### Benefits:

- For ergonomic, back-friendly working
- Individually positionable in the workshop, as it is independent from the power network
- Minimum space requirements during non-use
- Simple handling due to four castors including total lock function
- Variable fixing of mounting plates with a quick-release fastener

### Technical specifications:

- Tilt adjustment approx. 0 - 80°

### Supply includes:

- Assembly frame
- 1 clamping unit pack, bottom
- 1 clamping unit pack, top

### Note:

- With the assembly frame extension, a maximum machining area of 1900 x 1900 mm can be achieved.

Model No.	Packs of	4050.150	4050.200	4050.300	Page
Design		150 MN (manually tilt-adjustable)	200 EN (electrically tilt-adjustable)	300 ENH (electrically tilt- and height-adjustable)	
Dimensions (W x D) mm		1400 x 1250	1400 x 1250	1400 x 1250	
Product-specific scope of supply		-	Charger unit Battery	Charger unit Battery	
Dimensions of support surface (W x H) min. mm		1110 x 1230	1110 x 1230	1110 x 1230	
Dimensions of support surface (W x H) max. mm		1110 x 1900	1110 x 1900	1110 x 1900	
Load capacity kg		150	200	300	
Working height (min./max.) cm		100 / 100	90 / 90	80 / 110	
Weight kg		138.0	148.0	250.0	
<b>Accessories</b>					
Extension	1 pc(s).	4050.210	4050.210	4050.210	59
Enclosure set	1 pc(s).	4050.211	4050.211	4050.211	59
Wire routing	1 pc(s).	4050.212	4050.212	4050.212	59
Clamping unit		see page	see page	see page	59
Wire reel holder	1 pc(s).	4050.216	4050.216	4050.216	60
Screw adaptor	1 pc(s).	4050.218	4050.218	4050.218	60
Set of brackets	1 pc(s).	4050.221	4050.221	4050.221	61
Roller conveyor	1 pc(s).	-	-	4050.220	60
Spare battery	1 pc(s).	-	4050.217	4050.217	60
Voltage supply	1 pc(s).	-	4050.219	4050.219	61
Connection adaptor	1 pc(s).	-	4050.222	4050.222	61

# Accessories

## for assembly frame

### Extension

#### for assembly frame

For widening assembly frames 150 MN, 200 EN, 300 ENH to a maximum width of 1900 mm.

#### Supply includes:

- Extension
- Assembly parts

To fit Model No.	Packs of	Model No.
4050.150/4050.200/ 4050.300	1 pc(s).	<b>4050.210</b>



### Enclosure set

#### for assembly frame

For secure attachment of an enclosure such as AE or AX to assembly frames 150 MN, 200 EN, 300 ENH.

#### Supply includes:

- Packs of 2

To fit Model No.	Packs of	Model No.
4050.150/4050.200/ 4050.300	1 pc(s).	<b>4050.211</b>



### Wire routing

#### for assembly frame

For user-friendly handling of wires on assembly frames 150 MN, 200 EN, 300 ENH.

To fit Model No.	Packs of	Model No.
4050.150/4050.200/ 4050.300	1 pc(s).	<b>4050.212</b>



### Clamping unit

#### for assembly frame

For secure attachment of a mounting plate onto the assembly frames 150 MN, 200 EN and 300 ENH.

To fit Model No.	For	Design	Product-specific scope of supply	Packs of	Model No.
4050.150/ 4050.200/ 4050.300	Mounting plate VX/TS/SE	Top	1 clamping unit pack, top	1 pc(s).	<b>4050.213</b>
4050.150/ 4050.200/ 4050.300	Mounting plate VX/TS/SE	Bottom	1 clamping unit pack, bottom	1 pc(s).	<b>4050.214</b>



# Accessories

## for assembly frame



### Wire reel holder

#### for assembly frame

For adapting wire reels or drums on assembly frames 150 MN, 200 EN and 300 ENH.

To fit Model No.	Packs of	Model No.
4050.150/4050.200/ 4050.300	1 pc(s).	<b>4050.216</b>



### Spare battery

#### for assembly frame

Battery to fit electrical tilt/height adjuster for assembly frames 200 EN, 300 ENH.

To fit Model No.	Packs of	Model No.
4050.200/4050.300	1 pc(s).	<b>4050.217</b>

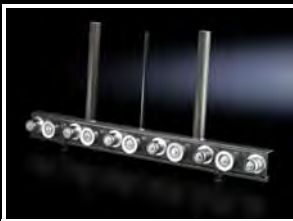


### Screw adaptor

#### for spindle hoist

For operating the assembly frame spindle drive using a cordless screwdriver. To fit assembly frame 150 MN.

To fit Model No.	Packs of	Model No.
4050.150	1 pc(s).	<b>4050.218</b>



### Roller conveyor

#### for assembly frame

For inserting the mounting plate sideways into the enclosure. To fit assembly frame 300 ENH.

To fit Model No.	Packs of	Model No.
4050.300	1 pc(s).	<b>4050.220</b>

# Accessories

## for assembly frame

### Set of brackets

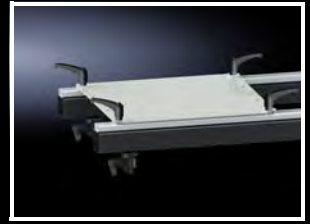
#### for assembly frame

For secure attachment of a mounting plate onto the assembly frames 150 MN, 200 EN, 300 ENH.

#### Supply includes:

- 4 cover caps
- 12 handles
- 2 holders
- 16 washers
- 12 sliding blocks

To fit Model No.	For	Packs of	Model No.
4050.150/ 4050.200/ 4050.300	Mounting plate AE/AX	1 pc(s).	<b>4050.221</b>



### Voltage supply

#### for assembly frame

Charging station power pack for assembly frames 200 EN and 300 ENH.

To fit Model No.	Suitable for rated operating voltage	Packs of	Model No.
4050.200/ 4050.300	110 V	1 pc(s).	<b>4050.219</b>



#### Also required:

- Connection adaptor, see page 61



### Connection adaptor

#### for voltage supply

Adaptor connector for the power supply to assembly frames 200 EN and 300 ENH.

#### Design:

- USA, Canada, Central and South America, Japan

To fit Model No.	Packs of	Model No.
4050.200/4050.300	1 pc(s).	<b>4050.222</b>



#### Also required:

- Voltage supply, see page 61



# Storage and transport trolley LT 1000



The LT 1000 warehouse and transport trolley is used for storage and order picking, and ensures easy handling of enclosure panels such as mounting plates, enclosure doors, side panels and rear panels.

**Design:**

- 2 fan supports each with 8 slots, distance between tubes 100 mm

**Benefits:**

- Individually adjustable thanks to height-adjustable supports
- Effortless storage and transportation of enclosure panels
- User-friendly transportation on industrial castors
- Fan support, powder-coated, protects enclosure panels such as doors, side panels etc. from scratches and damage.

**Material:**

- Base plate: Plastic
- Fan support: Steel, powder-coated

Model No.	Packs of	4050.000	Page
Transport dimensions (W x H x D) mm		1000 x 1500 x 1000	
Load capacity kg		500	
Weight kg		122.0	

# Functional trolley



Whether for transporting essential materials and tools to the installation site or for commissioning, the functional trolley's fold-out system is the ideal solution for assembly technicians and service personnel.

**Benefits:**

- Table surface suitable for computer mouse
- Converts from its transport function to a practical desk by simply unfolding
- High level of resilience and robustness

**Material:**

- Functional trolley: Stainless steel 1.4301 (AISI 304)
- Work surface: Plastic coating
- Seat surface: Woven polyester fabric, coated in PVC

**Load capacity:**

- Handcart (max. 20 kg)
- Table (max. 30 kg)
- Folding chair (max. 100 kg)

**Supply includes:**

- Functional trolley
- Folding chair

Model No.	Packs of	4050.130	Page
Transport dimensions (W x H x D) mm		610 x 1000 x 85	
Handcart dimensions (W x H x D) mm		300 x 610 x 1000	
Table dimensions (W x H x D) mm		1290 x 780 x 610	
Weight kg		20.0	

# No-one knows your machines better than the manufacturer

**Rittal Manufacturer's Service specialists safeguard the availability and performance of your machine – at plannable cost.**









Preventive maintenance to keep production running smoothly. Your machines represent the heart of your business. Unplanned downtime can easily lead to delivery bottlenecks, leaves your customers dissatisfied and literally costs you money. With our individual service concepts, we safeguard the availability of your Perforex machining centre BC, Perforex laser centre LC or Secarex cutting centre.












# Optimum support – direct from the manufacturer

## The benefits of preventive maintenance

-  Maximum production reliability and a long service life for your machines
-  Rittal Manufacturer's Service – qualified Rittal service technicians
-  Plannable costs – fixed and transparent terms, including a reduced hourly rate
-  Fast problem rectification and guaranteed response times
-  We are on hand to assist you around the clock
-  Remote service
-  Maintenance in accordance with DIN 31 051/DIN EN 13 306
-  Original spare parts

## Individual service packages

Opt for an individual service contract for your Perforex machining centre BC, Perforex laser centre LC or cutting centre Secarex AC18 today. Combine the standard contract with optional modules, for service tailored optimally to your particular needs. In this way, you can calculate your service budget for the coming years.

		Scope of services included in standard contract	Optional contract modules
Maintenance		1x per year	2x per year
Availability		Working days (Mon – Fri) 7 a.m. – 5 p.m.	24/7/365
On-site service		Within 72 hours, incl. reduced hourly rate	Within 48 hours, incl. reduced hourly rate
Warranty of the machine		No warranty extension	+ 12 months
Individual spare parts stocks		On request	
DXF training Remote		One training session	
Software update		As necessary (but excluding hardware/PC or operating system replacement)	

The scope of services in the table above applies to Germany only.  
Please contact your Rittal subsidiary to ask about service packages in your country: [www.rittal.com/contact](http://www.rittal.com/contact)

# The right tool for every application!

All from a single source – Rittal offers a comprehensive range of hand-held tools for professional support with your work operations. All the machining and handling technology you need for time-saving and cost-cutting manufacturing processes, all from a single source.



- Screwdrivers, insulated
- Screwdrivers, uninsulated

- Tools for cable processing

- Pliers
- Cutting tools

- Bits
- Bit holders

- Manual and electric hand-held hydraulic punches

- Hole punches

## Tool bag

### configured

Configured tool bag comprising a selected range of Rittal hand tools, designed especially for electricians. The practical, high-quality shoulder bag may be used either as a tool bag or laptop case.

### Design:

- 19 separate compartments for tools
- Cushioned compartment for laptop or tablet
- Document wallet
- Two additional storage pockets inside

### Benefits:

- Careful storage
- Shoulder pad for comfortable carrying
- Flexible use

### Material:

- Polyester

### Supply includes:

- Screwdriver, insulated SL 3.5 x 0.6 (Model No.: 4052.102), SL 6 x 1.2 (Model No.: 4052.107), PZ 2 (Model No.: 4052.122)
- Screwdriver, non-insulated PZ 2 (Model No.: 4052.022), SL 6 x 1.2 (Model No.: 4052.011), TX 20 (Model No.: 4052.055), TX 25 (Model No.: 4052.056), TX 30 (Model No.: 4052.058)
- Bit holder with handle, magnetic (Model No.: 4053.300)
- Bit set with bit holder, 7-piece (Model No.: 4053.420)
- Crimping pliers for wire end ferrules, for cross-section 0.5 - 6 mm<sup>2</sup>, square crimp (Model No.: 4054.001)
- Wire stripper for wire end ferrules, for cross-section 0.02 - 11 mm<sup>2</sup> (Model No.: 4054.300)
- Stripping tools for cables Ø 2.5 - 11 mm (Model No.: 4054.400), for cables Ø 8 - 13 mm (Model No.: 4054.405)
- Side cutter for cables Ø 0.2 - 11 mm (Model No.: 4054.600)
- Electrician's scissors for cables Ø 0.1 - 3.7 mm (Model No.: 4054.700)
- Combination pliers with insulated handle (Model No.: 4054.800)
- Needle-nose pliers with insulated handle (Model No.: 4054.850)
- Tool bag (Model No.: 4053.000)

Width mm	Height mm	Depth mm	Packs of	Model No.
420	340	190	1 pc(s).	<b>4053.500</b>

## Tool bag

### unconfigured

The practical, high-quality shoulder bag may be used either as a tool bag or laptop case.

### Design:

- 19 separate compartments for tools
- Cushioned compartment for laptop or tablet
- Document wallet
- Two additional storage pockets inside

### Benefits:

- Careful storage
- Shoulder pad for comfortable carrying
- Flexible use

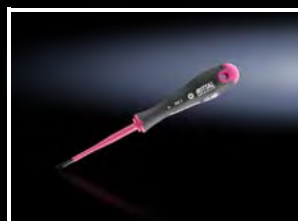
### Material:

- Polyester

Width mm	Height mm	Depth mm	Packs of	Model No.
420	340	190	1 pc(s).	<b>4053.000</b>



# Screwdriver



## Screwdriver

### insulated

With a long, slender handle and high-performance tip with non-transfer insulation.

### Design:

- Isolation protection 1000 V

### Benefits:

- Minimal force required, thanks to ergonomically styled handle
- Handle head with anti-roll protection and clear screw labelling
- Black coated blade tip to preserve precision and accuracy of fit
- Handle 30% and insulation up to 50% slimmer than comparable tools
- Optimum interconnection of hand and handle supports higher torques and longer, fatigue-free working

### Material:

- Blade: Chrome-molybdenum-vanadium alloy
- Handle core: Hard plastic
- Handle body: Elastic, highly flexible plastic

### Colour:

- Handle: Anthracite and Rittal Power Pink

### Standards:

- IEC 60 900

### Approvals:

- VDE
- TÜV-tested safety

### For slot-head screws

Blade tip	Blade (width x thickness) mm	Blade length mm	Blade dia. mm	Handle length mm	Handle dia. mm	Packs of	Model No.
SL	3 x 0.5	100	3.5	105	25	1 pc(s).	<b>4052.101</b>
SL	3.5 x 0.6	100	3.5	105	25	1 pc(s).	<b>4052.102</b>
SL	4 x 0.8	100	4	105	25	1 pc(s).	<b>4052.104</b>
SL	5.5 x 1	125	5.5	115	27	1 pc(s).	<b>4052.106</b>
SL	6.5 x 1.2	125	6.5	115	27	1 pc(s).	<b>4052.107</b>

### For pozidrive screws

Blade tip	Blade (width x thickness)	Blade length mm	Blade dia. mm	Handle length mm	Handle dia. mm	Packs of	Model No.
PZ 1	–	80	4.5	105	25	1 pc(s).	<b>4052.121</b>
PZ 2	–	100	6	115	27	1 pc(s).	<b>4052.122</b>

### For Phillips-head screws

Blade tip	Blade (width x thickness)	Blade length mm	Blade dia. mm	Handle length mm	Handle dia. mm	Packs of	Model No.
PH 1	–	80	4.5	105	25	1 pc(s).	<b>4052.131</b>
PH 2	–	100	6	115	27	1 pc(s).	<b>4052.132</b>

### For plus/minus

Blade tip	Blade (width x thickness)	Blade length mm	Blade dia. mm	Handle length mm	Handle dia. mm	Packs of	Model No.
Z 1	–	80	4.5	105	25	1 pc(s).	<b>4052.141</b>
Z 2	–	100	6	115	27	1 pc(s).	<b>4052.142</b>

## Screwdriver set

### insulated

Multi-part screwdriver set. With a long, slender handle and high-performance tips with non-transfer insulation.

### Design:

- Isolation protection 1000 V

### Benefits:

- Minimal force required, thanks to ergonomically styled handle
- Handle head with anti-roll protection and clear screw labelling
- Black coated blade tip to preserve precision and accuracy of fit
- Handle 30% and insulation up to 50% slimmer than comparable tools

### Material:

- Blade: Chrome-molybdenum-vanadium alloy
- Handle core: Hard plastic
- Handle body: Elastic, highly flexible plastic

### Colour:

- Handle: Anthracite and Rittal Power Pink

### Supply includes:

- Set with 5 screwdrivers

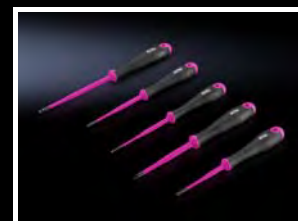
### Standards:

- IEC 60 900

### Approvals:

- VDE
- TÜV-tested safety

Blade tip	Packs of	Model No.
SL 3 x 0.5 mm SL 4 x 0.8 mm SL 5.5 x 1 mm PH 1 PH 2	1 pc(s).	<b>4052.210</b>
SL 3 x 0.5 mm SL 4 x 0.8 mm SL 5.5 x 1 mm PZ 1 PZ 2	1 pc(s).	<b>4052.211</b>
SL 3 x 0.5 mm SL 4 x 0.8 mm PH 1 PH 2 Z 2	1 pc(s).	<b>4052.212</b>



# Screwdriver



## Screwdriver

### uninsulated

Ergonomic screwdriver which adapts perfectly to the hand, thereby minimising the force required.

### Benefits:

- Handle head with anti-roll protection and clear screw labelling
- Black coated blade tip to preserve precision and accuracy of fit
- Optimum interconnection of hand and handle supports higher torques and longer, fatigue-free working

### Material:

- Blade: Chrome-molybdenum-vanadium alloy
- Handle core: Hard plastic
- Handle body: Elastic, highly flexible plastic

### Colour:

- Handle: Anthracite and Rittal Power Pink

### Approvals:

- TÜV-tested safety

### For slot-head screws

Blade tip	Blade (width x thickness) mm	Blade length mm	Blade dia. mm	Handle length mm	Handle dia. mm	Packs of	Model No.
SL	2.5 x 0.4	75	2.5	86	25	1 pc(s).	4052.001
SL	3.5 x 0.6	100	3.5	86	25	1 pc(s).	4052.003
SL	4 x 0.8	100	4	94	30	1 pc(s).	4052.004
SL	5.5 x 1	150	5	101	33	1 pc(s).	4052.007
SL	6.5 x 1.2	150	6	106	36	1 pc(s).	4052.011
SL	8 x 1.2	175	7	112	39	1 pc(s).	4052.014
SL	5.5 x 1	25	5	60	21	1 pc(s).	4052.018

### For pozidrive screws

Blade tip	Blade (width x thickness)	Blade length mm	Blade dia. mm	Handle length mm	Handle dia. mm	Packs of	Model No.
PZ 1	–	80	4.5	94	30	1 pc(s).	4052.021
PZ 2	–	100	6	106	36	1 pc(s).	4052.022

### For Phillips-head screws

Blade tip	Blade (width x thickness)	Blade length mm	Blade dia. mm	Handle length mm	Handle dia. mm	Packs of	Model No.
PH 1	–	80	4.5	94	30	1 pc(s).	4052.031
PH 2	–	100	6	106	36	1 pc(s).	4052.032
PH 2	–	25	6	60	21	1 pc(s).	4052.038

### For multi-tooth screws

Blade tip	Blade (width x thickness)	Blade length mm	Blade dia. mm	Handle length mm	Handle dia. mm	Packs of	Model No.
TX 10	–	100	3.5	86	25	1 pc(s).	4052.053
TX 15	–	100	4	94	30	1 pc(s).	4052.054
TX 20	–	100	5	101	33	1 pc(s).	4052.055
TX 25	–	100	5	106	36	1 pc(s).	4052.056
TX 30	–	115	6	112	39	1 pc(s).	4052.058

# Screwdriver

## Screwdriver set

### uninsulated

Multi-part screwdriver set.

#### Benefits:

- Minimal force required, thanks to ergonomically styled handle
- Handle head with anti-roll protection and clear screw labelling
- Black coated blade tip to preserve precision and accuracy of fit

#### Material:

- Blade: Chrome-molybdenum-vanadium alloy
- Handle core: Hard plastic
- Handle body: Elastic, highly flexible plastic

#### Colour:

- Handle: Anthracite and Rittal Power Pink

#### Approvals:

- TÜV-tested safety

Blade tip	Product-specific scope of supply	Packs of	Model No.
SL 3.5 x 0.6 mm SL 6.5 x 1.2 mm PZ 1 PZ 2 PH 1 PH 2	6-part set	1 pc(s).	<b>4052.200</b>
PH 1 PH 2 TX 15 TX 20 TX 25 TX 30	6-part set	1 pc(s).	<b>4052.201</b>
TX 10 TX 15 TX 20 TX 25 TX 30	5-part set	1 pc(s).	<b>4052.202</b>



## Interchangeable screwdriver set

### uninsulated

13-piece tool set with comfortable, foldable, lockable handle.

#### Technical specifications:

- PH 1 - SL 4 x 0.8 mm
- PH 2 - PH 3
- PZ 1 - SL 5 x 0.8 mm
- PZ 2 - SL 6 x 1 mm
- PZ 3 - SL 7 x 1.2 mm
- TX 6 - TX 7
- TX 8 - TX 9
- TX 10 - TX 15
- TX 20 - TX 25
- TX 30 - TX 40
- Hex socket 3 mm - hex socket 4 mm
- Hex socket 5 mm - hex socket 6 mm

#### Material:

- Blade: Chrome-molybdenum-vanadium alloy
- Handle core: Hard plastic
- Handle body: Elastic, highly flexible plastic

#### Colour:

- Handle: Anthracite and Rittal Power Pink

#### Supply includes:

- Combined blade holder: Screwdriver and T handle
- 12 blades each with 2 tips
- Storage box

Blade length mm	Handle length mm	Handle dia. mm	Packs of	Model No.
160	105	39	1 pc(s).	<b>4053.450</b>



# Hex wrench



## Hex wrench set

### for Allen screws

Hex wrench with optimum, narrow-tolerance hexagonal profiles and precise ballhead geometry. The extra-long design achieves a greater leverage effect.

### Benefits:

- Up to 30% more corrosion resistance
- Optimum hardness and elasticity
- Intensive leverage effect
- Special geometry in the critical zone

### Technical specifications:

- For hex socket: 1.27 - 1.5 - 2.0 - 2.5 - 3.0 - 3.5 - 4.0 - 4.5 - 5.0 - 5.5 - 6.0 - 7.0 - 8.0 - 9.0 - 10.0 mm

### Supply includes:

- 15 hex wrenches
- Storage box

Packs of	Model No.
1 pc(s).	<b>4052.480</b>



## Industrial bit for cordless screwdrivers

### with long shaft

Precisely manufactured screwdriver with a long shaft for industrial use.

#### Benefits:

- Maximum hardness and torque values

#### Technical specifications:

- Tool adaptation E 6.3 (¼")

#### Material:

- High-quality special tool steel

#### For slot-head screws

Blade tip	Blade (width x thickness) mm	Length mm	Blade dia. mm	Packs of	Model No.
SL	3.5 x 0.6	73	6.3	3 pc(s).	<b>4053.002</b>
SL	4 x 0.8	73	6.3	3 pc(s).	<b>4053.003</b>

#### For pozidrive screws

Blade tip	Blade (width x thickness)	Length mm	Blade dia. mm	Packs of	Model No.
PZ 1	–	73	6.3	3 pc(s).	<b>4053.011</b>
PZ 2	–	73	6.3	3 pc(s).	<b>4053.012</b>

#### For Phillips-head screws

Blade tip	Blade (width x thickness)	Length mm	Blade dia. mm	Packs of	Model No.
PH 1	–	73	6.3	3 pc(s).	<b>4053.021</b>
PH 2	–	73	6.3	3 pc(s).	<b>4053.022</b>

#### For plus/minus

Blade tip	Blade (width x thickness)	Length mm	Blade dia. mm	Packs of	Model No.
Z 1	–	73	6.3	3 pc(s).	<b>4053.031</b>
Z 2	–	73	6.3	3 pc(s).	<b>4053.032</b>

#### For multi-tooth screws

Blade tip	Blade (width x thickness)	Length mm	Blade dia. mm	Packs of	Model No.
TX 10	–	73	6.3	3 pc(s).	<b>4053.041</b>
TX 15	–	73	6.3	3 pc(s).	<b>4053.042</b>
TX 20	–	73	6.3	3 pc(s).	<b>4053.043</b>
TX 25	–	73	6.3	3 pc(s).	<b>4053.044</b>
TX 27	–	73	6.3	3 pc(s).	<b>4053.045</b>
TX 30	–	73	6.3	3 pc(s).	<b>4053.046</b>
TX 40	–	73	6.3	3 pc(s).	<b>4053.047</b>



# Bits and bit holders



## Industrial bit set for cordless screwdriver

### with long shaft

Precisely manufactured screwdriver with a long shaft for industrial use.

#### Benefits:

- Robust viewing box
- Secure storage

#### Technical specifications:

- Tool adaptation E 6.3 (1/4")

#### Material:

- High-quality special tool steel

#### Supply includes:

- Set with 6 bits
- Viewing box

Blade tip	Length mm	Packs of	Model No.
SL 3.5 x 0.6 mm SL 4 x 0.8 mm SL 5.5 x 1 mm PH 1 PH 2 PZ 2	73	1 pc(s).	<b>4053.400</b>
TX 10 TX 15 TX 20 TX 25 TX 30 TX 40	73	1 pc(s).	<b>4053.410</b>



## Bit set

### with bit holder

7-piece bit set with a practical assortment of quality bits with a short shaft and magnetic holder.

#### Benefits:

- One-handed operation
- Function as auxiliary screwdriver

#### Technical specifications:

- Tool adaptation C 6.3 (1/4")

#### Supply includes:

- Set with 6 bits
- Bit holder

Blade tip	Length mm	Packs of	Model No.
TX 25 TX 30 TX 40 PH 1 PH 2 PH 3	25	1 pc(s).	<b>4053.420</b>



## Bit holder

### with handle, magnetic

Ergonomic, adaptable bit holder with handle.

#### Benefits:

- Extra-strong magnet for optimum retention force
- Precise concentricity
- Handle for anti-roll protection

#### Technical specifications:

- Tool adaptation C 6.3 (1/4")
- Tool adaptation E 6.3 (1/4")

#### Material:

- Handle core: Hard plastic
- Handle body: Elastic, highly flexible plastic

#### Colour:

- Handle: Anthracite and Rittal Power Pink

Blade length mm	Blade dia. mm	Handle length mm	Handle dia. mm	Packs of	Model No.
100	6.3	101	33	1 pc(s).	<b>4053.300</b>

# Bits and bit holders

## Bit holder

### magnetic

Magnetic holder with hex drive to hold bits securely.

### Benefits:

- Extra-strong magnet for optimum retention force
- Precise concentricity

### Technical specifications:

- Tool adaptation E 6.3 (1/4")

### Material:

- High-quality special tool steel

Blade length mm	Blade dia. mm	Packs of	Model No.
47	6.3	1 pc(s).	<b>4053.310</b>



# Crimping pliers



## Crimping pliers

### for wire end ferrules

For use with wire end ferrules with no insulating collar to DIN 46228, Part 1 and wire end ferrules with insulating collar to DIN 46228, Part 4.

#### Benefits:

- Minimal effort required with large conductor cross-sections
- Uniformly high quality compression
- Releasable ratchet
- Self-adjusting

#### Material:

- High-quality special tool steel

#### Surface finish:

- Matt, plated

#### Colour:

- Handle: Anthracite and Rittal Power Pink



#### Accessories:

- Wire end ferrule, see page 80

For cross-section mm <sup>2</sup>	AWG	Direction of cable entry	Compression	Length mm	Design	Packs of	Model No.
0.14 - 10	26 - 8	Side	Square crimp	176	Straight	1 pc(s).	<b>4054.002</b>
0.14 - 10	26 - 8	Side	Hexagonal crimp	176	Straight	1 pc(s).	<b>4054.003</b>

# Crimping pliers

## Crimping pliers

### for wire end ferrules

For use with wire end ferrules with no insulating collar to DIN 46228 Part 1 and wire end ferrules with insulating collar to DIN 46228 Part 4.

#### Benefits:

- Minimal effort required with large conductor cross-sections
- Uniformly high quality compression
- Marked die stations for precise machining of the relevant cross-sections
- Releasable ratchet

#### Material:

- High-quality special tool steel

#### Surface finish:

- Matt, plated

#### Colour:

- Handle: Anthracite and Rittal Power Pink



#### Accessories:

- Wire end ferrule, see page 80

For cross-section mm <sup>2</sup>	AWG	Direction of cable entry	Compression	Length mm	Design	Packs of	Model No.
0.25 - 6	24 - 10	Side	Trapezoid crimp	198	Angled	1 pc(s).	4054.000
0.5 - 6	22 - 10	Front	Square crimp	198	Angled	1 pc(s).	4054.001
10 - 25	8 - 4	Side	WM crimp	256	Straight	1 pc(s).	4054.004
35 - 50	2 - 1	Side	WM crimp	256	Straight	1 pc(s).	4054.008

## Crimping pliers

### for crimp tab terminals

For use with non-insulated crimp tab terminals.

#### Benefits:

- Releasable ratchet
- Marked die stations for precise machining of the relevant cross-sections

#### Material:

- High-quality special tool steel

#### Surface finish:

- Matt, plated

#### Colour:

- Handle: Anthracite and Rittal Power Pink

For cross-section mm <sup>2</sup>	AWG	Compression	Length mm	Design	Packs of	Model No.
0.1 - 1.5	26 - 16	B-crimp	198	Angled	1 pc(s).	4054.080
0.5 - 6	22 - 10	B-crimp	256	Straight	1 pc(s).	4054.081



# Crimping pliers



## Crimping pliers

### for ring terminals

For use with non-insulated ring terminals.

#### Benefits:

- Releasable ratchet
- Optimised lever transmission means that only minimal actuator forces are required, even with large cross-sections

#### Material:

- High-quality special tool steel

#### Surface finish:

- Matt, plated

#### Colour:

- Handle: Anthracite and Rittal Power Pink

For cross-section mm <sup>2</sup>	AWG	Compression	Length mm	Design	Packs of	Model No.
0.5 - 2.5	20 - 14	Indent crimp	198	Angled	1 pc(s).	<b>4054.020</b>
0.35 - 6	22 - 10	Indent crimp	198	Angled	1 pc(s).	<b>4054.021</b>
4 - 10	12 - 8	Double-indent crimp	256	Straight	1 pc(s).	<b>4054.023</b>
10 - 25	8 - 4	Indent crimp	256	Straight	1 pc(s).	<b>4054.024</b>

# Crimping pliers

## Crimping pliers

### for ring terminals

For use with insulated ring terminals and connectors.

#### Benefits:

- Clear allocation of cross-sections, thanks to colour coding on the dies
- Releasable ratchet
- Releases as soon as the required pressure is reached, to prevent underpressing

#### Material:

- High-quality special tool steel

#### Surface finish:

- Matt, plated

#### Colour:

- Handle: Anthracite and Rittal Power Pink

For cross-section mm <sup>2</sup>	AWG	Compression	Length mm	Design	Packs of	Model No.
0.75 - 2.5	22 - 14	Oval crimp	198	Angled	1 pc(s).	<b>4054.140</b>
0.75 - 6	22 - 10	Oval crimp	256	Straight	1 pc(s).	<b>4054.141</b>



# Wire end ferrules



## Wire end ferrule

With plastic collar.

### Technical specifications:

- Heat-resistant to 105 °C

### Material:

- E-Cu, galvanic tin-plated
- Plastic collar: Polypropylene

### Note:

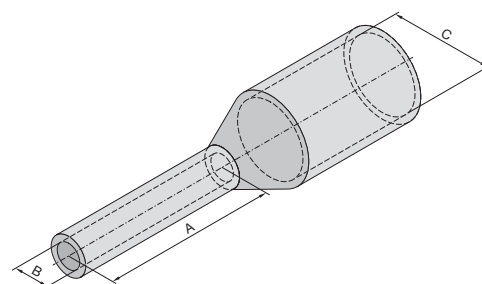
- UL-certified in conjunction with the relevant tools, such as crimping machines.

### Standards:

- AEH DIN 46228

### Approvals:

- Available on the Internet



A: Length  
B: Cross-section  
C: Internal diameter

### For cross-section 0.14 - 0.34 mm<sup>2</sup>

Model No.	4050.752	4050.754	4050.757
Packs of	500 pc(s).	500 pc(s).	500 pc(s).
Delivery form	Loose	Loose	Loose
For	Manual wire processing	Manual wire processing	Manual wire processing
For cross-section mm <sup>2</sup>	0.14	0.25	0.34
AWG	26	24	22
Length mm	8	8	8
Internal diameter mm	1.5	1.8	2
Colour	Grey	Light blue	Turquoise
DIN colour code	–	–	–
Rittal colour code	■	■	■
Multiple colour codes supported	–	–	–

### For cross-section 0.5 mm<sup>2</sup>

Model No.	4050.730	4050.737	4050.746	4050.760	4050.761	4051.597	4051.598
Packs of	500 pc(s).	1000 pc(s).	5000 pc(s).	500 pc(s).	500 pc(s).	5000 pc(s).	5000 pc(s).
Delivery form	Loose	Loose (10 packs of 100)	Taped	Loose	Loose	Taped	Taped
For	Crimping machine L8 Manual wire processing	Manual wire processing	Crimping machine RC Crimping machine R8 Crimping machine R8 E	Crimping machine L8 Manual wire processing	Manual wire processing	Crimping machine RC Crimping machine R8 Crimping machine R8 E	Crimping machine RC
For cross-section mm <sup>2</sup>	0.5	0.5	0.5	0.5	0.5	0.5	0.5
AWG	20	20	20	20	20	20	20
Length mm	8	12	8	8	10	8	10
Internal diameter mm	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Colour	White	White	White	Orange	Orange	Orange	Orange
DIN colour code	■	■	■	–	–	–	–
Rittal colour code	–	–	–	■	■	■	■
Multiple colour codes supported	–	–	–	–	–	–	–



# Wire end ferrules

## For cross-section 0.5 mm<sup>2</sup>

Model No.	4051.638	4051.695	4050.742	4051.536	4051.540	4051.544	4051.548
Packs of	1000 pc(s).	5000 pc(s).	500 pc(s).	4000 pc(s).	4000 pc(s).	4000 pc(s).	4000 pc(s).
Delivery form	Loose (10 packs of 100)	Taped	Loose	Taped	Taped	Taped	Taped
For	Manual wire processing	Crimping machine RC	Crimping machine L8 Manual wire processing	Crimping machine RC	Crimping machine RC Crimping machine R8	Crimping machine RC	Crimping machine RC Crimping machine R8
For cross-section mm <sup>2</sup>	0.5	0.5	0.5	0.5	0.5	0.5	0.5
AWG	20	20	20	20	20	20	20
Length mm	10	10	8	10	8	10	8
Internal diameter mm	2.6	2.6	2.9	2.9	2.9	2.9	2.9
Colour	White	White	White	Orange	Orange	White	White
DIN colour code	■	■	■	-	-	■	■
Rittal colour code	-	-	-	■	■	-	-
Multiple colour codes supported	-	-	-	■	■	■	■

## For cross-section 0.75 mm<sup>2</sup>

Model No.	4050.731	4050.738	4050.747	4050.764	4050.766	4051.599	4051.600
Packs of	500 pc(s).	1000 pc(s).	5000 pc(s).	500 pc(s).	500 pc(s).	5000 pc(s).	5000 pc(s).
Delivery form	Loose	Loose (10 packs of 100)	Taped	Loose	Loose	Taped	Taped
For	Crimping machine L8 Manual wire processing	Manual wire processing	Crimping machine RC Crimping machine R8 Crimping machine R8 E	Crimping machine L8 Manual wire processing	Manual wire processing	Crimping machine RC Crimping machine R8 Crimping machine R8 E	Crimping machine RC
For cross-section mm <sup>2</sup>	0.75	0.75	0.75	0.75	0.75	0.75	0.75
AWG	18	18	18	18	18	18	18
Length mm	8	12	8	8	10	8	10
Internal diameter mm	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Colour	Grey	Grey	Grey	White	White	White	White
DIN colour code	■	■	■	-	-	-	-
Rittal colour code	-	-	-	■	■	■	■
Multiple colour codes supported	-	-	-	-	-	-	-

## For cross-section 0.75 mm<sup>2</sup>

Model No.	4051.641	4051.696	4050.743	4051.537	4051.541	4051.545	4051.549
Packs of	1000 pc(s).	5000 pc(s).	500 pc(s).	4000 pc(s).	4000 pc(s).	4000 pc(s).	4000 pc(s).
Delivery form	Loose (10 packs of 100)	Taped	Loose	Taped	Taped	Taped	Taped
For	Manual wire processing	Crimping machine RC	Crimping machine L8 Manual wire processing	Crimping machine RC	Crimping machine RC Crimping machine R8	Crimping machine RC	Crimping machine RC Crimping machine R8
For cross-section mm <sup>2</sup>	0.75	0.75	0.75	0.75	0.75	0.75	0.75
AWG	18	18	18	18	18	18	18
Length mm	10	10	8	10	8	10	8
Internal diameter mm	2.8	2.8	3.4	3.4	3.4	3.4	3.4
Colour	Grey	Grey	Grey	White	White	Grey	Grey
DIN colour code	■	■	■	-	-	■	■
Rittal colour code	-	-	-	■	■	-	-
Multiple colour codes supported	-	-	-	■	■	■	■

# Wire end ferrules

## For cross-section 1 mm<sup>2</sup>

Model No.	4050.732	4050.739	4050.748	4050.769	4050.770	4051.601	4051.602
Packs of	500 pc(s).	1000 pc(s).	5000 pc(s).	500 pc(s).	500 pc(s).	5000 pc(s).	5000 pc(s).
Delivery form	Loose	Loose (10 packs of 100)	Taped	Loose	Loose	Taped	Taped
For	Crimping machine L8 Manual wire processing	Manual wire processing	Crimping machine RC Crimping machine R8 Crimping machine R8 E	Crimping machine L8 Manual wire processing	Manual wire processing	Crimping machine RC Crimping machine R8 Crimping machine R8 E	Crimping machine RC
For cross-section mm <sup>2</sup>	1	1	1	1	1	1	1
AWG	18	18	18	18	18	18	18
Length mm	8	12	8	8	10	8	10
Internal diameter mm	3	3	3	3	3	3	3
Colour	Red	Red	Red	Yellow	Yellow	Yellow	Yellow
DIN colour code	■	■	■	-	-	-	-
Rittal colour code	-	-	-	■	■	■	■
Multiple colour codes supported	-	-	-	-	-	-	-

## For cross-section 1 mm<sup>2</sup>

Model No.	4051.644	4051.697	4050.744	4051.538	4051.542	4051.546	4051.550
Packs of	1000 pc(s).	5000 pc(s).	500 pc(s).	4000 pc(s).	4000 pc(s).	4000 pc(s).	4000 pc(s).
Delivery form	Loose (10 packs of 100)	Taped	Loose	Taped	Taped	Taped	Taped
For	Manual wire processing	Crimping machine RC	Crimping machine L8 Manual wire processing	Crimping machine RC	Crimping machine RC Crimping machine R8	Crimping machine RC	Crimping machine RC Crimping machine R8
For cross-section mm <sup>2</sup>	1	1	1	1	1	1	1
AWG	18	18	18	18	18	18	18
Length mm	10	10	8	10	8	10	8
Internal diameter mm	3	3	3.5	3.5	3.5	3.5	3.5
Colour	Red	Red	Red	Yellow	Yellow	Red	Red
DIN colour code	■	■	■	-	-	■	■
Rittal colour code	-	-	-	■	■	-	-
Multiple colour codes supported	-	-	-	■	■	■	■

## For cross-section 1.5 mm<sup>2</sup>

Model No.	4050.733	4050.740	4050.749	4050.773	4050.774	4051.603	4051.604
Packs of	500 pc(s).	1000 pc(s).	5000 pc(s).	500 pc(s).	500 pc(s).	5000 pc(s).	5000 pc(s).
Delivery form	Loose	Loose (10 packs of 100)	Taped	Loose	Loose	Taped	Taped
For	Crimping machine L8 Manual wire processing	Manual wire processing	Crimping machine RC Crimping machine R8 Crimping machine R8 E	Crimping machine L8 Manual wire processing	Manual wire processing	Crimping machine RC Crimping machine R8 Crimping machine R8 E	Crimping machine RC
For cross-section mm <sup>2</sup>	1.5	1.5	1.5	1.5	1.5	1.5	1.5
AWG	16	16	16	16	16	16	16
Length mm	8	12	8	8	10	8	10
Internal diameter mm	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Colour	Black	Black	Black	Red	Red	Red	Red
DIN colour code	■	■	■	-	-	-	-
Rittal colour code	-	-	-	■	■	■	■
Multiple colour codes supported	-	-	-	-	-	-	-

# Wire end ferrules

## For cross-section 1.5 mm<sup>2</sup>

Model No.	4051.647	4051.698	4050.745	4051.539	4051.543	4051.547	4051.551
Packs of	1000 pc(s).	5000 pc(s).	500 pc(s).	4000 pc(s).	4000 pc(s).	4000 pc(s).	4000 pc(s).
Delivery form	Loose (10 packs of 100)	Taped	Loose	Taped	Taped	Taped	Taped
For	Manual wire processing	Crimping machine RC	Crimping machine L8 Manual wire processing	Crimping machine RC	Crimping machine RC Crimping machine R8	Crimping machine RC	Crimping machine RC Crimping machine R8
For cross-section mm <sup>2</sup>	1.5	1.5	1.5	1.5	1.5	1.5	1.5
AWG	16	16	16	16	16	16	16
Length mm	10	10	8	10	8	10	8
Internal diameter mm	3.5	3.5	4	4	4	4	4
Colour	Black	Black	Black	Red	Red	Black	Black
DIN colour code	■	■	■	-	-	■	■
Rittal colour code	-	-	-	■	■	-	-
Multiple colour codes supported	-	-	-	■	■	■	■

## For cross-section 2.5 mm<sup>2</sup>

Model No.	4050.734	4050.741	4050.750	4050.779	4051.525
Packs of	500 pc(s).	1000 pc(s).	3000 pc(s).	500 pc(s).	1000 pc(s).
Delivery form	Loose	Loose (10 packs of 100)	Taped	Loose	Loose (10 packs of 100)
For	Crimping machine L8 Manual wire processing	Manual wire processing	Crimping machine RC Crimping machine R8 Crimping machine R8 E	Manual wire processing	Manual wire processing
For cross-section mm <sup>2</sup>	2.5	2.5	2.5	2.5	2.5
AWG	14	14	14	14	14
Length mm	8	12	8	10	10
Internal diameter mm	4.2	4.2	4.2	4.2	4.2
Colour	Blue	Blue	Blue	Blue	Blue
DIN colour code	■	■	■	-	■
Rittal colour code	■	-	■	■	-
Multiple colour codes supported	-	-	-	-	-

## For cross-section 2.5 - 6 mm<sup>2</sup>

Model No.	4051.605	4050.735	4050.782	4050.783	4050.736	4050.785
Packs of	3000 pc(s).	500 pc(s).	500 pc(s).	500 pc(s).	100 pc(s).	100 pc(s).
Delivery form	Taped	Loose	Loose	Loose	Loose	Loose
For	Crimping machine RC	Manual wire processing	Manual wire processing	Manual wire processing	Manual wire processing	Manual wire processing
For cross-section mm <sup>2</sup>	2.5	4	4	4	6	6
AWG	14	12	12	12	10	10
Length mm	10	10	8	12	12	12
Internal diameter mm	4.2	4.8	4.8	4.8	6.3	6.3
Colour	Blue	Grey	Grey	Grey	Yellow	Black
DIN colour code	■	-	-	■	■	-
Rittal colour code	■	■	■	-	-	■
Multiple colour codes supported	-	-	-	-	-	-

# Insulation stripping tools



## Wire stripper

For stripping cables and conductors. Self-adjusting, with ergonomically styled handle, replaceable insulation stripping blade.

### Benefits:

- Flexible end stop for the insulation stripping length
- Practical integrated wire cutter
- Automatic adjustment mechanism for a wide range of insulations and conductor diameters
- Dies compatible with all types of pliers, may be replaced in a few actions
- Two-component handle with anti-slip soft zone

### Colour:

- Handle: Anthracite and Rittal Power Pink



### Accessories:

- Spare blade, see page 85

For cross-section mm <sup>2</sup>	AWG	Length mm	Design	Note	Packs of	Model No.
0.02 - 10	34 - 8	191	-	-	1 pc(s).	<b>4054.300</b>
0.02 - 10	34 - 8	168	Angled	-	1 pc(s).	<b>4054.315</b>
0.1 - 4	28 - 12	191	-	Also suitable for rubber and silicone insulation	1 pc(s).	<b>4054.310</b>
4 - 16	12 - 5	191	-	-	1 pc(s).	<b>4054.305</b>

## Stripping tool

### for cables Ø 2.5 - 11 mm

For stripping installation cables and wires.

### Colour:

- Handle: Anthracite and Rittal Power Pink

For cable diameters mm	Length mm	Packs of	Model No.
2.5 - 11	90.5	1 pc(s).	<b>4054.400</b>



### Accessories:

- Spare blade, see page 85

## Stripping tool

### for cables Ø 8 - 13 mm

For stripping single- and multi-wire signal, pilot and fibreglass cables.

### Colour:

- Handle: Anthracite and Rittal Power Pink

For cable diameters mm	Length mm	Packs of	Model No.
8 - 13	125	1 pc(s).	<b>4054.405</b>

# Insulation stripping tools

## Stripping tool

### for cables Ø 4.5 - 40 mm

For stripping cables. Vertically hinged blade for creating round, longitudinal and spiral cuts.

#### Colour:

– Handle: Anthracite and Rittal Power Pink

For cable diameters mm	Length mm	Packs of	Model No.
4.5 - 40	167	1 pc(s).	<b>4054.410</b>



#### Accessories:

– Spare blade, see page 85



## Spare blade

### for wire strippers

Interchangeable blade cassettes for cables with different cross-sections. Also suitable for special insulations.

To fit Model No.	For cross-section mm <sup>2</sup>	Colour	Packs of	Model No.
4054.300	0.02 - 10	Black	1 pc(s).	<b>4054.500</b>
4054.310	0.1 - 4	Blue	1 pc(s).	<b>4054.510</b>
4054.305	4 - 16	Red	1 pc(s).	<b>4054.505</b>



## Spare blade

### for stripping tools

Practical, easily replaceable blades for stripping wires and cables.

To fit Model No.	For cable diameters mm	Packs of	Model No.
4054.400	2.5 - 11	1 pc(s).	<b>4054.520</b>
4054.410	4.5 - 40	1 pc(s).	<b>4054.530</b>



# Cutting tools



## Side cutter

For copper and aluminium conductors.

### Benefits:

- Guarantees long-term stable cutting performance and a clean cut
- Ergonomically styled handles for fatigue-free, non-slip working

### Material:

- High-quality special tool steel

### Surface finish:

- Matt, plated

### Colour:

- Handle: Anthracite and Rittal Power Pink

For cable diameters mm	Length mm	Design	Packs of	Model No.
0.2 - 11	160	Straight	1 pc(s).	<b>4054.600</b>



## Electronic side cutter

With pointed head, 21° angled blades and small chamfer.

### Benefits:

- Even, smooth-running opening with opening spring
- Ergonomically styled handles
- Box-joint for permanent stability and optimum force progression

### Material:

- High-quality special tool steel

### Surface finish:

- Polished, oiled

### Colour:

- Handle: Anthracite and Rittal Power Pink

Length mm	Packs of	Model No.
115	1 pc(s).	<b>4054.750</b>



## Cable cutter

For copper and aluminium conductors.

### Benefits:

- Ergonomically styled handles for fatigue-free, non-slip working

### Material:

- High-quality special tool steel

### Colour:

- Handle: Anthracite and Rittal Power Pink



For cross-section mm <sup>2</sup>	For cable diameters mm	Length mm	Design	Packs of	Model No.
0.5 - 35	12	160	Straight	1 pc(s).	<b>4054.650</b>
0.5 - 50	18	180	Angled	1 pc(s).	<b>4054.660</b>

## Electrician's scissors

For cutting copper, aluminium, Kevlar and plastic.

### Benefits:

- High cutting performance thanks to micro-serration in the cutting zone
- Ergonomically styled handles
- Two-component handle with anti-slip soft zone
- Adjustable screw joint

### Material:

- High-quality special tool steel

### Surface finish:

- Brushed

### Colour:

- Handle: Anthracite and Rittal Power Pink

For cable diameters mm	Length mm	Packs of	Model No.
0.1 - 3.7	160	1 pc(s).	<b>4054.700</b>



# Pliers



## Combination pliers

Length mm	Packs of	Model No.
180	1 pc(s).	4054.800

With serrated gripping surface and integral ring spanner M8 to M10.

### Benefits:

- Ergonomically styled handles for fatigue-free, non-slip working
- Favourable transmission ratios for good holding and cutting performance
- Minimal force required

### Material:

- High-quality special tool steel

### Surface finish:

- Matt, plated

### Colour:

- Handle: Anthracite and Rittal Power Pink



## Needle-nose pliers

Length mm	Packs of	Model No.
200	1 pc(s).	4054.850

With serrated gripping surface.

### Benefits:

- Ergonomically styled handles for fatigue-free, non-slip working

### Material:

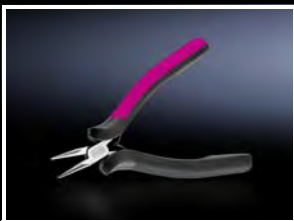
- High-quality special tool steel

### Surface finish:

- Matt, plated

### Colour:

- Handle: Anthracite and Rittal Power Pink



## Electronic needle-nose pliers

Length mm	Packs of	Model No.
120	1 pc(s).	4054.860

With smooth gripping surface.

### Benefits:

- Ergonomically styled handles for fatigue-free, non-slip working
- Even, smooth-running opening with opening spring

### Material:

- High-quality special tool steel

### Surface finish:

- Matt, plated

### Colour:

- Handle: Anthracite and Rittal Power Pink



## Slip-joint pliers

For width across flats 10 - 36 mm.

### Benefits:

- Ergonomically styled handles for fatigue-free, non-slip working
- Smooth cheeks avoid the usual damage caused by wrenches and pipe wrenches on screws/nuts
- QuickSnap ratcheting for fast adjustment to the workpiece with no push-button
- Robust box-joint

### Material:

- High-quality special tool steel

### Surface finish:

- Matt, plated

### Colour:

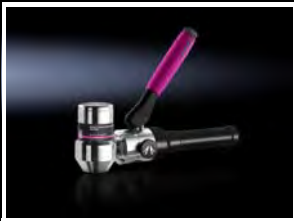
- Handle: Anthracite and Rittal Power Pink

Length mm	Packs of	Model No.
260	1 pc(s).	<b>4054.900</b>



# Hole punching tools

## Hydraulic punches



### Manual hydraulic punch

For punching round, square and rectangular cut-outs.

**Benefits:**

- Extend tool life with a built-in overpressure valve

**Punching capacity:**

- Round punch up to Ø 82 mm
- Square punch up to 68 x 68 mm
- Rectangular punch up to 46 x 86 mm
- Punching force 75 kN
- Max. operating pressure 680 bar/9850 psi

**Material:**

- Aluminium

**Supply includes:**

- Manual hydraulic punch
- Hydraulic screw Ø 19 mm
- Hydraulic screw Ø 9.5 / 19 mm
- HSS pilot drill Ø 11 mm
- Spacer sleeve set (3-part)
- Plastic case

Design	Packs of	Model No.
Straight	1 pc(s).	<b>4055.000</b>
With 90° angled and 360° rotating cylinder head	1 pc(s).	<b>4055.010</b>
Flexible, with hydraulic hose and separate cylinder	1 pc(s).	<b>4055.020</b>

### Electric hydraulic punch

For punching round, square and rectangular cut-outs.

**Benefits:**

- Extend tool life with a built-in overpressure valve
- High-performance drive motor with ergonomically styled handle
- Slide in the battery packs from two sides to balance the weight

**Punching capacity:**

- Round punch up to Ø 82 mm
- Square punch up to 68 x 68 mm
- Punching force 75 kN
- Max. operating pressure 680 bar/9850 psi

**Material:**

- Aluminium

**Supply includes:**

- Electric hydraulic punch with 2 NiMH batteries, 18 V
- Charging device 18 - 28 V
- Hydraulic screw Ø 9.5 / 19 mm
- Hydraulic screw Ø 19 mm
- Spacer sleeve set (3-part)
- HSS pilot drill Ø 11 mm
- Plastic case

Packs of	Model No.
1 pc(s).	<b>4055.040</b>

# Hole punching tools

## Hydraulic punches

### Manual hydraulic punch set, M16 - M63

Manual hydraulic punch in a practical set with hole punches for sheet steel. Maximum machinable material thickness 2 or 3 mm.

#### Benefits:

- Extend tool life with a built-in overpressure valve

#### Supply includes:

- Manual hydraulic punch, straight
- 7 splitter hole punches, triple splitting
- Hydraulic screw Ø 19 mm
- Hydraulic screw Ø 9.5 / 19 mm
- HSS pilot drill Ø 10 mm
- Spacer sleeve set (3-part)
- Plastic case

For threads	Ø punch mm	Packs of	Model No.
M16	16.2	1 pc(s).	4055.070
M20	20.4		
M25	25.4		
M32	32.5		
M40	40.5		
M50	50.5		
M63	63.5		



### Manual hydraulic punch set, M16 - M40

Manual hydraulic punch in a practical set with hole punches for sheet steel. Maximum machinable material thickness 2 or 3 mm.

#### Design:

- With 90° angled and 360° rotating cylinder head

#### Benefits:

- Extend tool life with a built-in overpressure valve

#### Supply includes:

- Manual hydraulic punch
- 5 splitter hole punches, triple splitting
- Hydraulic screw Ø 19 mm
- Hydraulic screw Ø 9.5 / 19 mm
- HSS pilot drill Ø 10 mm
- Spacer sleeve set (3-part)
- Plastic case

For threads	Ø punch mm	Packs of	Model No.
M16	16.2	1 pc(s).	4055.080
M20	20.4		
M25	25.4		
M32	32.5		
M40	40.5		



### Manual hydraulic punch set, PG 9 - PG 48

Manual hydraulic punch in a practical set with hole punches for sheet steel. Maximum machinable material thickness 2 or 3 mm.

#### Design:

- With 90° angled and 360° rotating cylinder head

#### Benefits:

- Extend tool life with a built-in overpressure valve

#### Supply includes:

- Manual hydraulic punch
- 9 splitter hole punches, triple splitting
- Hydraulic screw Ø 19 mm
- Hydraulic screw Ø 9.5 / 19 mm
- HSS pilot drill Ø 10 mm
- Spacer sleeve set (3-part)
- Plastic case

For PG	Ø punch mm	Packs of	Model No.
9	15.2	1 pc(s).	4055.085
11	18.6		
13	20.4		
16	22.5		
21	28.3		
29	37		
36	47		
42	54		
48	60		



# Hole punching tools

## Hole punches



### Hole punch, round

#### for sheet steel

For punching round cut-outs. The hole punch is operated with a wrench or hydraulic punch.

#### Design:

- With 3 cutting points

#### Supply includes:

- Female die
- Male die
- Tension screw without ball bearing

#### Note:

- When operating with wrenches, tension screws with ball bearings should be used.



#### Accessories:

- Tension screw, see page 102
- Hydraulic tension screw, see page 102

For threads	For PG	Ø punch mm	Tension screw (Ø x L) mm	Tension screw with ball bearing Model No.	Hydraulic tension screw Ø mm	Hydraulic tension screw Model No.	Maximum machinable material thickness, sheet steel mm	Packs of	Model No.
M12	7	12.7	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.212</b>
–	9	15.2	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.215</b>
M16	–	16.2	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.216</b>
–	11	18.6	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.218</b>
M20	13	20.4	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.220</b>
–	16	22.5	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.222</b>
M25	–	25.4	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.225</b>
–	21	28.3	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.228</b>
–	–	30.5	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.230</b>
M32	–	32.5	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.232</b>
–	–	34.6	19 x 55	4055.633	19	4055.663	3	1 pc(s).	<b>4055.234</b>
–	29	37	19 x 55	4055.633	19	4055.663	3	1 pc(s).	<b>4055.237</b>
M40	–	40.5	19 x 55	4055.633	19	4055.663	3	1 pc(s).	<b>4055.240</b>
–	–	43.2	19 x 55	4055.633	19	4055.663	3	1 pc(s).	<b>4055.243</b>
–	36	47	19 x 75	4055.634	19	4055.663	3	1 pc(s).	<b>4055.247</b>
–	–	49.6	19 x 75	4055.634	19	4055.663	3	1 pc(s).	<b>4055.249</b>
M50	–	50.5	19 x 75	4055.634	19	4055.663	3	1 pc(s).	<b>4055.250</b>
–	42	54	19 x 75	4055.634	19	4055.663	3	1 pc(s).	<b>4055.254</b>
–	48	60	19 x 75	4055.634	19	4055.663	3	1 pc(s).	<b>4055.260</b>
–	–	61.5	19 x 75	4055.634	19	4055.663	3	1 pc(s).	<b>4055.261</b>
M63	–	63.5	19 x 75	4055.634	19	4055.663	3	1 pc(s).	<b>4055.263</b>

### Hole punch set, metric

#### for sheet steel

For punching round cut-outs. The hole punch is operated with a wrench or hydraulic punch.

#### Design:

- With 3 cutting points

#### Supply includes:

- 5 female dies
- 5 male dies
- Plastic case

#### Note:

- When operating with wrenches, tension screws with ball bearings should be used.

#### Accessories:

- Tension screw, see page 102
- Hydraulic tension screw, see page 102

For threads	Ø punch mm	Tension screw with ball bearing Model No.	Hydraulic tension screw Model No.	Maximum machinable material thickness, sheet steel mm	Packs of	Model No.
M16	16.2	4055.631	4055.661	2	1 pc(s).	<b>4055.480</b>
M20	20.4	4055.631	4055.661	2		
M25	25.4	4055.631	4055.661	2		
M32	32.5	4055.631	4055.661	2		
M40	40.5	4055.633	4055.663	3		

### Hole punch set, PG

#### for sheet steel

For punching round cut-outs. The hole punch is operated with a wrench or hydraulic punch.

#### Design:

- With 3 cutting points

#### Supply includes:

- 5 female dies
- 5 male dies
- 2 tension screws with ball bearing Ø 9.5 x 50 mm
- HSS pilot drill Ø 11 mm
- 1 tube of lubricant paste
- Plastic case

#### Note:

- When operating with wrenches, tension screws with ball bearings should be used.

#### Accessories:

- Hydraulic tension screw, see page 102

For PG	Ø punch mm	Hydraulic tension screw Model No.	Maximum machinable material thickness, sheet steel mm	Packs of	Model No.
9 11 13 16 21	15.2 18.6 20.4 22.5 28.3	4055.661	2	1 pc(s).	<b>4055.481</b>



# Hole punching tools

## Hole punches



### Splitter hole punch, round

#### for sheet steel, with triple splitting

For punching round cut-outs. The hole punch is operated with a wrench or hydraulic punch.

#### Design:

- With triple splitting

#### Supply includes:

- Female die
- Male die

#### Note:

- When operating with wrenches, tension screws with ball bearings should be used.



#### Accessories:

- Tension screw, see page 102
- Hydraulic tension screw, see page 102

For threads	For PG	Ø punch mm	Tension screw (Ø x L) mm	Tension screw with ball bearing Model No.	Hydraulic tension screw Ø mm	Hydraulic tension screw Model No.	Maximum machinable material thickness, sheet steel mm	Packs of	Model No.
M12	–	12.5	6 x 40	4055.630	6/19	4055.660	1.5	1 pc(s).	<b>4055.512</b>
–	9	15.2	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.515</b>
M16	–	16.2	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.516</b>
–	11	18.6	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.518</b>
M20	13	20.4	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.520</b>
–	16	22.5	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.522</b>
M25	–	25.4	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.525</b>
–	21	28.3	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.528</b>
–	–	30.5	9.5 x 50	4055.631	9.5/19	4055.661	2	1 pc(s).	<b>4055.530</b>
M32	–	32.5	19 x 55	4055.633	19	4055.663	3	1 pc(s).	<b>4055.532</b>
–	–	34.6	19 x 55	4055.633	19	4055.663	3	1 pc(s).	<b>4055.534</b>
–	29	37	19 x 55	4055.633	19	4055.663	3	1 pc(s).	<b>4055.537</b>
M40	–	40.5	19 x 75	4055.634	19	4055.663	3	1 pc(s).	<b>4055.540</b>
–	–	43.2	19 x 75	4055.634	19	4055.663	3	1 pc(s).	<b>4055.543</b>
–	36	47	19 x 75	4055.634	19	4055.663	3	1 pc(s).	<b>4055.547</b>
–	–	49.6	19 x 75	4055.634	19	4055.663	3	1 pc(s).	<b>4055.549</b>
M50	–	50.5	19 x 75	4055.634	19	4055.663	3	1 pc(s).	<b>4055.550</b>
–	42	54	19 x 75	4055.634	19	4055.663	3	1 pc(s).	<b>4055.554</b>
–	48	60	19 x 75	4055.634	19	4055.663	3	1 pc(s).	<b>4055.560</b>
–	–	61.5	19 x 75	4055.634	19	4055.663	3	1 pc(s).	<b>4055.561</b>
M63	–	63.5	19 x 75	4055.634	19	4055.663	3	1 pc(s).	<b>4055.563</b>

### Splitter hole punch set, M16 to M40

#### for sheet steel, with triple splitting

For punching round cut-outs. The hole punch is operated with a wrench or hydraulic punch.

#### Design:

- With triple splitting

#### Supply includes:

- 5 female dies
- 5 male dies
- Plastic case

#### Note:

- When operating with wrenches, tension screws with ball bearings should be used.

#### Accessories:

- Tension screw, see page 102
- Hydraulic tension screw, see page 102

For threads	Ø punch mm	Tension screw with ball bearing Model No.	Hydraulic tension screw Model No.	Maximum machinable material thickness, sheet steel mm	Packs of	Model No.
M16	16.2	4055.631	4055.661	2	1 pc(s).	4055.580
M20	20.4	4055.631	4055.661	2		
M25	25.4	4055.631	4055.661	2		
M32	32.5	4055.633	4055.663	3		
M40	40.5	4055.634	4055.663	3		

### Splitter hole punch set, M12 to M40

#### for sheet steel, with triple splitting

For punching round cut-outs. The hole punch is operated with a wrench or hydraulic punch.

#### Design:

- With triple splitting

#### Supply includes:

- 6 female dies
- 6 male dies
- Tension screw with ball bearing Ø 6 x 40 mm
- Tension screw with ball bearing Ø 9.5 x 50 mm
- Tension screw with ball bearing Ø 19 x 55 mm
- HSS pilot drill Ø 10 mm
- 1 can of lubricant paste
- Plastic case

#### Note:

- When operating with wrenches, tension screws with ball bearings should be used.

#### Accessories:

- Hydraulic tension screw, see page 102

For threads	Ø punch mm	Hydraulic tension screw Model No.	Maximum machinable material thickness, sheet steel mm	Packs of	Model No.
M12	12.5	4055.660	1.5	1 pc(s).	4055.581
M16	16.2	4055.661	2		
M20	20.4	4055.661	2		
M25	25.4	4055.661	2		
M32	32.5	4055.663	3		
M40	40.5	4055.663	3		



# Hole punching tools

## Hole punches



### Splitter hole punch set, PG 9 to PG 21

#### for sheet steel, with triple splitting

For punching round cut-outs. The hole punch is operated with a wrench or hydraulic punch.

#### Design:

- With triple splitting

#### Supply includes:

- 6 female dies
- 6 male dies
- 2 tension screws with ball bearing  $\varnothing$  9.5 x 50 mm
- HSS pilot drill  $\varnothing$  10 mm
- 1 tube of lubricant paste
- Plastic case

#### Note:

- When operating with wrenches, tension screws with ball bearings should be used.



#### Accessories:

- Hydraulic tension screw, see page 102

For PG	$\varnothing$ punch mm	Hydraulic tension screw Model No.	Maximum machinable material thickness, sheet steel mm	Packs of	Model No.
9 11 13 16 21	15.2 18.6 20.4 22.5 28.3 30.5	4055.661	2	1 pc(s).	<b>4055.582</b>



# Hole punching tools

## Hole punches

### Splitter hole punch, round

#### for stainless steel, round, with triple splitting

For punching round cut-outs. The hole punch is operated with a wrench or hydraulic punch.

#### Design:

- With triple splitting

#### Supply includes:

- Female die
- Male die

#### Note:

- When operating with wrenches, tension screws with ball bearings should be used.



#### Also required:

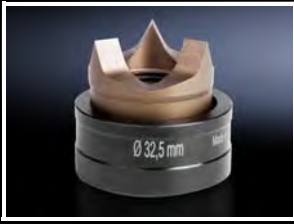
- Tension screw, see page 102
- Hydraulic tension screw, see page 102
- Hydraulic tension screw for higher loads, see page 103



For threads	For PG	Ø punch mm	Tension screw (Ø x L) mm	Tension screw with ball bearing Model No.	Hydraulic tension screw Ø mm	Hydraulic tension screw Model No.	Maximum machinable material thickness, stainless steel mm	Packs of	Model No.
–	9	15.2	11.1 x 60	4055.632	11.1/19	4055.665	2	1 pc(s).	<b>4055.115</b>
M16	–	16.2	11.1 x 60	4055.632	11.1/19	4055.665	2	1 pc(s).	<b>4055.116</b>
–	11	18.6	11.1 x 60	4055.632	11.1/19	4055.665	2	1 pc(s).	<b>4055.118</b>
M20	13	20.4	11.1 x 60	4055.632	11.1/19	4055.665	2	1 pc(s).	<b>4055.120</b>
–	16	22.5	11.1 x 60	4055.632	11.1/19	4055.665	2	1 pc(s).	<b>4055.122</b>
M25	–	25.4	11.1 x 60	4055.632	11.1/19	4055.665	2	1 pc(s).	<b>4055.125</b>
–	21	28.3	19 x 55	4055.633	19	4055.663	2.5	1 pc(s).	<b>4055.128</b>
–	–	30.5	19 x 55	4055.633	19	4055.663	2.5	1 pc(s).	<b>4055.130</b>
M32	–	32.5	19 x 55	4055.633	19	4055.663	2.5	1 pc(s).	<b>4055.132</b>
–	–	34.6	19 x 55	4055.633	19	4055.663	2.5	1 pc(s).	<b>4055.134</b>
–	29	37	19 x 55	4055.633	19	4055.663	2.5	1 pc(s).	<b>4055.137</b>
M40	–	40.5	19 x 75	4055.634	19	4055.663	2.5	1 pc(s).	<b>4055.140</b>
–	–	43.2	19 x 75	4055.634	19	4055.663	2.5	1 pc(s).	<b>4055.143</b>
–	36	47	19 x 75	4055.634	19	4055.663	2.5	1 pc(s).	<b>4055.147</b>
–	–	49.6	19 x 75	4055.634	19	4055.663	2.5	1 pc(s).	<b>4055.149</b>
M50	–	50.5	19 x 75	4055.634	19	4055.663	2.5	1 pc(s).	<b>4055.150</b>
–	42	54	19 x 75	4055.634	19	4055.663	2.5	1 pc(s).	<b>4055.154</b>
–	48	60	19 x 75	4055.634	19	4055.663	2.5	1 pc(s).	<b>4055.160</b>
–	–	61.5	19 x 75	4055.634	19	4055.663	2.5	1 pc(s).	<b>4055.161</b>
M63	–	63.5	19 x 75	4055.634	19	4055.663	2.5	1 pc(s).	<b>4055.163</b>

# Hole punching tools

## Hole punches



### Splitter hole punch set, metric

#### for stainless steel, round, with triple splitting

For punching round cut-outs. The hole punch is operated with a wrench or hydraulic punch.

#### Design:

- With triple splitting

#### Supply includes:

- 5 female dies
- 5 male dies
- Plastic case

#### Note:

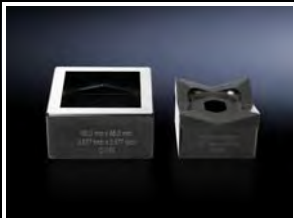
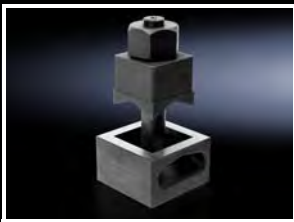
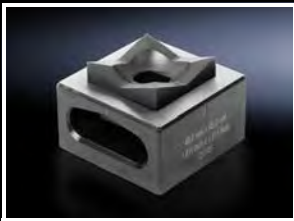
- When operating with wrenches, tension screws with ball bearings should be used.



#### Also required:

- Tension screw, see page 102
- Hydraulic tension screw, see page 102
- Hydraulic tension screw for higher loads, see page 103

For threads	Ø punch mm	Tension screw with ball bearing Model No.	Hydraulic tension screw Model No.	Maximum machinable material thickness, stainless steel mm	Packs of	Model No.
M16	16.2	4055.632	4055.665	2	1 pc(s).	<b>4055.180</b>
M20	20.4	4055.632	4055.665	2		
M25	25.4	4055.632	4055.665	2		
M32	32.5	4055.633	4055.663	2,5		
M40	40.5	4055.634	4055.663	2,5		



### Hole punch, square

#### for sheet steel

For punching square cut-outs. The hole punch is operated with a hydraulic punch.

#### Benefits:

- With side ejector for the waste
- No jamming of the die

#### Supply includes:

- Female die
- Male die
- Tension bolt
- Lock nut
- Plastic case

□ punch mm	Maximum machinable material thickness, sheet steel mm	Product-specific scope of supply	Operation, manual	Operation, hydraulic	Packs of	Model No.
22.2 x 22.2	2	Pressure nut with ball bearing Adaptor for hydraulics	■	■	1 pc(s).	<b>4055.322</b>
45.5 x 45.5	3	-	-	■	1 pc(s).	<b>4055.345</b>
46 x 46	3	-	-	■	1 pc(s).	<b>4055.346</b>
50.8 x 50.8	3	-	-	■	1 pc(s).	<b>4055.350</b>
68 x 68	3	-	-	■	1 pc(s).	<b>4055.368</b>
92 x 92	3	Spacer sleeve	-	■	1 pc(s).	<b>4055.392</b>

# Hole punching tools

## Hole punches

### Spacer sleeve

#### for hole punch, square

For punching cut-outs from size 92 x 92 mm.

To fit Model No.	Packs of	Model No.
4055.392	1 pc(s).	<b>4055.667</b>



#### Also required:

- Special tension bolt, see page 99



### Special tension bolt

#### for hole punch, square

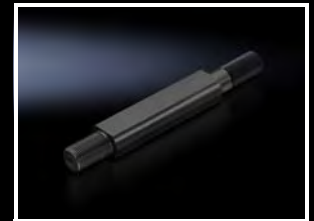
For punching cut-outs from size 92 x 92 mm.

To fit Model No.	Packs of	Model No.
4055.392	1 pc(s).	<b>4055.666</b>



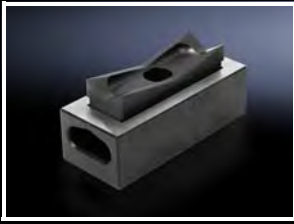
#### Also required:

- Spacer sleeve, see page 99



# Hole punching tools

## Hole punches



### Hole punch, rectangular

#### for sheet steel

For punching rectangular cut-outs. The hole punch is operated with a wrench or hydraulic punch.

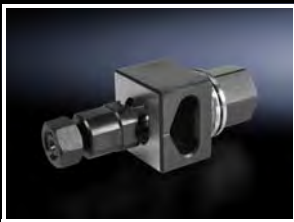
#### Benefits:

- With side ejector for the waste
- No jamming of the die

#### Supply includes:

- Female die
- Male die
- Tension bolt
- Lock nut
- Plastic case

□ punch mm	Maximum machinable material thickness, sheet steel mm	Product-specific scope of supply	Operation, manual	Operation, hydraulic	Packs of	Model No.
22 x 30	2	Pressure nut with ball bearing Adaptor for hydraulics	■	■	1 pc(s).	<b>4055.400</b>
22 x 42	2	Pressure nut with ball bearing Adaptor for hydraulics	■	■	1 pc(s).	<b>4055.401</b>
45 x 92	2	-	-	■	1 pc(s).	<b>4055.402</b>
46 x 92	2	-	-	■	1 pc(s).	<b>4055.403</b>



### Hole punch, special contour

4055.440

#### for sheet steel

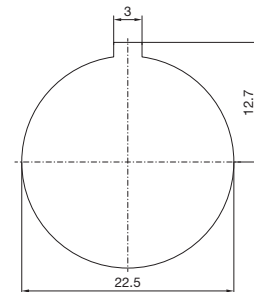
For punching cut-outs with a special contour. The hole punch is operated with a wrench or hydraulic punch.

#### Benefits:

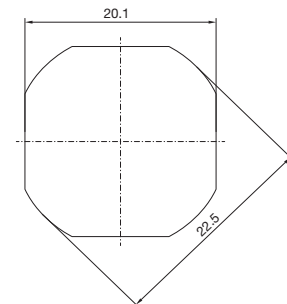
- With side ejector for the waste
- No jamming of the die

#### Supply includes:

- Female die
- Male die
- Tension bolt
- Lock nut
- Pressure nut with ball bearing
- Adaptor for hydraulics
- Plastic case



4055.441



Design	Ø punch mm	Maximum machinable material thickness, sheet steel mm	Packs of	Model No.
With 3 mm lug	22.5	2	1 pc(s).	<b>4055.440</b>
Flattened to 20.1 mm on 4 sides	22.5	2	1 pc(s).	<b>4055.441</b>

# Hole punching tools

## Hole punches

### Hole punch, heavy connectors

#### for sheet steel

For punching rectangular cut-outs for connectors.  
The hole punch is operated with a hydraulic punch.

#### Benefits:

- With side ejector for the waste
- No jamming of the die
- When the die and stamp are compressed, the mounting holes for connectors are marked on the metal sheet between them.

#### Supply includes:

- Female die
- Male die
- Tension bolt
- Lock nut

□ punch mm	No. of poles	Maximum machinable material thickness, sheet steel mm	Packs of	Model No.
36 x 52	6-pole	2	1 pc(s).	<b>4055.460</b>
36 x 65	10-pole	2	1 pc(s).	<b>4055.461</b>
36 x 86	16-pole	2	1 pc(s).	<b>4055.463</b>
36 x 112	24-pole	2	1 pc(s).	<b>4055.465</b>

### Hole punch, sub-D

#### for sheet steel and stainless steel

For punching rectangular cut-outs for connectors.  
The hole punch is operated with a wrench or hydraulic punch.

#### Benefits:

- With side ejector for the waste
- No jamming of the die
- Anti-twist axles for stamps and dies are used as tension bolts.

#### Supply includes:

- Female die
- Male die
- Tension bolt
- Lock nut
- Pressure nut with ball bearing
- Adaptor for hydraulics
- Plastic case

□ punch mm	No. of poles	Maximum machinable material thickness, sheet steel mm	Maximum machinable material thickness, stainless steel mm	Packs of	Model No.
19.8 x 11.3	9-pole	2	1.5	1 pc(s).	<b>4055.470</b>
28.2 x 11.3	15-pole	2	1.5	1 pc(s).	<b>4055.471</b>
41.9 x 11.3	25-pole	1.75	1.25	1 pc(s).	<b>4055.472</b>
58.4 x 11.3	37-pole	1.75	1.25	1 pc(s).	<b>4055.473</b>
55.7 x 13.9	50-pole	1.65	1	1 pc(s).	<b>4055.474</b>



# Hole punching tools

## Hole punches



### Tension screw

Accessories for hole punches. Required as a connecting part between the die and stamp.

**Note:**

- For operation with wrench

Tension screw (Ø x L) mm	Packs of	Model No.
9.5 x 40	1 pc(s).	<b>4055.600</b>
9.5 x 50	1 pc(s).	<b>4055.601</b>
19 x 55	1 pc(s).	<b>4055.602</b>
19 x 75	1 pc(s).	<b>4055.603</b>



### Tension screw

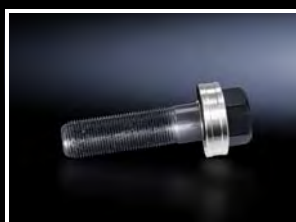
#### with ball bearing

Accessories for hole punches. Required as a connecting part between the die and stamp.

**Note:**

- For operation with wrench

Tension screw (Ø x L) mm	Packs of	Model No.
6 x 40	1 pc(s).	<b>4055.630</b>
9.5 x 50	1 pc(s).	<b>4055.631</b>
11.1 x 60	1 pc(s).	<b>4055.632</b>
19 x 55	1 pc(s).	<b>4055.633</b>
19 x 75	1 pc(s).	<b>4055.634</b>



### Hydraulic tension screw

Accessories for hole punches. Required as a connecting part between the die and stamp.

**Note:**

- For operation via hydraulic punch

Hydraulic tension screw Ø mm	Product-specific scope of supply	Packs of	Model No.
6/19	Adaptor for hydraulics	1 pc(s).	<b>4055.660</b>
9.5/19	Adaptor for hydraulics	1 pc(s).	<b>4055.661</b>
11.1/19	Adaptor for hydraulics	1 pc(s).	<b>4055.662</b>
19	–	1 pc(s).	<b>4055.663</b>



# Hole punching tools

## Hole punches

### Hydraulic tension screw for higher loads

Accessories for hole punches. Required as a connecting part between the die and stamp.

**Benefits:**

- Hydraulic tension screw made from high-alloy tool steel for higher loads

**Note:**

- For operation via hydraulic punch

Hydraulic tension screw Ø mm	Packs of	Model No.
9.5/19	1 pc(s).	<b>4055.664</b>
11.1/19	1 pc(s).	<b>4055.665</b>



### Notching pliers

Punches slots quickly and easily. Saves the time-consuming process of filing the grooves for anti-twist protection of push buttons, switches and instruments. Slots in sizes 3.2 mm and 4.8 mm can be created.

**Benefits:**

- Long service life
- Male and female die made from hardened tool steel
- Easy punching with large leverage

**Material:**

- Handles: Plastic-coated

Maximum machinable material thickness, sheet steel mm	Packs of	Model No.
2	1 pc(s).	<b>4055.690</b>



# List of model numbers

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4050.000	62	4050.730	80	4050.833	22	4052.011	70
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4050.020	25	4050.732	82	4050.835	22	4052.018	70
4050.022	26	4050.733	82	4050.836	22	4052.021	70
4050.030	20	4050.734	83	4050.837	22	4052.022	70
4050.035	25	4050.735	83	4050.838	22	4052.031	70
4050.041	20	4050.736	83	4050.839	22	4052.032	70
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4050.044	20	4050.738	81	4050.842	18	4052.053	70
4050.045	20	4050.739	82	4050.843	18	4052.054	70
4050.050	23	4050.740	82	4050.844	18	4052.055	70
4050.051	23	4050.741	83	4050.845	18	4052.056	70
4050.056	23	4050.742	81	4050.846	18	4052.058	70
4050.057	23	4050.743	81	4050.847	18	4052.101	68
4050.058	23	4050.744	82	4050.848	18	4052.102	68
4050.059	23	4050.745	83	4050.849	18	4052.104	68
4050.060	24	4050.746	80	4050.860	19	4052.106	68
4050.061	24	4050.747	81	4050.861	18	4052.107	68
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4050.064	24	4050.750	83	4050.885	17	4052.131	68
4050.065	24	4050.752	80	4050.886	17	4052.132	68
4050.066	21	4050.754	80	4050.887	17	4052.141	68
4050.067	22	4050.757	80	4050.888	21	4052.142	68
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4050.081	24	4050.764	81	4051.024	55	4052.202	71
4050.082	24	4050.766	81	4051.036	55	4052.210	69
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4050.107	10	4050.770	82	4051.536	81	4052.212	69
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4050.210	59	4050.783	83	4051.541	81	4053.011	73
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4055.220	92	4055.602	102		
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- Wiring duct cutter

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