

AGIE

Agiecut Classic, Challenge,
Evolution, Excellence

C2.1
Technical data
Place of installation
Connections
Transport

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1 Technical data

1.1 AGIECUT CLASSIC 2 / 3

EDM system		AGIECUT CLASSIC 2	AGIECUT CLASSIC 3
Equipment dimensions	length x width x height	1'640 x 2'040 x 2'220 mm	1'940 x 2'300 x 2'220 mm (3S :h max. = 2607 mm)
	floor to workpiece clamping level distance	1'075 mm	
Net weight of equipment		2'580 kg (2S : 2680 kg)	3'460 kg (3S : 3900 kg)
Weight ready for work		ca. 2'800 kg (2S : 3230 kg)	ca. 3'690 kg (3S : 4650 kg)
Utilities	rated line power	9,7 kW	
	line voltage	3 x 400 V ± 10%	
	Compressed air connection and characteristics	Ø 7 mm, 6 ÷ 8 bar, 5 m ³ / hour, filtered (class 2 ISO/DIS8573-1, max. dust residue = 1µm resp. 1 mg/m ³), dried (class 4 ISO/DIS8573-1, max. water residue = 6 g/m ³ at +3 C° DTP) and not oiled (class 4 ISO/DIS8573-1, max. oil residue = 5 mg/m ³) with WPC + 150 l	
	capacity required	1.5 ÷ 6 kW	
max. workpiece dimensions	length x width x height	750 x 550 x 250 mm (2S : with bath, h max. = 150 mm)	1'050 x 650 x 250 mm (3S : with bath, h Max. = 300 mm / with suppl. Tank 420 mm)
max. workpiece weight		450 kg (2S : with bath 200 kg)	800 kg (3S : with bath 400 kg)
Travels	X / Y / Z axes	350 / 250 / 256 mm	500 / 350 / 256 mm
	U / V axes	± 70 / ± 70 mm	
	max. taper ∠° / height	30° / 100 mm	
High-speed motion	X, Y axes	900 mm/min	
	U / V / Z axes	600 mm/min	
Drives	X / Y / U / V / Z axes	brushless AC servomotors	
Jogbox	remote control	for X/Y/U/V/Z axes movement	
Control console	colour screen	TFT 15" XGA (1024 x 768)	
	input elements	alphanumeric push-button keyboard / mouse	
AGIEJET wire threading system	threadable height	up to 250 mm	
	threading nozzles	2 mm / 1 mm (Option)	
Combination wire guide system	wire diameter	0.2 ÷ 0.33 mm	
	<V> guide	cylindrical to 2°	
	toroide guide	2° ÷ 30°	
Wire drive	wire spool	up to 25 kg	
	wire tension	0 ÷ 25 N	
	wire speed	60 ÷ 300 mm/s	
	wire feed	semi-automatic	
	wire disposal	chopper	
AGIESETUP 2D	measuring cycles	for automatic determination of workpiece position	
Work tank	door	manual drop type	
	accessibility	front	
	clamping base	left / right beam with supporting plate	
	operating modes	AGIEDUOFLUX (2S/3S : in bath or AGIEDUOFLUX without bath)	
	Manual level adjustment (2S/3S only)	0 ÷ 190 mm	
Flushing	pressure	0.2 ÷ 18 bar programmable	
	combination	coaxial flushing / high and low pressure / suction combined water curtain flood around coaxial flushing	
AGIEDUOFLUX (2S/3S : without bath)			
DA	dielectric conditioning unit	integrated	
	charge volume	220 litre (2S : 550 litres / 3S : 750 litres, with suppl. Tank 1000 litres)	
	pre-deionised water	10 µS/cm	
	Filter / medium	2 filter casings with 4 cartridge filters (2S/3S : 4 casings with 8 cartridge filters)	
	filtrate quality	5 µm	
	deionising resin	10 litre	
	water conductivity control	1 ÷ 25 µS/cm automatic	
	cooling system	external flow cooler unit with circulation pump (2S/3S : water/water cooler with ± 1° autom. temp. reg.)	

Technical data AGIECUT
CLASSIC 2/3 (continuation)

EDM system		AGIECUT CLASSIC 2 / 3
AGIEHSSC	generator	integrated
	mean working current	45 A
	feed control	servo controlled / fixed feed
	cooling system	fan with ambient air (2S/3S : water/water cooler)
	max. cutting rate, cylindrical [1]	300 mm ² /min with wire CCS 0.33 mm
	best roughness R _a [1]	0.30 µm
	mean contour tolerance T _{km} [1]	± 6 µm
AGIEVISION	control / operator interface system	integrated / object-oriented man/machine interface
	operating system	OS/2 multitasking operating system
	operating mode	multiprocessor
	CPU	Pentium for CNC and operator interface
	units of measurement	mm / inch
	command format	absolute / incremental
	smallest programmable step	0.0001 mm
	max. command length	15 places with floating point
	max. path correction	6 mm
	TECCUT	automatic suggestion of technology based on machining objectives
	ISOCONVERTER	import of PP100, PP123 AGIECUT geometries
	CAMLINK	for importing of machining objectives and additional information for machining job
	AUTOSEQUENCE	predefined machining strategies
	DNC	DNC port with Xon/Xoff and LSV2 protocols
	HELP	context-sensitive help functions, explanations with text and graphics
	GRAFICHECK	2D in principal views, selectable in 3D
	rescue strategies	rethreading on wire break / on "no-thread" detection, restart after power failure
	DYNAMIC CORNER CONTROL	Dynamic path optimisation and process adaptation on radii
	PURECUT	reduction of the oxidization effect on the workpiece surface
	languages	Chinese - Czech - Danish - Dutch - English - French - German - Italian - Japanese - Russian - Spanish
storage capacity	hard disk >9 GB	
interfaces	2 x RS232C / 1 x parallel	
data storage media	3 1/2" disc / CD-ROM	
Variants and Options (see price list)		
2 filter casings (2S/3S : Standard)	with additional 4 filter cartridges	extended filter autonomy
Clamping frame	instead of the supporting plate	universal clamping frame
Handbox with AGIEJOGGER	set-up functions, LCD display and electronic handwheel	wire drive system/ work tank/ measuring cycles for X/Y/U/V/Z axes movement
Cooling kit (2S/3S : Standard)	heat exchanger	air/water for generator and control unit, water/water for the dielectric unit
Extension kit for wire Ø smaller 0.15 ÷ 0.1 mm	wire drive system adaptation and technology	for small internal radii and narrow slots applications
PIECEINSERT		quickly insert rush orders without effort
USERSEQUENCE		Predefined and user defined machining strategies
AGIESETUP 3D		pickup cycles for automatic determination of workpiece plane and position
VARIOCUT		automatic process optimisation
R-MODUL		finishing-power modul Ra 0.2 µm
Accessories	cooling system	technical requirements
Cooling of standard version (not 2S/3S)	flow cooler unit with circulation pump	cooling capacity required 1.5 ÷ 6 kW, flow approx. 30 l/min, pressure ca. 1 bar
Cooling of variant with cooling kit	cooling water unit	cooling capacity required 1.5 ÷ 7 kW, Water temperature T _{Ambient} – 7° C, flow approx. 20 l/min, pressure ca. 1.5 ÷ 3 bar

[1] with AGIE standard settings

1.2 AGIECUT CHALLENGE, EVOLUTION, EXCELLENCE 2 / 3

EDM system		AGIECUT CHA/EVO/EXC 2, EXC 2+F	AGIECUT CHA/EVO/EXC 3
Equipment dimensions	length x width x height	2'215 x 2'215 x x2'220 mm	2'800 x 2'400 x x2'220 mm
	distance floor-clamping plane piece	1'100 mm	
Net weight of equipment		3'600 kg	4'500 kg
Weight ready for work		ca. 4'500 kg	ca. 6'000 kg
Utilities	rated line power	10.5 kVA	
	line voltage	3 x 400 V ± 10%	
	Compressed air connection and characteristics	Ø 7 mm, 6 ÷ 8 bar, 5 m ³ / hour, filtered (class 2 ISO/DIS8573-1, max. dust residue = 1µm resp. 1 mg/m ³), dried (class 4 ISO/DIS8573-1, max. water residue = 6 g/m ³ at +3 C° DTP) and not oiled (class 4 ISO/DIS8573-1, max. oil residue = 5 mg/m ³) with WPC + 150 l	
	cooling water temperature/flow rate/pressure	T _{Ambient} - 7° C / ≈ 20 l/min / 1.5 ÷ 3 bar	
	cooling capacity required	7.5 kW	
max. workpiece dimensions	length x width x height	750 x 550 x 250 mm	1'050 x 650 x 250 mm
max. workpiece weight	submerged / not submerged	200 / 450 kg	400 / 800 kg
Travel distances	X / Y / Z axes	350 / 250 / 256 mm	500 / 350 / 256 mm
	U / V axes	± 70 / ± 70 mm	
	max. taper ∠° / height	30° / 100 mm	
High-speed movement	X, Y axes	CHA/EVO 3'000 mm/min, EXC/EXC 2F 900 mm/min	
	U / V / Z axes	600 mm/min	
Drives	X / Y / U / V / Z axes	brushless AC servomotors	
Machine corrections	X / Y / U / V / Z axes	linearity / angularity / screw pitch	
Accuracy accord. To ISO 230-2			
X, Y axes	positional variation Pa	5 µm, EXC 4 µm	
	mean positional spread Ps	CHA 2 µm, EVO 1.5 µm, EXC 1 µm	
	mean reversal distance U	2.5 µm, EXC 1.5 µm	
U, V axes	positional variation Pa	5 µm	
	mean positional spread Ps	2 µm	
	mean reversal distance U	2.5 µm	
Remote control unit with LCD display	setup functions	wire drive / work tank / measuring cycles	
	axis display	0.0001 mm	
AGIEJOGGER	electronic handwheel (CHA / EVO option)	for X / Y / U / V / Z axes	
Control console	colour display	TFT 15" XGA (1024 x 768)	
	input elements	alphanumeric push-button keyboard / mouse	
AGIEJET wire threading system	threadable height	up to 250 mm	
	threading nozzles	2 mm, 1 mm	
Combi wire guide system	wire diameter	0.1 ÷ 0.33 mm, EVO 2SFF + EXC 2F 0.03 – 0.33	
	<V> guide	cylindrical to 2°	
	toroide guide	2° ÷ 30°	
Wire drive	wire spool	up to 25 kg	
	wire tension	0 ÷ 25 N	
	wire speed	60 ÷ 300 mm/s	
	wire feed	semi-automatic	
	wire disposal	chopper	
AGIESETUP 3D (CHA AGIESETUP 2D)	measuring probe and measuring cycles	automatic determination of workpiece plane and position	
Work tank	tank	automatic drop tank	
	accessibility	front / left	
	clamping system	clamping support or universal clamping frame	
	operating mode	water bath and/or coaxial flushing	
	level adjustment	0 ÷ 250 mm automatic	

Technical data AGIECUT
CHA/EVO/EXC 2/3 (connection)

EDM system		AGIECUT CHA/EVO/EXC 2, EXC 2F	AGIECUT CHA/EVO/EXC 3
AGIEFLUSH	pressure flushing	0.2 ÷ 18 bar programmable	
	combination flushing	coaxial flushing / pressure / suction	
DA	dielectric unit	integrated	
	charge volume	700 litre	1'000 litre
	pre-deionised water	10 µS/cm	
	filter/medium	4 canisters with 8 cartridge filters	
	filtrate quality	5 µm	
	deionising resin	10 litre	
	deionising resin	1 ÷ 25 µS/cm automatic	
	cooling system	water / water heat exchanger	
	temperature control	± 1°C automatic	
	AGIEHSSC	generator	integrated
mean working current		45 A	
feed control		servo controlled / fixed feed	
cooling system		air / water heat exchanger	
max. cutting rate, cylindrical [1]		300 mm ² /min [2]	
best roughness Ra [1]		CHA 0.3 µm, EVO 0.2 µm, EXC 0.1µm	
mean contour tolerance Tkm [1]		CHA ± 4 µm, EVO ± 3 µm, EXC ± 1.5 µm	
AGIEVISION	control / operator interface system	integrated / object-oriented man/machine interface	
	operating system	OS/2 multitasking operating system	
	operating mod	multiprocessor	
	CPU's	Pentium for CNC and operator interface	
	units of measurement	mm / inch	
	command format	absolute / incremental	
	smallest programmable step	0.0001 mm	
	max. command length	15 places with floating point	
	max. path correction	6 mm	
	GEOEDITOR	simple 2D on-board geometry programming	
	TECCUT	automatic technology suggestion based on machining objectives	
	ISOCONVERTER	import of PP100, PP123 AGIECUT geometries	
	CAMLINK	for job-specific data import from CAD/CAM systems	
	USERSEQUENCE	predefined and user defined machining strategies	
	DNC	DNC port with Xon/Xoff and LSV2 protocols	
	HELP	context-sensitive help functions, explanations with text and graphics	
	GRAFICHECK	3 principal 2D views, selectable in 3D	
	rescue strategies	rethreading on wire break / on "no-thread" detection, restart after power failure	
	DYNAMIC CORNER CONTROL	Dynamic path optimisation and process adaptation on radii	
	PURECUT	reduction of the oxidization effect on the workpiece surface	
	VARIOCUT	automatic process optimisation	
	languages	Chinese - Czech - Danish - Dutch - English - French - German - Italian - Japanese - Russian - Spanish	
	storage capacity	hard disk >9 GB	
	interfaces	2 x RS232C / 1 x parallel	
	data storage media	3 ¹ / ₂ " disc / CD-ROM	

Notes:

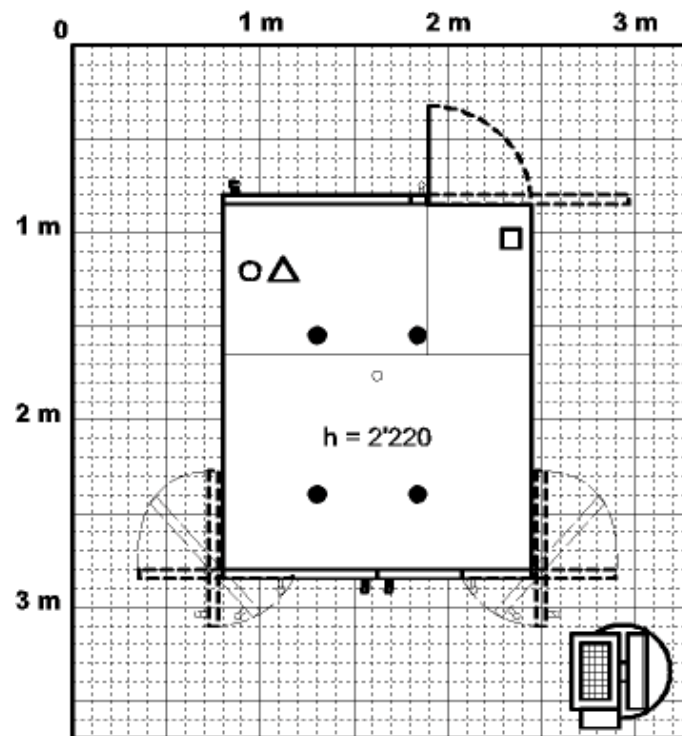
- [1] with AGIE standard settings
- [2] with CCS 0.33 mm wire Ø

Technical data AGIECUT
CHA / EVO / EXC 2/3 (connection)

EDM system		AGIECUT CHA/EVO/EXC 2 / 3
Variants and Options (see price list)		
PIECEINSERT		quickly insert rush orders without effort
USERSEQUENCE		Predefined and user defined machining strategies
AGIESETUP 3D		pickup cycles for automatic determination of workpiece plane and position
R-MODUL		finishing-power modul Ra 0.2 µm (CHA)
SF-MODUL		finishing-power modul Ra 0.1 µm (EVO)
ROBOTCOMMAND	Communication interface	for controlling handling systems
HOSTCONTROL	Communication interface	for connecting a cell computer
I/O INTERFACE	Communication interface	for the exchange of control instructions with the on-line peripheral equipment
Accessories		
Standing cooling	Cooling water unit	cooling capacity required. max. 7.5 kW, water temperature T _{Ambient} – 7° C, flow capacity approx. 20 l/min, pressure approx. 1.5 ÷ 3 bar
Automation		integrated handling and clamping devices
WPC	number of workpieces max. workpiece dimension workpiece weight (with pallet)	min. 12 max: 20 depending on application depending on application max. 120 kg (depending the device variant)

2 Requirements for the place of installation

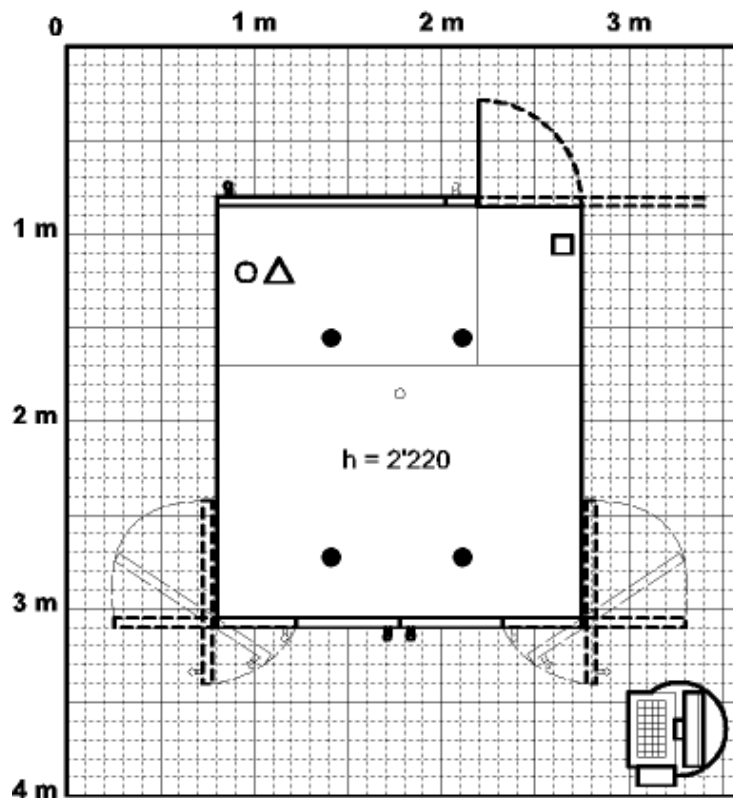
2.1 Installation plan and connection values for AGIECUT CLASSIC 2



min. room height: 3.0 m

- mains connection
- △ compressed air connection
- coolant water connections
- bearing surfaces: floor load max. 12 kg/cm²

2.2 Installation plan and connection values for AGIECUT CLASSIC 3

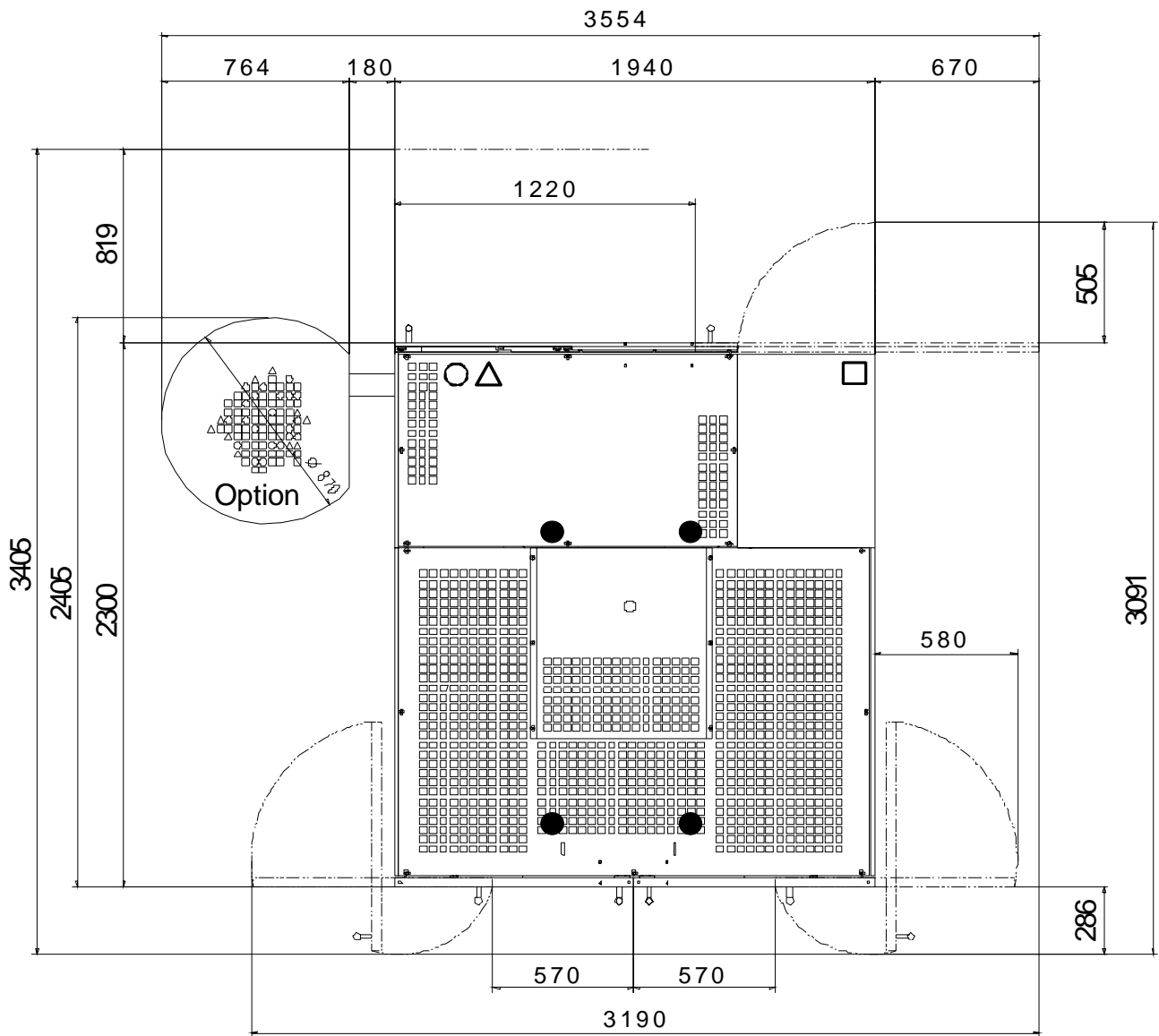


min. room height: 3.0 m

- mains connection
- △ compressed air connection
- coolant water connections
- bearing surfaces: floor load max. 15 kg/cm²

2.3 Installation plan and connection values for AGIECUT CLASSIC 3S

Top view

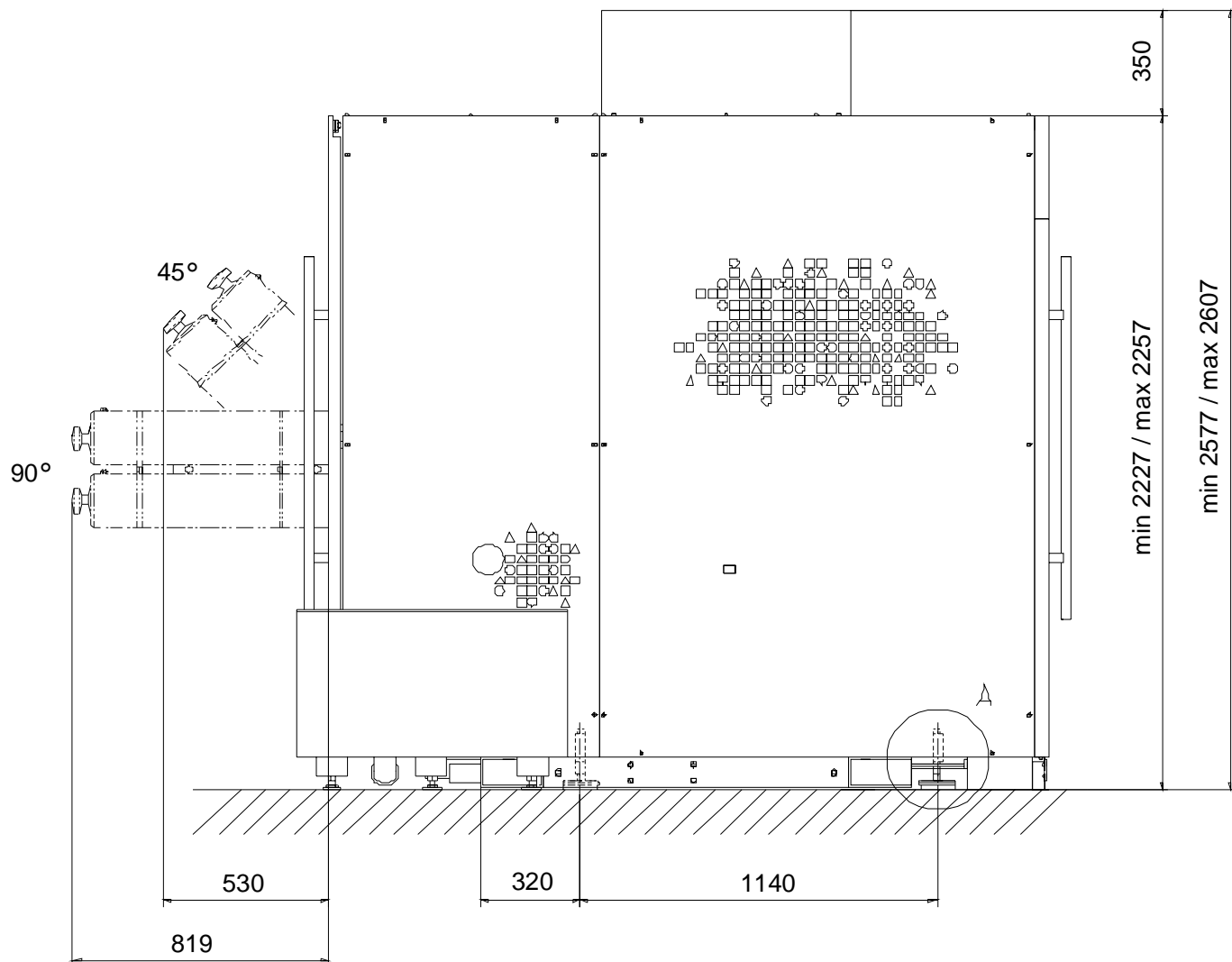


min. room height: 3.0 m

- mains connection
- △ compressed air connection
- coolant water connections
- bearing surfaces: floor load max. 16 kg/cm²

Left lateral view

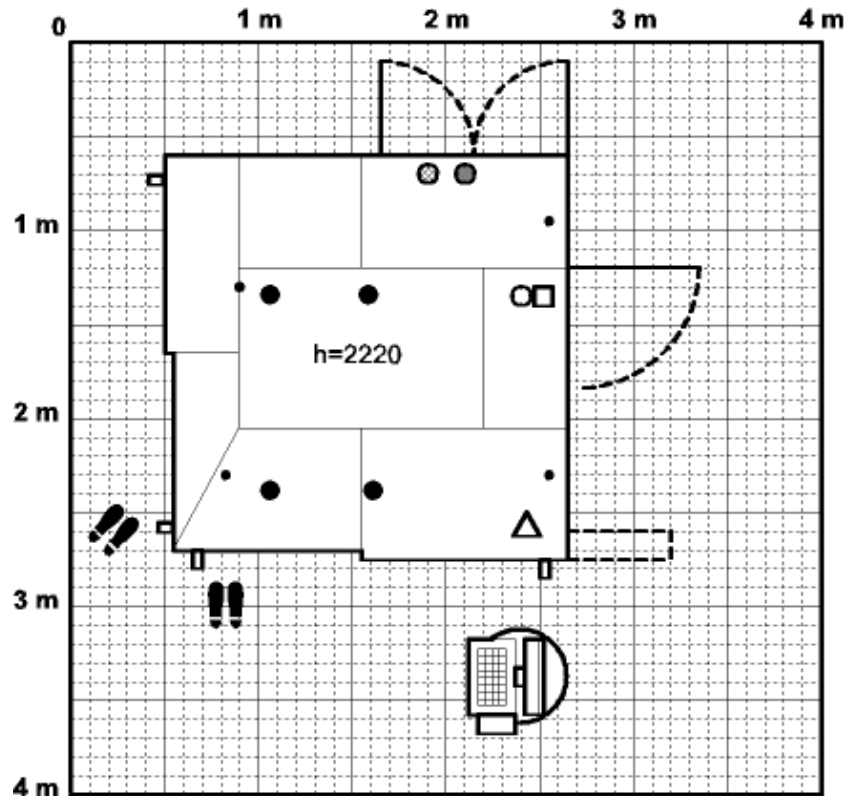
Caution:
At the moment of placing the equipment, bear in mind the possibility of pivoting the dielectric liquid filter by 45 respectively 90 degrees in order to facilitate emptying and take into consideration the due distance from walls or objects.



2.4 Connection values AGIECUT CLASSIC 2/3

Mains frequency	50/60 Hz
Accessory: autotransformer	3/190 ÷ 250, 3/360 ÷ 460 o 3/330 ÷ 520 V; 50/60 Hz
External fuses	3/25 A, T
Cos Φ	> 0.8
Earthing	permitted: Mains system TT + TN (IEC 364) forbidden: Mains system IT (IEC364) see "Table for selecting accessories according to mains conditions" EN 60204-1 (§ 4.3.2)
Mains supply quality	outside thread 1 ¹ / ₄ "
Water drain	Ø 7 mm, 6 ÷ 8 bar, 5 m ³ / hour
Compressed air connection and characteristics	Filtered (class 2 ISO/DIS8573-1, max. dust residue = 1µm resp. 1 mg/m ³), dried (class 4 ISO/DIS8573-1, max. water residue = 6 g/m ³ at +3 C° DTP) and not oiled (class 4 ISO/DIS8573-1, max. oil residue = 5 mg/m ³)
Coolant water connections	outside thread ³ / ₄ inch (inlet/outlet)
• standard: (not 2S/3S)	T = T _{ambient} (°C) Q = ~ 30 l/min. p = ~ 1 bar
• variant with cooling kit: (2S/3S : Standard)	T _{max.} = T _{ambient} - 7° C Q = ~ 20 l/min. p = 1.5 ÷ 3 bar
Coolant water quality	drinking or industrial water solid particles < 50 µm
Thermal output	
• standard: (not 2S/3S)	Max. 2.7 kW
to be dissipated from the room	Max. 4.85 kW
to be dissipated by the coolant water	
• variant with cooling kit: (2S/3S : Standard)	1.0 kW
to be dissipated from the room	Max. 6.6 kW
to be dissipated by the coolant water	20 °C (for precision machining)
Ambient requirements	Min./mass. 15 ÷ 35° C
temperature variation:	≤ 0.5° C / hour ≤ 2° C / day
	no vibration influence, without air current or heat sources

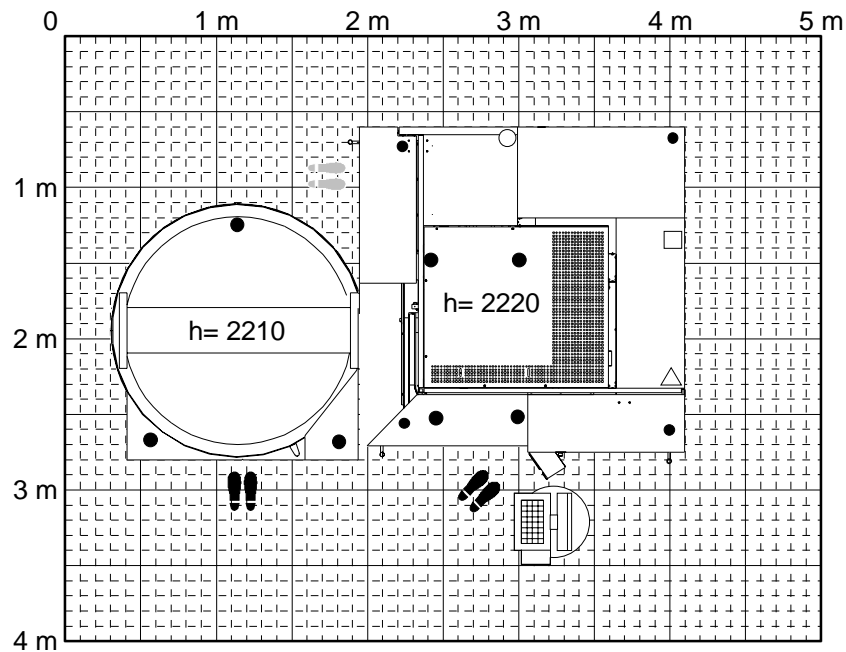
2.5 Installation plan and connection values for AGIECUT CHALLENGE, EVOLUTION, EXCELLENCE 2



min. room height: 3.0 m

- mains connection
- △ compressed air connection
- coolant water connections
- connection of the dirty tank drain
- ⊗ connection of the clean tank drain
- / ● bearing surfaces: floor load max. 16 kg/cm²

2.6 Installation plan and connection values for AGIECUT CHALLENGE, EVOLUTION, EXCELLENCE 2 with WPC (work-piece pallet changer)



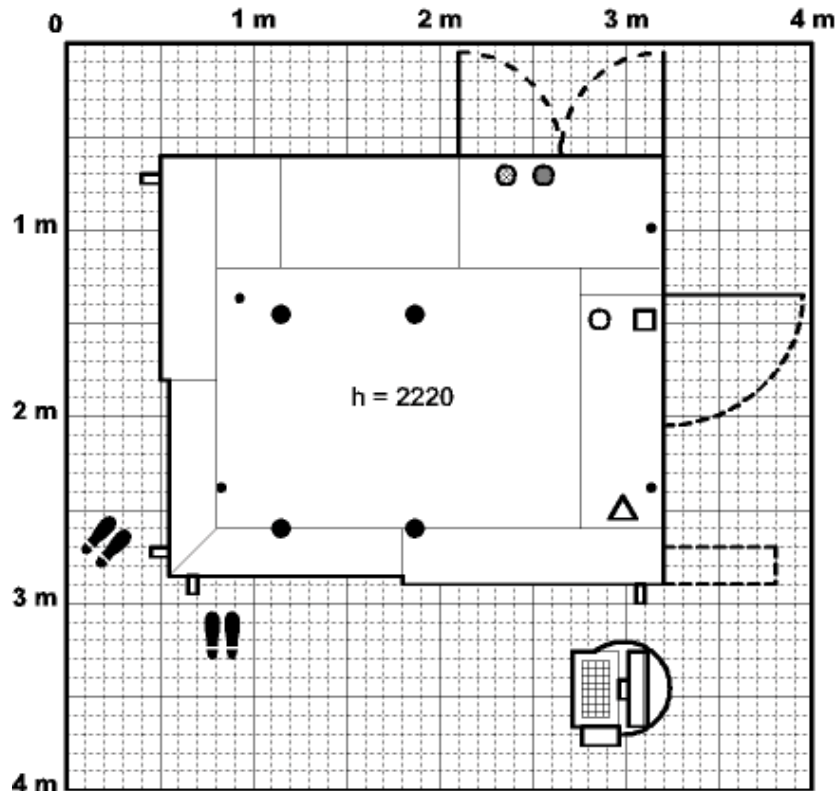
min. room height: 3.0 m

- mains connection
- △ compressed air connection
- coolant water connections
- connection of the dirty tank drain
- ⊗ connection of the clean tank drain
- / • bearing surfaces: floor load max. 16 kg/cm²

Additional Consumption of AGIE installation with WPC (work-piece pallet changer)

Dimension (W x D x H mm)	1'625 x 1'685 x 2'210 mm
Net weight	ca. 960 kg (empty)
Line power	+1 kVA (with dryer +3 kVA)
Compressed air	6-7 bar, +150 l/h

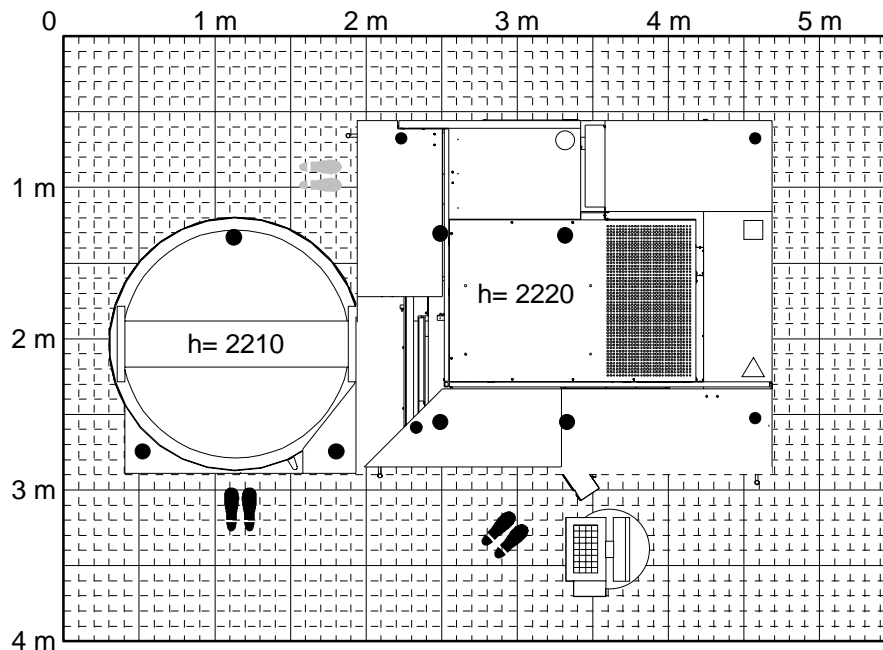
2.7 Installation plan and connection values for AGIECUT CHALLENGE, EVOLUTION, EXCELLENCE 3



min. room height: 3.0 m

- mains connection
- △ compressed air connection
- coolant water connections
- connection of the dirty tank drain
- ⊗ connection of the clean tank drain
- / • bearing surfaces: floor load max. 27 kg/cm²

2.8 Installation plan and connection values for AGIECUT CHALLENGE, EVOLUTION, EXCELLENCE 3 with WPC (work-piece pallet changer)



min. room height: 3.0 m

- mains connection
- △ compressed air connection
- coolant water connections
- connection of the dirty tank drain
- ⊗ connection of the clean tank drain
- / ● bearing surfaces: floor load max. 27 kg/cm²

Additional Consumption of AGIE installation with WPC (work-piece pallet changer)

Dimension (W x D x H mm)	1'625 x 1'685 x 2'210 mm
Net weight	ca. 960 kg (empty)
Line power	+1 kVA (with dryer +3 kVA)
Compressed air	6-7 bar, +150 l/h

2.9 Connection values

AGIECUT CHA/EVO/EXC 2/3

Mains frequency	50/60 Hz
Autotransformer (accessory)	3/190 ÷ 250, 3/360 ÷ 460 o 3/330 ÷ 520 V, 50/60 Hz
External fuses	3/25 A, T
Cos Φ	> 0.8
Earthing	permitted: Mains system TT + TN (IEC 364) forbidden: Mains system IT (IEC364) see "Table for selecting accessories according to mains conditions" EN 60204-1 (§ 4.3.2)
Mains supply quality	
Water drains	outside thread 1 ¹ / ₄ inch
Compressed air connection and characteristics	Ø 7 mm, 6 ÷ 8 bar, 5 m ³ / hour Filtered (class 2 ISO/DIS8573-1, max. dust residue = 1µm resp. 1 mg/m ³), dried (class 4 ISO/DIS8573-1, max. water residue = 6 g/m ³ at +3 C° DTP) and not oiled (class 4 ISO/DIS8573-1, max. oil residue = 5 mg/m ³)
Coolant water connections	outside thread ³ / ₄ inch (inlet/outlet) $T_{max.} = T_{ambient} - 7^{\circ} C$ $Q = \sim 20$ l/min. $p = 1.5 \div 3$ bar
Coolant water quality	drinking or industrial water, solid particles < 50 µm
Thermal output to be dissipated by the coolant water	Max. 7.0 kW
Ambient requirements	20° C (for precision machining) min./max. 15 ÷ 35° C
changes of temperature:	≤ 0.5° C / hour ≤ 2° C / day
	no vibration influence, without air current or heat sources
Thermal output to be dissipated from the room	1.0 kW

2.10 Environment

The choice of the place of installation is very important for a precision machine tool, since the accuracy of the workpiece depends on this.

Vibrations

The AGIECUT equipment should not be installed near to machines, which transmit vibrations through the foundations (loss of the precision of the alignment of the machine). If sources of disturbance cannot be avoided, the machine must be mounted on vibration-damping elements. For this purpose, consult a damping element supplier. Fixing with anchor bolts is not necessary

Dust

The equipment must be installed in a room as free of dust as possible.

Room temperature

General rules:

- Ideal temperature constant = 20° C
- The temperature may be considered constant when the fluctuations are less than 0.5° C/hour and 2° C/day. The daily mean is to be taken as a basis.

Situation	!!!!	Provisions, possible improvements
RADIATION <ul style="list-style-type: none"> • lighting • solar radiation • radiators 	hazard increases if constantly varying	keep distant; leave cold light switched "on" externally fitted curtains or slatted blinds; avoid walls exposed to direct sunlight keep distant, shield
AMBIENT AIR <ul style="list-style-type: none"> • layer formation • draughts • influence from other system parts or other systems • instable ambient temperature 	enclosed rooms, low ceilings increase with Δt small rooms, low ceilings increases with the fluctuation speed	mixing ventilation effect; cold air blown in from above; extraction of hot air from above close windows and doors; double doors; wind protection; avoid cold air flow from air conditioning system do not install machines in corners and exposed to direct or indirect (deflected) air flow; install deflection or protection elements keep dielectric unit temperature to a constant (seasonal) mean; keep possible heat sources (compressors etc.) out of machine room; cabins open at top; air conditioning with suitable cost / performance ratio (↗ also section "Air conditioning system".

Air conditioning system (General requirements)

Air conditioning systems are recommended where room temperatures reach extremely high levels or where very unstable conditions prevail, while high precision requirements have to be met.

Current air-conditioning systems feature the operating states:

- off
- part capacity (normally 30%)
- full capacity

The most suitable air conditioning systems are those with sufficient capacity to maintain the temperature at a constant $\pm 1^\circ \text{C}$ throughout the day, but allowing the room temperature to follow seasonal variations. Another more costly variant would be a "Super" installation maintaining a room temperature of $20^\circ\text{C} \pm 0.5^\circ\text{C}$ throughout the whole year.

Depending on their refrigerating capacity, air conditioning systems can also be real "cold air factories" having a negative effect on the accuracy of a machine.

Note the following points when selecting an air conditioning system:

- Choose systems with a large Δt -coefficient, i.e. avoid those which blow out air too cold (disproportionate relationship between refrigerating capacity and quantity of air circulated).
- Avoid airflows directly on to the machine. Systems must be installed in such a manner that the cooled air can mix effectively with the room air near the ceiling and then "trickle down". Perforated hollow ceilings are ideal in this respect.
- Unnecessary heat sources should be removed from the room.

Systems combining efficient performance with moderate cost are available on the market in different variants. The decisive points for a good cost/performance ratio are a small Δt -coefficient and dissipated thermal output (especially with high value systems).

Calculating the capacity of an air conditioning system

The following factors must be taken into account for determining the required capacity of an optimal air conditioning system (not exhaustive):

- Room air volume
- Room air temperature
- Room in
- Thermal output to be dissipated

The factors room air volume, room air temperature and room insulation are dependent on the installation site and are accordingly within your area of influence. The factor "thermal output to be dissipated" is dependent on the number and output of all heat sources contained in the room (machine systems, equipment etc.).

Thermal output to be dissipated from the room

The input electricity is partially converted into heat. The greatest part of it is dissipated by the coolant water (↗ below) and the rest is released into the room.

On AGIECUT equipment, the thermal output to be dissipated from the room amounts to:

	CLASSIC	CHA/EVO/EXC
Idling (standard / cooling kit)	1 / 1 kW	1 kW
Max. (standard / cooling kit)	2.7 / 1 kW	-

(1 kW = 860 kcal/h = 3'610 kJ/h)

Thermal output to be dissipated by the coolant water

On the AGIECUT systems, the following thermal output is to be dissipated by the coolant water:

	CLASSIC	CHA/EVO/EXC
Idling (standard / cooling kit)	1 / 1 kW	1.5 kW
Max. (standard / cooling kit)	4.85 / 6.6 kW	7 kW

(1 kW = 860 kcal/h = 3'610 kJ/h)

Air output volume

The AGIECUT CLASSIC produces the following air output:

CLASSIC (standard)	CLASSIC (with cooling kit) CHA/EVO/EXC
800 m ³ /h	0 m ³ /h

3 Connecting the equipment

3.1 Mains supply connection

3.1.1 General requirements

The AGIECUT equipment must be connected to a **TT** or **TN** type mains system showing characteristics according to the International Standard IEC 364 part 3, Nr. 312.2.1+2 (↗ also "Mains system" below).

It is **strictly forbidden** to **directly** connect the AGIECUT equipment to an **IT** type mains system (IEC 364 part 3, Nr. 312.2.3.)

The mains supply **quality** must correspond to the International Standard IEC 60204-1: 1997 § 4.3.2 (↗ also "Mains supply quality" below).

Caution:

The **certification of the mains system and quality** is a prerequisite for connecting the equipment to the mains and as such specifically requested in the Protocol of Installation and Putting into operation. In the lack of such a certification (signature of the customer or his representative) the service technician must suspend the putting into operation because the requirements for the safe functioning of the equipment are not met.

Should it not be possible to verify and certify the mains system and quality, the customer must ask the mains supplier for a relevant written attest that is to be attached to the Protocol of Installation and Putting into operation.

Local regulations with regard to connection and earthing material must be observed.

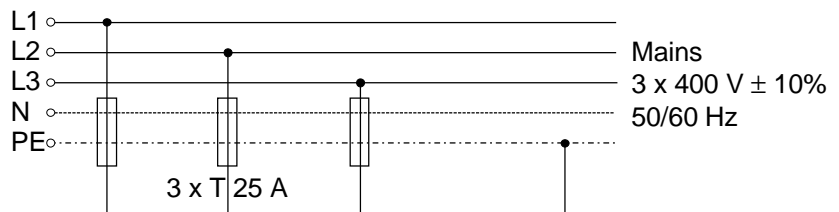
3.1.2 Detailed requirements

Mains supply cable

The mains supply cable must have four leads. The cable cross section must be at least $4 \times 4 \text{ mm}^2$. The mains cable is to be provided by the customer.

Mains

$3 \times 400 \text{ V} \pm 10\%$, 3 phases and earth (50 or 60 Hz, ↗ label on the AGIECUT installation).



01979b_x.dsf

In the case of the mains voltage varying from the rated values it is necessary to install a transformer between the mains and the equipment.

(↗ Table for selecting accessories according to mains conditions).

Protection

25 A protection fuses with delayed action

Earthing

Danger!

In order to guarantee

a) the protection of the operator against tensions from indirect contact in case of breakdown,

b) the best functionality of the system and immunity against the electromagnetic perturbations,

the earth system that the customer has to put at disposal must have a total earth resistance (protecting conductor included) of ca. 0.3 Ω.

If on the same earth are connected other systems beyond the AGIE one, the value of the maximum acceptable earth resistance reduces according to the relevant prescriptions of the International Norm IEC 364-4-41.

Mains system

The AGIECUT equipment must be connected to a mains system with **earthed neutral** of type **TT** (↗ International standard IEC 364 part 3, 312.2.1) or type **TN** (↗ International standard IEC 364 part 3, 312.2.2).

It is **strictly forbidden** to **directly** connect AGIECUT installations to a mains system of type **IT** with **insulated neutral or neutral connected to earth through high impedance** (↗ International standard IEC 364 part 3, Nr. 312.2.3.).

If the equipment must inevitably be connected to an IT mains, it is then **indispensable** to install a **Separation Transformer** or a **Line Conditioner** (↗ Table for selecting accessories according to mains conditions).

Mains supply quality

The machine is designed to operate with a power supply whose characteristics are in accordance with the International Standard IEC 60204-1 § 4.3.2.

In particular the following is strictly to be respected:

- Voltage:
0.9 to 1.1 of nominal voltage.
- Frequency:
0.99 to 1.01 of nominal frequency, continuously.
- Harmonics:
Harmonic distortion not to exceed 10% of the total r.m.s. voltage.
- Voltage unbalance:
Neither the voltage of the negative sequence component nor the voltage of the zero sequence component in three-phase supplies shall exceed 2% of the positive sequence component.
- Voltage interruption:
Supply interrupted or at zero voltage for not more than 3 ms at any random time in the supply cycle. There shall be more than 1 second between successive interruptions.
- Voltage dips:
Voltage dips shall not exceed 20% of the peak voltage of the supply for more than one cycle. There shall be more than 1 second between successive dips.

Procedure in case of mains voltage non-corresponding to requirements

Caution:

- If the rated voltage has a slow fluctuation exceeding $\pm 10\%$ (e.g. due to load variations in the workshop), install a line stabilizer upstream to the machine.
- If the rated voltage has a rapid fluctuation exceeding $\pm 10\%$, install a line conditioner upstream to the machine.
- In the case of overvoltage on the mains supply (producing high levels of energy) due to, for example, heavy inductive loads (induction furnaces, large motors, etc.) or frequent flashes of lightning in the zone, it is advisable/necessary to install a line conditioner upstream to the machine.

Note:
to check for the last two cases, a line analyzer is required or else an assessment based on experience encountered with other users in the workshop (e.g. failures to equipment or instruments during storms, sudden drops in lighting, frequent interruptions or interference in operation, connection of heavy inductive loads).

Table for selecting accessories according to mains conditions

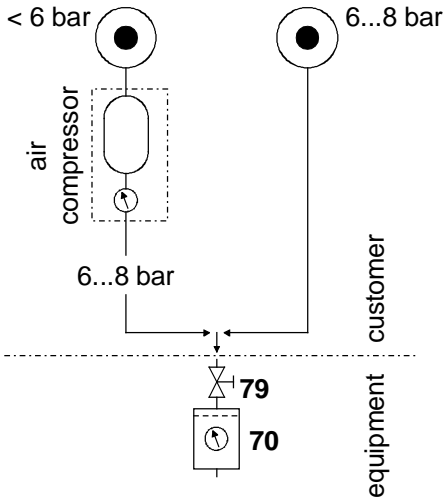
Standard conditions and solutions proposed	Main voltage conditions						
	400V $\pm 10\%$	Voltage peaks (Surge) according to EN 61000-4-5	Rated voltage $\neq 400$ V	Slow fluctuations: 400 V $\pm 15\%$	Rapid fluctuations: 400 V $\pm 15\%$	Voltage peaks (Surge) worse than as prescribed by EN 61000-4-5	Type IT
Standard machine	X	X					
Transformers TP-E-415 or 416			X				X (*)
Line voltage stabilizers E334n/12AI or T308A-20AI				X			
Line conditioners TST12AI				X	X	X	X

(*) To be used only in case of rated voltage = 400 V

3.2 Pneumatic and hydraulic connections

Compressed air connection

Connection diagram:



01268a_e.ds4

Equipment:

connection: \varnothing 7 mm

working pressure setting 6 bar

By the customer:

compressed air source ①: 6 ÷ 8 bar

compressed air capacity and characteristics: 5 m³/h, **filtered** (class 2 ISO/DIS8573-1, max. dust residue = 1 μm resp. 1 mg/m³), **dried** (class 4 ISO/DIS8573-1, max. water residue = 6 g/m³ at +3 C° DTP) and **not oiled** (class 4 ISO/DIS8573-1, max. oil residue = 5 mg/m³)

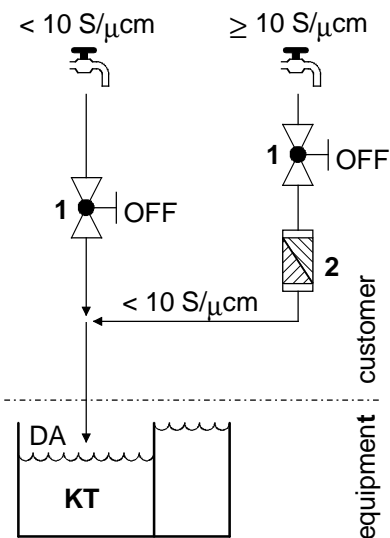
pipes, fixings: are not supplied by AGIE; these are to be provided by the customer

Note:

- ① If there is no compressed air network available or if the required pressure cannot be attained, a compressed air compressor must be provided by the customer. A suitable compressor is available from AGIE as an accessory (↗ "Mobile air compressor ECO 3/40").

Water connection

Connection diagram:



01021a_e.ds4

- If the mains water supply has an electric conductance of ≥ 10 μS/cm, a pre-deioniser system (2) must be inserted in-line.
- Shut-off valve 1 must be closed and may only be opened for filling or topping up.

Equipment:

connection:

none fitted; filling and topping up must be made directly into the dirty tank **KT**

necessary amount of water (dielectric unit) (first filling)

CLASS	CHA 2	CHA 3
2 / 3	EVO 2	EVO 3
	EXC 2 / 2F	EXC 3
	220 l	1000 l
(2S: 550 l, 3S: 750 l, with suppl. Tank 1000 l)	700 l	

Evaporation:

100 l / week with 20° C

Customer:

water supply quality:

↗ "Water (dielectric)"

pipe, fixings, main valve:

are not supplied by AGIE; these are to be provided by the customer

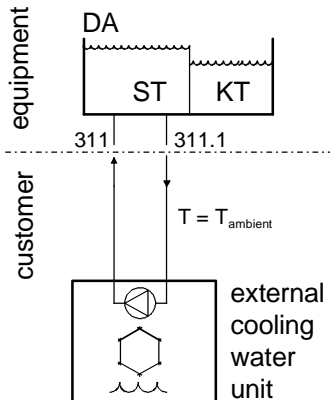
Note:

A suitable pre-deioniser system is available from AGIE as an option (↗ chap. C12.11)

Coolant water connections for AGIECUT CLASSIC 2 / 3

a) Standard (not 2S/3S)

Connection diagram:



01609a_e.ds4

Equipment:

connections: outside thread $\varnothing \frac{3}{4}$ "

thermal output to be dissipated: Max 4.85 kW

customer:

demands upon the external cooling water unit: (to be supplied by customer)

type: flow cooler unit with circulation

cooling capacity required: 5.5 ÷ 6.5 kW

water temperature, operative range: $T = T_{\text{ambient}}$, 15 ÷ 35° C

circulation pump: ~ 30 l/min.

water pressure: ~ 1 bar

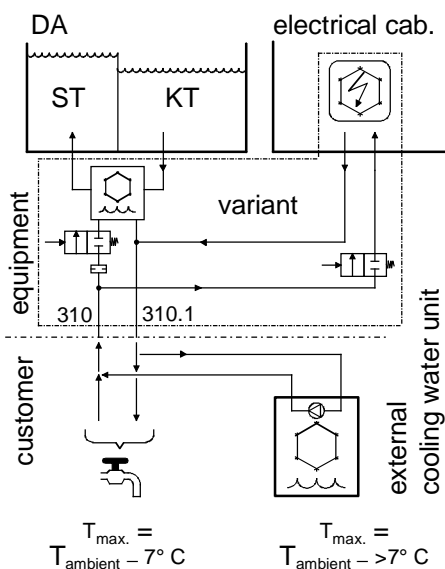
pipe, fixings: are not supplied by AGIE; these are to be provided by the customer.

Note:

A suitable cooling water unit is available from AGIE as accessory (↗) "Flow cooler unit WG 15a TP"

b) Variant with cooling kit (2S/3S: Standard)

Connection diagram:



01610a_e.ds4

Equipment:

connections: outside thread $\varnothing \frac{3}{4}$ "

thermal output to be dissipated: Max 6.6 kW

customer:

water supply quality:

- drinking or industrial water
- solid particles < 50 μm

water temperature: ①

$$T_{\text{max.}} = T_{\text{ambient}} - 7^{\circ} \text{C}$$

water capacity:

~ 20 l/min.

water pressure:

1.5 ÷ 3 bar

pipe, fixings:

are not supplied by AGIE; these are to be provided by the customer.

Note:

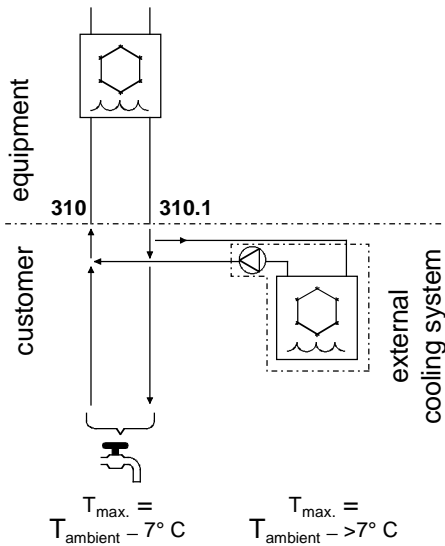
① If the permitted coolant water temperature cannot be attained, an external cooling water unit must be provided by the customer.

Recommended cooling capacity of cooling water unit: 7 ÷ 9 kW

A suitable cooling water unit is available from AGIE as accessory (↗) "Cooling water unit WG 20a TPS").

Coolant water connections
AGIECUT CHA/EVO/EXC 2 / 3

Connection diagram:



01270a_d.ds4

Equipment:

connections:
 Thermal output to be dissipated:

outside thread $\varnothing \frac{3}{4}$ “
 Max 7 kW

Customer:

water supply quality:

- drinking or industrial water
- solid particles < 50 μm

water temperature: ①

$$T_{\text{max.}} = T_{\text{Ambient}} - 7^{\circ} \text{C}$$

water capacity:

$$Q = \sim 20 \text{ l/min.}$$

water pressure

$$p = 1.5 \div 3 \text{ bar}$$

pipe, fixings:

are not supplied by AGIE; these are to be provided by the customer

Note:

- ① If the permitted coolant water temperature cannot be attained, an external coolant water unit must be provided by the customer.
 Recommended cooling capacity of coolant water unit: 7.÷.9 kW
 A suitable coolant water unit is available from AGIE as accessory (↗ “Coolant water unit WG 27a TCPS”).

Water drains

- The DA may only be emptied into the sewage system from the clean tank **ST**.
- **Water from the dirty tank KT must never be let into the sewage system!** The dirty tank may only be emptied if a suitable sewage treatment plant for industrial waste water is available in the works sewage system.

Depending on the local conditions and regulations, the following variants are possible:

Variant 1:

The works sewage system is **not connected to a suitable** treatment plant for industrial waste water:

CLASSIC 2 / 3	CHA/EVO/EXC 2 / 3, EXC 2F
The clean tank ST can be drained into the sewage system by suction	Connect clean tank outlet 42 to the sewage system

- Dirty tank outlet **41** must always be closed.
- The water from the dirty tank must first be filtered and can then be let into the sewage system through the clean tank.

Variant 2:

The works sewage system is **connected to a suitable** treatment plant for industrial waste water:

CLASSIC 2/3	CHA/EVO/EXC 2/3, EXC 2F
The clean tank ST can be drained into the sewage system by suction	Connect clean tank outlet 42 to the sewage system

- Connect dirty tank outlet **41** to the works sewage system.

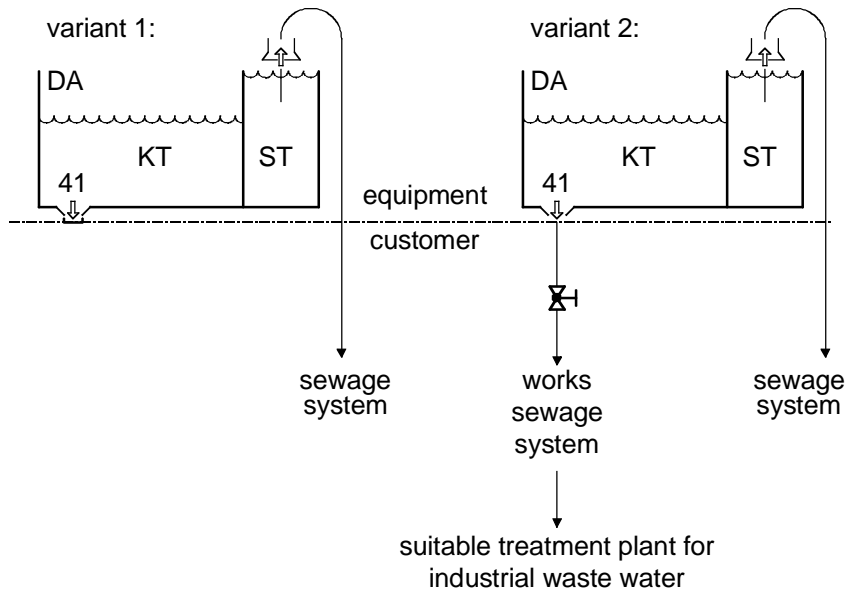
Equipment:

connections: outside thread
Ø 1 1/4"

Customer:

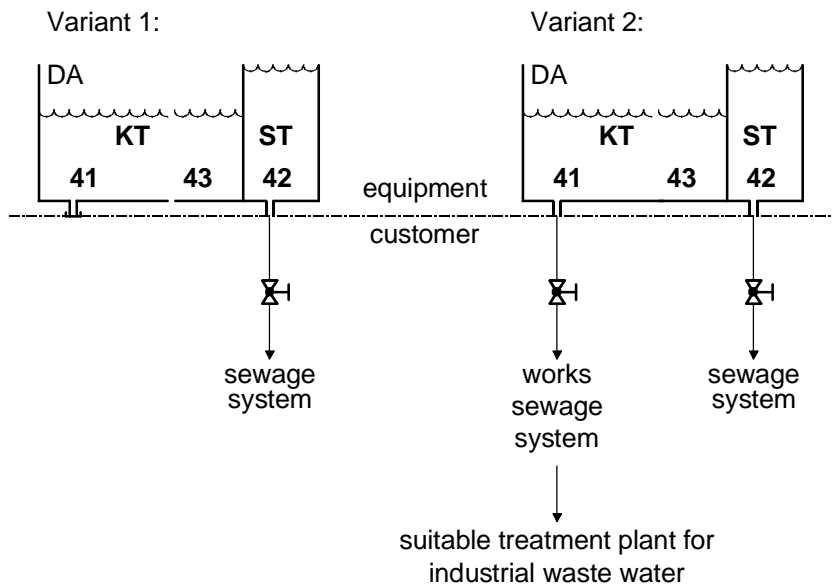
pipes, connections, main valves: are not supplied by AGIE; these are to be provided by the customer

Connection diagram CLASSIC 2/3:



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Connection diagram CHA/EVO/EXC 2/3:



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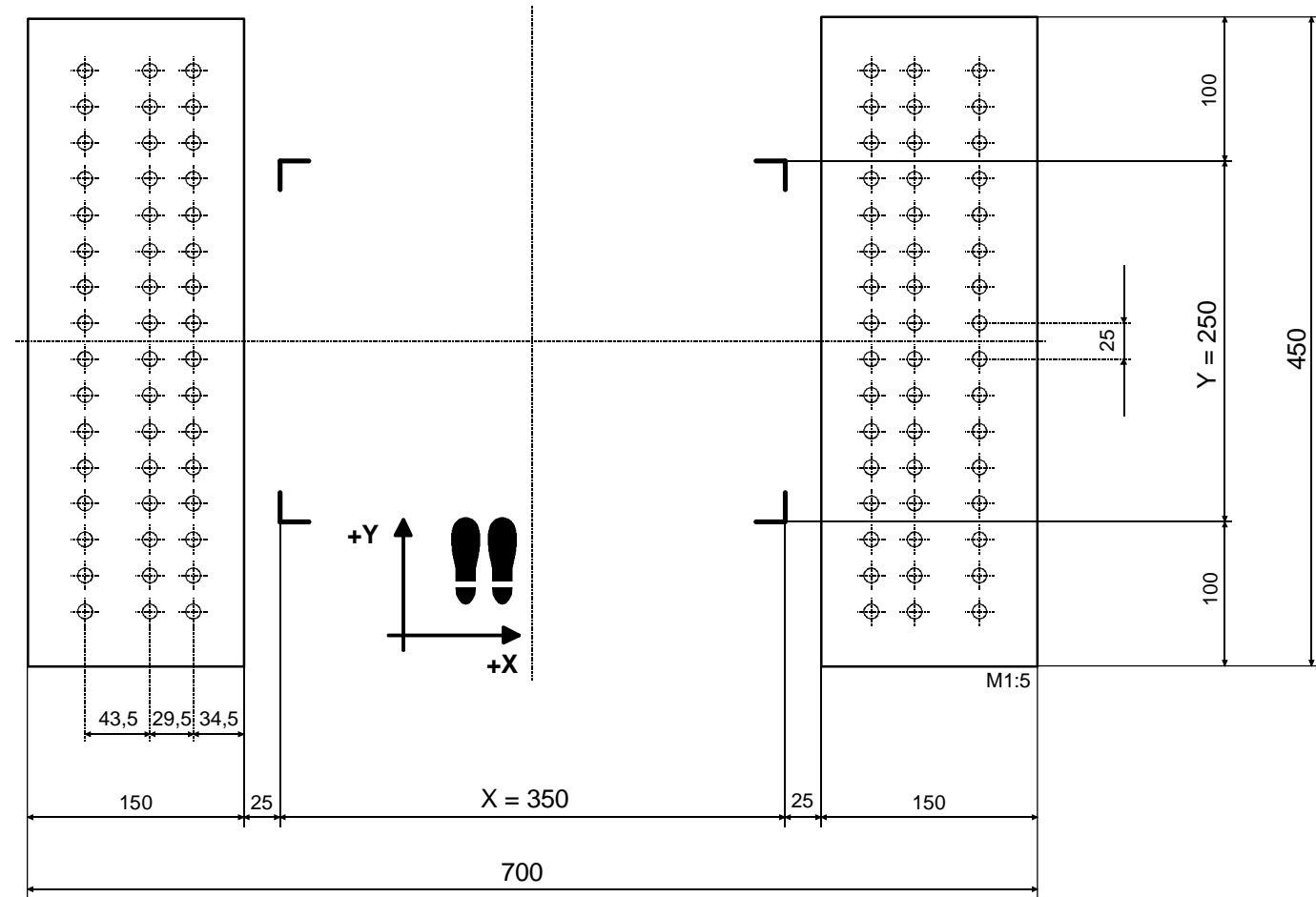
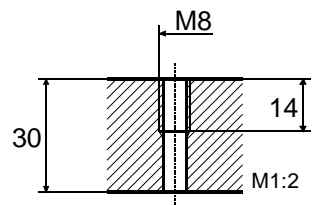
3.3 Clamping plates

The clamping plane is at the same height as the lower nozzle (0 height).

Clamping plates left/right
only AGIECUT CLASSIC 2
+ CHALLENGE 2

STANDARD

Fixing holes

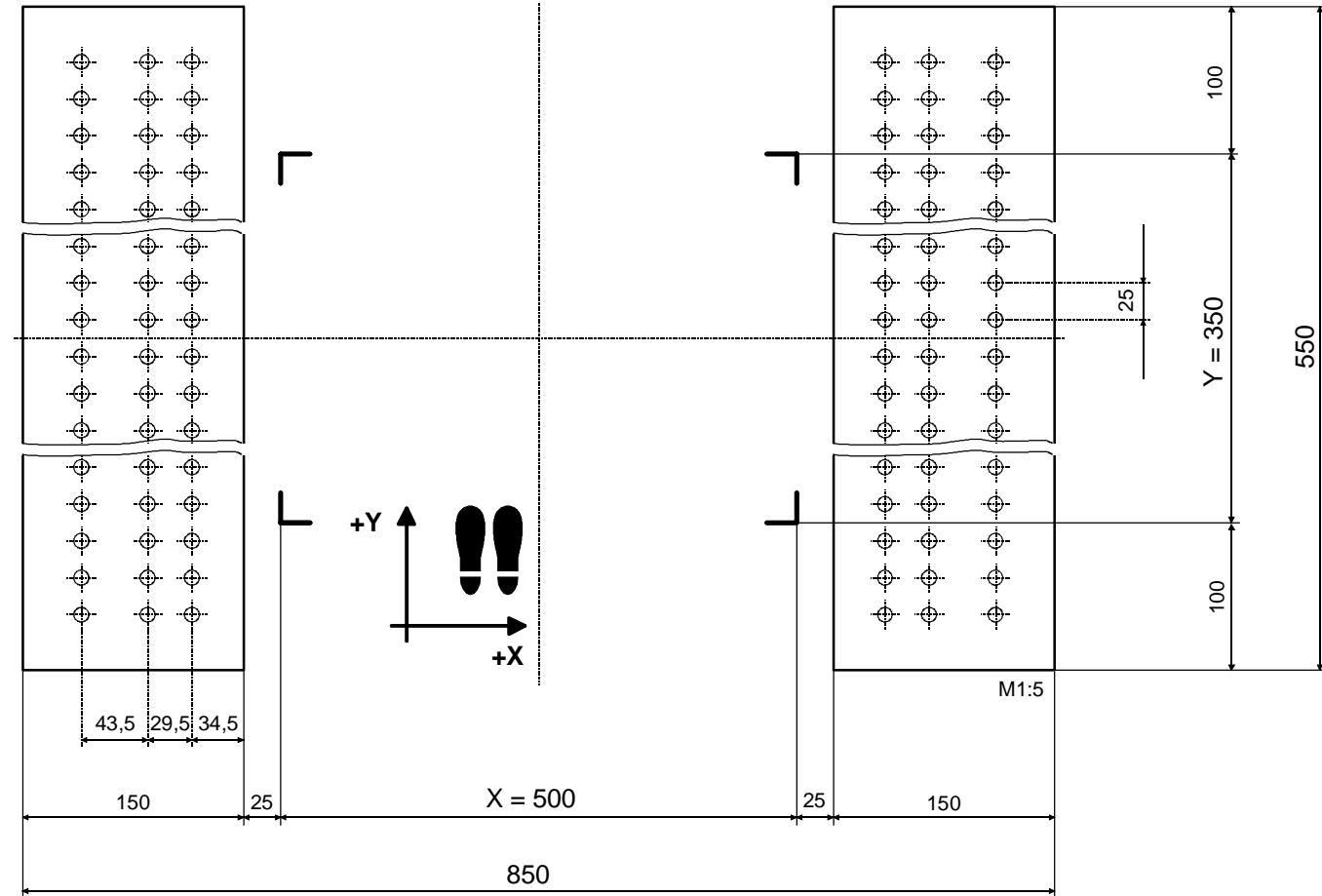
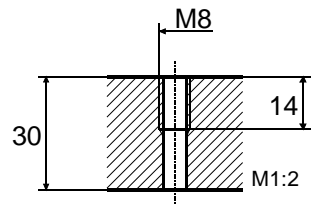


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Clamping plates left/right
only AGIECUT CLASSIC 3
+ CHALLENGE 3

STANDARD

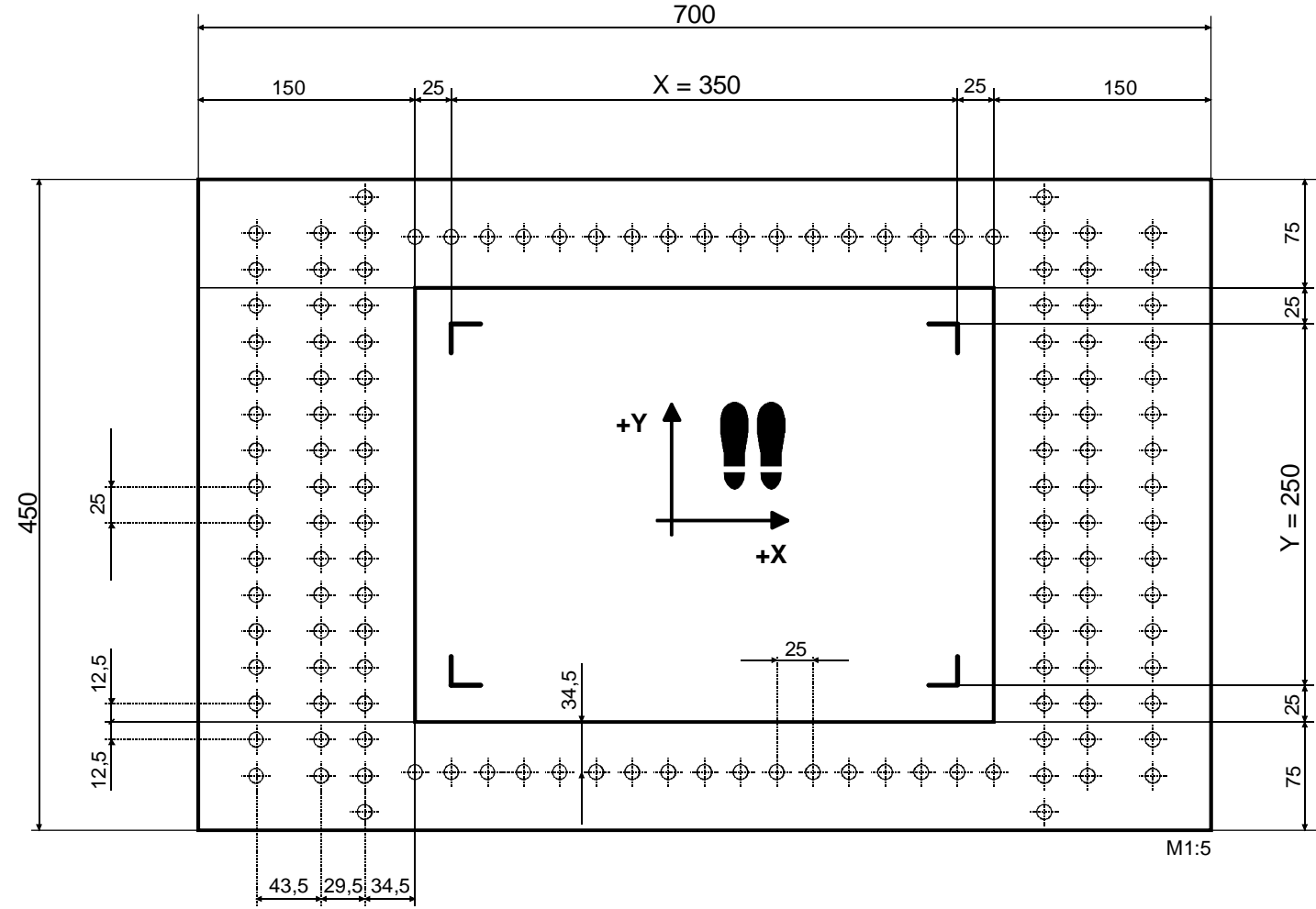
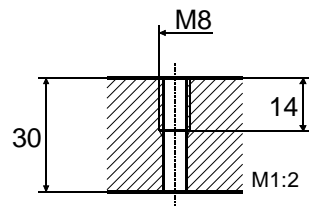
Fixing holes



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**AGIECUT CLASSIC 2
+ CHALLENGE 2 (Var.),
EVO/EXC 2**

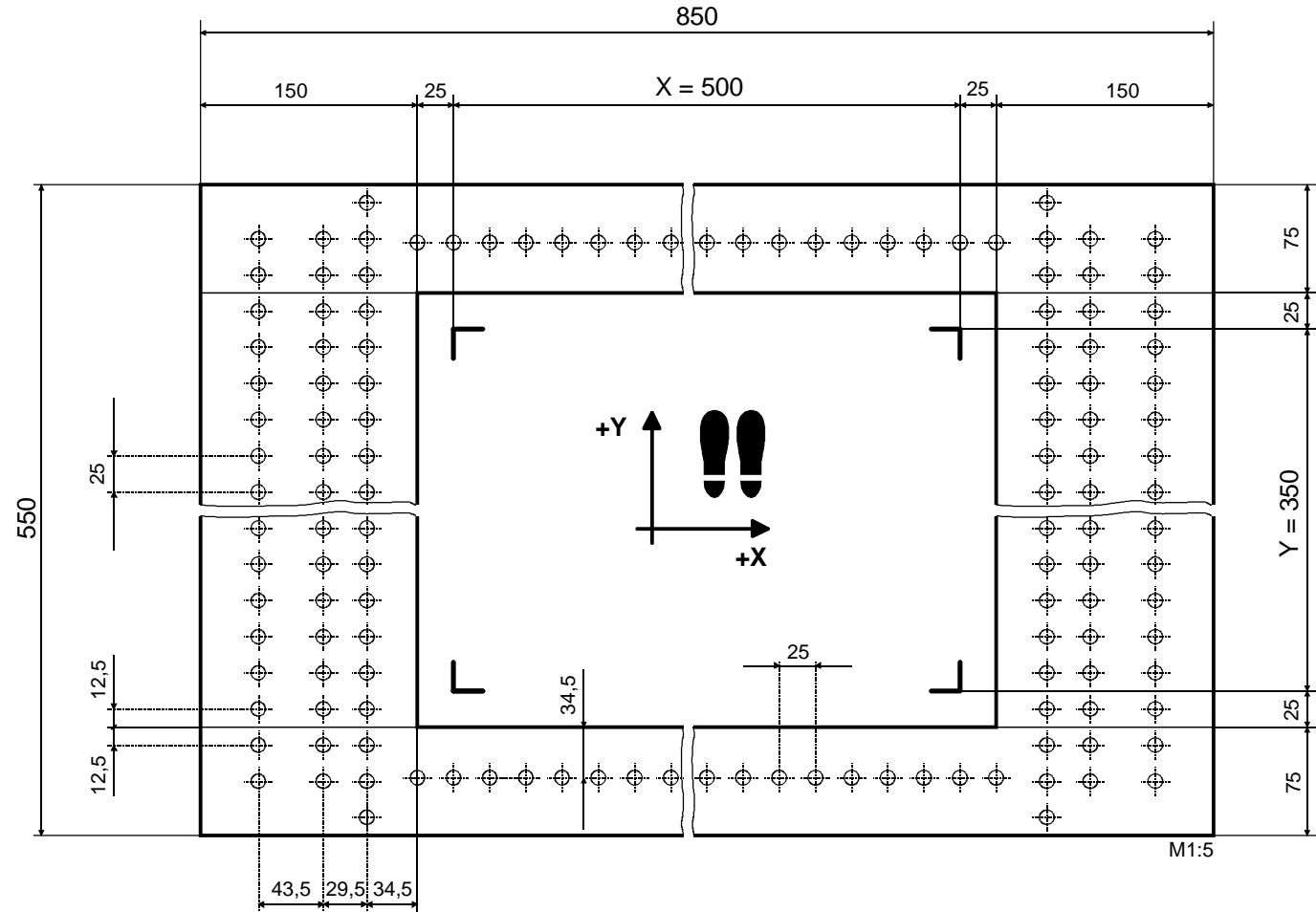
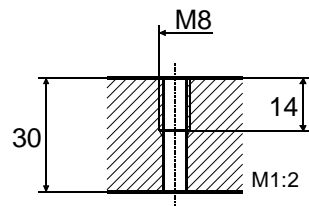
Fixing holes



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**AGIECUT CLASSIC 3
+ CHALLENGE 3 (Var.),
EVO/EXC 3**

Fixing holes



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Extension of the clamping system

The AGIE Universal Clamping Frame allows the workpiece to be fastened directly to its clamping plates. The hole pattern is compatible for all current clamping devices from the following manufacturers:

- Mecatool
- EROWA
- 3R
- Hirschmann

The clamping devices must be mounted in accordance with the manufacturer's instructions.

Caution:

When using the clamping devices, great attention must be paid to the risk of collision (↗ "Collision-free zones").

Also take the size of the moving parts (arms, heads, cables, ...) into consideration during positioning, this being particularly important when clamping several pieces in the working area.

Collision-free zones

The collision-free zones in the following drawings may be occupied by the workpiece, clamping devices or anything else without the risk of collision.

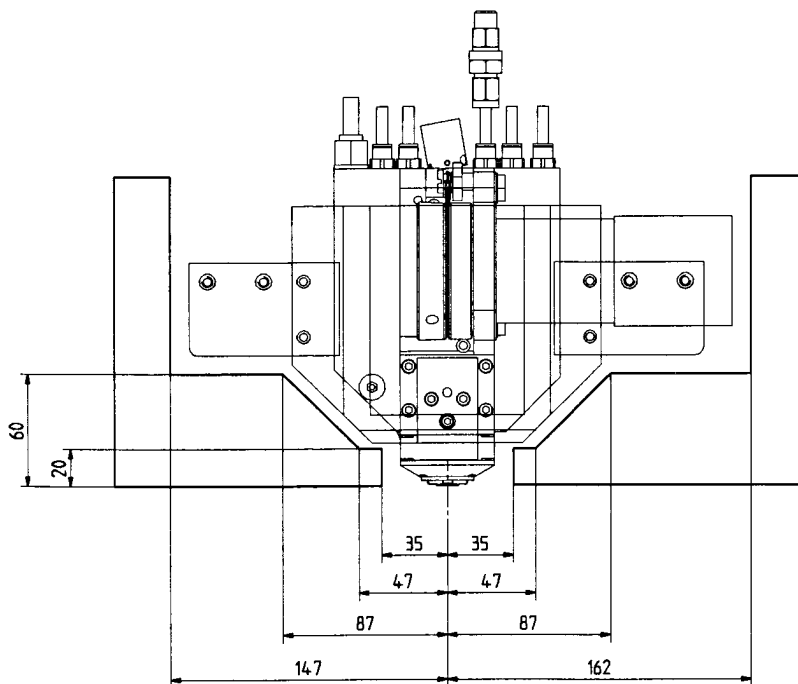
This is the case as long as nothing is clamped on the guide heads or the arms.

These collision-free zones can be enlarged if the distance between the flushing nozzles and the workpiece surface is increased.

Collision-free zones
(continuation)

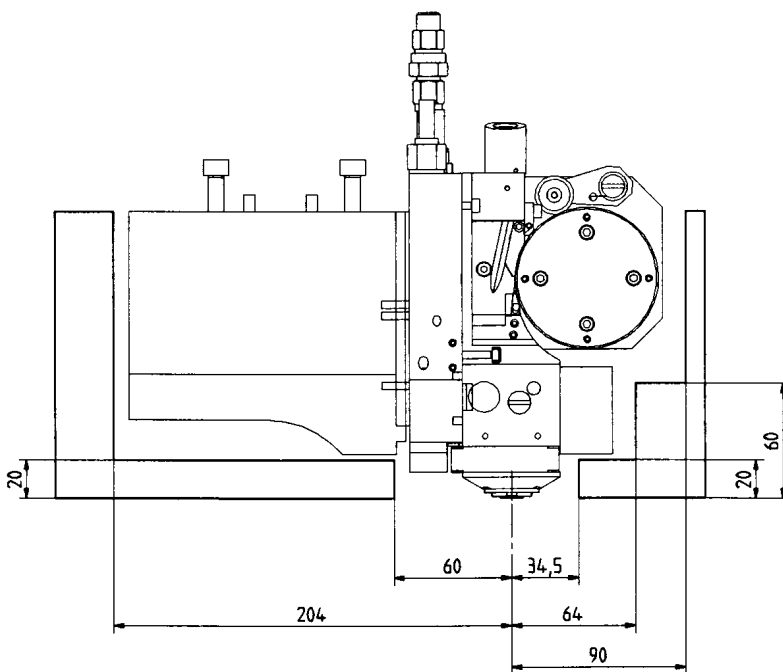
Collision-free zones with parallel
cut for AGIECUT
CLA/CHA/EVO/EXC 2/3 (best case):

X axis



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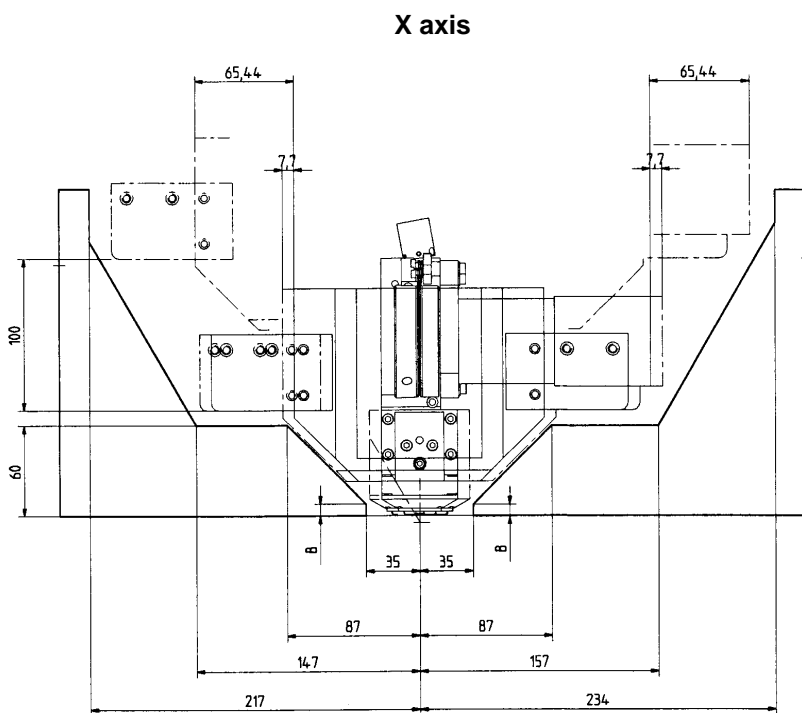
Y axis



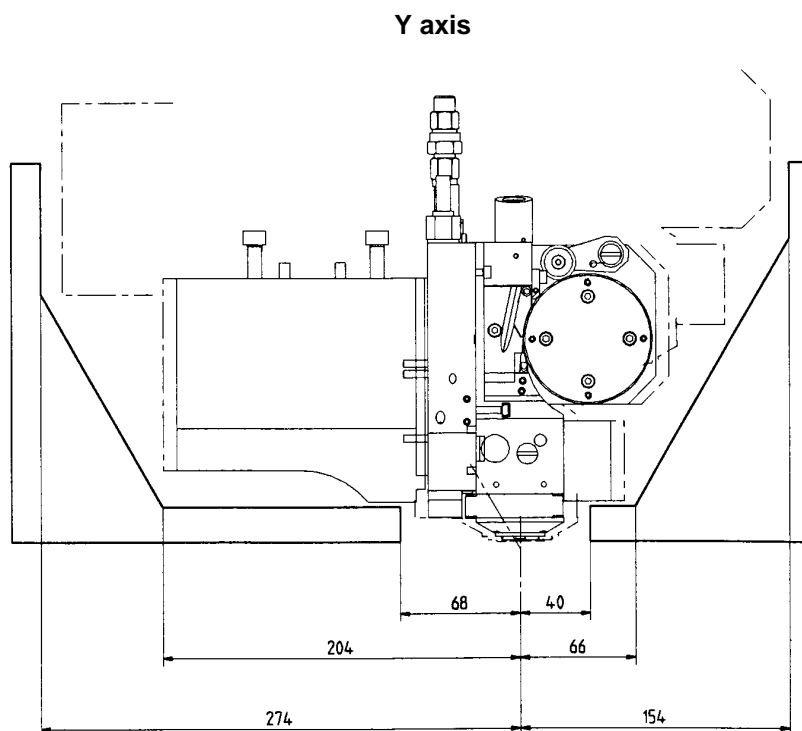
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Collision-free zones
(continuation)

Collision-free zones with 30° taper cut for AGIECUT
CLA/CHA/EVO/EXC 2/3 (worst possible case):



03886a_x.bmp



03887a_x.bmp

4 Accessories, Options, Variants

4.1 Printer

↗ also "Connection of peripheral equipment" chap. C2.3

The package contains:

- matrix printer EPSON LQ 570/continuous paper with CENTRONICS parallel interface
- interface filter for parallel interface
- 5 m cable

Caution:

The interface filter for the parallel interface is to be used at all events for the protection of both units (machine, printer).

4.2 Trasformers TP-E 415/416

Trasformers to be used for adaptation to the mains voltage of the 3 x 400 V power supply required for the machine; it also serves to make the IT mains supply compatible with our machine also in case of 3 x 400 V mains supply.

Accessory

↗ also attached supplier's operating manual

- place of Installation: can be installed near by the equipment or outside of the workshop, in environment suitable for the transformer's characteristics
- Dimensions (B x T x H): 650 mm x 470 mm x 610 mm
- Mains voltages:

Type	TP-E 415	3 x 190 ÷ 230 V; 50/60 Hz
	TP-E 416	3 x 340 ÷ 440 V; 50/60 Hz
- output voltage/power: 3 x 400 V/12 kVA
- connection diagram: ↗ "Commissioning/Accessories"

Customer

- mains cable: four or five leads (3 phases, with or without neutral, earthing); is to be supplied by the customer
- protection fuse / cross section of the mains cable:

Type	TP-E 415	T 40 A / 10 mm ²
	TP-E 416	T 25 A / 4 mm ²
- connection cable to the machine: four leads (3 phases and earthing, without neutral); is to be supplied by the customer
- cross section of the connection cable: 4 mm²

4.3 Voltage stabilizer E334n/12AI

If the mains voltage fluctuates between minimum and maximum values exceeding the permissible tolerance by more than $\pm 10\%$, it is necessary to install a Voltage stabilizer which allows compensation of slow fluctuations in the mains voltage.

Accessory

↗ also attached supplier's operating manual

- place of Installation: can be installed near by the equipment or outside of the workshop, in environment suitable for the voltage stabilizer characteristics
- Dimensions (B x T x H): 270 mm x 445 mm x 500 mm
- input mains voltages: 3 x 400 V $\pm 15\%$; 50/60 Hz
- output voltage/power: 3 x 400 V $\pm 1.5\%$ / 12 kVA
- connection diagram: ↗ "Commissioning/Accessories"

Customer

- mains cable: four or five leads (3 phases, with or without neutral, earthing); is to be supplied by the customer
- connection cable to the machine: four leads (3 phases and earthing, without neutral); is to be supplied by the customer
- protection fuse / cross section of the mains and cross section of connection cable: T 25 A / 4 mm²

4.4 Line conditioner TST-12AI

The Line conditioner is designed for compensation of slow and rapid fluctuations in main supply voltage, voltage peaks in the mains supply, high frequency interference; furthermore it makes the IT mains supply compatible with our machine.

Accessory

↗ also attached supplier's operating manual

- place of Installation: can be installed near by the equipment or outside of the workshop, in environment suitable for the line conditioner characteristics
- Dimensions (B x T x H): 535 mm x 410 mm x 1160 mm
- input mains voltages: 3 x 400 V $\pm 15\%$; 50/60* Hz
* for 60 Hz, follow the adaptation instructions inside the line conditioner user manual.
- output voltage/power: 3 x 400 V $\pm 3\%$ / 12 kVA
- connection diagram: ↗ "Commissioning/Accessories"

Customer

- mains cable: four or five leads (3 phases, with or without neutral, earthing); is to be supplied by the customer
- connection cable to the machine: four leads (3 phases and earthing, without neutral); is to be supplied by the customer
- protection fuse / cross section of the mains and cross section of connection cable: T 32 A / 6 mm² / 4 mm²

4.5 Mobile air compressor ECO 3/40

Accessory

place of Installation:

↗ also attached supplier's operating manual

- can be installed near by the equipment or outside of the workshop
- install the compressor in a well aired and dust free location
- minimal distance 50 cm from walls and equipment
- environment temperature must not be lower than + 5° C or higher than + 35° C

contents of the compressed air tank:

40 l

supply:

3 x 230 V/50 Hz

cross section of the mains cable:

2.5 mm²

connection-hose nozzle:

Ø 7 mm

Customer:

slow-blow protection fuse:

min. 16 A

hose, fixings:

- are not supplied by AGIE; these are to be provided by the customer
- the compressed air hose must be flexible

4.6 Handling device WPC (Workpiece Changer)

This device has been developed and constructed for the loading and unloading of machine tools with prepalleted workpieces.

The WPC is a PC-controlled workpiece changer which, depending on the version, can accommodate several workpiece pallets on its turntable.

Depending on the object to be loaded or unloaded, a passive or a pneumatic active gripper is employed.

For further information regarding technical data, place of installation and transport of the handling devices WPC and WEC please see chapter C11.5 Automation with WEC/WPC.

4.7 Flow cooler unit WG 15a TP (CLASSIC) (Standard)

Accessory:

place of Installation:

↗ also attached supplier's operating manual

- frost sheltered place
- no heat source close to the machine (f.ex. radiators)
- minimal distance 50 cm from walls
- must not be installed in the same air-conditioned room as the equipment

Dimensions (B x T x H):

750 mm x 550 mm x 800 mm

supply:

3 x 400 V; 50/60 Hz

cooling capacity:

6 kW

connections:

- cooling water inlet G^{3/4}"
- cooling water outlet G^{3/4}"

connection diagram:

↗ "Commissioning/Accessories"

Customer:

mains cable:

- four leads (3 phases and earthing, without neutral)
- is to be supplied by the customer

slow-blow protection fuse/cross section of the mains cable:

min. 10 A / 1.5 mm²

hoses, fixings, hose nozzles:

- are not supplied by AGIE; these are to be provided by the customer
- connection-hose nozzles: 2 x Ø 16 mm/G^{3/4}";
- the two hoses (Ø 16 mm) must be flexible
- the direction of water flow must be indicated with arrows on the hoses

4.8 Cooling water unit WG 20a TPS (CLASSIC) (Variant with cooling kit)

Accessory:

place of Installation:

↗ also attached supplier's operating manual

- frost sheltered place
- no heat source close to the machine (f.ex. radiators)
- minimal distance 50 cm from walls
- must not be installed in the same air-conditioned room as the equipment

Dimensions (B x T x H):

700 mm x 755 mm x 1'470 mm

supply:

3 x 400 V; 50/60 Hz

cooling capacity:

7 kW

connections:

- cooling water inlet G^{3/4}"
- cooling water outlet G^{3/4}"
- automatic refilling G^{1/2}"
- cooling water drain G^{3/4}"

connection diagram:

↗ "Commissioning/Accessories"

Customer:

mains cable:

- four leads (3 phases and earthing, without neutral)
- is to be supplied by the customer

slow-blow protection fuse/cross section of the mains cable:

min. 10 A / 1.5 mm²

hoses, fixings, hose nozzles:

- are not supplied by AGIE; these are to be provided by the customer
- connection-hose nozzles:
 - 3 x Ø 16 mm/G^{3/4}";
 - 1 x Ø 16 mm/G^{1/2}";
- the four hoses (Ø 16 mm) must be flexible
- the direction of water flow must be indicated with arrows on the hoses

4.9 Cooling water unit WG 27a TCPS (CHA/EVO/EXC)

Accessory

place of Installation:

↗ also attached supplier's operating manual

- frost sheltered place
- no heat source close to the machine (f.ex. radiators)
- minimal distance 50 cm from walls
- must not be installed in the same air-conditioned room as the equipment

Dimensions (B x T x H):

700 mm x 755 mm x 1470 mm

supply:

3 x 400 V; 50/60 Hz

cooling capacity:

8.9 kW

connections:

- cooling water inlet G $\frac{3}{4}$ "
- cooling water outlet G $\frac{3}{4}$ "
- automatic supply G $\frac{1}{2}$ "
- cooling water drain G $\frac{3}{4}$ "

connection diagram:

↗ "Commissioning/Accessories"

Customer:

mains cable:

- four leads (3 phases and earthing, without neutral)
- is to be supplied by the customer

slow-blow protection fuse/cross section of the mains cable:

min. 10 A / 1.5 mm²

hoses, fixings, hose nozzles:

- are not supplied by AGIE; these are to be provided by the customer
- connection-hose nozzles:
3 x Ø 16 mm/G $\frac{3}{4}$ ";
1 x Ø 16 mm/G $\frac{1}{2}$ ";
- the four hoses (Ø 16 mm) must be flexible
- the direction of water flow must be indicated with arrows on the hoses

5 Commodities

5.1 Water (dielectric)

Only water with the following characteristics may be used for EDM cutting with AGIECUT equipment:

Low salt content

- The recommended chemical-physical characteristics for the water used to produce dielectric are:
- Conductivity: < 10 $\mu\text{S}/\text{cm}$
- Chloride Cl^- : < 20 mg/l
- Sulphate SO_4^{2-} : < 20 mg/l
- Hardness Ca^{2-} : < 120 mg/l (16 dH° ; 29 fH°)
- Never add salts, particularly if they contain chlorides (common salt). Normally, the conductivity of the dielectric tends to increase during the erosive process, making the addition of salts unnecessary. In the case of an extreme need, we recommend the use of sodium molybdate (Na_2MoO_4).
- If you have water very high in calcium carbonate or water with greatly increased conductivity, it will be necessary to make provision for the installation of a water pre-pre-deionised system or for the purchase of pre-deionised water from hospitals or other institutions.

The pre-deionised system can be supplied as an option by AGIE.

The use of this system offers the following advantages (↗ also chapter C12.11 "Pre-deionised system")

- Increased autonomy of the deionising cartridges of the DA.
- Great reduction of the time losses caused by the water change or automatic filling (no more waiting time to reach the desired conductivity value).
- Better utilisation of AGIECUT.
- Less special waste disposal: the resin resulting from the deionising unit can be disposed as normal waste

"Purity"

- Only use drinking water. If industrial water has to be used, make provision for filtration and pre-deionisation.
- Work with clean hands. Avoid adding fats and oily substances since they encourage biological deterioration of the water (bacteria, fungi, bad odours) and clog the filters and the resin.

5.2 Wire

Packing:

The spools are vacuum packed in white Styrofoam boxes with coloured labels (↗ table).

type of wire	Label colour	wire Ø (mm)	weight of a spool (kg)	length of a spool (m)	AGIE ID.-NR.
Cobra Cut A	orange	0.10	1.6	23'500	646.127
		0.15	6	39'500	646.117
		0.20	25	57'500	646.107
		0.25	25	37'000	646.097
		0.30	15.7	25'800	646.087
Cobra Cut D	brown	0.25	15.7	37'000	661.747
		0.30		25'800	661.757
Cobra Cut S	blue	0.30	15.7	25'800	672.167
		0.33		21'170	672.177
Cobra Cut W	red	0.25	15.7	37'000	694.427
Brass (BercoCut)	rufous	0.25	15.7	37'000	690.687
Tungsten ①	blue	0.03	0.3	5'000	661.277
Tungsten ①	blue	0.05	0.4	5'000	661.287
SP Wire	Silver	0.07	0.4	5'000	697.027
SP Wire	Silver	0.07	1.5	20'000	697.037

① AGIECUT EXCELLENCE 2F only

5.3 Filter cartridges

Type of filter	CLASSIC	CHA/EVO/EXC
Type of filter	Mann & Hummel type H15 190/16	
Number of filters	4 (Variant 8) 2S/3S: 8 Standard	8
Order No.:	618.377.6 (1 Type of filter)	

Filter consumption:	CLASSIC	CHA/EVO/EXC
with main cut	20 h (4 cartridges) 50 h (8 cartridges)	50 h
with mixed operation (main- and trim cuts)	120 h (4 cartridges) 320 h (8 cartridges)	320 h

Technical specification

Filter surface	27'500 cm ²
Filter fineness	5 µm
Flow direction	from outside to inside

5.4 Deionising resin

Type of resin	Non-returnable resin RELITE MI-700
Order No.:	029.696 (one 10 l bag)
Resin requirement	10 l
Autonomy:	~ 100 operating hours with 10 µS/cm (depending on the water hardness in your region)

Caution:

The deionising resin must be stored at a temperature of between -10°C and +40°C. If only partially used, the bag containing the remaining resin must be closed air-tight again in order to prevent the resin from losing its own moisture through oxidation and thus becoming unusable.

5.5 Lubricants

Some machine elements of the AGIECUT equipment, such as recirculating spindles, roller bearings, guides, etc. require regular lubrication in accordance with the maintenance intervals (↗ chap. C8 "Maintenance"). The following lubricants should be kept available for this:

AGIECUT equipments				
type	product	application	CLASSIC	CHA/EVO/EXC
grease	Microlube GBUY 131	<ul style="list-style-type: none"> • work tank seal / back wall • work tank arm • work tank guides • work tank spindles 	X	X X X X
grease	Klueber CENTOPLEX CX4/375 AU	<ul style="list-style-type: none"> • guides X, Y, Z, U, V axes 	X	X
grease	Klueber ISOFLEX Topas AK50 *	<ul style="list-style-type: none"> • spindles X, Y, Z, U, V axes 	X	X
grease	Klueber ISOFLEX NBU15	<ul style="list-style-type: none"> • moving elements 	X	X

* only for the service technician

5.6 Cleaning material

Cleaning brushes for the brakes

Order No	826.508.4
Contents	10 cleaning brushes
Application	↗ chap. C8 "Maintenance"

Cleaning the work tank back wall

Clean regularly with a rag and petrol 80/110. Incrustations are to be removed with emery paper no. 220 and petrol 80/110.

5.7 Anticorrosive agents

The anticorrosive agent SAVAN RVH 600 is a very effective agent, which has been tested on several occasions in our laboratory for its efficacy. It was specially developed by Savan-Chemie for use in the water of wire- erosion machines.

The product is non-toxic and does not contain any materials, such as nitrites, aldehydes or phenols. It does not have any detrimental dermatological effects and is biologically 100% degradable.

The product's effect is not dependent on the electric conductance of the water. Especially in the case of processing work during which the workpieces have to remain in water for a lengthier period, thus increasing the risk of corrosion, the use of this agent is to be very much recommended.

Various tests have shown that the addition of SAVAN RVH 600 allows the attack of corrosion on the workpieces to be considerably delayed both in the processing of steel and of hard metal.

In addition, the machine components and the workroom are also "treated" with anticorrosive agent during the use of this product, meaning that the erosion particles can settle less, thus making cleaning of the equipment easier.

The product is neutral in behaviour towards metals and plastics.

Application: 5 litres SAVAN RVH 600 to 1000 litres water

Source: AGIE agencies

Caution:

In order to guarantee trouble-free working with this agent, the following points must be strictly observed:

After being used for the first time, the water must be replaced after a few days as the SAVAN exercises a cleaning effect on the whole equipment, thus allowing troublesome, dissolved residue to be eliminated.

The water temperature should be below 25°C in order to avoid biological deterioration.

No traces of acid, not even the smallest amounts, should get into the water.

Do not use other anticorrosives or protective greases together with SAVAN en.

The concentration (see above) must be monitored and complied with. This can be carried out using a hand refractometer.

SAVAN must be added finely dosed while the plant is running.

5.8 Wear parts

The number of wear parts given is that recommended for 2000 hours of operation.

Quantity	Quantity	AGIE Id. no.	
		CLASSIC	CHA/EVO/EXC
1	Upper pressure flushing nozzle	199.122	
1	Lower pressure flushing nozzle	155.772	
2	Pressure flushing nozzle		155.772
1	Flushing nozzle for stepped workpieces		201.702
1	Upper blade of shear	191.593	
1	Upper blade of shear	417.964	
2	Toroide guide	262.163	
2	Pair wire guide prisms (approx. 8,000 hrs working life)	326.834	
1	Pressure roller for brake (f. wires $\varnothing 0.1 \div 0.15$)	338.454	
1	Pressure roller for brake (f. wires $\varnothing 0.2$)	000.274	
1	Pressure roller for brake (f. wires $\varnothing \geq 0.25$)	418.774	
2	Guide ring for brake	326.604	
1	Upper current pick-up pad W/Cu	443.474	
2	Upper/lower current pick-up pad HM	443.464	
2	Wire-chopper blade	848.614	
1	Wire-chopper die insert	833.974	
2	Wire draw-off roller (f. wires $\varnothing 0.2 \div 0.33$ CLA) Wire draw-off roller (f. wires $\varnothing 0.2 \div 0.33$ CHA, EVO, EXC)	259.483	
2	Wire draw-off roller (f. wires $\varnothing 0.03 \div 0.15$ CLA) Wire draw-off roller (f. wires $\varnothing 0.03 \div 0.15$ CHA, EVO, EXC)	261.183	
2	Carbon brush for wire draw-off unit and wire-chopper	652.397	
1	Threading nozzle M ($\varnothing 1 \div 2$ mm)		250.943
1	Standard threading nozzle ($\varnothing \geq 2$ mm)	250.433	
1	Inner nozzle upper head (CLA) Standard inner nozzle (CHA, EVO, EXC)	426.494	
2	Big splash guard (CLA)	832.514	
2	Small splash guard (CLA)	832.494	
1	Pressure roller HP for brake ① (f. wires $\varnothing 0.03 \div 0.07$)		362.504
2	Guide ring HP for brake ①		459.494
2	* wire guide prisms for wire guide HP ①		388.394
2	Wire draw-off roller HP ① (f. wires $\varnothing \leq 0.07$)		262.343
1	Kit Jet 0.5 ①; includes 1 threading nozzle 0.5 ($\varnothing 0.5$ mm), 1 wire guide HP/J 0.5; 1 special inner nozzle		847.264
1	Kit inner nozzle 0.5		001.444
1	Lower deflection sealing		689.857
1	O-Ring set for head		848.644

① for AGIECUT EXCELLENCE 2F only

6 Transport

Bear in mind that the equipment is part of a tool machine of the highest precision and reliability. So take care when installing or shifting.

Take care to ensure that the equipment is not exposed to shocks or to any other possible source of damage.

Caution:

Only use suitable vehicles, lifting gear and load suspension devices with adequate lifting power

The slinging of loads, the directing, driving or operation of a crane or fork-lift truck must only be carried out by experienced persons.

The person giving directions must stay within view of the operator or be in radio contact with him.

This section is arranged chronologically as follows:

- Types of transport
- Types of packing
- Packing dimensions and weights
- Unload the equipment
- Acclimatise the equipment
- Unpack the equipment
- Lift the equipment and remove the pallet
- Equipment alignment and installation
- Standard accessories, accompanying material, documentation
- Check of completeness

6.1 Types of transport

AGIECUT CLASSIC

Transport material

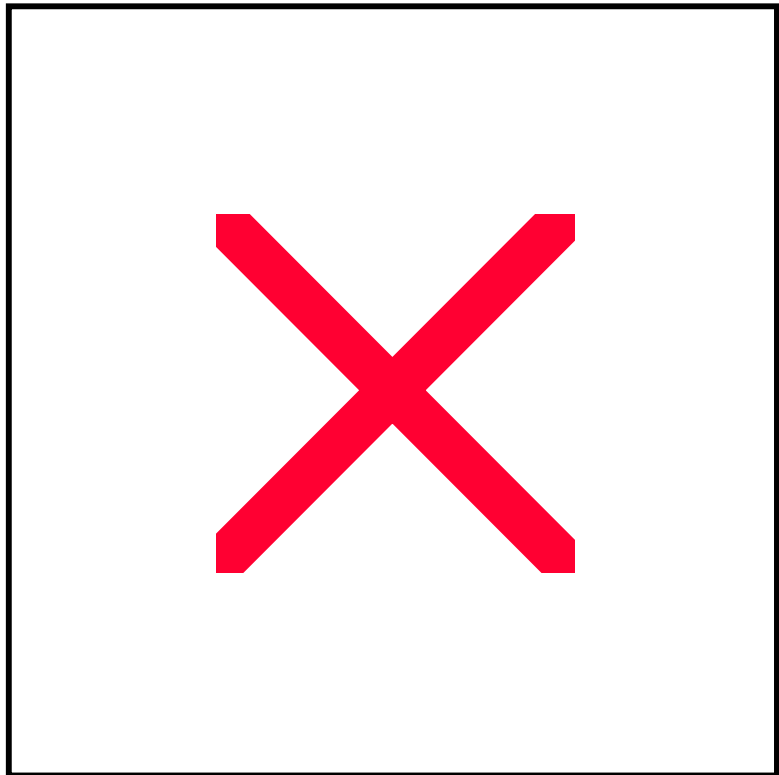
(included in the scope of supply)

- **Transport securing catches:**

- 1 Blocking support (1x)
- 2 Transport securing plate (1x)
- 3 V axis support (2x)
- 4 U axis support (2x)

- **Auxiliary material for the leveling of the equipment**

- 5 Underlay plate 50/10x200 (4x)
(will be deposited on the pallet during the transport)



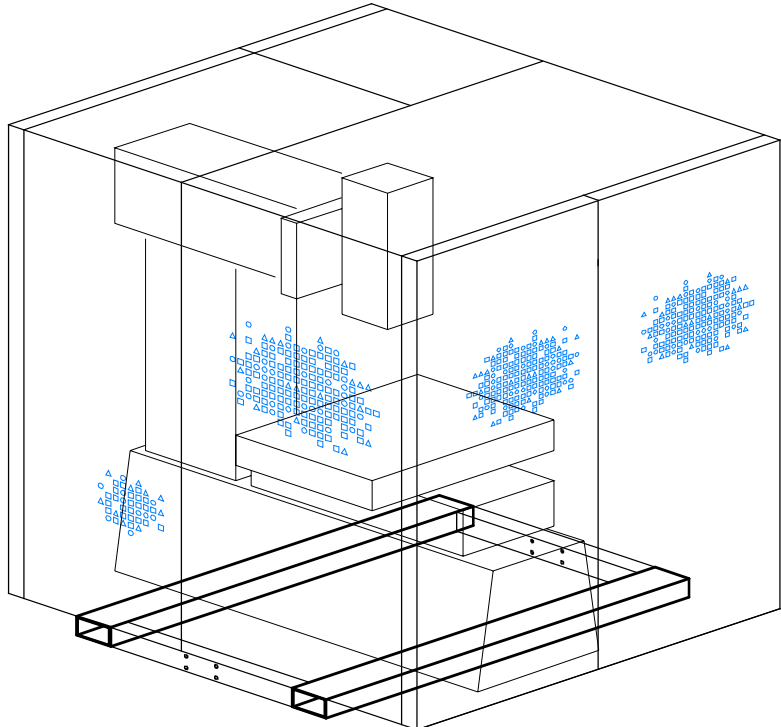
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Transport systems

Basis transport kits

- **Equipment transverse beams:**
(are integrated in the equipment)

suitable for lifting and transporting with a fork-lift truck.



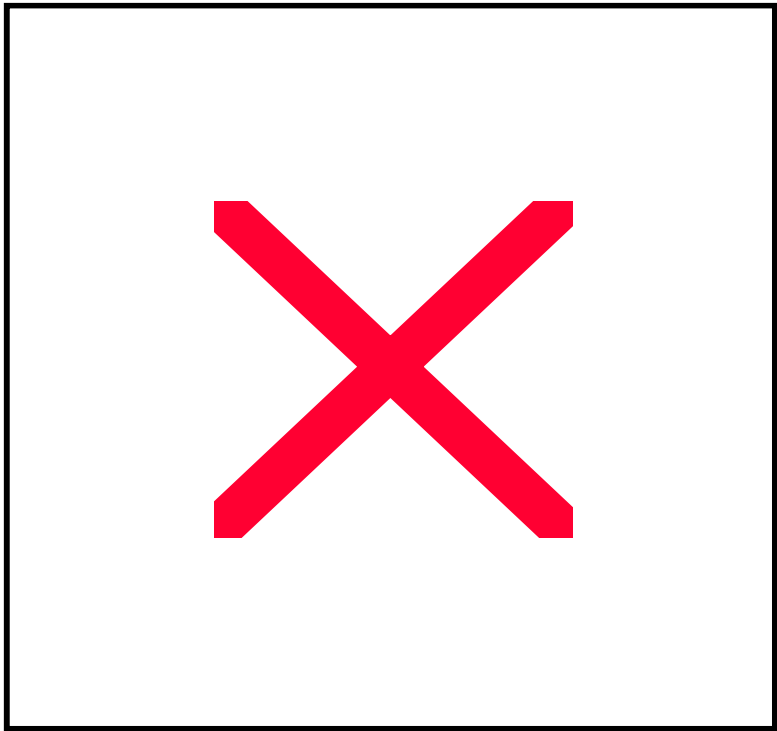
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- **Crane moving kit:**
(included in the scope of supply)

suitable for lifting and transporting with a crane.

The following is included:

- 1 Lifting support (1x)
- 2 Lifting rod
M16 x1'045 (1x)
- 3 Ring bolt M30 (1x)
(will be deposited on the pallet during the transport)
- 4 Thing annexed (1x)



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Manual moving kit

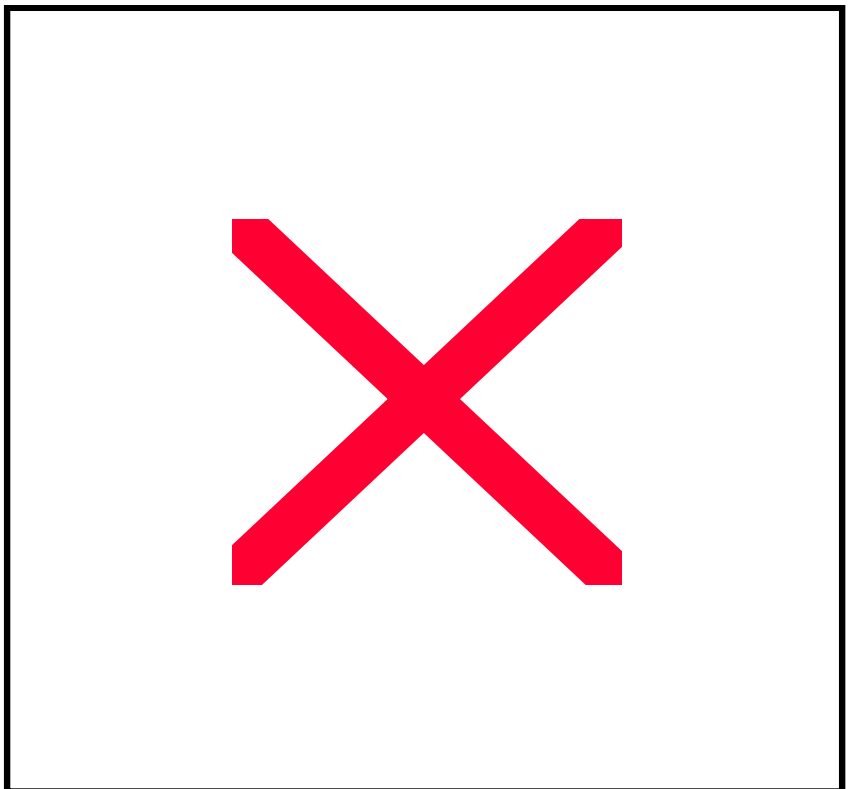
(not included in the scope of supply, the customer can order them from AGIE with the Id.-Nr. **458. 054**).

- **Steerable manual jack:**

Suitable for manually shifting or positioning the equipment up to a maximum threshold height of 2 cm; especially in restricted space conditions.

The following is included:

- 1 Manual jack
- 2 Lifting plate (2x)
- 3 Spacer block (4x)
- 4 Wheel support (2x)
- 5 Wheel (4x)
- 6 Axis (2x)



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Special tools
(included in the scope of supply)

The special tools for removing the packaging are contained in a cardboard box on the bottom of the pallet.

Transport material
(included in the scope of supply)

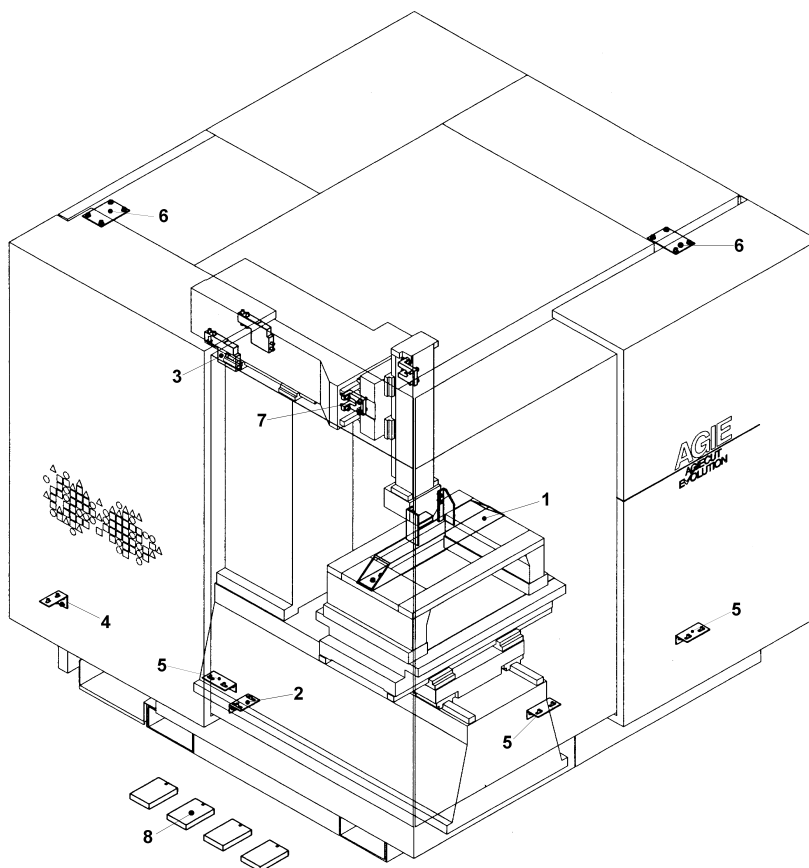
AGIECUT CHA/EVO/EXC 2

Transport securing catches:

- 1 Blocking support (1x)
- 2 Angle (1x)
- 3 V axis support (2x)
- 4 Door support (1x)
- 5 Angle (3x)
- 6 Plate (2x)
- 7 U axis support (2x)

Auxiliary material for the levelling of the equipment:

- 8 Underlay plate
100 x 25 x 150 mm (4x)
(placed on the pallet)



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Transport material
(included in the scope of supply)

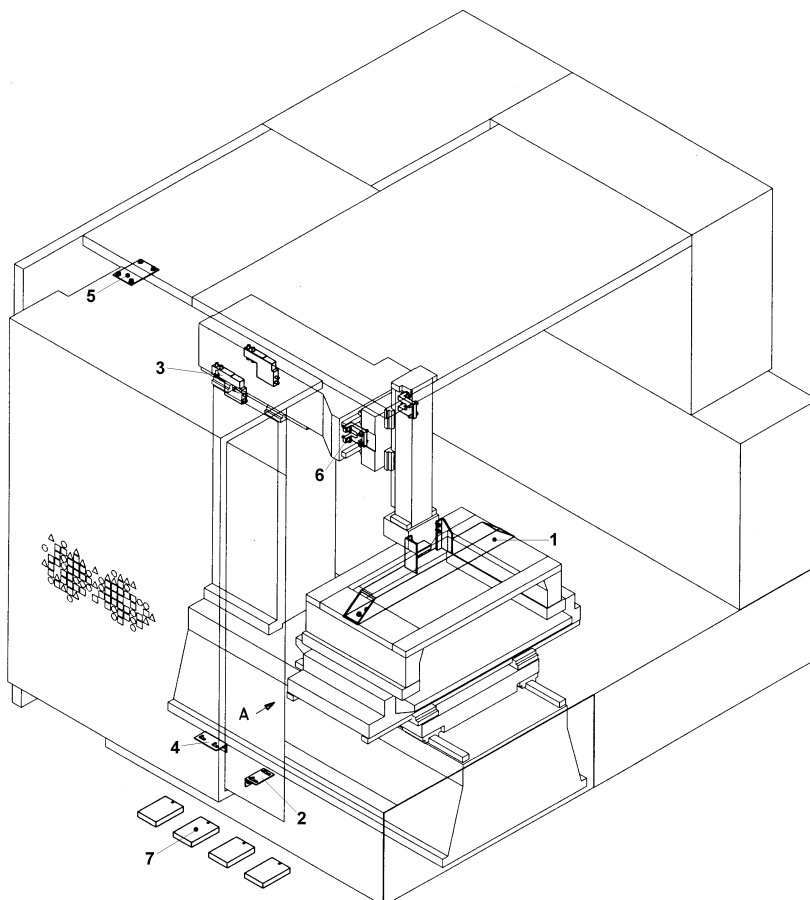
AGIECUT CHA/EVO/EXC 3

Transport securing catches:

- 1 Blocking support (1x)
- 2 Angle (1x)
- 3 V axis support (2x)
- 4 Angle (2x)
- 5 Plate (1x)
- 6 U axis support (2x)

Auxiliary material for the levelling of the equipment

- 7 Underlay plate
100 x 25 x 150 mm (4x)
(placed on the pallet)



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Transport systems

(not included in the scope of supply, the customer can order them as an option from AGIE)

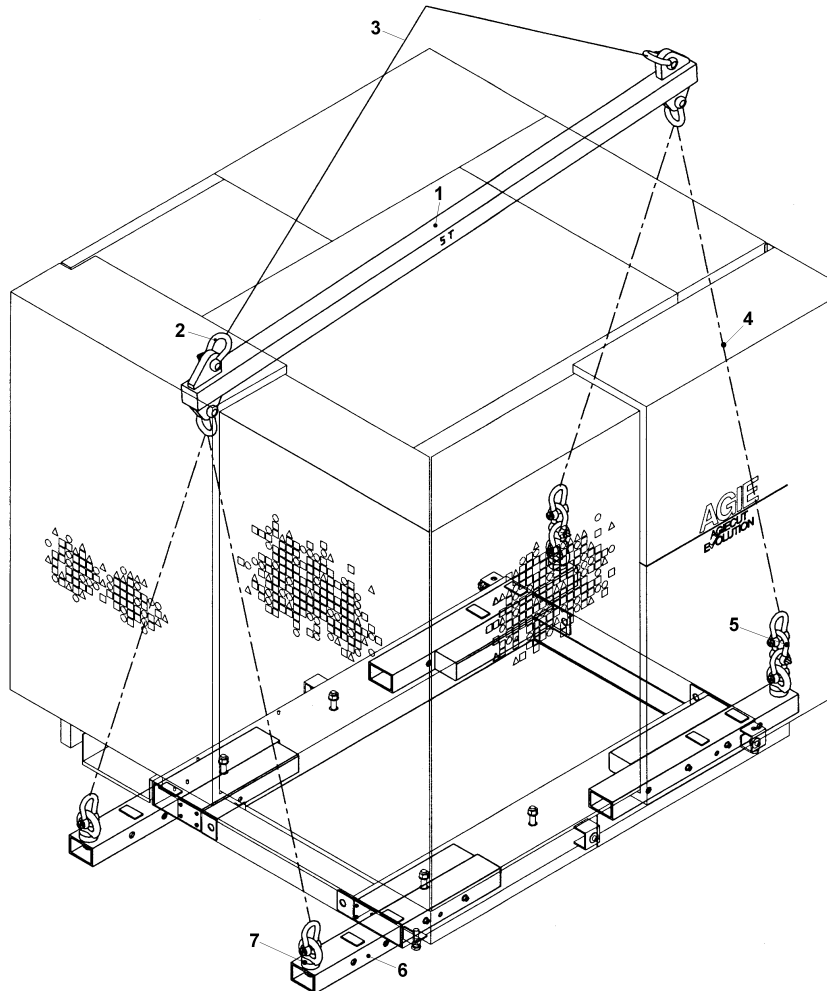
AGIECUT CHA/EVO/EXC 2 (Id. Nr. 846.324 + 260.833)

Lifting cross beam for the crane

suitable for lifting and transporting with a crane.

The following is included in addition to the transport material:

- 1 lifting cross beam dimensioned for 5'000 kg (distance between the belt attachment points = 2'400 mm at bottom and top)
- 2 shackle 7/8" (4x)
- 3 transport belt (2x 1'500 mm)
- 4 transport belt (4x 2'000 mm)
- 5 fixing ring $\frac{3}{4}$ (8x)
- 6 hoisting bar extension (4x)
- 7 ring bolt M30 (4x)



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Transport systems

(not included in the scope of supply, the customer can order them as an option from AGIE)

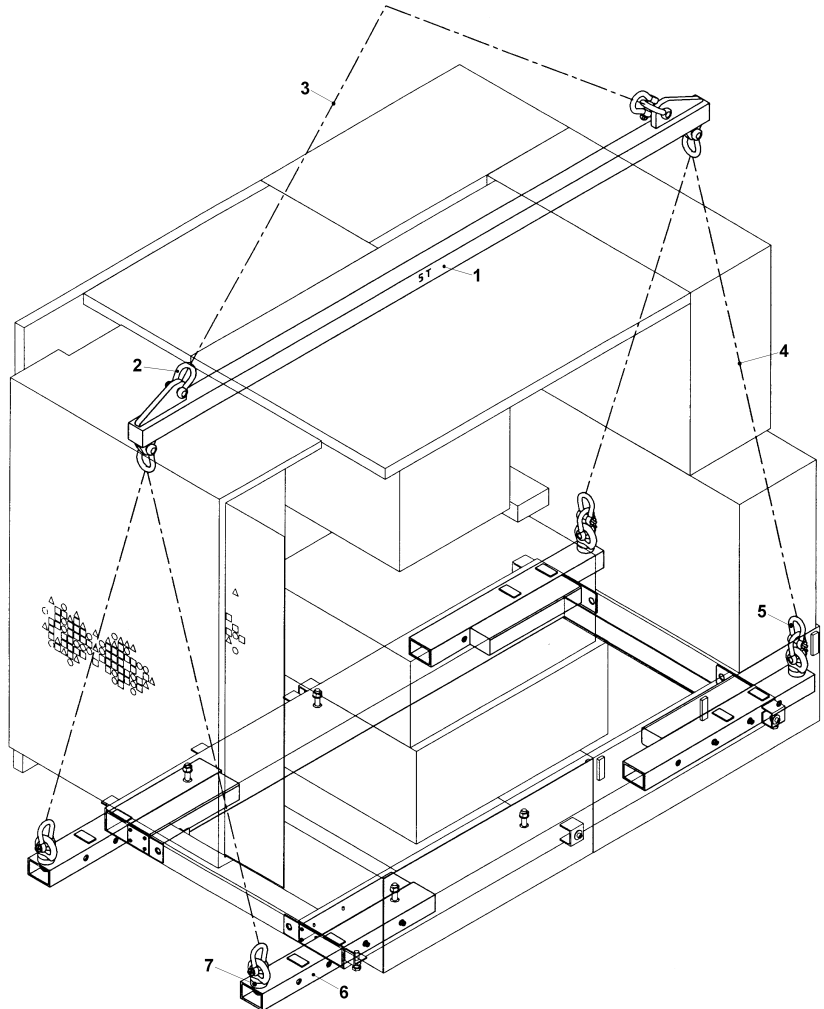
AGIECUT CHA/EVO/EXC 3 (Id.Nr. 846.334 + 260.843)

Lifting cross beam for the crane

suitable for lifting and transporting with a crane.

The following is included in addition to the transport material:

- 1 lifting cross beam dimensioned for 5'000 kg (distance between the belt attachment points = 3'000 mm at bottom, 2'660 mm on top)
- 2 shackle 7/8" (5x)
- 3 transport belt (2x 1'700 mm)
- 4 transport belt (4x 2'000 mm)
- 5 fixing ring $\frac{3}{4}$ " (6x)
- 6 hoisting bar extension (4x)
- 7 ring bolt M30 (4x)



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Manual moving kit

(not included in the scope of supply;
can be ordered by the customer as an
option from AGIE)

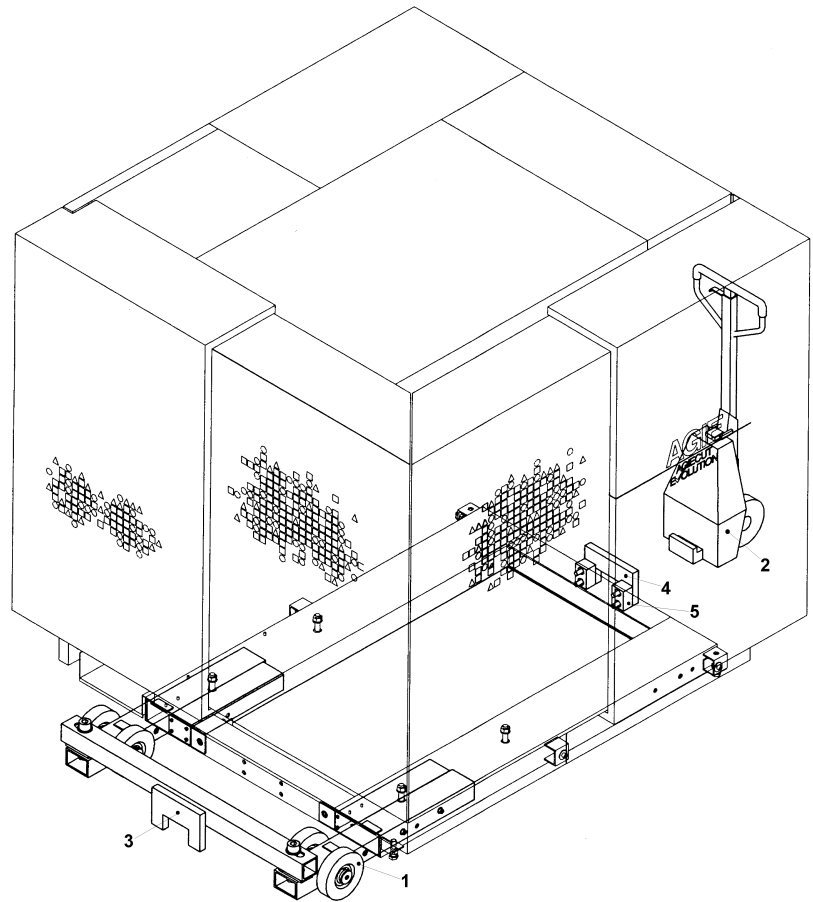
Steerable manual jack:

Suitable for manually shifting or position-
ing the equipment up to a maxi-
mum threshold height of 2 cm; espe-
cially in restricted space conditions.

The following is included:

- 1 roller (2x)
- 2 manual jack (1X)
- 3 cross beam (1X)
- 4 plate (1x)
- 5 spacer block (2x)

AGIECUT CHA/EVO/EXC 2 / 3 (Id.Nr. 846.314)

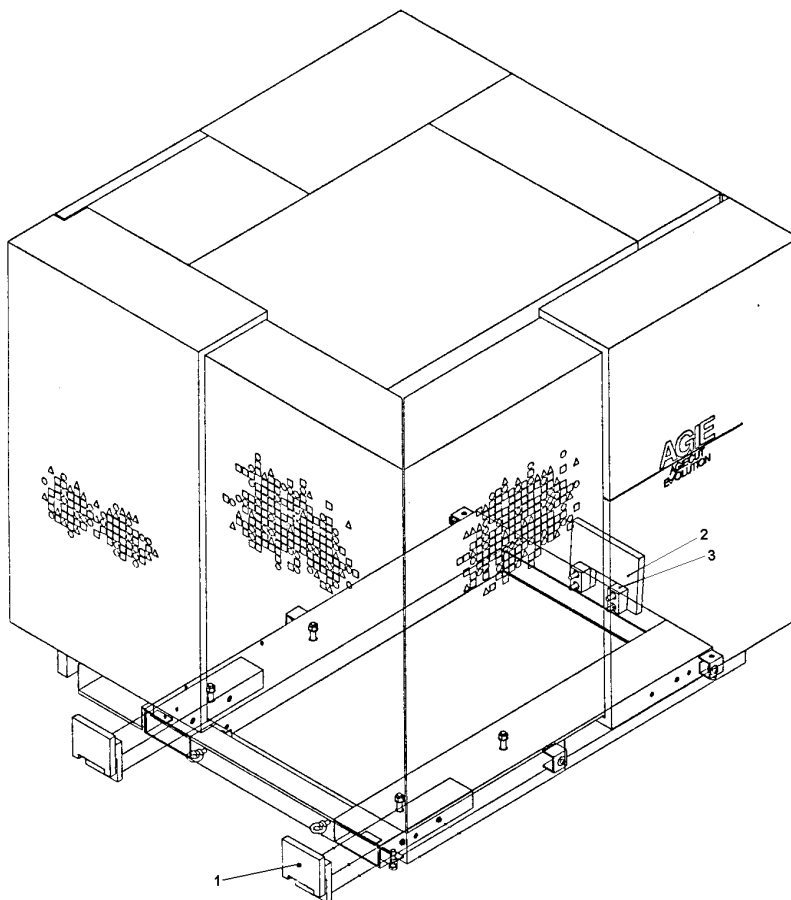


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Transport IN-OUT-IN

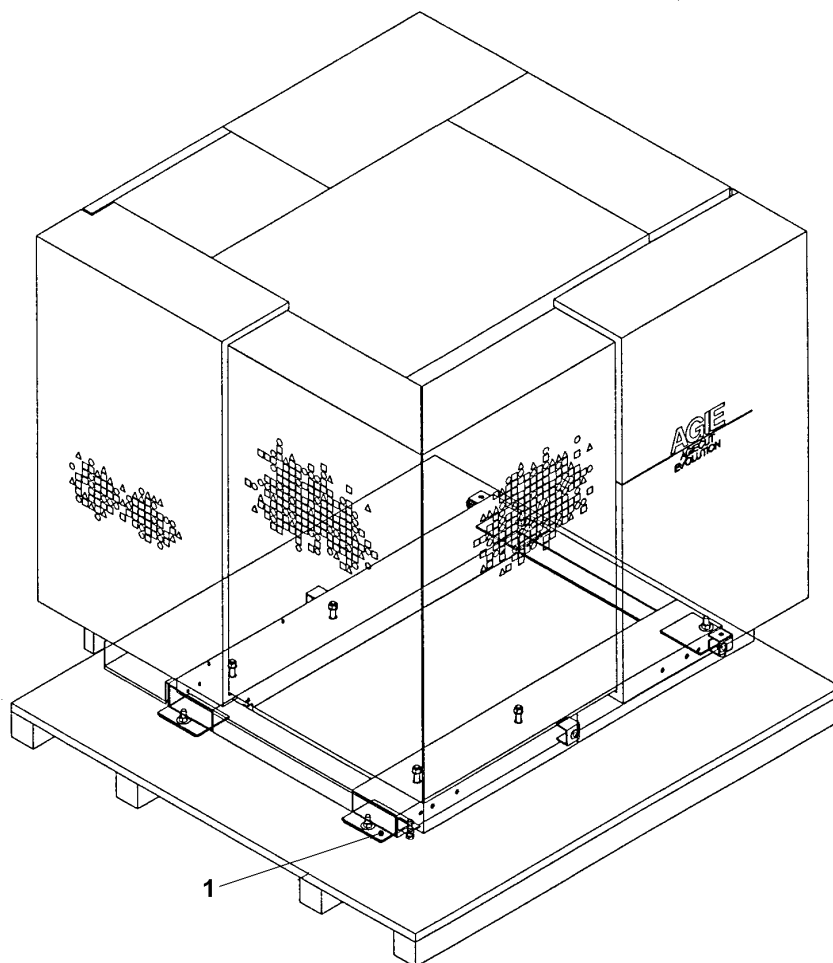
AGIECUT CHA/EVO/EXC 2 / 3 (Id.Nr. 846.344)

- 1 pull-out plate (2x)
- 2 IN-OUT-IN-plate (1x)
- 3 spacer block (2x)
- 4 spacer made of wood (4x)



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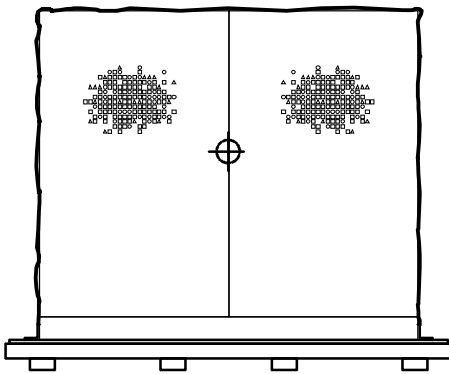
1 Fixing plate (4x)



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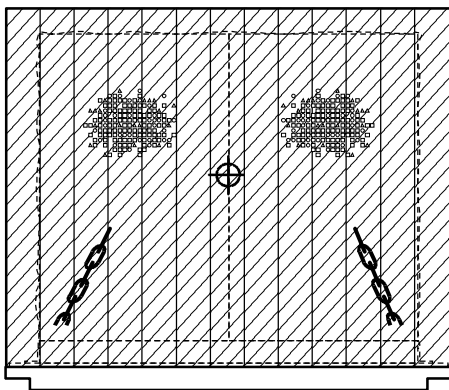
6.2 Types of packing

The equipment is packed differently depending on which of the two methods of transport is used:



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- pallet with VCI corrosion protection:
⇒ Switzerland, Central Europe



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- in an export crate for shipment by sea or air with VCI corrosion protection + ALU:
⇒ overseas, Eastern Europe (in part), Middle East

VCI corrosion protection

With the **Volatile Corrosion Inhibitor** method, the equipment is covered with a transparent PE sheet (does not have to be hermetically sealed). Vapour phase inhibitors (foamed plastic strips) are placed under the sheet as carrier agents for the protection against corrosion. A gas evaporates slowly out of these carrier agents which have been soaked in a chemical substance and this settles as an invisible protective layer on the metal surface, thus forming a corrosion-inhibiting coating. Before unpacking the equipment, see "Acclimatising the equipment".

Aluminium/Desiccant corrosion protection

In this method, the equipment is packed in an aluminium laminate protective sheet and sealed hermetically. A very dry atmosphere brought about by the hermetically sealed cover and by the addition of desiccants which reduce the air humidity serves as protection against corrosion.

Before unpacking the equipment, see "Acclimatising the equipment".

6.3 Packing dimensions and weights

Caution:
Subject to change of dimensions and weights without prior notice.

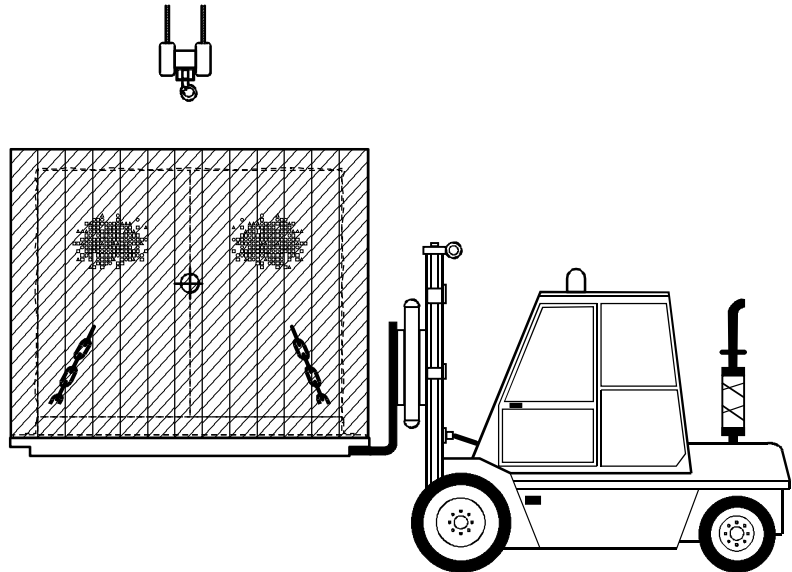
TYPE OF AGIECUT EQUIPMENT	PALLET	OCEAN / AIR - GOING CRATE	DIMENSIONS L x P x A (m)
CLASSIC 2 / 2S + ACCESSORIES	2'850 kg 80 kg	3'160 kg 110 kg	2.25 x 1.95 x 2.54 0.9 x 1.1 x 1.3
CLASSIC 3 + ACCESSORIES	3'700 kg 80 kg	4'050 kg 110 kg	2.65 x 2.2 x 2.54 0.8 x 1.1 x 1.1
CLASSIC 3S + ACCESSORIES	4'180 kg 155 kg	4.480 kg 235 kg	2.66 x 2.2 x 2.94 1.3 x 0.9 x 1.55
CHA/EVO/EXC 2 / 2F + ACCESSORIES	3'680 kg 80 kg	3'850 kg 110 kg	2.42 x 2.29 x 2.54 1.3 x 0.9 x 1.1
CHA/EVO/EXC 3 + ACCESSORIES (Doors)	4'280 kg 310 kg	4'580 kg 420 kg	3.07 x 2.2 x 2.54 2.1 x 1.5 x 1.6

6.4 Unloading the equipment

- Unload the equipment from the truck using a fork-lift truck (or a crane in case of shipment by sea or air) as shown on the following pages, and bring it into a protected shed.
- The packing must not be dropped or tipped.
- If the crates are visibly damaged, the equipment must not be unpacked before notifying AGIE or its agents and the relevant insurance company.

Note:

For unloading with crane, see next section "Equipment hoisting and handling" under "Crane".



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Note:

On the AGIECUT CHA/EVO/EXC 3, the front sliding doors have been removed and are transported on a separate pallet..

6.5 Acclimatising the equipment

If the indoor and outdoor temperatures are identical ($\pm 5^\circ \text{C}$), it is possible to dispense with the acclimatisation in the case of both packings. Otherwise, leave the packing units **at least 24 hours still packed** at the place of installation.

In urgent cases, the time of acclimatisation can be reduced at the discretion and **risk of the recipient**.

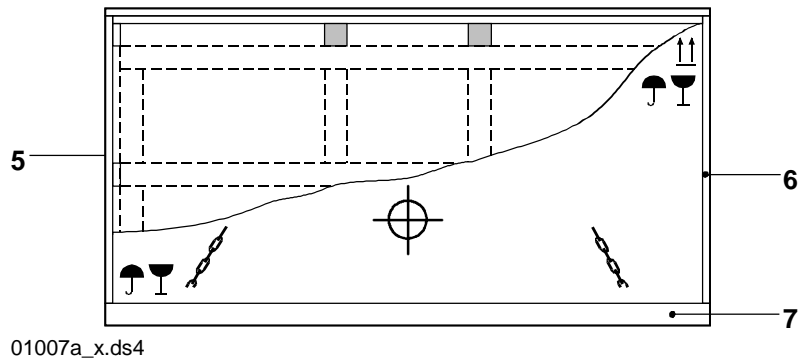
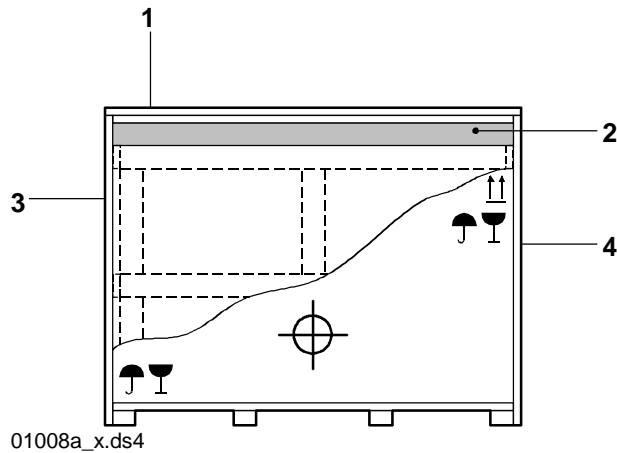
6.6 Unpacking the equipment

If there is any visible damage to the equipment, AGIE or its local Agent, as well as the relevant insurance company must be informed at once. It may be advisable to photograph the damaged parts.

Ocean/air-going crate

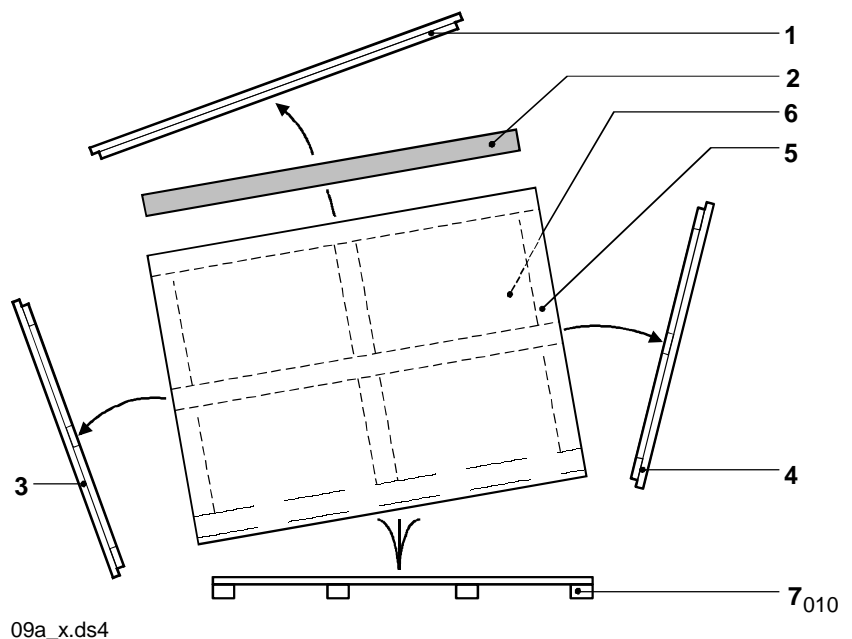
Legend:

- 1 Lid
- 2 Lid stringers (beams)
- 3 Left side wall
- 4 Right side wall
- 5 Front wall
- 6 Rear wall
- 7 Transport bottom



Procedure for dismantling:

- 1 Remove the nails of the lid with the help of a V-shaped gouge and lift off lid.
- 2 Remove lid stringers 2, then side wall 3 and then front wall 5.
- 3 Remove side wall 4 and then back wall 6.
- 4 Remove the aluminium or VCI protective cover.



6.7 Transport to the place of installation and remove the pallet

The equipment can be transported from the unpacking or conditioning zone

- either directly with the pallet to the permanent installation site
- or else the pallet can be removed before transporting the equipment to the permanent installation site.

The following operations should be carried out:

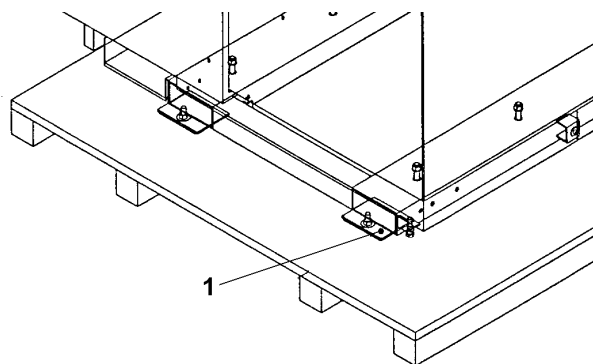
- 1 Carry out the operations described in the section "Removal of pallet".
- 2 Transport the equipment to its installation site using a fork lift truck, manual lifting gear/manual jack (only possible without pallet) or crane.

Caution:

If the equipment is transported to the installation site with the pallet, the above two operations should be carried out in reverse order, i.e. first operation 2, then operation 1.

Remove the pallet

- Back off and remove the fastening nuts.
- Remove the fastening angles 1
- Lift the equipment according to the section "Equipment lifting and transporting"
- Remove the equipment



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Equipment lifting and transporting

Caution:

Disconnect the equipment from every external supply of energy before even the smallest change of location!

Fork-lift truck or manual fork-lift

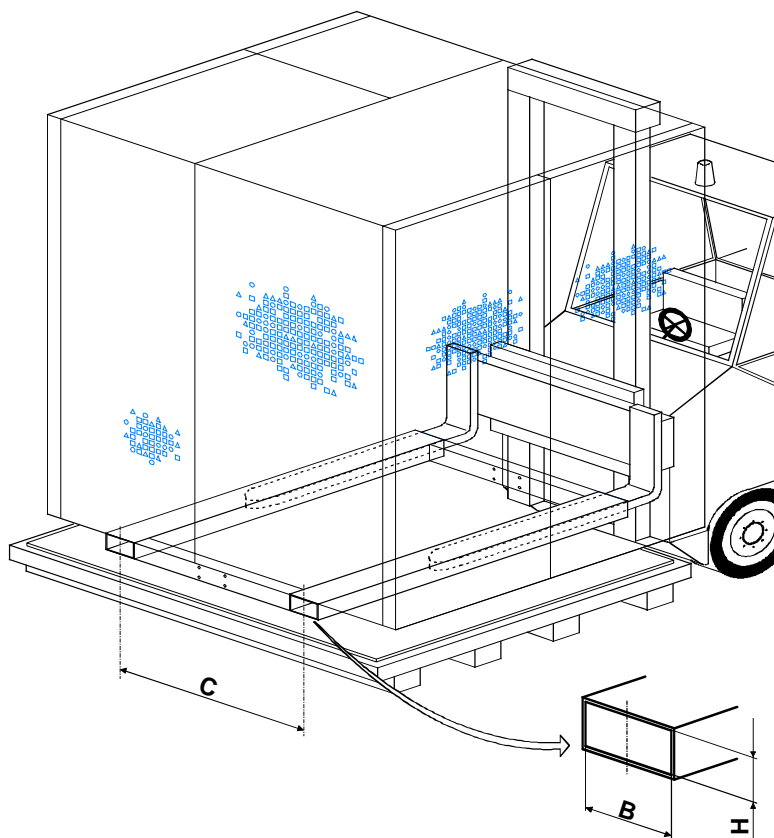
Caution:

The equipment may only be lifted on the DA side (perforated metal sheet, as otherwise damage will be caused. Before lifting, the equipment on the fork must be secured!

Capacity

Caution:
the preceding paragraph PACKING DIMENSIONS AND WEIGHTS allows determining the capacity of the forklift truck respectively crane necessary for a safe lifting of the system.

	C	B	H
CLA 2 / 2S, 3 / 3S	990 mm	190 mm	90 mm
CHA/EVO/ EXC 2	782 mm	232 mm	93 mm
CHA/EVO/ EXC 3	832 mm	232 mm	93 mm

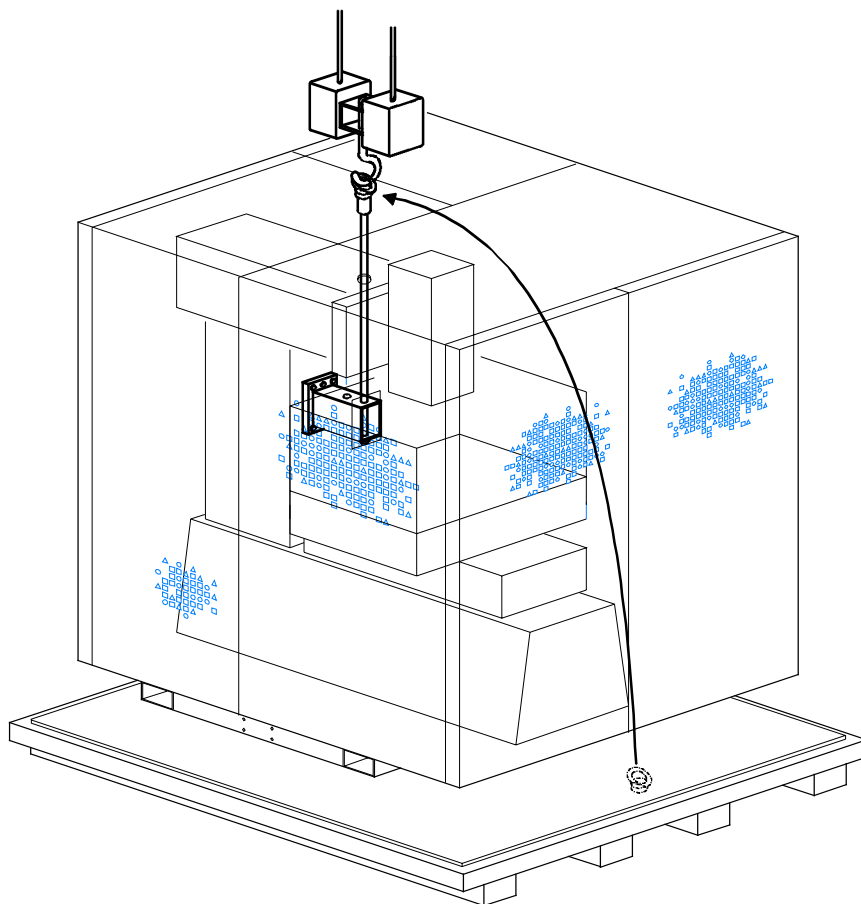


01644a_x.ds4

Equipment lifting and transporting (CLASSIC)

Crane

Ring screw M30 for lifting the equipment is deposited on the pallet during transport; mount it on the top of the equipment in the connecting part.



01642b_x.ds4

Danger:
Do not stand or work under suspended loads!

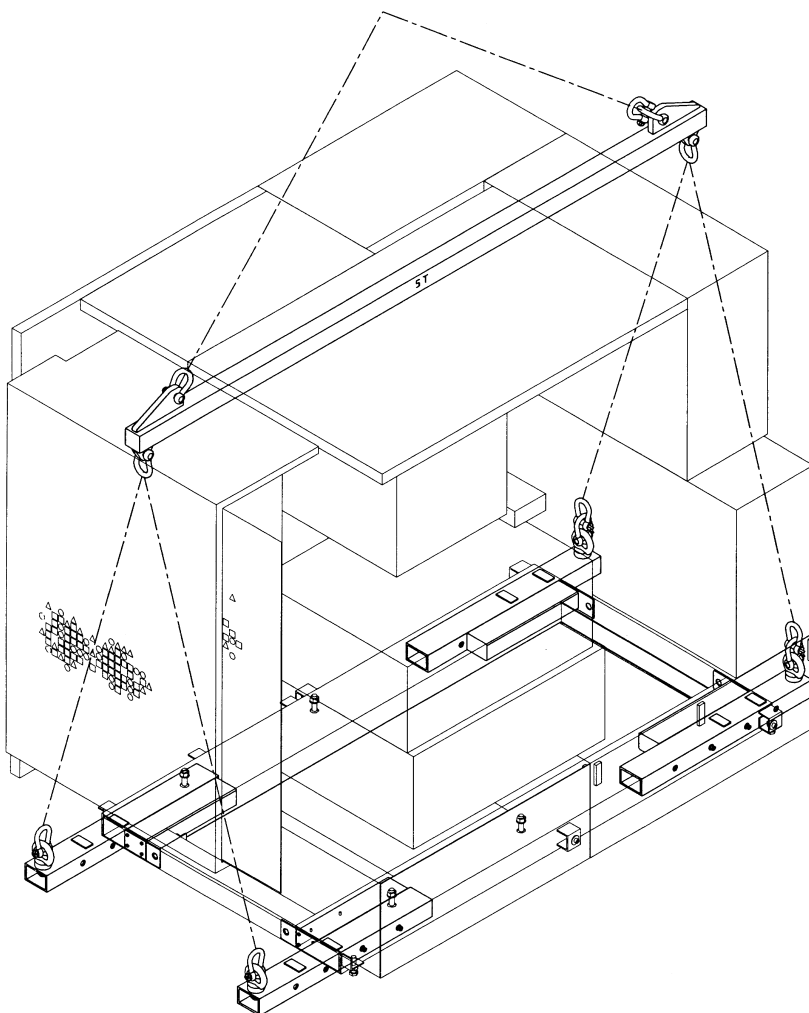
Equipment lifting and transporting
CHALLENGE, EVOLUTION,
EXCELLENCE

Crane

- 1 Insert the four bars **6** into the support frame until the mounting holes correspond, then fasten with the appropriate screws.
- 2 Screw the four eyebolts **7** supplied with the equipment into bars **6**.
- 3 Hang up lifting cross beam **1** (AGIE) complete with belts, handles and fastening rings (**3, 2, 4, 5**) at the four bars **6** and then at the crane hook.

Caution:

If the AGIE crane lifting device is not used, carefully observe the dimensions for the hoisting ropes/straps and hoisting bar, given in the § TRANSPORT SYSTEMS.



03755a_x.bmp

Danger:

Do not stand or work under suspended loads!

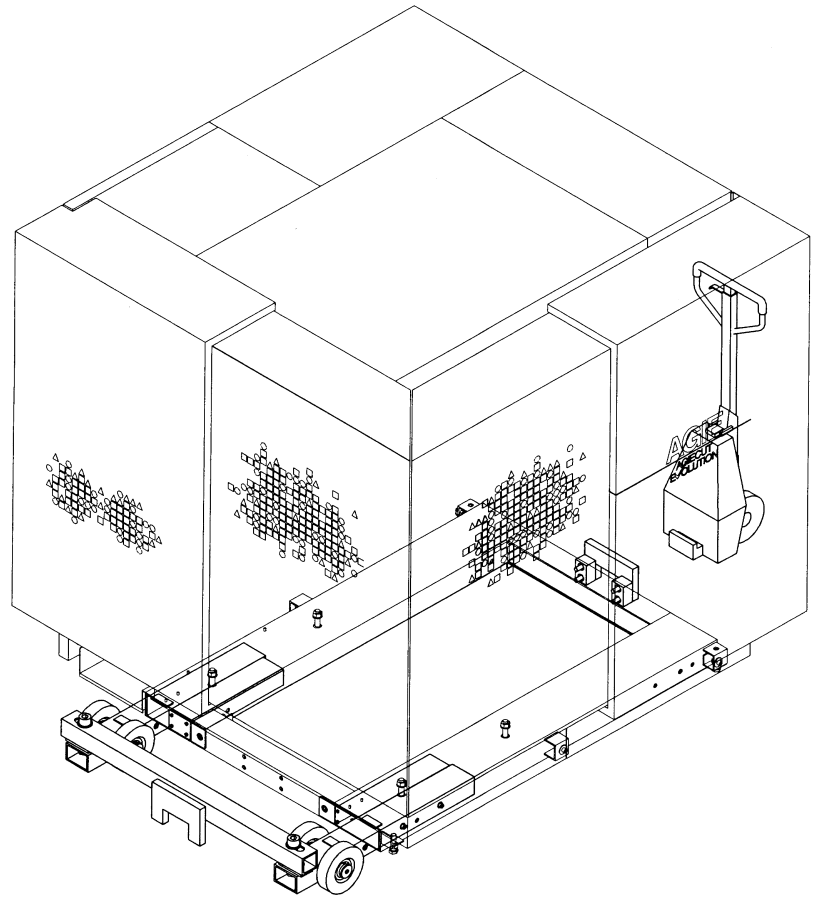
Steerable manual jack

Danger:



The steerable manual jack has no brakes; it may therefore only be used on very small gradients and with great care!

- 1 Fasten plate 4 with the appropriate screws on the right side of the support frame.
- 2 Insert the two bars, on which rollers 1 are fastened in the support frame, until the mounting holes correspond, then fasten with the appropriate screws.
- 3 Fasten transverse bar 3 with the appropriate screws.
- 4 Lift equipment some centimetres on the left side by operating the pole. Introduce the two taps with their roles 1 and fasten frontally with the appropriate screws.
- 5 Lower equipment slowly with the lowering lever of the manual jack on the rollers.
- 6 Lift equipment on the opposite side and afterwards shift.



03754b_x.bmp

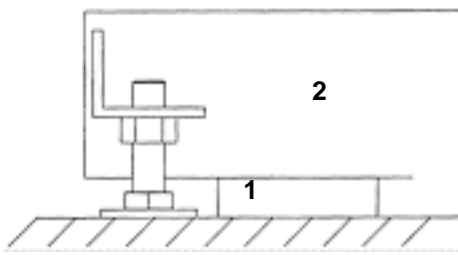
Net transport dimensions of the equipment

The net dimensions of the machines are shown at the beginning of this document under paragraphs TECHNICAL DATA and REQUIREMENTS FOR THE PLACE OF INSTALLATION (in mm):

Attention:

Take account of the transport height: machine height + floor/fork distance!

6.8 Placing the equipment



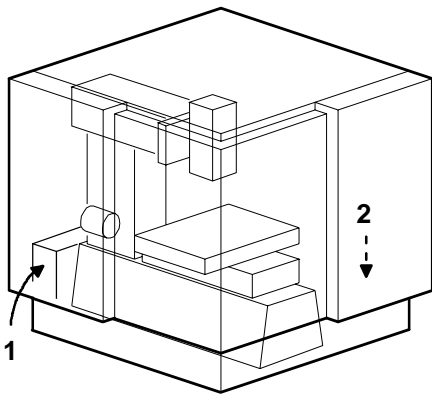
03760a_x.bmp

- Lay the four blue underlay plates **1** under the equipment transverse beams **2** as is shown in the left sketch.
- Set the equipment down on the underlays.
- **The equipment must be left standing like this until the AGIE technician arrives.**

Caution:

Verify that the threaded stands of the machine base do not touch the floor at setting down.

6.9 Standard accessories, accompanying material, documentation



01015b_x.ds4

- The standard accessories, accompanying material and documentation are to be found in the used wire container **1**.
- The already connected console is transported in the dielectric unit tank **2** (or the work tank with the AGIECUT CLASSIC).

Note:

The cardboard boxes in the crates must not be opened. They are to be kept under lock and key, together with the dispatch documents, until the AGIE technician arrives to carry out the necessary checks.

6.10 Completeness check

The lists are to be found in an envelope attached to one of the work tanks and must be checked together with the service technician.

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