

Automatic Blind Riveting Unit

GAV electronic

Model 8000

Model 8000 eco

Fully Automatic Blind Riveting System

Year of construction

Device No.

Operating Instructions

With Spare Parts List and Accessories



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A company of the **SFS** group





Table of Contents

Table of Contents

	Section	Page
1.	Dimension Sheet, Technical Data and Working Range	4
2.	Intended Use and Safety Information	5 - 6
3.	Environmental Information, Recycling, Declaration of Conformity..	7
4.	Transportation and Installation	8
5.	Start-Up and Operation	9 - 10
6.	Functional Principle	11
7.	Functional Description	12 - 16
8.	Operation	17
	8.1 Operating Controls	18
	8.2 Graphic Display	19
	8.3 Menu Structure	20
	8.4 Main Menu	21 - 22
	8.5 Error Messages	23 - 25
	8.6 Access Authorisation	26
	8.7 Manual Operation	27
	8.8 Parameter Settings	28
	8.9 Data Selection	29
	8.10 Text Entry	30
9.	GAV Settings	31
	9.1 Vibration Feed Unit	32
	9.2 Pressure Sensors	33 - 35
	9.3 Large Pressure Booster	36 - 39
	9.4 Small Pressure Booster	40 - 41
	9.5 Separator	42
	9.6 Blow Air	43 - 44
	9.7 Mandrel Evacuation	45 - 46
	9.8 Cycle	47
	9.9 Additional Functions	48
	9.10 PLC Activation	49
	9.11 Continuous Test	50
	9.12 I/O Test	51
	9.13 PLC Interface Test	52
10.	Maintenance	53
	10.1 Maintenance Information	54 - 55
	10.2 Maintenance Messages	56 - 57



Table of Contents

Table of Contents

	Section	Page
11.	Process Monitoring	58
	11.1 Functional Principle	59
	11.2 Settings	60 – 61
	11.3 Creating Profile	62 – 66
	11.4 Loading Profile	67
	11.5 Saving Profile	68 – 69
	11.6 Creating Profile List	70 – 73
	11.7 Loading Profile List	74
	11.8 PLC Profile Lists	75
	11.9 Process Monitoring Calibration	76
	11.9.1 Force Calibration	77
	11.9.2 Displacement Calibration	78
12.	Process Data	79
13.	Process Counter	80
14.	Operating Data Acquisition	-
15.	Access Codes	81
16.	Time and Language	82
17.	System Information	83
18.	GRivCheck	84
19.	Fault - Supply Unit	85
20.	Fault - Blind Riveting Gun	86 – 89
21.	Blind Riveting Gun Repair Instructions	90 – 93
22.	Removing and Installing Pressure Booster	94 – 95
23.	Pressure Booster Repair Instructions	96 – 97
24.	Filling Hydraulic Systems	98 – 99
25.	Replacing Controller Components	100
26.	Pneumatic Circuit Diagram	101
27.	Electrical Circuit Diagram	102 – 103
28.	PLC Interface	104
	28.1 Technical Description	105 – 107
	28.2 PLC Interface Test	108
	28.3 PLC Activation	109 – 110
	28.4 Process Counter	111
	28.5 Profile List Selection	112
	28.6 Profile Selection, Direct	113
	28.7 Profile Selection, In Steps	114
	28.8 Process Evaluation	115
	28.9 Component Evaluation	116
	28.10 Other Functions	117
29.	Teach-in of Measurement Range.the Displacement Sensor (WS1)	118 - 119

Not included in GAV-8000 eco





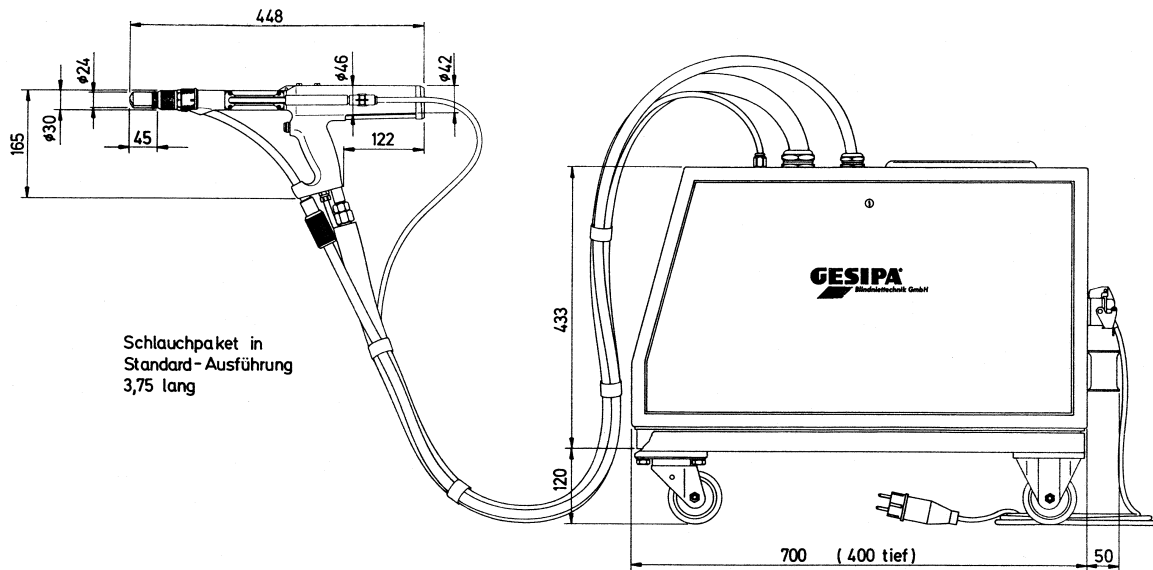
Table of Contents

Table of Contents

Spare Parts List

	Overview of Assemblies	Spare Parts List Page
Group 1:	Pneumatics Assembly	2 – 3
Group 2:	Blind Riveting Gun	4 – 10
Group 3:	Hydraulic Booster Unit	11 – 12
Group 4:	Separator	13
Group 5:	Housing Unit	14
Group 6:	Vibration Feed Unit	15
Group 7:	Supply Line Assembly	16
Group 8:	Controller	17
Group 9:	Accessories	18 – 19
Group 10:	Front Panel	20
Group 11:	Wiring Harness	21 – 23

Dimension Sheet, Technical Data and Working Range



Supply unit

Weight: 100 kg
 Volume of spent mandrel container: approx. 1800 - 5500 pieces (3.5 l) depending on size

Electrical system

- Nominal voltage: 230 Volt ~ 50 Hz
 - Nominal current: < 2.5 A
 - Protection class: IP 54

Pneumatic system

- System pressure: < 10 bar
 - Operating pressure: 6 - 7 bar
 - Air consumption/riveting operation: 15 NL
 - Air consumption/spent mandrel evacuation system (VAS): 340 NL/min.
 - Power cable: ½" (12.5 mm) max. 5 m long
 - Mandrel evacuation hose: 3.75 m long / outside Ø 8 mm / inside Ø 5 mm
 - Pressure booster: pneumatic/hydraulic

Hydraulic system

- Hydraulic oil ISO-VG 46 (e.g. Shell Hydrol HV 46 or comparable HVLDP-D products): 1.2 l
 - Viscosity, kinematic at 40°C (DIN 51562) with no silicone components: 47 mm²/s

Ambient temperature: 10 - 40 °C

Blind riveting gun

- Weight: approx. 2.5 kg
 - Setting stroke: 16 - 20 mm
 - Setting force: 11770 N
 - Length of hose assembly (standard): 3.75 m
 - Working cycle (theoretical setting rate) when used as intended: 1.25 s

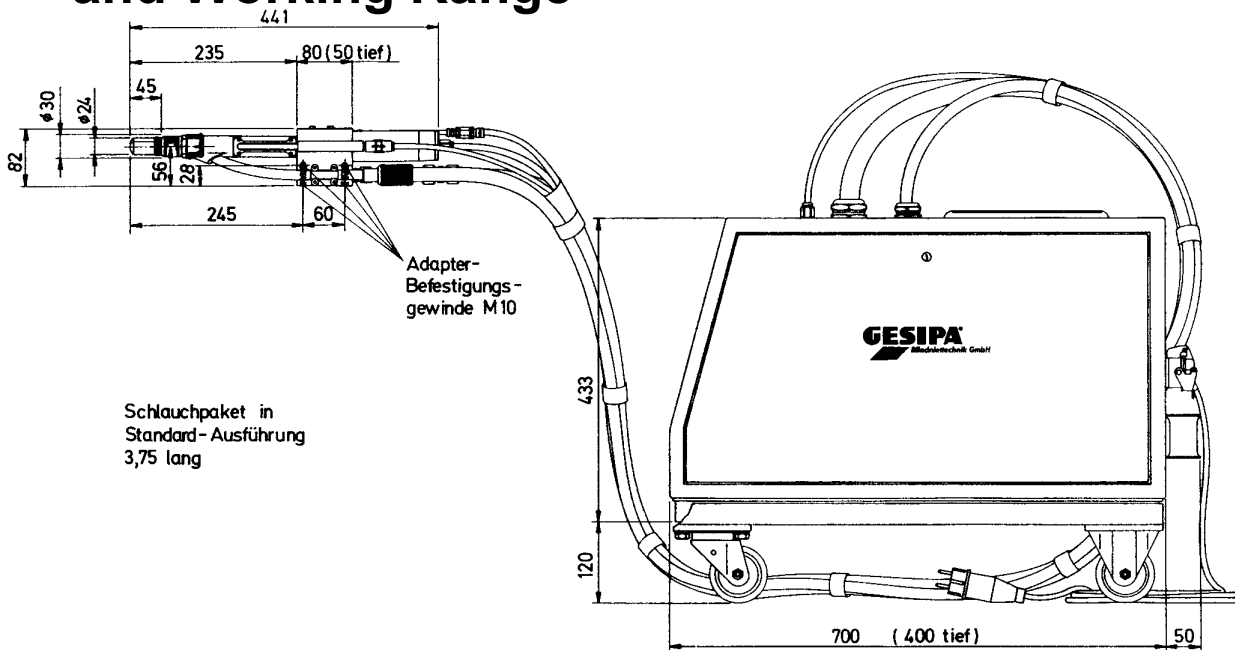
Working range

- Blind rivet up to Ø 5.0 mm stainless steel
 - Blind rivet up to Ø 6.0 mm steel
 - Blind rivet up to Ø 6.4 mm aluminium
 - Max. setting head diameter: 11.4 mm
 - Max. blind rivet body length: 25.0 mm
 (other lengths available on request)

The device is set up for a defined type of blind rivet suitable for automatic machines as per delivery agreement.



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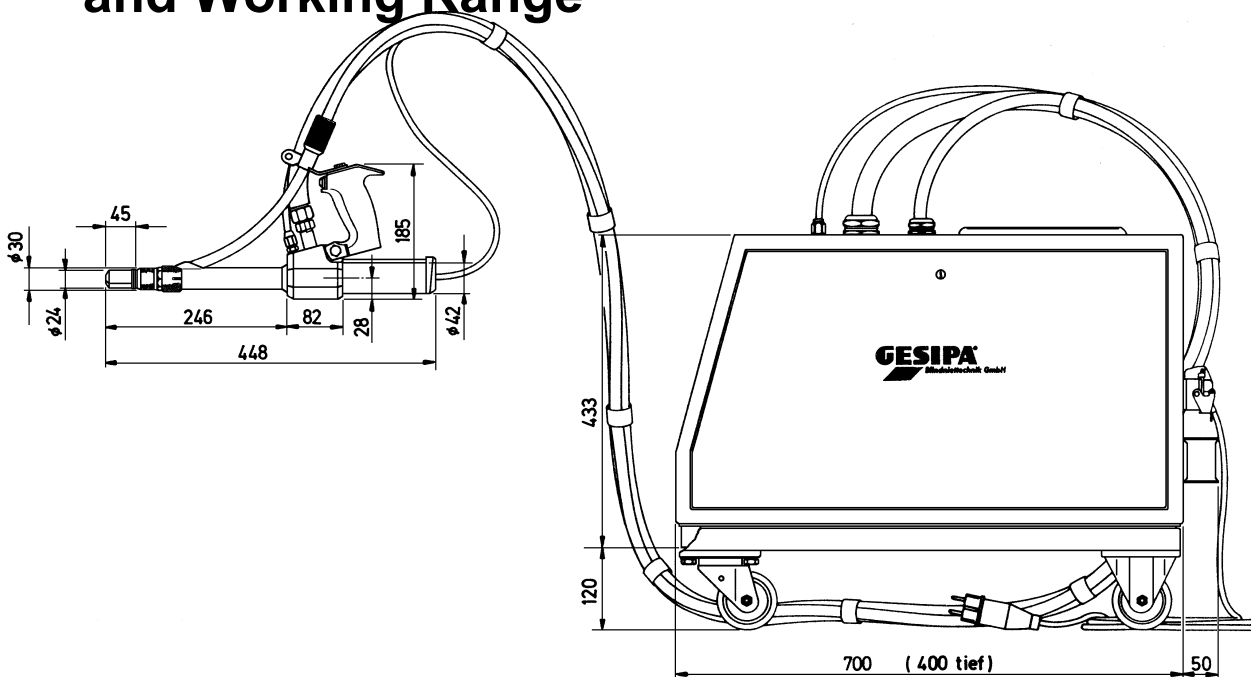
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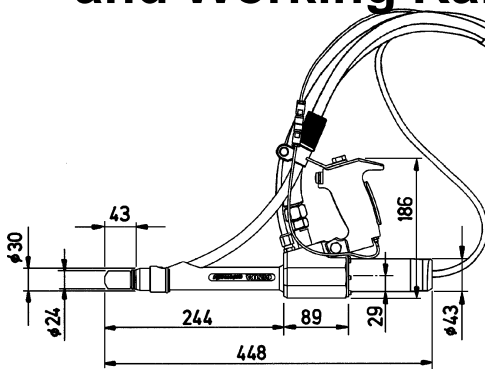
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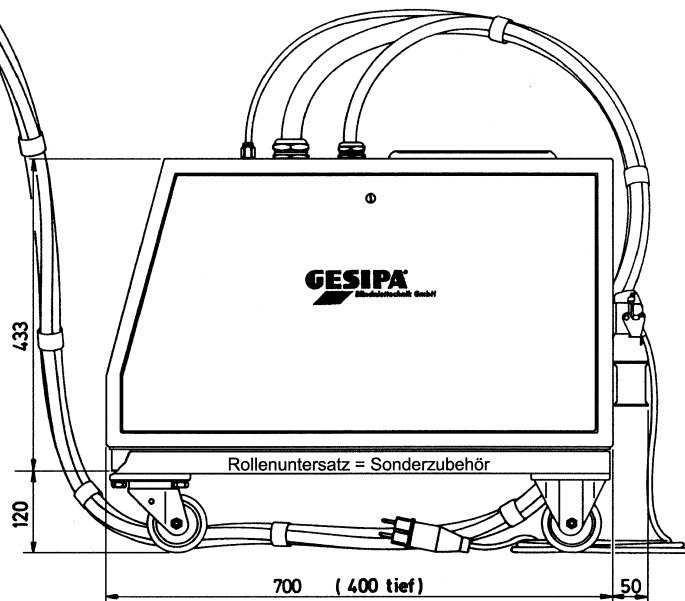
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Dimension Sheet, Technical Data and Working Range



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 (other lengths available on request)

The device is set up for a defined type of blind rivet suitable for automatic machines as per delivery agreement.



Intended Use and Safety Information

Intended use

- The blind riveting system is intended solely for the purpose of processing blind rivets that are suitable for automatic machines. Any other than the intended use shall be deemed as not for the intended purpose.
- The operator must be instructed and observe the safety information.

Safety information

- The device is of state-of-the-art design and constructed in accordance with recognised safety regulations.
- Safe operation is ensured when the device is used for its intended purpose.
- The device is intended solely for the purpose of processing blind rivets.
- The operating instructions must be read before starting up the device.
- Work on the electrical equipment of the device may only be undertaken by qualified electricians in accordance with the electrical engineering codes of practice.
- Work on the mechanical, hydraulic and pneumatic systems may only be undertaken by instructed persons with specific knowledge of the device.

Caution!



- To protect against electric shock, injury and the risk of fire it is necessary when carrying out all setup, maintenance and repair work as well as rectifying device malfunctions to
 - wear safety goggles
 - ensure that the power plug is disconnected
 - ensure the compressed air supply is disconnected from the device
 - check that there is no blind rivet on the chute and in the separator unit
 - never point the riveting gun at persons or other creatures.
- The blind rivet is fed at high speed from the supply unit through the feed hose to the blind riveting gun.
- If it is necessary to remove the feed hose or the spreader nosepiece while carrying out repair or maintenance, the measures described above must be adhered to and a warning sign additionally displayed on the device.
- Failure to use the device for its intended purpose, or to use the device improperly, may result in injury.

Intended Use and Safety Information

Accident prevention

Only persons may work with the GAV-8000 who

- have read and understood the operating instructions and safety information - instruction
- have checked the device and workplace for potential danger to life and limb before starting work
- comply with the accident prevention regulations
- do not wear long hair open, loose clothing or jewellery, including rings - risk of injury
- wear personal protective equipment such as: protective clothing, safety goggles, ear protection, safety footwear, safety gloves.

Workplace

- The workplace for this automatic blind riveting system is intended solely for an instructed operator with specific knowledge of this system.
- Keep workplace neat and tidy.
- Do not expose the blind riveting system to rain, wet conditions or moisture.
- Do not operate the blind riveting system in the vicinity of combustible gases or liquids. Danger of explosion!
- Ensure adequate lighting at the workplace.
- Ensure a stable foundation for the operator and the blind riveting system, uneven surfaces may lead to injury.
- Observe the Hazardous Substance Ordinance when handling hydraulic oil.

Blind riveting system

The spreader nosepiece and the mandrel guide with evacuation hose or a spend mandrel container must be installed before starting up the blind riveting system.

Caution!



- Do not use tool without material! The blind rivet could be flung from the device! Never turn the tool towards yourself or towards another person!
- Do not overload the blind riveting system.
- Before starting operation, check that the blind riveting system is in perfect working condition.
- If mounted on a transport frame, secure the steered casters by applying the brake.
- Maintenance and repair work must only be carried out by suitably skilled personnel. In case of doubt, always send in the device to the manufacturer.
- Spare parts and accessories must correspond to the requirements specified by the manufacturer. Genuine parts comply with these requirements.
- After use, securely replace the blind riveting gun to prevent it falling from its holder.
- Keep the blind riveting system in good working order. (Keep handle dry and free of oil and grease.)
- Regularly check the connectors and cables. If damaged, have replaced by an electrician.
- Routinely check the compressed air and hydraulic connections and lines. If damaged, have replaced by a correspondingly instructed person.

Environmental Information, Recycling, Declaration of Conformity

Environmental information

- Noise emission of the blind riveting system.
Applicable directives: 2006/42/EC:
Continuous sound level: **L_{PA} 78/84 dB** without/with feed unit
Measurement uncertainty K= 3 dB
- Vibration of GAV gun.
Applicable directives: 2006/42/EC:
<2.55 m/s²
Measurement uncertainty K=1 m/s²

Recycling

- Dispose of used hydraulic oil and spent mandrels in the corresponding recycling systems.
- Comply with the Hazardous Substances Ordinance.

Declaration of conformity

We hereby declare under sole responsibility that the products conform to the following standards and directives:

- 2006/42/EC
- 2006/95/EC
- 2004/108/EC



pp Dr. Richard Gärtner



Hans Ulrich Harder

4 Transportation and Installation

Transportation

- Corresponding to the agreement, the blind riveting system is delivered and installed or dispatched upright in a special wooden container.
- Left unpacked, the blind riveting system can be moved with a trolley, available as an accessory, on an even floor. The blind riveting system must be transported by the two lifting eyes on the top of the supply unit and suitable lifting gear or secured upright on a pallet by a pallet truck or fork-lift truck.



Caution!

The blind riveting system is supplied ready for connection and contains approx. 1.2 litres of hydraulic oil in its closed hydraulic system. The supply unit must always be transported in upright position and its stability ensured.

Installation

- Operating pressure: min. 6 bar
 - The compressed air supply system must be capable of making available dried, oil-free compressed air at a rate of 750 NL/min which must not drop below a pressure of 6 bar during operation of the GAV device (do not use mist lubricator!).
 - Pipe diameter 3/4"



Caution!

The inside diameter of the compressed air supply hose must be at least 12.5 mm (1/2"). The pressure must not drop below 6 bar during the riveting process; check operating pressure on pressure gauge.

- Hydraulic oil: For viscosity see technical data.
- Electrical connection: 230 V ~ 50 Hz, alternatively 115 V ~ 60 Hz.

Start-Up and Operation

Note!



Prior to start-up, read and follow the GAV operating instructions and safety information. Also observe the generally applicable Occupational Health and Safety Regulations.

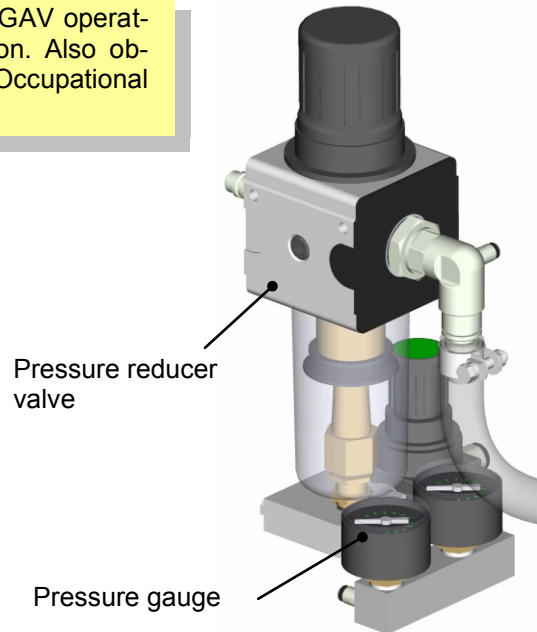
Start-up

- Connect the device to the compressed air supply system.
- Set the operating pressure at the pressure reducer valve to 6 bar, check on pressure gauge.
- Connect the power supply.
- Switch on the device at the master switch.
- Fill the vibration feed container half full with blind rivets and switch on the vibration feed unit (button F4, see Section 8 "Operation").
- Set the separator tongue at the setting screw such that only one blind rivet at a time is separated.
- Press "ON" button.
- Trigger blind riveting gun twice ("Cycle" function in "MAN" menu). The first blind rivet is transferred to the spreader nosepiece.

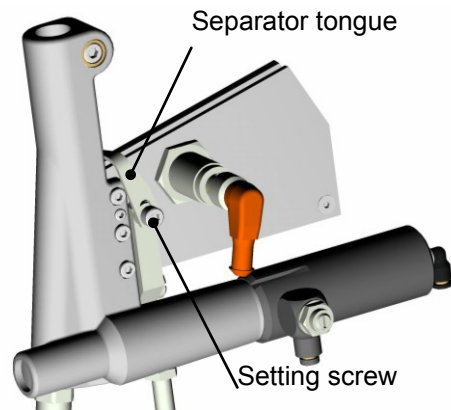
As per the delivery specifications, the device is set up for a certain size of blind rivet. Nevertheless make sure that

- the inside diameter of the rivet feed hose is 2 - 3 mm larger than the setting head diameter of the blind rivet (max. setting head diameter 11.4 mm)
- the hole of the spreader nosepiece 2-80 is 0.3 mm larger than the mandrel diameter of the blind rivet. Spreader nosepieces with a cylindrical extension of up to 15 mm are available for difficult to access riveting points (note length of blind rivet mandrel)
- the holding force of the spreader nosepiece 2-80 can be increased if necessary by fitting additional O-rings.

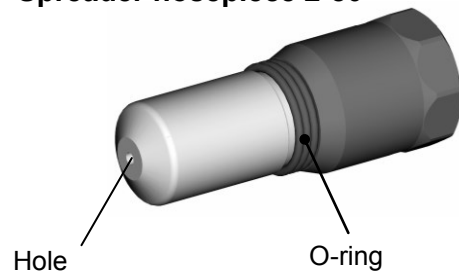
Maintenance unit



Separator



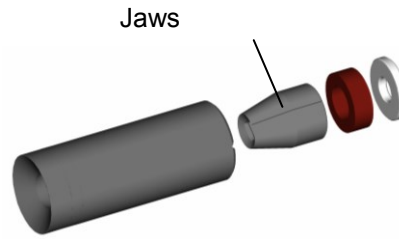
Spreader nosepiece 2-80



Start-Up and Operation

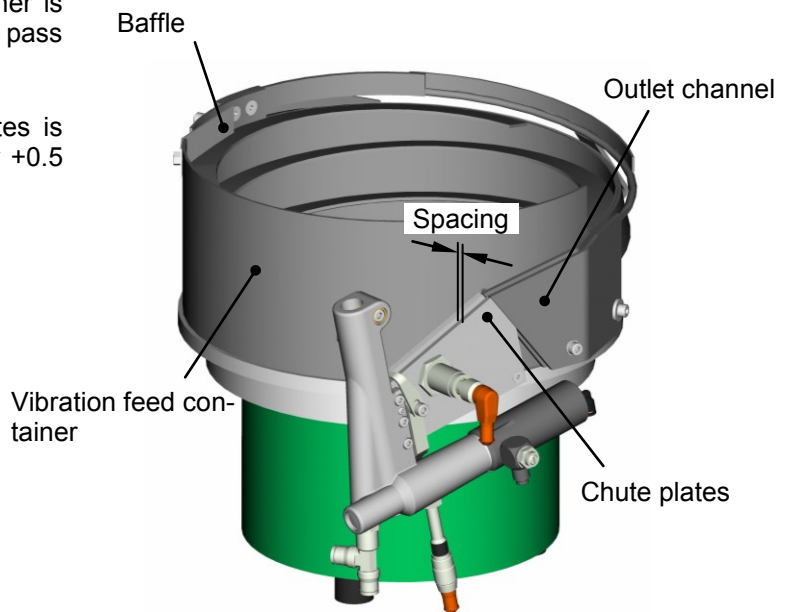
- jaws corresponding to the diameter of the blind rivet mandrel are used. The jaw sizes are graduated as follows:

Blind rivet mandrel diameter
1.5 to 2.1 mm
2.1 to 2.7 mm
2.7 to 3.3 mm
3.3 to 3.65 mm



Vibration feed unit

- the adjustable baffle ahead of the outlet channel of the vibration feed container is set such that only one blind rivet can pass through this chicane.
- the spacing between the chute plates is set to approx. the mandrel diameter +0.5 mm.



Operation

- Insert the blind rivet, set in the working position in the riveting gun, in the blind rivet hole up to the setting head.
- The riveting operation is triggered by pressing the triggering button, the spent mandrel is removed and the next blind rivet is automatically made available in the working position.

Immediately after the blind rivet mandrel has broken off, the blind riveting gun must be pulled back from the riveting point to ensure the next blind rivet can be fed in unobstructed from the spreader nosepiece.

- The spent mandrels are automatically conveyed to the spent mandrel container. The evacuation system is then switched off automatically.

Note!



The spent mandrel container can hold 1800 to 5500 spent mandrels (depending on the size). Ensure the spent mandrel container is emptied in good time.

- The blind riveting gun can be conveniently suspended from the balancer at the workplace.
- The supply unit must only be placed on an even surface. The operator must always check the stability.

Functional Principle

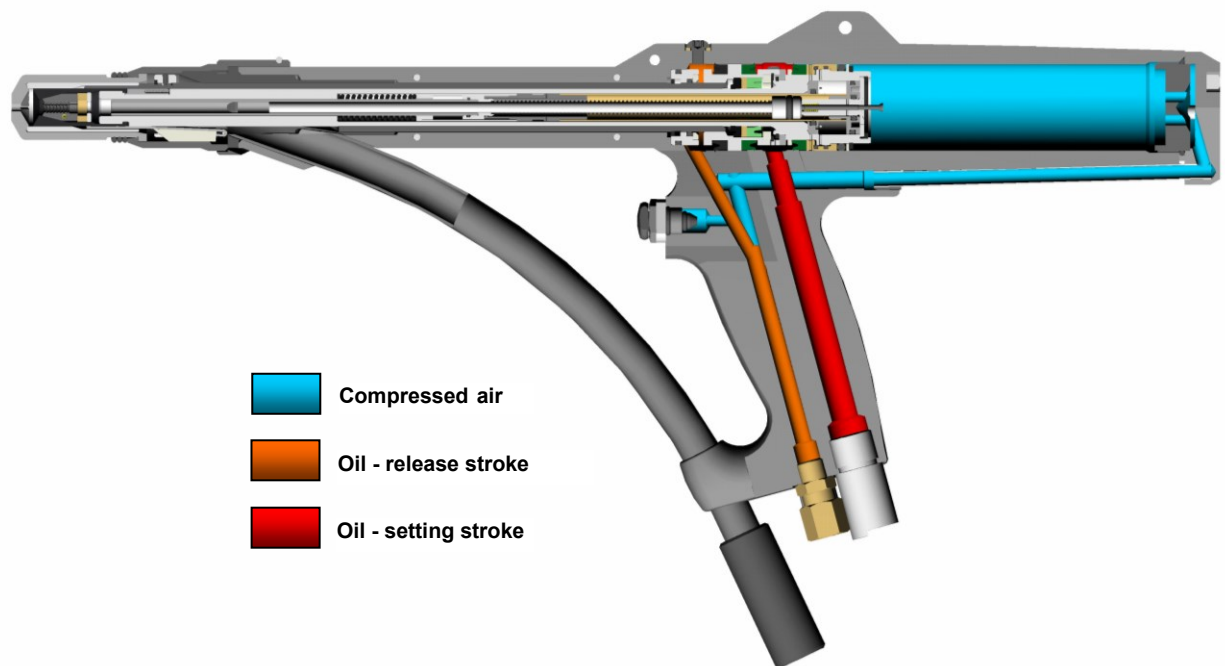
The fully automatic GAV electronic blind riveting system consists of a supply unit and a practical blind riveting gun, both connected by a flexible hose assembly.

The supply unit contains an electronic controller with dialogue unit, two hydraulic pressure boosters, an electrical blind rivet feed unit and a spent mandrel evacuation system with spent mandrel container.

The blind rivet made set in the nosepiece is processed when the riveting gun is triggered, the spent mandrel is conveyed into the spent mandrel container and the next rivet is loaded automatically.

The task of the vibration feed unit with automatic shut-down facility is to continuously feed in the blind rivets.

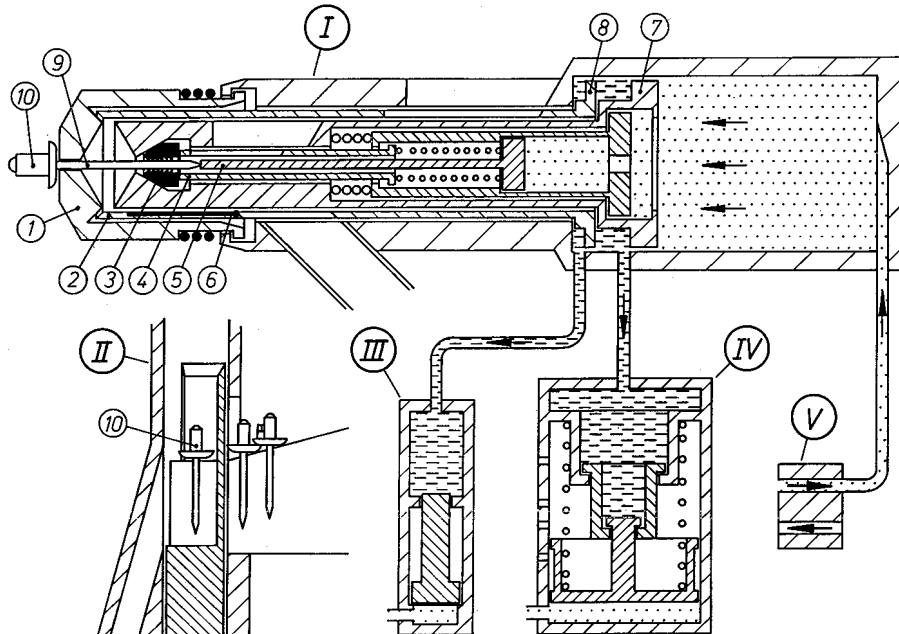
GAV blind riveting gun



Functional Description

7 Functional Components of the Blind Riveting Gun

The schematic diagrams and descriptions below illustrate the control and functional procedures in simplified form.



Spreader nosepiece - 3-piece - (1)
Loads the blind rivet positioned in the gun head into the processing position.

Closing sleeve (2)
Locks and unlocks the spreader nosepiece (1).

Jaws (3)
Grasp the blind rivet mandrel (9) and set the blind rivet (10).

Jaw tube (4)
Transfers the closing pressure to the jaws (3) to securely grasp the blind rivet mandrel (9) and set the blind rivet (10).

Stop piston (5)
End stop for blind rivet mandrel (9) while loading the rivet.

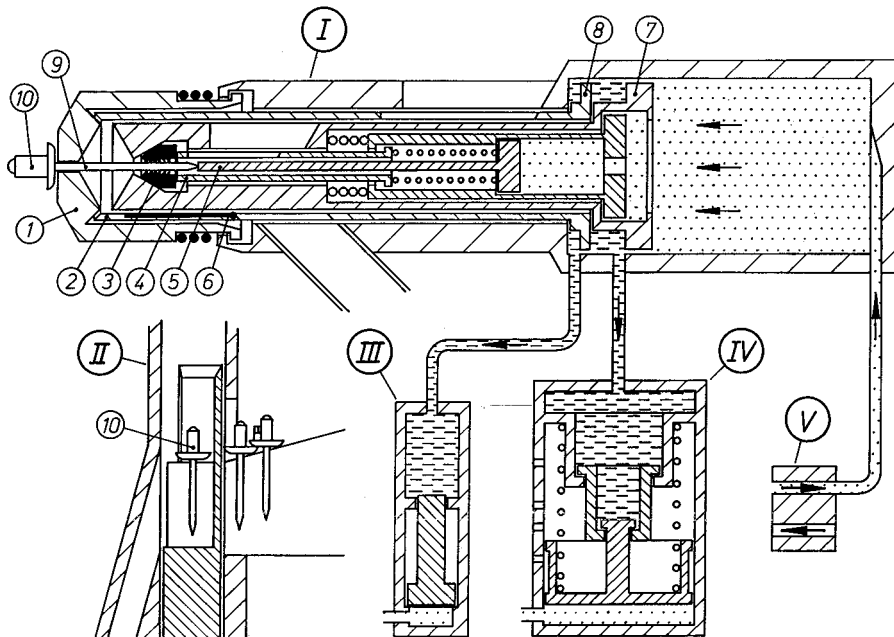
Lock spring (6)
Positions the blind rivet (10) in the gun head.

Pull piston (7)
Bears the complete gripping mechanism for setting the blind rivet (10).

Pressure piston (8)
Bears the closing sleeve (2) that locks and unlocks the spreader nosepiece (1).

Functional Description

7 Functional Assemblies of the Supply Unit



Blind rivet separator (II)

Component part of the blind rivet feed system. Here the blind rivets (10) are separated and fed by compressed air via the feed hose to the blind riveting gun.

Hydropneumatic pressure booster (III)

Applies pressure to the pressure piston (8), thus initiating the release stroke of the spreader nosepiece.

Hydropneumatic pressure booster (IV)

Applies pressure to the pull piston (7) to initiate the rivet setting stroke and to the back of the pressure piston (8) to lock the spreader nosepiece (1) during the setting procedure.

Cylinder switches send control pulses for the switching operations as the piston system moves back and forth in the pressure booster (IV).

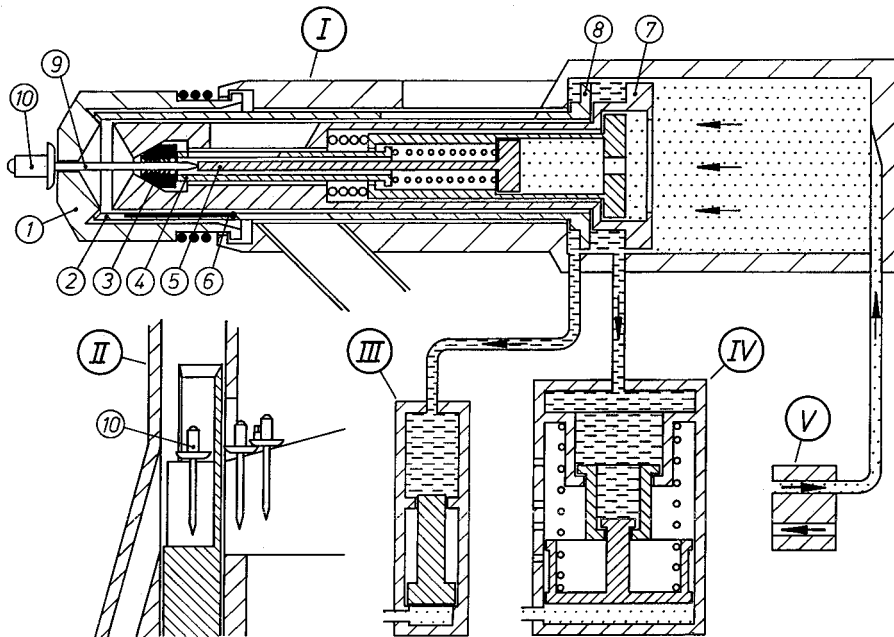
Valve (V)

Activates the reset air to return the complete piston unit (7/8) to its initial position. Corresponding pistons use the reset air applied until the riveting procedure is completed to hold the stop piston (5), jaw tube (4) as well as the closing sleeve (2) in the hold or end position.

Functional Description

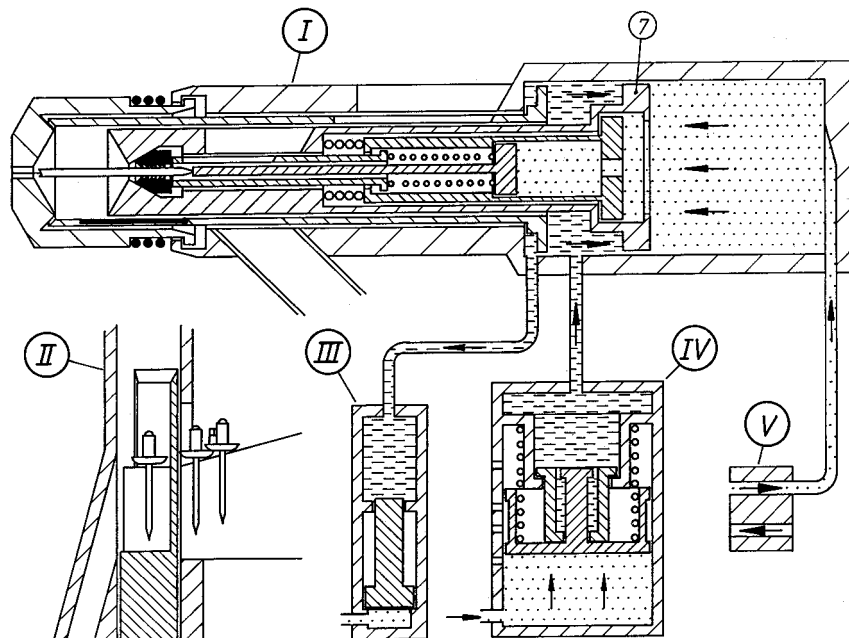
7 Functional Components of the Blind Riveting Gun

Functional diagram 1



The reset air initiated by valve (V) is applied and holds the complete piston unit (7/8) in the end position. The closing sleeve (2) locks the segments of the spreader nosepiece (1) at their recess. The jaw tube (4) keeps the jaws (3) closed on the blind rivet mandrel (9).

Functional diagram 2

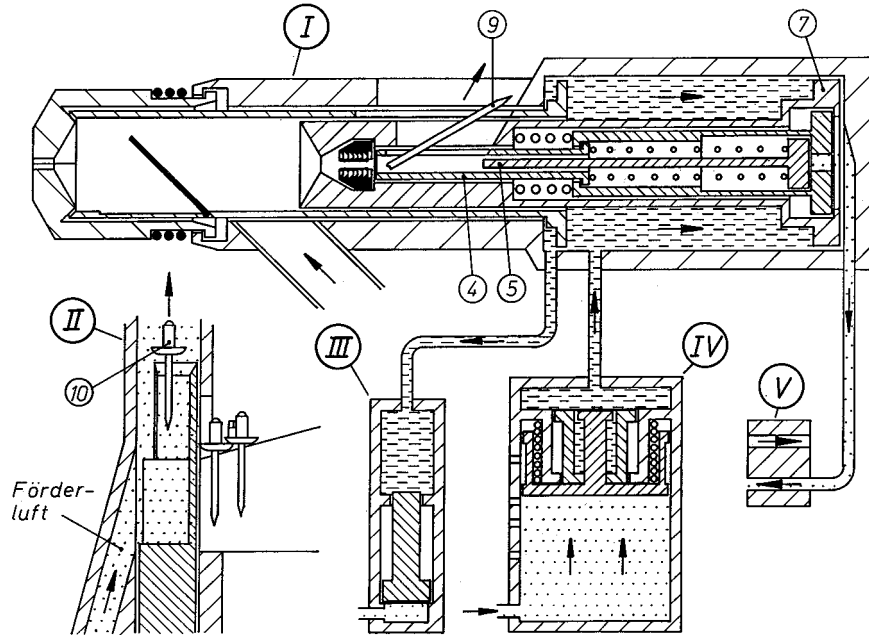


When actuating the GAV device, the pressure booster (IV) applies a pressure to the pull piston (7), to perform the rivet setting operation. The blind rivet is set. The reset air remains applied.

Functional Description

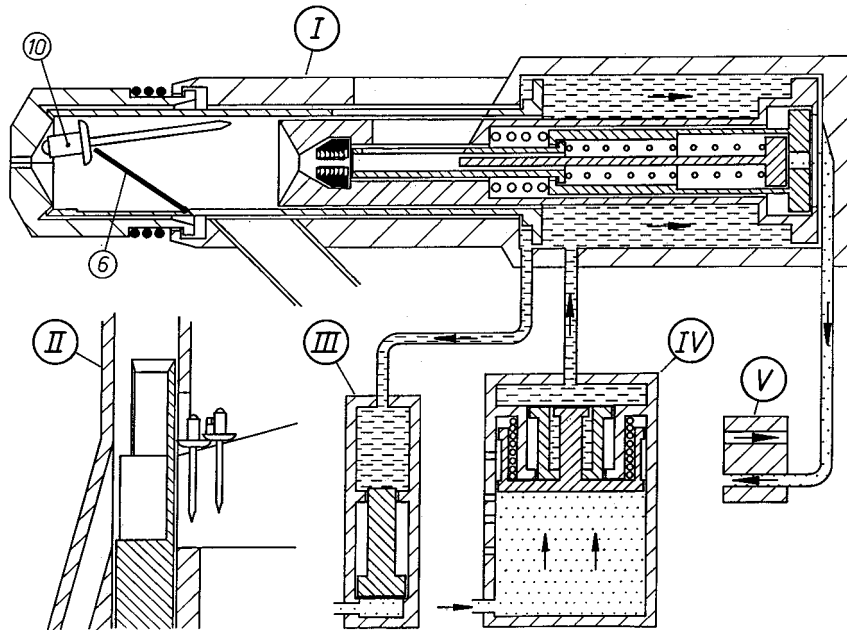
7 Functional Diagrams and Description

Functional diagram 3



The pressure booster (IV) continues applying pressure to the pull piston (7) so that it moves to the rear end position. Valve (V) switches to vent off the reset air. The stop piston (5) and jaw tube (4) are relieved and the jaws (3) release the blind rivet mandrel (9). The blind rivet feed air is switched on by a control pulse at the pressure booster (IV), the blind rivet (10) in the separator (II) is loaded and the broken mandrel (9) is ejected.

Functional diagram 4

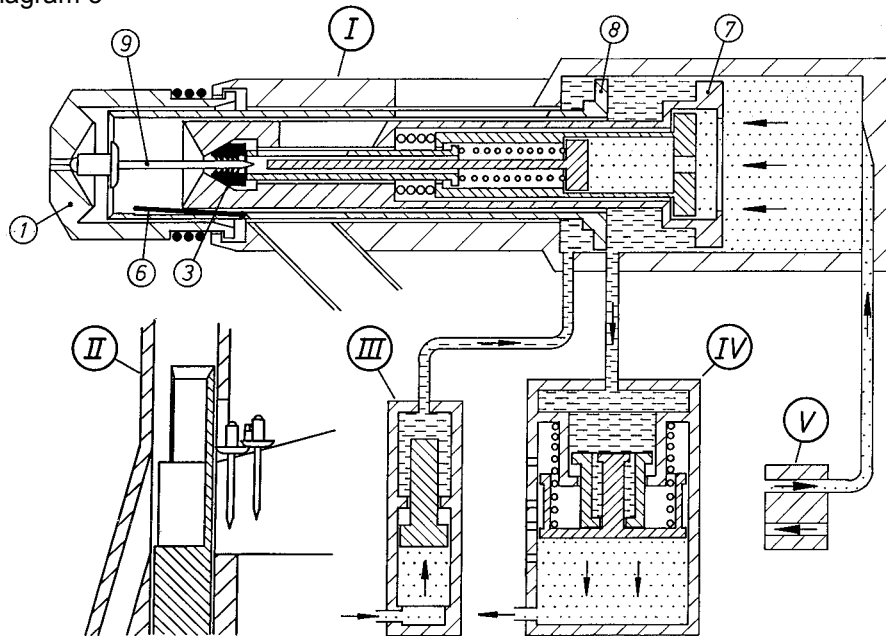


The lock spring (6) positions the blind rivet (10) in the gun head.

Functional Description

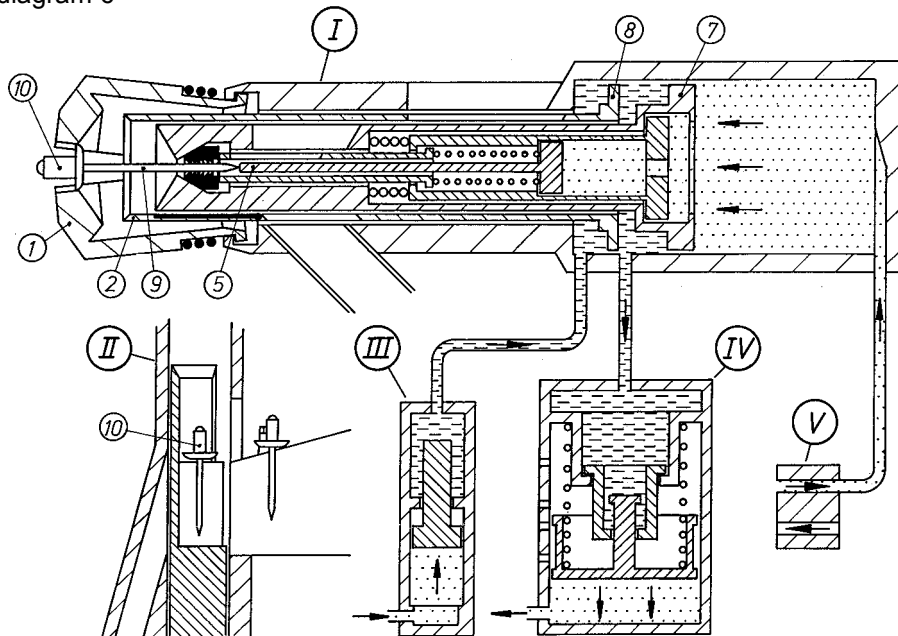
7 Functional Diagrams and Description

Functional diagram 5



The valve (V) releases the reset air and the pull piston (7) as well as the piston in the pressure booster (IV) are reset to their initial position. At the same time, the pressure booster (III) applies pressure to the pressure piston (8) to execute the release stroke for the spreader nosepiece (1). The blind rivet mandrel (9) is taken up by the gripping mechanism and centred in the jaws (3).

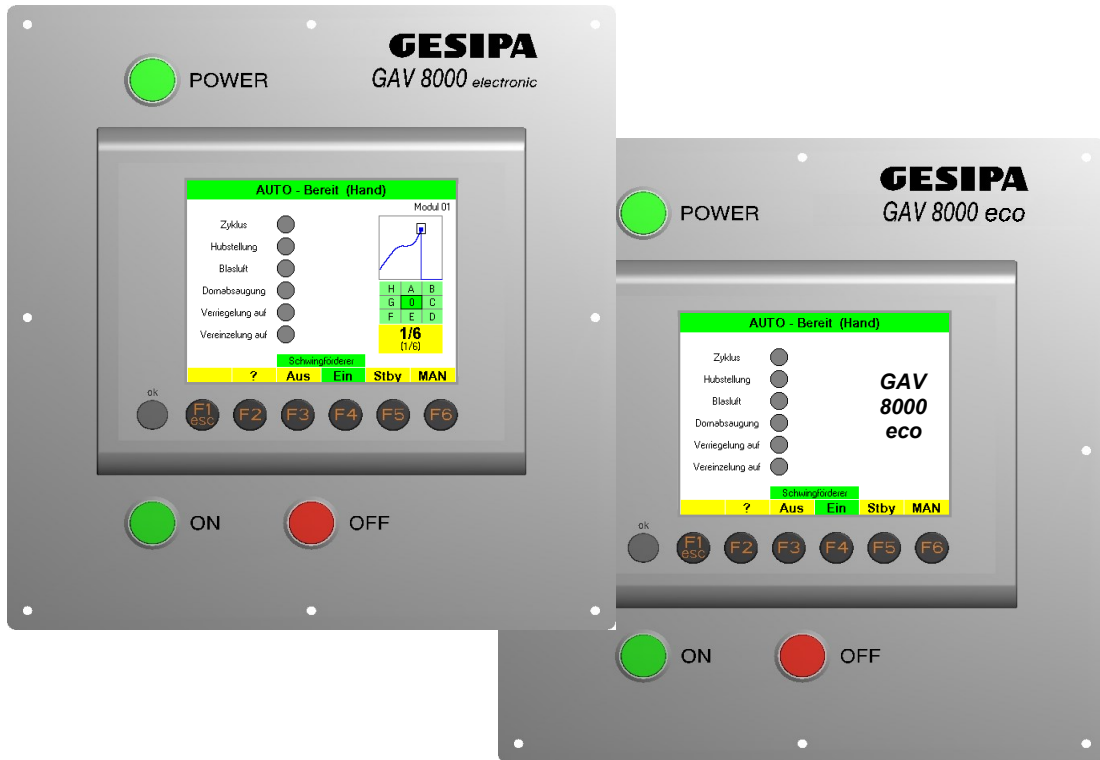
Functional diagram 6



As the pull piston (7) moves back, the blind rivet mandrel (9) knocks against the stop piston (5) so that the blind rivet (10) opens the spreader nosepiece (1) and assumes the processing position. The pressure piston (8) executes the locking stroke for the spreader nosepiece (1) after the pressure booster (III) relieves the pressure. Triggered by a switching pulse at the pressure booster (IV) a further blind rivet (10) is set in the separator (II).

Operation

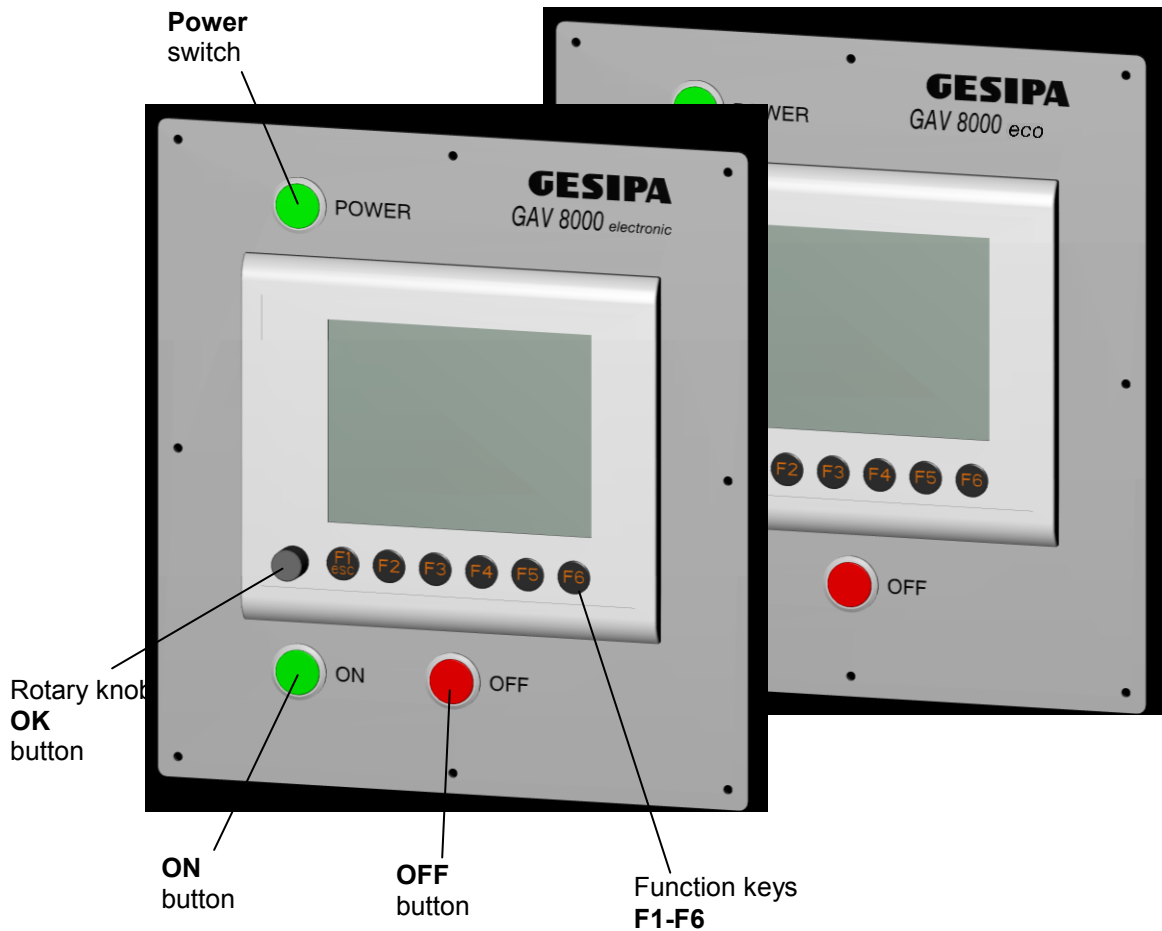
8.0 Overview



- 8.1 Operating Controls
- 8.2 Graphic Display
- 8.3 Menu Structure
- 8.4 Main Menu
- 8.5 Error Messages
- 8.6 Access Authorisation
- 8.7 Manual Operation
- 8.8 Parameter Settings
- 8.9 Data Selection
- 8.10 Text Entry

Operation

8.1 Operating Controls

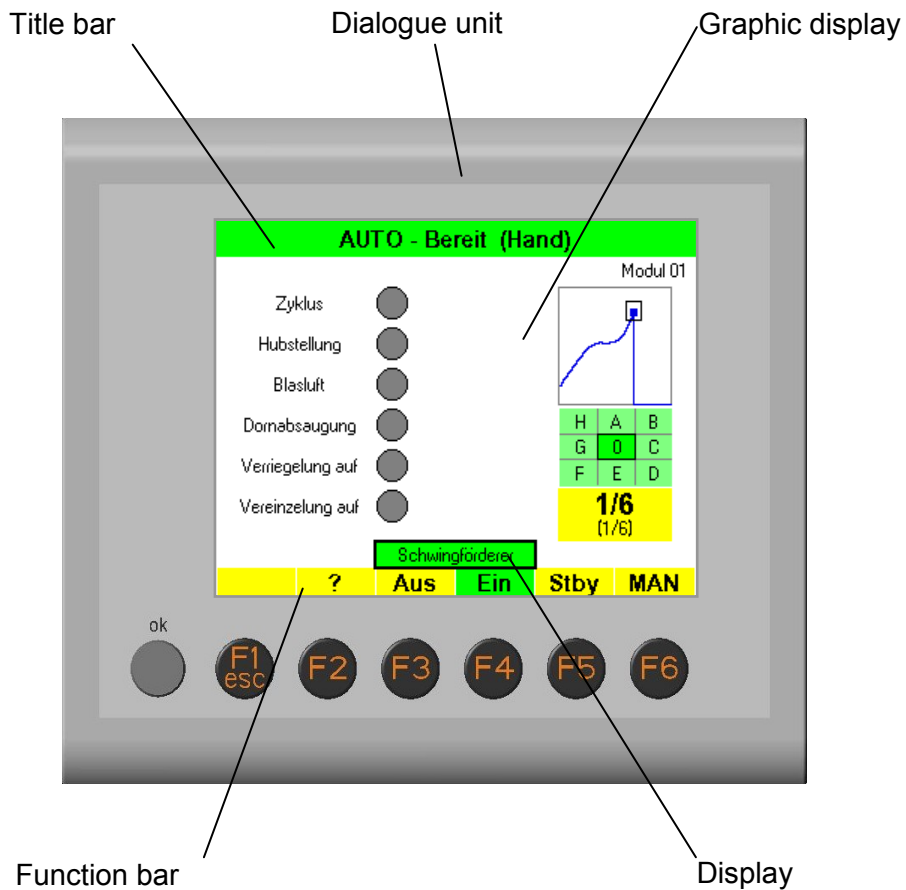


1. **POWER** switch (master switch)
 - connects the power supply (230 V/50 Hz or 110 V/60 Hz).
 - lights green.
2. **ON** button
 - activates various control functions (depending on the display menu).
 - sets GAV to home position.
 - lights green.
3. **OFF** button
 - deactivates various control functions (depending on the display menu).
 - safely isolates all valves from the power supply.
 - lights red.
4. Function buttons **F1..F6**
 - execute various functions (depending on the display menu).
 - light orange.
5. Rotary knob / **OK** button
 - executes various functions (depending on the display menu).



Operation

8.2 Graphic Display



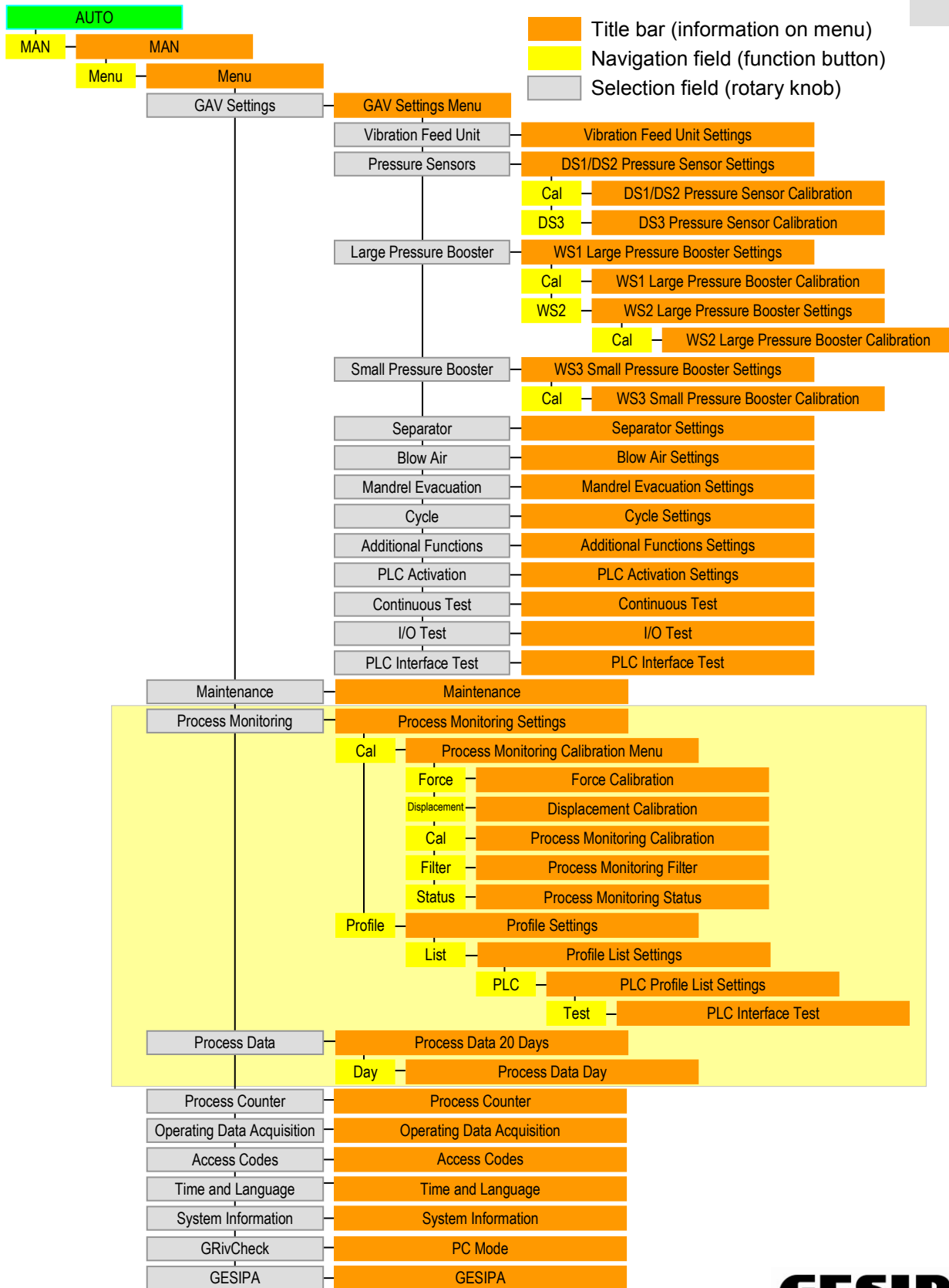
The graphic display is part of the dialogue unit and enables interactive operation of the GAV device. The graphic display shows statuses and parameters, displays messages and visualises internal procedures. Uniform display elements and a clear menu structure ensure user-friendly operation.

1. The **title bar** of the graphic display shows information relating to the current menu.
2. The **function bar** of the graphic display is divided into 6 fields and shows the functions of the function buttons F1 to F6 assigned to the current menu.
3. Functions can be selected within the menu with the rotary knob of the dialogue unit and executed by pressing the rotary knob. The selection is highlighted by an additional frame about the corresponding element.

Operation

8.3 Menu Structure

The following list shows the path to the various menus. They are selected with the function buttons or the rotary knob. From each menu it is possible to go back to the previous menu with **Back**.



Not included in GAV-8000 eco



Operation

8.4 Main Menu

After being switched on and in normal operation mode, the GAV device is set to to the main menu AUTO.

AUTO - Bereit (Hand)

Modul 01

Zyklus ●
 Hubstellung ●
 Blasluft ●
 Dornabsaugung ●
 Verriegelung auf ●
 Vereinzlung auf ●

Überwachung bereit

- (1/6)

Schwingförderer

? Aus Ein Stby MAN

Navigation:
 AUTO

AUTO main menu
 Status "Ready"
 Start option "Hand" (hand trigger)

Title bar	Status
AUTO-OFF (press ON)	GAV switched on ("POWER" master switch) - Valves de-energised.
Set AUTO home position...	"ON" button pressed: - Setting home position.
AUTO home position	Home position: - Home position was set. - Start conditions not met: FAULT or vibration feed unit OFF
AUTO ready (hand)	GAV ready (start conditions met): - GAV in home position. - Start conditions met: No fault and vibration feed unit ON - Start options: Hand = hand trigger Foot = foot trigger PLC = PLC activation

Vibration feed unit OFF / ON	Switches the vibration feed unit. By selecting "vibration feed unit" it is possible to switch directly to the "Vibration Feed Unit Settings" menu where the feed rate, for example, can be set.
Stby	Sets the GAV to Standby mode. The display goes blank and GAV switched to "OFF". This function is cancelled by pressing any button.
MAN	Opens the MAN menu for manual operation.

The configuration of the main menu may differ from that illustrated when additional functions such as "Process Counter" are active.

Operation

8.4 Main Menu

If the start conditions are met in AUTO mode, a cycle can be triggered with one of the active start options (shown in the title bar). The current device status is then shown in the title bar of the main menu. The main device functions are additionally indicated by 6 red lamps in the main menu.

Step in cycle	Device status
<u>GAV ready:</u> - Start conditions met. - A cycle can be triggered with the displayed start option.	AUTO ready (hand) Cycle ● Stroke position ● Blow air ● Mandrel evacuation ● Lock open ● Separator open ●
<u>Cycle up to stroke position:</u> - Blind rivet is processed. - Spent mandrel is ejected and evacuated.	AUTO cycle up to stroke position Cycle ● Stroke position ● Blow air ● Mandrel evacuation ● Lock open ● Separator open ●
<u>Cycle stroke position reached:</u> - GAV gun has reached rear end position. - Spent mandrel is evacuated.	AUTO cycle stroke position reached Cycle ● Stroke position ● Blow air ● Mandrel evacuation ● Lock open ● Separator open ●
<u>Cycle stroke position ready:</u> - GAV gun has reached rear end position. - Spent mandrel evacuated. - The GAV remains in this position during PLC activation until the gun is moved away from the workpiece and the "return cycle" signal was sent from the PLC to the interface.	AUTO cycle stroke position ready Cycle ● Stroke position ● Blow air ● Mandrel evacuation ● Lock open ● Separator open ●
<u>Return cycle:</u> - New blind rivet is loaded.	AUTO return cycle Cycle ● Stroke position ● Blow air ● Mandrel evacuation ● Lock open ● Separator open ●
<u>End of cycle:</u> - Home position reached after cycle.	End of AUTO cycle Cycle ● Stroke position ● Blow air ● Mandrel evacuation ● Lock open ● Separator open ●

Operation

8.5 Error Messages

Device faults and malfunctions are shown abbreviated in white text in red fields in the AUTO main menu, warnings flash. Information on the cause of fault can be found in the corresponding menus in the "GAV Settings" area.

Error message	Submenu	
	Remedy	Navigation
Vibration feed unit Lack of blind rivets.	Vibration Feed Unit Settings	
	Top up blind rivets or check vibration feed unit settings.	<ul style="list-style-type: none"> ▶ MAN ▶ Menu ▶ GAV settings ▶ Vibration feed unit
System pressure:	DS1/DS2 Pressure Sensor Settings	
Air supply is not in permissible pressure range.	Secure adequate compressed air supply.	<ul style="list-style-type: none"> ▶ MAN ▶ Menu ▶ GAV settings ▶ Pressure sensors
Oil level	WS2 Large Pressure Booster Settings	
Oil level in the large pressure booster has dropped below the minimum mark or exceeded the maximum mark.	Correct oil level in large pressure booster, observe oil level mark.	<ul style="list-style-type: none"> ▶ MAN ▶ Menu ▶ GAV settings ▶ Large pressure booster ▶ WS2
Oil level in the small pressure booster has dropped below the minimum mark.	WS3 Small Pressure Booster Settings	
	Use oil can to move piston rod to upper end position.	<ul style="list-style-type: none"> ▶ MAN ▶ Menu ▶ GAV settings ▶ Small pressure booster
Riveting gun	WS2 Large Pressure Booster Settings	
GAV gun has not reached front end position.	See Section 20 "Riveting Gun Faults".	<ul style="list-style-type: none"> ▶ MAN ▶ Menu ▶ GAV settings ▶ Large pressure booster ▶ WS2

Operation

8.5 Error Messages

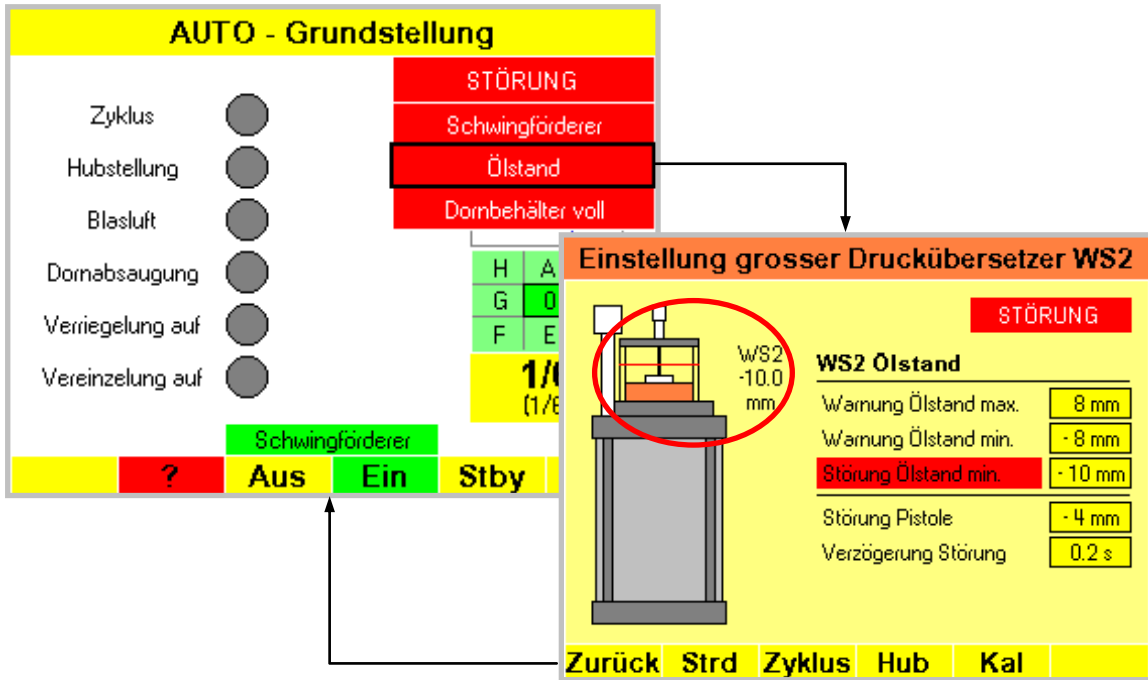
Error message	Submenu	
	Remedy	Navigation
Nosepiece Spreader nosepiece of GAV gun was not closed.	WS3 Small Pressure Booster Settings	
	- Press OFF button. - Remove blind rivet. - Press ON button.	▶ MAN ▶ Menu ▶ GAV settings ▶ Small pressure booster
Separator Separator was not closed, blind rivet jammed.	Separator Settings	
	Open separator in MAN mode and remove blind rivet.	▶ MAN ▶ Menu ▶ GAV settings ▶ Separator
Mandrel evacuation Spent mandrel was not ejected.	Mandrel Evacuation Settings	
	See Section 20 "Riveting Gun Faults".	▶ MAN ▶ Menu ▶ GAV settings ▶ Mandrel evacuation
Mandrel container full Spent mandrel container full.	Mandrel Evacuation Settings	
	Empty spent mandrel container.	▶ MAN ▶ Menu ▶ GAV settings ▶ Mandrel evacuation
Rivet check nosepiece Blind rivet was not loaded.	PLC Activation Settings	
	See Section 20 "Riveting Gun Faults".	▶ MAN ▶ Menu ▶ GAV settings ▶ PLC activation
Rivet check feed hose Blind rivet was not fed in.	Additional Functions Settings	
	See Section 20 "Riveting Gun Faults".	▶ MAN ▶ Menu ▶ GAV settings ▶ Additional functions
Cycle Cycle error, blind rivet was not processed.	Cycle Settings	
	See Section 20 "Riveting Gun Faults".	▶ MAN ▶ Menu ▶ GAV settings ▶ Cycle

Operation

8.5 Error Messages

Direct menu selection:

To simplify the search for the required menu with information of the cause of fault and to therefore shorten the navigation path, the selection can be switched to the displayed error messages with **?** in the main menu. The corresponding menu then opens directly after selecting an error message and pressing the rotary knob. You return to the main menu by pressing **Back**.



Example:


In the illustrated example, the "WS2 Large Pressure Booster Settings" menu is opened directly with **?** and selecting "Error - oil level". Here the setting parameter "Error - min. oil level" is marked in red as the cause of the fault, the current oil level in the oil reservoir of the large pressure booster is displayed in numeric and graphic form.

In the illustrated example, the fault can be rectified by topping up the hydraulic oil in the large pressure booster. The numeric and graphic display of the oil level allows you to observe the re-filling procedure on the display.

Operation

8.6 Access Authorisation

Access authorisation ensures that only authorised persons carry out maintenance and setting work on the GAV. Access authorisations are assigned after entering a four-digit access code. A distinction is made between two access authorisations:

- Service code	For service and general set-up work.
- GESIPA code	For entering calibration data. The relevant menus are correspondingly marked in the operating instructions.
 GESIPA code	

In most menus an access code is only requested when parameters or settings are to be changed. Once assigned, an access authorisation is valid for the entire manual area. All access authorisations are cancelled on return to the AUTO main menu.

Entering access code:

An additional window appears in the menu to enter the access code, the navigation bar changes accordingly. The **title bar** of the window shows which access code is to be entered, the Service code or the GESIPA code.

The access code is entered using the digits **1** to **4**. The entry starts in the left-hand field and, with concealed entry (standard), is displayed as an asterisk *.

The Service code default is 1111.

Cncl Cancels the code entry.

New allows you to enter the code again.

The corresponding access authorisation is assigned after correctly entering the code.

The access authorisations are deleted in the main menu.

Example: Code entry Service code

Title bar

Navigation:
 AUTO
 ► MAN

Example:

In the illustrated example, the "Cycle" function was selected in the "MAN" menu. The access authorisation "Service code" is required to execute this function.

Operation

8.7 Manual Operation

GAV functions can be executed manually in the MAN menu. Device faults are displayed in the same way as in the AUTO main menu, however, they are not start conditions. **For safety reasons, the active start options in the AUTO main menu are blocked in the entire manual area.**

MAN - Bereit

Zyklus

Hubstellung

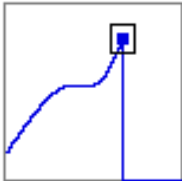
Blasluft

Dornabsaugung

Verriegelung auf

Vereinzelung auf

Modul 01



H	A	B
G	D	C
F	E	D

1/6

(1/6)

Schwingförderer

AUTO
?
Aus
Ein
Stby
Menü

MAN manual operation

Navigation:
 AUTO
 ► MAN

Function	Description
Cycle	<ul style="list-style-type: none"> - Condition: GAV in home position. - One complete processing cycle is executed.
Stroke position	<ul style="list-style-type: none"> - Condition: GAV in home position. - Gun is moved to rear end position, the functions "Gun air OFF", "Blow air ON" and "Mandrel evacuation ON" are not executed. - Press again or ON button to reset GAV to home position, the functions "Blow air OFF", "Lock open" and "Separator open" are not executed.
Blow air	<ul style="list-style-type: none"> - Condition: "Stroke position" function active. - "Blow air ON" function is activated. - "Mandrel evacuation ON" function is activated. - "Gun air OFF" function is activated.
Mandrel evacuation	<ul style="list-style-type: none"> - Condition: None. - "Mandrel evacuation ON" function is activated. - Press again or ON button to reset the function.
Lock open	<ul style="list-style-type: none"> - Condition: GAV in home position. - "Lock open" function is activated. - Press again or ON button to reset the function.
Separator open	<ul style="list-style-type: none"> - Condition: GAV in home position. - "Separator open" function is activated. - Press again or ON button to reset the function.
Vibration feed unit OFF / ON	Same function as in AUTO main menu.
Stby	Same function as in AUTO main menu.
MAN	Opens the MAN menu for manual operation.
Menu	Opens the selection menu.
AUTO	Back to AUTO main menu.

Operation

8.8 Parameter Settings

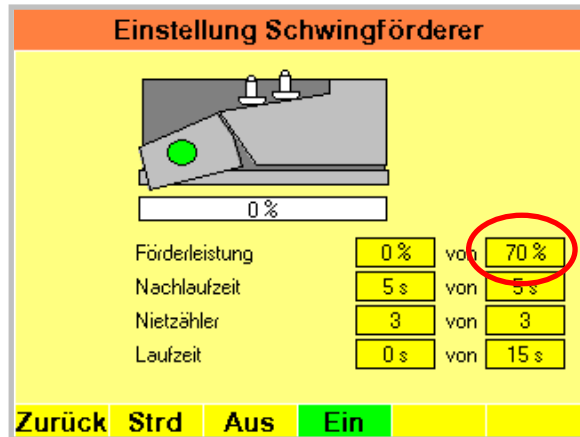
Set parameters are represented and set in the same way in all menus.

Setting ranges and step width can be limited depending on the parameter and type of data.

Parameters requiring a high degree of accuracy are set in multiple stages. Whole numbers and decimal places can be set in two steps, large values initially in steps of hundred and then of one.

Example:

Setting the feed rate of the vibration feed unit in the "Vibration Feed Unit Settings" menu



Step	Entry	Result												
1. Select parameter		<table border="1"> <tr> <td>Förderleistung</td> <td>0 %</td> <td>von</td> <td>70 %</td> </tr> <tr> <td>Nachlaufzeit</td> <td>5 s</td> <td>von</td> <td>5 s</td> </tr> <tr> <td>Nietzähler</td> <td>3</td> <td>von</td> <td>3</td> </tr> </table>	Förderleistung	0 %	von	70 %	Nachlaufzeit	5 s	von	5 s	Nietzähler	3	von	3
Förderleistung	0 %	von	70 %											
Nachlaufzeit	5 s	von	5 s											
Nietzähler	3	von	3											
2. Activate setting		<table border="1"> <tr> <td>Förderleistung</td> <td>0 %</td> <td>von</td> <td>70 %</td> </tr> <tr> <td>Nachlaufzeit</td> <td>5 s</td> <td>von</td> <td>5 s</td> </tr> <tr> <td>Nietzähler</td> <td>3</td> <td>von</td> <td>3</td> </tr> </table>	Förderleistung	0 %	von	70 %	Nachlaufzeit	5 s	von	5 s	Nietzähler	3	von	3
Förderleistung	0 %	von	70 %											
Nachlaufzeit	5 s	von	5 s											
Nietzähler	3	von	3											
3. Set parameter		<table border="1"> <tr> <td>Förderleistung</td> <td>0 %</td> <td>von</td> <td>62 %</td> </tr> <tr> <td>Nachlaufzeit</td> <td>5 s</td> <td>von</td> <td>5 s</td> </tr> <tr> <td>Nietzähler</td> <td>3</td> <td>von</td> <td>3</td> </tr> </table>	Förderleistung	0 %	von	62 %	Nachlaufzeit	5 s	von	5 s	Nietzähler	3	von	3
Förderleistung	0 %	von	62 %											
Nachlaufzeit	5 s	von	5 s											
Nietzähler	3	von	3											
4. Adopt parameter		<table border="1"> <tr> <td>Förderleistung</td> <td>0 %</td> <td>von</td> <td>62 %</td> </tr> <tr> <td>Nachlaufzeit</td> <td>5 s</td> <td>von</td> <td>5 s</td> </tr> <tr> <td>Nietzähler</td> <td>3</td> <td>von</td> <td>3</td> </tr> </table>	Förderleistung	0 %	von	62 %	Nachlaufzeit	5 s	von	5 s	Nietzähler	3	von	3
Förderleistung	0 %	von	62 %											
Nachlaufzeit	5 s	von	5 s											
Nietzähler	3	von	3											

Step 3 is repeated as often as required for multi-stage setting.

Function buttons F1..F6 are disabled during step 3 "Set parameter".


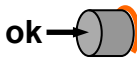
Operation

8.9 Data Selection

It is necessary to select data in various menus. An additional window appears for data selection, the navigation bar changes accordingly.

The **title bar** of the window shows the selected data.

The **status bar** shows information on the currently selected dataset.

Entry		Function
Rotary knob		Select dataset in white highlighted field.
First		Select first dataset in table.
Last		Select last dataset in table.
OK		Adopt selected dataset.
Cncl		Cancel without selection.

Einstellung Profil

Profil auswählen

Bezeichnung	Niet Art.-Nr.
PG 6,4x10 FK11 FG 2,5	6705890
PG 6,4x10 FK11 FG 2,0	6705890
PG 6,4x10 FK11 FG 3,0	6705890
PG 6,4x10 FK11 FG 4,0	6705890

Profil 3/4 - Index 1/1

Abbr
Erstes
Letztes
OK

Example: Data selection

Title bar

Status bar

Navigation:

- AUTO
- ▶ MAN
- ▶ Menu
- ▶ Process monitoring
- ▶ Profile
- ▶ Load

Example:

In the illustrated example, a profile from the profile database is to be loaded in the "Profile Settings" menu. The profile to be loaded can be selected in the displayed window. The number of the selected profile and its change index are shown in the status bar.

The example is from the setting process monitoring area and does not apply to the GAV-8000 eco

Operation




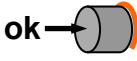
8.10 Text Entry

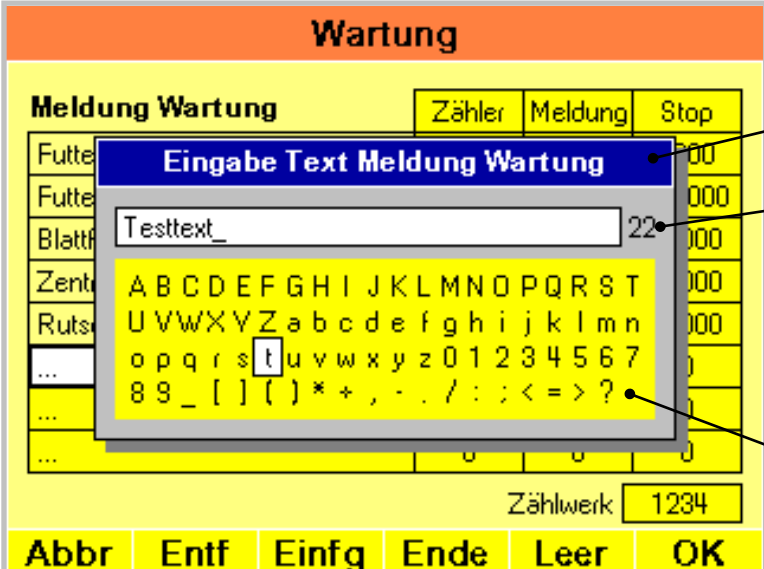
It is necessary to enter text in various menus. An additional window appears for Text entries, the navigation bar changes accordingly.

The **title bar** of the window shows the expected text entry.

The entered text with the number of text characters still available is shown in the **entry line** in the window. The flashing cursor "_" indicates the entry position.

The number of characters available for the text entry is shown in the **selection field**.

Entry	Function	
	Select text character in selection field.	
ok 	Adopt selected text character in entry line.	
Delete	Deletes character before the cursor. Hold for 2 seconds to delete the entire text line.	
Insert		Select insert position.
	ok 	Text entry
End	End insert mode, place cursor at end of text line.	
Space	Space.	
OK	Adopt entry.	
Cncl	Cancel entry without change.	



Example: Text entry

Title bar

Entry line

Navigation:
 AUTO
 ► MAN
 ► Menu
 ► Maintenance

Selection

Example:

The example shows the text entry for one of the freely definable maintenance texts.

GAV Settings

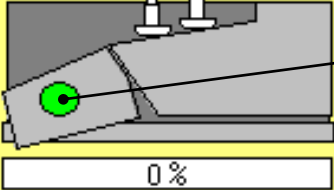
9.0 Overview

- 9.1 Vibration Feed Unit
- 9.2 Pressure Sensors
- 9.3 Large Pressure Booster
- 9.4 Small Pressure Booster
- 9.5 Separator
- 9.6 Blow Air
- 9.7 Mandrel Evacuation
- 9.8 Cycle
- 9.9 Additional Functions
- 9.10 PLC Activation
- 9.11 Continuous Test
- 9.12 I/O Test
- 9.13 PLC Interface Test

GAV Settings

9.1 Vibration Feed Unit

Einstellung Schwingförderer



Förderleistung	0 %	von	70 %
Nachlaufzeit	5 s	von	5 s
Nietzähler	3	von	3
Laufzeit	0 s	von	15 s

Zurück
Strd
Aus
Ein

Vibration Feed Unit Settings Menu

Proximity switch NS1

Navigation:

- AUTO
- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ Vibration feed unit

Vibration Feed Unit Settings

(The setting of the proximity switch NS1 is described in Section 9.5 "GAV Settings" - "Separator".)

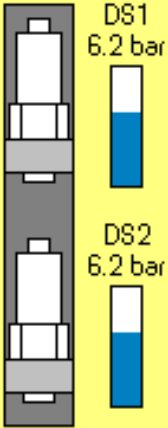
Feed rate	Controls the feed rate of the vibration feed unit.
Afterrunning time	The afterrunning time begins when the proximity switch NS1 on the separator chute is "ON" (separator chute filled with blind rivets). This function creates a supply of blind rivets on the separator chute.
Rivet counter	The rivet counter is set to the number of blind rivets that are still on the separator chute after proximity switch NS1 "OFF". This function prevents the separator from running empty. Vibration feed unit fault on reaching the set value.
Runtime	Cannot be set. Short runtime for normal operation, long runtime when vibration feed container is empty. This function prevents blind rivets wedging together in the event of a backup. Vibration feed unit fault on reaching the set value.

Default	Resets all settings to default.
OFF / ON	Switches the vibration feed unit on or off.

GAV Settings

9.2 Pressure Sensors

Einstellung Drucksensor DS1/DS2



DS1
6.2 bar

DS2
6.2 bar

DS1 Netzdruck

Netzdruck max.	7.0 bar
Netzdruck min.	6.0 bar

DS2 Pistolenluft

Handauslösung	5.6 bar
Entlüftung Zyklus	0.8 bar
Nachspeiserverzögerung	1.5 s
Nachspeisedauer	100 ms

Zurück
Strd
Zyklus
Hub
Kal
DS3

Navigation:
 AUTO
 ▶ MAN
 ▶ Menu
 ▶ GAV settings
 ▶ Pressure sensors

DS1 System pressure

Monitors the compressed air supply to GAV
(for settings see Section 5 "Start-Up and Operation").

Max. system pressure	System pressure fault on exceeding the set value.
Min. system pressure	System pressure fault on dropping below the set value.

DS2 Riveting gun air

Monitors the compressed air supply to the GAV riveting gun.

Hand trigger	Cycle starts when the pressure drops below the set value.
Vent cycle	Cycle continues from stroke position when the pressure drops below the set value.
Supply delay	Delayed supply of the riveting gun air blocked in home position after pressure drops below the min. DS1 system pressure.
Supply time	Duration of riveting gun air supply.

The setting range of the individual parameters can vary depending on other set parameters.

Default	Resets all settings to default.
Cycle	Executes one processing cycle (see Section 8.7 "Manual Operation" "Cycle" function).
Stroke	Moves riveting gun to stroke position (see Section 8.7 "Manual Operation" "Stroke Position" function).
Cal	"DS1/DS2 Pressure Sensor Calibration" menu.
DS3	"DS3 Pressure Sensor Calibration" menu.

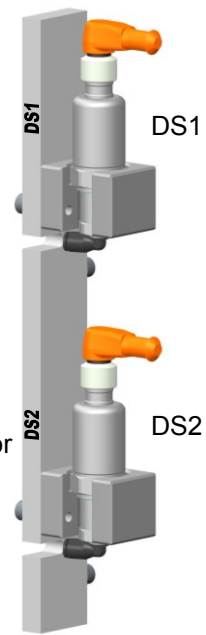
GAV Settings

9.2 Pressure Sensors

DS1/DS2 Pressure Sensor Calibration and Basic Setting

The calibration data "Signal Type" and "Measuring Range" are set in the "DS1/DS2 Pressure Sensor Calibration" menu during device installation and must not be changed.

Basic setting of the pressure sensors is not required.



DS1/DS2 Pressure sensor calibration menu

Kalibrierung Drucksensor DS1/DS2

DS1
6.2 bar

Kalibrierung DS1

Signaltyp 0-10 V

Messbereich 0 bis 10 bar

DS2
6.2 bar

Kalibrierung DS2

Signaltyp 0-10 V

Messbereich 0 bis 10 bar

Zurück
Strd
Zyklus
Hub

Navigation:

- AUTO
- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ Pressure sensors
- ▶ Cal

←
GESIPA code

Calibration DS1	
Signal type	Signal type of pressure sensor.
Measuring range	Measuring range of pressure sensor.
Calibration DS2	
Signal type	Signal type of pressure sensor.
Measuring range	Measuring range of pressure sensor.
Default	Resets all settings to default.
Cycle	Executes one processing cycle (see Section 8.7 "Manual Operation" "Cycle" function).
Stroke	Moves riveting gun to stroke position (see Section 8.7 "Manual Operation" "Stroke Position" function).

GAV Settings

9.2 Pressure Sensors

Not in GAV-8000 eco

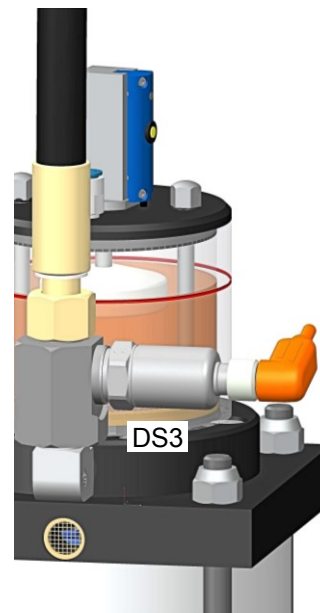
DS3 Pressure Sensor Calibration and Basic Setting

The DS3 pressure sensor is adapted at the connection for the hydraulic line of the large pressure booster.

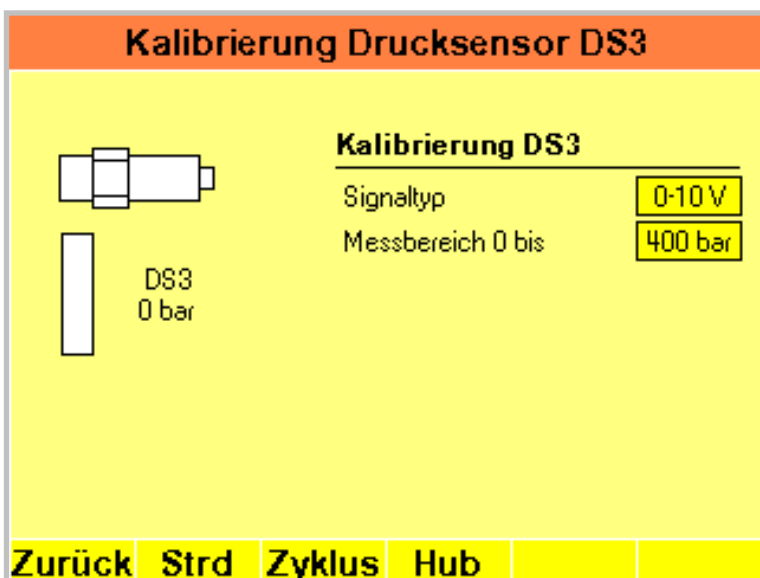
The calibration data "Signal Type" and "Measuring Range" are set in the "DS3 Pressure Sensor Calibration" menu during device installation and must not be changed.

Basic setting of the pressure sensor is not required.

It is necessary to bleed the hydraulic system after replacing the pressure sensor (see Section 24 "Filling Hydraulic Systems").



DS3 Pressure sensor calibration menu



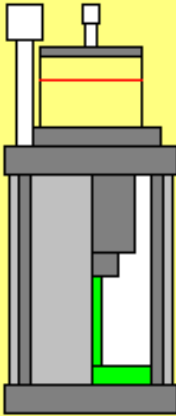
- Navigation:
- AUTO
 - ▶ MAN
 - ▶ Menu
 - ▶ GAV settings
 - ▶ Pressure sensors
 - ▶ DS3
- GESIPA code

Calibration DS3	
Signal type (Standard 0-10 V)	Signal type of pressure sensor.
Measuring range (Standard 0-400 bar)	Measuring range of pressure sensor.
Default	Resets all settings to default.
Cycle	Executes one processing cycle (see Section 8.7 "Manual Operation" "Cycle" function).
Stroke	Moves riveting gun to stroke position (see Section 8.7 "Manual Operation" "Stroke Position" function).

GAV Settings

9.3 Large Pressure Booster

Einstellung grosser Druckübersetzer WS1



WS1
0.0
mm

WS1 Schaltpunkte Zyklus

Pistolenluft aus	78 mm
Blasluft ein	78 mm
Dornabsaugung ein	78 mm
Hubstellung	90 mm
Blasluft aus	88 mm
Verriegelung auf	88 mm
Vereinzelung auf	88 mm
Grundstellung	5 mm

Zurück
Strd
Zyklus
Hub
Kal
WS2

← 0
GESIPA code

Large pressure booster settings menu
WS1 displacement sensor

- Navigation:
- AUTO
 - ▶ MAN
 - ▶ Menu
 - ▶ GAV settings
 - ▶ Large pressure booster

WS1 Cycle switching points

The switching points control the sequences within the processing cycle. The setting range is the entire measuring range as from sensor zero point.

Pulling	Riveting gun air OFF	Switches off the riveting gun air at the end of the power stroke, the jaws are opened and the spent mandrel released.
	Blow air ON	Switches on the blow air at the end of the power stroke, the spent mandrel is ejected and a new blind rivet loaded.
	Mandrel evacuation ON	Switches mandrel on mandrel evacuation, the spent mandrel is conveyed into the spent mandrel container.
	Stroke position	Stroke position reached:
Return	Blow air OFF	Switches off the blow air.
	Lock open	Opens the lock to load a blind rivet.
	Separator open	Opens the separator for a new blind rivet.
	Home position	Home position reached, the lock is activated and the separator closed.

Default	Resets all settings to default.
Cycle	Executes one processing cycle (see Section 8.7 "Manual Operation" "Cycle" function).
Stroke	Moves riveting gun to stroke position (see Section 8.7 "Manual Operation" "Stroke Position" function).
Cal	"WS1 Large Pressure Booster Calibration" menu.
WS2	"WS2 Large Pressure Booster Settings" menu.

GAV Settings

9.3 Large Pressure Booster

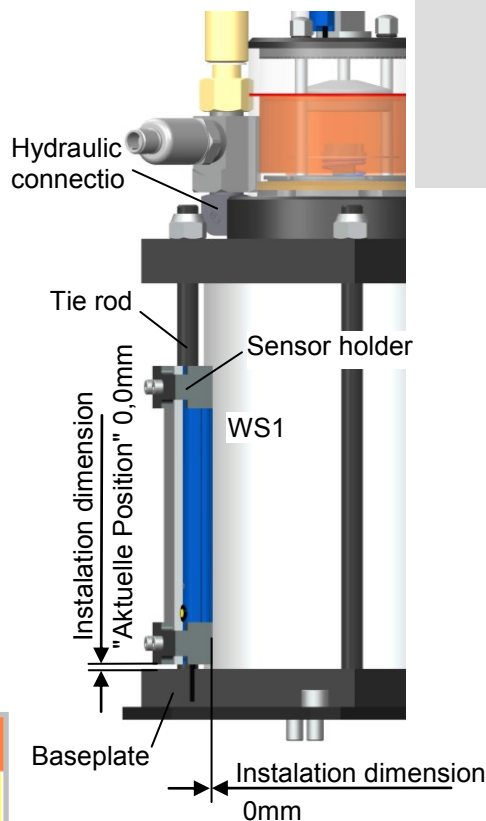
WS1 Displacement Sensor Calibration and Basic Setting

The displacement sensor (WS1) can be replaced with the pressure booster installed in position. Based on the hydraulic connection, the displacement sensor (WS1) should be installed on the tie rod on the right-hand side.

When installing the displacement sensor (WS1) the end face of the sensor body (cable side facing upwards) must be directed with the sensor holder towards the top of the baseplate and the longitudinal side of the displacement sensor (WS1) additionally pressed flush against the cylinder wall and screwed in position.

The displacement sensor (WS1) is calibrated and the calibration data "signal type" and "measuring range" in the "WS1 Large Pressure Booster Calibration" menu are set at the factory and must not be changed.

The basic setting of the pressure booster is achieved with the "zero point" parameter. In the basic setting, "zero point" is set such that the "current position" is 0.0 mm. The "zero point" parameter should then be 3 mm. Slight corrections can be made by shifting the displacement sensor on the pressure booster.



Kalibrierung WS1 grosser Druckübersetzer

Kalibrierung WS1

Signaltyp 0-10 V

Messbereich 0 bis 100 mm

Nullpunkt bei 3.0 mm

Aktuelle Position 0.0 mm

Zurück
Strd
Zyklus
Hub

Large pressure booster calibration WS1 displacement sensor menu

Navigation:

- AUTO
- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ Large pressure booster
- ▶ Cal

🔑
GESIPA code

Calibration WS1	
Signal type	Signal type of displacement sensor.
Measuring range	Measuring range of displacement sensor.
Zero point	Zero point of displacement sensor.

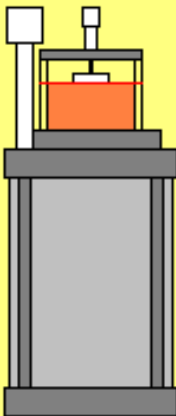
Default	Resets all settings to default.
Cycle	Executes one processing cycle (see Section 8.7 "Manual Operation" "Cycle" function).
Stroke	Moves riveting gun to stroke position (see Section 8.7 "Manual Operation" "Stroke Position" function).



GAV Settings

9.3 Large Pressure Booster

Einstellung grosser Druckübersetzer WS2



WS2
0.0
mm

WS2 Ölstand	
Warnung Ölstand max.	8 mm
Warnung Ölstand min.	- 8 mm
Störung Ölstand min.	- 10 mm
Störung Pistole	- 4 mm
Verzögerung Störung	0.2 s

Zurück
Strd
Zyklus
Hub
Kal

Large pressure booster settings menu WS2 displacement sensor

Navigation:

- AUTO
- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ Large pressure booster
- ▶ WS2

WS2 Oil level (3-8198)	
Monitors the oil level in the reservoir of the large pressure booster.	
Warning - max. oil level	Oil level warning on reaching the set value.
Warning - min. oil level	Oil level warning on reaching the set value.
Fault - min. oil level	Oil level fault on reaching the set value.
Fault - riveting gun	Riveting gun fault on reaching the set value. A riveting gun blocked while moving back results in a rapid drop in the oil level, the fault is evaluated in home position.
Fault delay	The evaluation of the "riveting gun fault" is delayed.
The setting range of the individual parameters can vary depending on other set parameters.	

Default	Resets all settings to default.
Cycle	Executes one processing cycle (see Section 8.7 "Manual Operation" "Cycle" function).
Stroke	Moves riveting gun to stroke position (see Section 8.7 "Manual Operation" "Stroke Position" function).
Cal	"WS2 Large Pressure Booster Calibration" menu.

GAV Settings

9.3 Large Pressure Booster

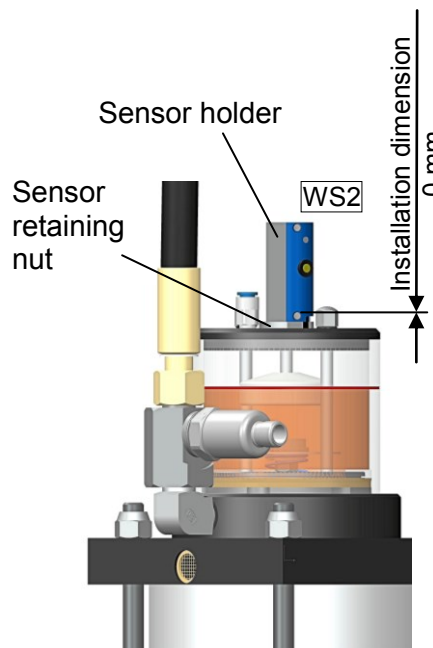
WS2 Displacement Sensor Calibration and Basic Setting

The displacement sensor (WS2) can be replaced with the pressure booster installed in position.

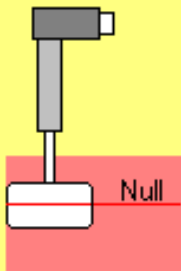
When installing the displacement sensor (WS2) the cable side of the sensor body must be directed downwards towards the top of the sensor retaining nut and the longitudinal side of the displacement sensor (WS2) additionally pressed flush against the sensor holder and screwed in position.

The displacement sensor (WS2) is calibrated and the calibration data "signal type" and "measuring range" in the "WS2 Large Pressure Booster Calibration" menu are set at the factory and must not be changed.

The basic setting of the float is achieved with the "zero point" parameter. For this purpose, the oil level must be topped up to reach the mark on the sight glass. The "zero point" parameter is set such that the "current position" is 0.0 mm. The "zero point" should then be 14 mm. Slight corrections can be made by shifting the displacement sensor in the pressure booster.



Kalibrierung WS2 grosser Druckübersetzer



Kalibrierung WS2

Signaltyp	0-10 V
Messbereich 0 bis	24 mm
Nullpunkt bei	14 mm
Aktuelle Position	0.0 mm

Zurück
Strd
Zyklus
Hub

Large pressure booster calibration menu
WS2 displacement sensor

- Navigation:
- AUTO
 - ▶ MAN
 - ▶ Menu
 - ▶ GAV settings
 - ▶ Large pressure booster
 - ▶ WS2
 - ▶ Cal

← 0 GESIPA code

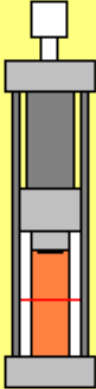
<u>Calibration WS2</u>	
Signal type	Signal type of displacement sensor.
Measuring range	Measuring range of displacement sensor.
Zero point	Zero point of displacement sensor.

Default	Resets all settings to default.
Cycle	Executes one processing cycle (see Section 8.7 "Manual Operation" "Cycle" function).
Stroke	Moves riveting gun to stroke position (see Section 8.7 "Manual Operation" "Stroke Position" function).

GAV Settings

9.4 Small Pressure Booster

Einstellung kleiner Druckübersetzer WS3



WS3
45.5
mm

WS3 Ölstand

Warnung Ölstand min.	30 mm
Störung Ölstand min.	25 mm
Verzögerung Störung	0.2 s
Verriegelungshub	14.0 mm
Störung Mundstück	15.0 mm

Small pressure booster settings menu WS3 displacement sensor

Navigation:

AUTO

- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ Small pressure booster

Zurück
Strd
Zyklus
Auf
Kal

WS3 Oil level	
Monitors the oil level in the small pressure booster.	
Warning - min. oil level	Oil level warning on reaching the set value.
Fault - min. oil level	Oil level fault on reaching the set value.
Fault delay	The evaluation of the "oil level fault" is delayed.
Lock stroke	Cannot be set. Shows the last lock stroke. This parameter is used to set the parameter for "nosepiece fault".
Nosepiece fault	Nosepiece fault on reaching the set value. Setting: <ul style="list-style-type: none"> - Release spreader nosepiece on riveting gun by a ¼ turn - Open and close the lock with the Open button - Adopt value of the "lock stroke" parameter - Tighten the spreader nosepiece on the gun
The setting range of the individual parameters can vary depending on other set parameters.	

Default	Resets all settings to default.
Cycle	Executes one processing cycle (see Section 8.7 "Manual Operation" "Cycle" function).
Open	Opens the riveting gun lock in home position (see Section 8.7 "Manual Operation" "Lock Open" function).
Cal	"WS3 Small Pressure Booster Calibration" menu.



GAV Settings

9.4 Small Pressure Booster

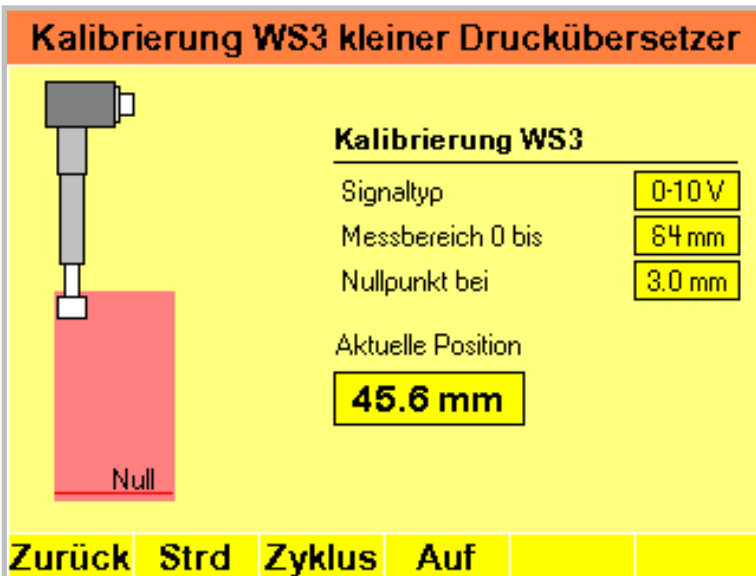
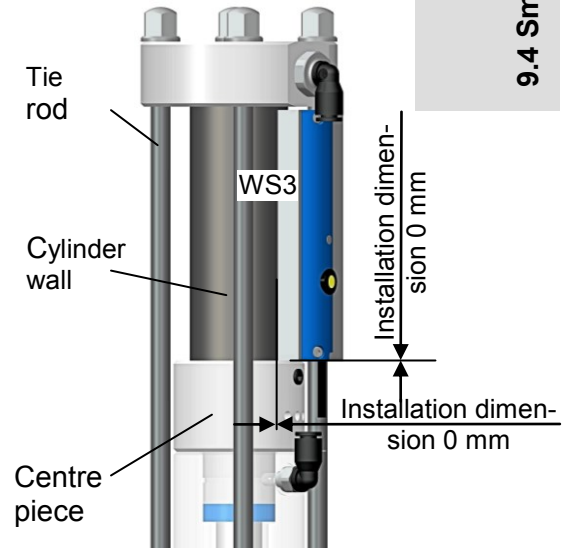
WS3 Displacement Sensor Calibration and Basic Setting

The displacement sensor (WS3) can be replaced with the pressure booster installed in position. Based on the hydraulic connection, the displacement sensor (WS3) should be installed on the tie rod on the right-hand side.

When installing the displacement sensor (WS3) the cable side of the sensor body must be directed with the sensor holder downwards towards the top of the centre piece and the longitudinal side of the displacement sensor (WS3) additionally pressed flush against the cylinder wall and screwed in position.

The calibration data "signal type" and "measuring range" are set in the "WS3 Small Pressure Booster Calibration" menu during device installation and must not be changed.

The basic setting of the pressure booster is achieved with the "zero point" parameter. In the basic setting, "zero point" is set such that the "current position" is 0.0 mm. The "zero point" parameter should then be between 2 and 4 mm. Slight corrections can be made by shifting the displacement sensor in the pressure booster.



Small pressure booster calibration menu
WS3 displacement sensor

- Navigation:
- AUTO
 - ▶ MAN
 - ▶ Menu
 - ▶ GAV settings
 - ▶ Small pressure booster
 - ▶ Cal

<u>Calibration WS3</u>	
Signal type	Signal type of displacement sensor.
Measuring range	Measuring range of displacement sensor.
Zero point	Zero point of displacement sensor.
Default	Resets all settings to default.
Cycle	Executes one processing cycle (see Section 8.7 "Manual Operation" "Cycle" function).
Open	Opens the riveting gun lock in home position (see Section 8.7 "Manual Operation" "Lock Open" function).

GAV Settings

9.5 Separator

Basic setting of proximity switch NS1

(vibration feed control)

- Disconnect plug and release lock nut.
- Set sensor flush with inner edge of chute plate.
- Tighten lock nut and reconnect plug.

Basic setting of proximity switch NS2

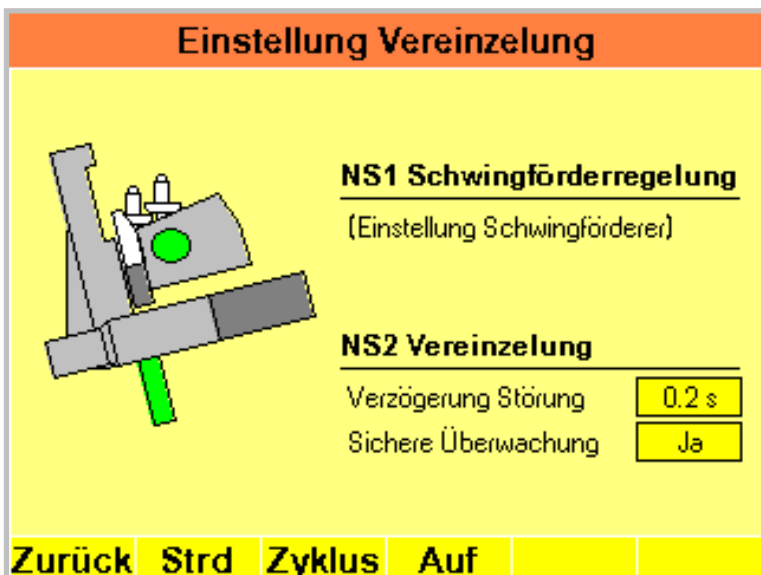
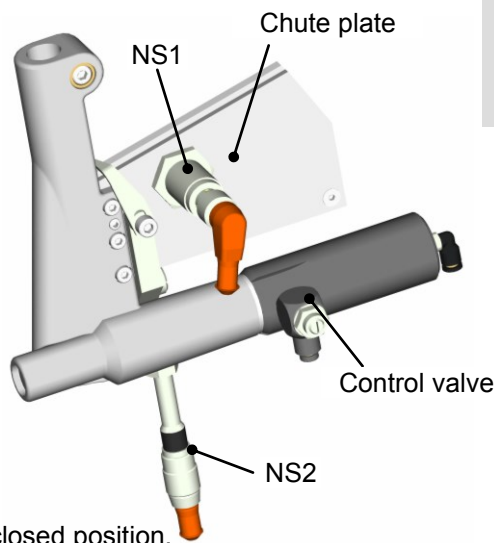
(separator scoop monitoring)

- Separator closed in home position.
- Disconnect plug and release lock nuts.
- Screw in sensor by hand as far as it will go.
- Release sensor by a 1/4 turn.
- Tighten lock nut and reconnect plug.

Basic setting of control valve

(separator stop damping)

Undo adjusting screw of control valve by 2 turns from the closed position.



Separator settings menu

- Navigation:
- ▶ AUTO
 - ▶ MAN
 - ▶ Menu
 - ▶ GAV settings
 - ▶ Separator

<u>NS1 Vibration feed control</u>	
See Section 9.1 "Vibration Feed Unit Settings".	
<u>NS2 Separator</u>	
Monitors the status of the separator.	
Separator fault when the respective end position is not reached.	
Fault delay	The evaluation of the "separator fault" is delayed.
Safe monitoring	The separator closing is the start condition for the cycle.
Default	Resets all settings to default.
Cycle	Executes one processing cycle (see Section 8.7 "Manual Operation" "Cycle" function).
Open	Opens the separator in GAV home position (see Section 8.7 "Manual Operation" "Separator Open" function).

GAV Settings

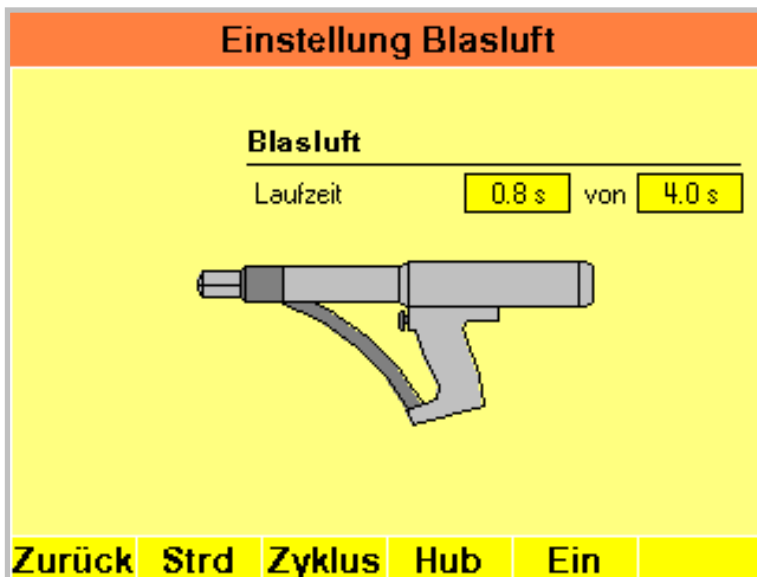
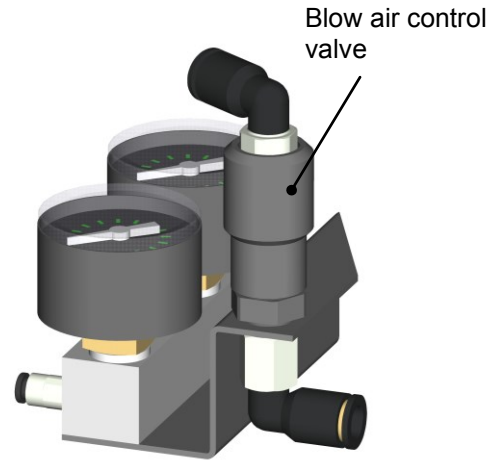
9.6 Blow Air

Basic setting of blow air

Undo adjusting screw of blow air control valve by 2 turns from the closed position.

Deviating settings:

- Less blow air due to damage to the blind rivet caused by the feed system.
- More blow air in the event of defective blind rivet feed or faulty mandrel ejection.



Blow air settings menu

- Navigation:
- AUTO
 - ▶ MAN
 - ▶ Menu
 - ▶ GAV settings
 - ▶ Blow air

Blow air

Monitors the blow air runtime.

Runtime	Switches off the blower on reaching the set value.
---------	--

Default	Resets all settings to default.
Cycle	Executes one processing cycle (see Section 8.7 "Manual Operation" "Cycle" function).
Stroke	Moves riveting gun to stroke position (see Section 8.7 "Manual Operation" "Stroke Position" function).
ON	Activates the blow air in GAV stroke position (see Section 8.7 "Manual Operation" "Blow Air" function).

GAV Settings

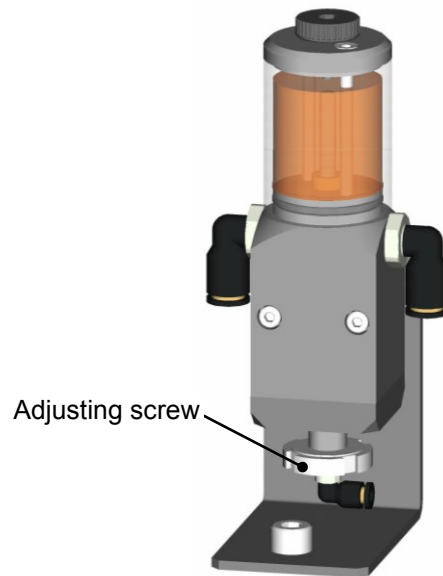
9.6 Blow Air

Basic setting of central lubrication

- Adjusting screw, upper end position:
Oil output per piston stroke close to 0.

- Adjusting screw, lower end position:
Maximum oil output per piston stroke. In
this setting, the filling is used up after
approx. 22,000 cycles.

Basic setting: Undo adjusting screw by 1 turn
from upper end position.



GAV Settings

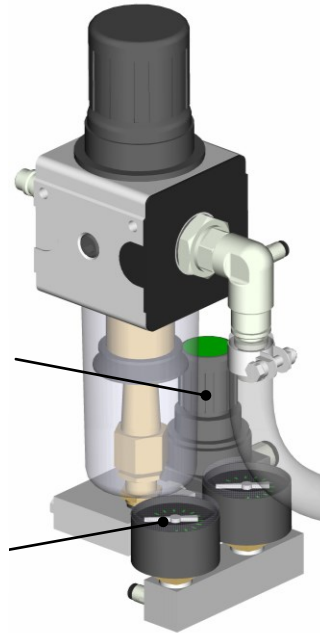
9.7 Mandrel Evacuation

Basic setting of operating pressure for mandrel evacuation

- Activate mandrel evacuation with "Mandrel Evacuation" function in the "MAN" menu.
- With mandrel evacuation active, set the mandrel evacuation pressure reducer valve to 4 bar (flow pressure), check at mandrel evacuation pressure gauge.

Pressure reducer valve
Mandrel evacuation

Pressure gauge
Mandrel evacuation

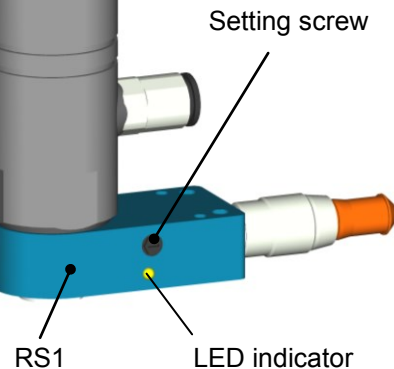


Basic setting of RS1 mandrel evacuation

- Turn the setting screw of the ring sensor RS1 clockwise (more sensitive) until the LED indicator comes on.
- Turn the setting screw of the ring sensor RS1 anticlockwise (less sensitive) until the LED indicator goes out.

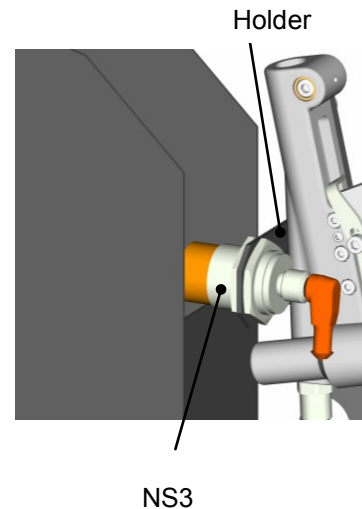
The sensitivity of the ring sensor RS1 must be varied depending on the material and dimensions of the spent mandrel.

The switching status of the ring sensor RS1 can also be checked in the "Mandrel Evacuation Settings" menu.



Basic setting of NS3 spent mandrel container

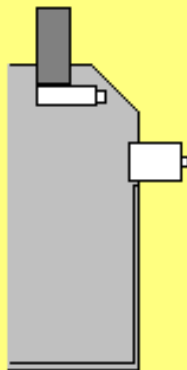
- Undo lock nuts of sensor NS3.
- Set sensor NS3 as far as possible in the spent mandrel container direction.
- Tighten lock nuts of sensor NS3.
- Undo holder mounting screws.
- Push spent mandrel container to just before the sensor NS3.
- Set the height of the sensor NS3 to just above the edge of the spent mandrel container.
- Tighten holder mounting screws.



GAV Settings

9.7 Mandrel Evacuation

Einstellung Dornabsaugung



RS1 Dornabsaugung

Dornrückstand	0	von	3
Laufzeit	1.2 s	von	3.5 s

NS3 Dornbehälter

Störung Dornbehälter voll

Mandrel evacuation settings menu

Zurück
Strd
Zyklus
Hub
Ein

Navigation:

- AUTO
- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ Mandrel evacuation

RS1 mandrel evacuation

Registers spent mandrels.

Mandrel evacuation fault on exceeding the set value for "mandrel lag" and reaching the set value for "runtime".

Mandrel lag	<p>On exceeding the set value, the processing cycle is stopped in stroke position until a spent mandrel is registered.</p> <p>Settings greater than 0 facilitate faster operation as not every processing cycle is interrupted until a spent mandrel reaches the spent mandrel container.</p>
Runtime	Switches off mandrel evacuation on reaching the set value.

NS3 spent mandrel container

Monitors the level in the mandrel container.

Mandrel container full fault when the mandrel container is full.

Default	Resets all settings to default.
Cycle	Executes one processing cycle (see Section 8.7 "Manual Operation" "Cycle" function).
Stroke	Moves riveting gun to stroke position (see Section 8.7 "Manual Operation" "Stroke Position" function).
ON	Activates mandrel evacuation (see Section 8.7 "Manual Operation" "Mandrel Evacuation" function).

GAV Settings

9.8 Cycle

Einstellung Zyklus

Grundstellung ON

Entriegelungszeit 2.0 s von 2.0 s

Zeiten im Zyklus

Überwachungszeit Hubstellung 0.6 s von 2.0 s

Wartezeit in Hubstellung 0 ms von 0 ms

Überwachungszeit Rücklauf 0.7 s von 2.0 s

Zurück Strd Zyklus Hub

Cycle settings menu

Navigation:

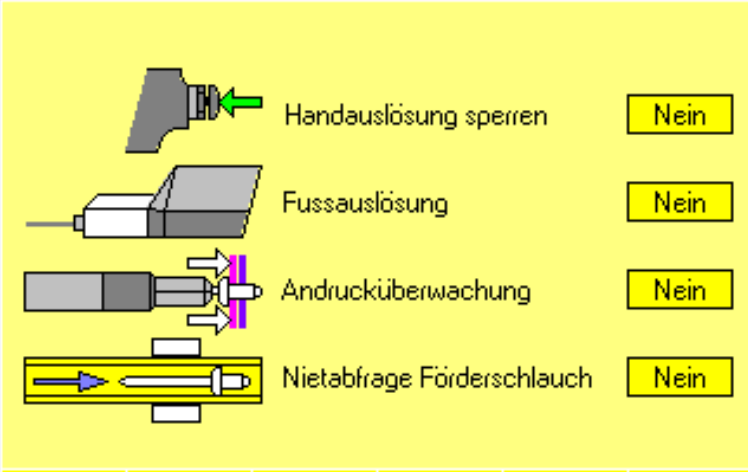
- AUTO
- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ Cycle

Home position ON	
"ON" button function from "OFF" state.	
Release time	Home position is activated on reaching the set value.
Times in cycle	
Monitors and controls times in the cycle.	
Stroke position monitoring time	Cycle fault on reaching the set value.
Stroke position waiting time	Cycle is stopped in stroke position until the set value is reached. This function can be activated under special conditions (e.g. excessively long supply line assembly).
Return monitoring time	Cycle fault on reaching the set value.
Default	Resets all settings to default.
Cycle	Executes one processing cycle (see Section 8.7 "Manual Operation" "Cycle" function).
Stroke	Moves riveting gun to stroke position (see Section 8.7 "Manual Operation" "Stroke Position" function).

GAV Settings

9.9 Additional Functions

Einstellung Zusatzfunktionen



Handauslösung sperren Nein

Fussauslösung Nein

Andrucküberwachung Nein

Nietabfrage Förderschlauch Nein

Zurück
Strd
Zyklus

Additional functions settings menu

Navigation:

AUTO


- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ Additional functions

Additional functions settings	
Block hand trigger	The hand trigger is blocked when the function is activated. The hand trigger can be deactivated when other start options (foot trigger or PLC activation) were activated.
Foot trigger	Precondition: Foot trigger connected (accessory). The cycle is started by a foot trigger when the function is active (start option "Foot").
Contact pressure monitoring	Precondition: GAV riveting gun with contact pressure monitoring connected (special version) With the function activated, the blind riveting gun is pressed against the material to be joined at a defined force to start a cycle.
Rivet monitoring, feed hose	Precondition: Additional sensor RS2 fitted on feed hose (accessory). With the function activated, rivet feed is monitored and a Rivet check, feed hose fault may be triggered.
Default	Resets all settings to default.
Cycle	Executes one processing cycle (see Section 8.7 "Manual Operation" "Cycle" function).

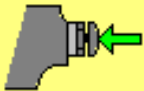
GAV Settings

9.10 PLC Activation

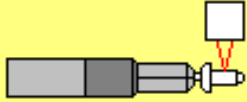
Einstellung Ansteuerung SPS



Ansteuerung SPS
(über SPS-Interface)



Handauslösung sperren



Nietabfrage Mundstück

Zurück
Strd

PLC activation settings menu

Navigation:

- AUTO
- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ PLC activation

PLC activation settings	
PLC Activation	<p>Precondition: PLC interface connected (accessory).</p> <p>With the function activated, the PLC starts the cycle via the PLC interface (start option "PLC"). Activation is described in detail in Section 28 "PLC Interface".</p>
Block hand trigger	<p>The hand trigger is blocked when the function is activated.</p> <p>The hand trigger can be deactivated when other start options (foot trigger or PLC activation) were activated.</p>
Rivet check, nosepiece	<p>Precondition: PLC interface connected (accessory), additional sensor (e.g. light barrier) installed in nosepiece area of GAV riveting gun and connected to PLC interface.</p> <p>With the function activated, the blind rivet loading procedure in the nosepiece of the GAV riveting gun is monitored and a Rivet check, nosepiece fault may be triggered. Installation of the sensor is described in Section 28 "PLC Interface".</p>
Default	Resets all settings to default.
Cycle	Executes one processing cycle (see Section 8.7 "Manual Operation" "Cycle" function).

GAV Settings

9.11 Continuous Test

With the continuous test function, the GAV system can automatically trigger processing cycles up to a set time or piece number.

During a continuous test it is possible to switch to other menus to observe the statuses, sequences, parameters and settings. Parameters and settings can be changed during a continuous test run.

A continuous test can be cancelled at any time with the "ON" or "OFF" button.

Dauertest

Zyklus	<input type="radio"/>	Startverzögerung	<input type="text" value="0 s"/>	von	<input type="text" value="0 s"/>
Hubstell.	<input type="radio"/>	Ohne Niete testen	<input type="text" value="Nein"/>		
Blasluft	<input type="radio"/>	Bis Stückzahl testen	<input type="text" value="0"/>		
Dornabs.	<input type="radio"/>	Bis Zeit testen	<input type="text" value="0 min"/>		
Verriegel.	<input type="radio"/>	Stückzahl	Zeit		
Vereinzel.	<input type="radio"/>	<input type="text" value="0"/>	<input type="text" value="0:00:00"/>		

Zurück Strd Aus Ein C

Continuous test menu

Navigation:

- AUTO
- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ Continuous Test

<u>Continuous test</u>	
Start delay	Each cycle start is delayed by the set time.
Test without rivets	With the function activated, the vibration feed unit is switched "OFF" and the "vibration feed unit" fault is suppressed.
Test up to piece number	The test is stopped on reaching the set value.
Test till time	The test is stopped on reaching the set value.
Default	Resets all settings to default.
OFF / ON	Switches continuous test off/on.
C	Sets the "piece number" and "time" parameters to 0.

GAV Settings

9.12 I/O Test

All GAV input and output statuses are shown in the "I/O test" menu. Initial statuses can be changed irrespective of the current device status.

The values of the analog sensors for position and pressure are displayed as absolute values while the settings for "zero point" are not taken into account.



Caution!

Incorrect use of these functions can result in damage to the GAV.

E/A-Test		
Y1ab Pistolenentl.	●	WS1 Hub gr. Drucküb. = 3.0 mm
Y2a Pistolenluft	●	WS2 Ölst. gr. Drucküb. = 14.0 mm
Y2b Dornabsaug.	●	WS3 Hub kl. Drucküb. = 77.0 mm
Y3a kl. Drucküb.	●	DS1 Netzdruck = 6.2 bar
Y3b gr. Drucküb.	●	DS2 Pistolenluft = 6.2 bar
Y4 Vereinzlung	●	DS3 Öldruck gr. Drucküb. = 0.1 bar
Y5 Blasluft	●	Reserve A1 (0.1 V)
Schwingförderer	●	Reserve A2 (0.0 V)
		NS1 Rutsche
		NS2 Vereinzlung
		NS3 Restdornbeh.
		RS1 Dornabfrage
		RS2 Nietabfrage
		Taster ON
		Taster OFF
		Reserve D1

Zurück
Tast
Schalt

I/O test menu

Navigation:

AUTO

- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ I/O test

Button	The selected output changes the switched status when the rotary knob is pressed, the original status is re-established when the knob is released.
Switch	The selected output changes the switched status when the rotary knob is pressed, the status is retained when the knob is released.

GAV Settings

9.13 PLC Interface Test

The input and output assignments of the PLC interface are shown and the connection from the GAV to the interface tested in the PLC interface test menu. Communication with a connected PLC, an operating and evaluation unit or input and signalling devices can be additionally tested individually for each input and output.

PLC interface test

Navigation:

- AUTO
- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ PLC interface test

OFF	No test function active.
Button	Output test active, outputs 1..16 can be selected with the rotary knob and switched on/off with the button function.
Switch	Output test active, outputs 1..16 can be selected with the rotary knob and switched on/off with the switch function.
C	Outputs 1..16 are reset when the output test is active.

Refer to Section 28 "PLC Interface".

GAV Settings

9.14-UA Proximity Switch, Overhead Gun with Spring-Loaded Trigger System

Proximity switch

(spring-loaded trigger system)

Setting:

With the spring-loaded trigger system actuated, slightly turn the proximity switch towards the setscrew and then release by a 1/4 turn. Secure proximity switch with locknut. Change the setting of the setscrew only if necessary (secured with Loctite 222).

Check:

- The contact distance should be approx. 1 mm.

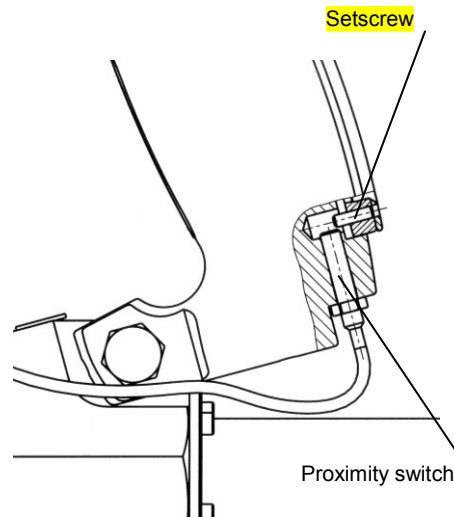
Possible faults:

- No triggering despite contact.

Cause: Contact distance too great.

- Triggering possible without contact.

Cause: Contact distance too small.



Maintenance

10.0 Overview

10.1 Maintenance Information

10.2 Maintenance Messages

Maintenance

10.1 Maintenance Information



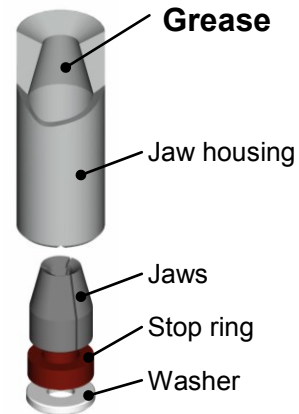
Caution!

**Observe safety information!
Wear safety goggles!**

Daily:

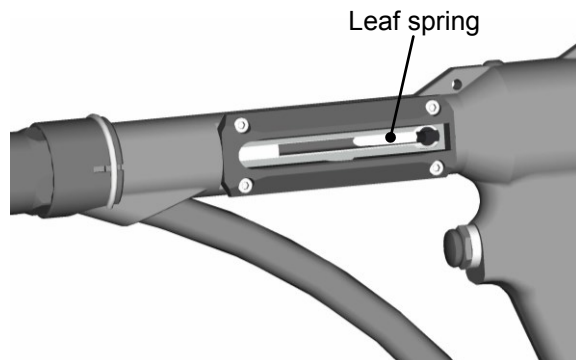
• To lubricate/replace jaws

- Switch off "POWER" master switch.
- Unscrew spreader nosepiece 2-80.
- Remove closing sleeve 2-8022 and unscrew jaw housing.
- Remove set of jaws with washer, stop ring and opening springs.
- Replace jaws if necessary.
- Lightly grease sliding surface of jaw housing (roller bearing grease).
- Fit jaw housing over the set of jaws, insert stop ring and washer.
- Install in reverse order of removal.
- Switch on "POWER" master switch, press "ON" button.



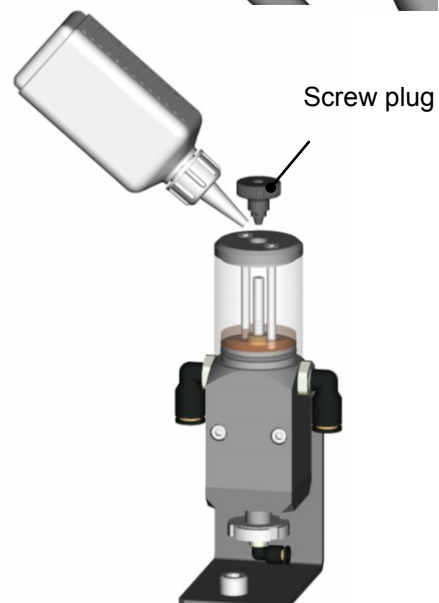
• To check/replace leaf spring

- Press "ON" button.
- Select "MAN" mode.
- Execute "Stroke position" function.
- Remove mandrel guide.
- Check that the leaf spring visible in the mandrel eject slot is seated and tensioned correctly.
- Replace leaf spring if necessary (see Section 21 "Blind Riveting Gun Repair Instructions").



• To refill central lubrication system

- Remove screw plug.
- Top up oil level to max. 5 mm below top edge of sight glass.
- Tighten screw plug.



Maintenance

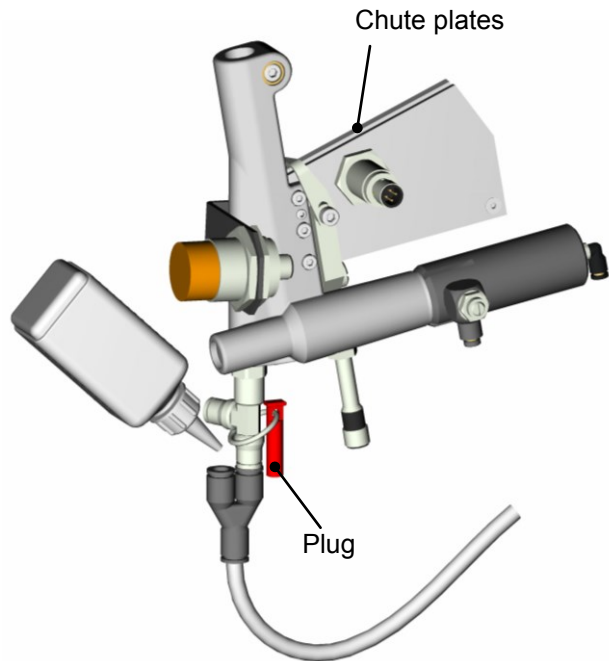
10.1 Maintenance Information

Weekly:

- **To clean chute plates**
Clean sliding surfaces of the chute plates (do not use oil).

As required:

- **To oil rivet feed hose**
(required after changing feed hose or longer dry-running period)
 - Press "OFF" button.
 - Remove plug and fill with approx. 0.5 ccm of oil.
 - Reinsert plug.
 - Press "ON" button.
 - Perform several working cycles to distribute the oil in the rivet feed hose.



Maintenance

10.2 Maintenance Messages

Maintenance intervals can be set in the "Maintenance" menu. Necessary maintenance jobs are then signalled in the AUTO main menu.

8 different maintenance messages are possible:

- 5 are assigned (see Section 10.1 "Maintenance" - "Maintenance Information")
- 3 can be freely defined.

Several maintenance messages are displayed simultaneously.

Wartung			
Meldung Wartung	Zähler	Meldung	Stop
Futterbacken schmieren	1234	5000	6000
Futterbacken erneuern	1234	100000	101000
Blattfeder prüfen / erneuern	1234	30000	31000
Zentralschmierung nachfüllen	1234	50000	51000
Rutschenbleche reinigen	1234	15000	16000
...	0	0	0
...	0	0	0
...	0	0	0

Zählwerk 1234

Zurück
Strd

Maintenance menu

Navigation:
 AUTO
 ► MAN
 ► Menu
 ► Maintenance

Column	Description
Counter	Cannot be set, however, the value can be reset to 0. Piece count of the number of blind rivets processed since the last maintenance.
Message	Setting range: 0 to 500,000 pieces Maintenance message when "counter" reaches or exceeds the set value, GAV does <u>not</u> stop.
Stop	Setting range: 0 to 500,000 pieces Maintenance message when "counter" reaches or exceeds the set value, GAV stops.
Default	Resets all settings to default.

Maintenance

10.2 Maintenance Messages

Meldung Wartung	Zähler	Meldung	Stop
Futterbacken schmieren	5000	5000	6000
Futterbacken erneuern	5000	100000	101000
Blattfeder prüfen / erneuern			
Zentralschmierung nachfüllen			
Rutschenbleche reinigen			
...			
...			
...			

Zurück **Strd**

AUTO - Bereit (Hand)

Modul 01

Zyklus

Umschaltstellung

WARTUNG

Futterbacken schmieren

Wartungsarbeiten durchgeführt?

Vereinzelung auf

1/6
(1/6)

Schwingförderer

Nein **Ja**

Example:

In the illustrated example, the maintenance message "Lubricate jaws" is active, the "Counter" has reached the set value "Message". The corresponding message is displayed in the "AUTO" main menu, GAV does not stop. Operation can continue till the maintenance is carried out and confirmed or till the "Counter" reaches "Stop".

Process Monitoring

11.0 Overview

Not in GAV-8000 eco

- 11.1 Functional Principle**
- 11.2 Settings**
- 11.3 Creating Profile**
- 11.4 Loading Profile**
- 11.5 Saving Profile**
- 11.6 Creating Profile List**
- 11.7 Loading Profile List**
- 11.8 PLC Profile Lists**

Process Monitoring

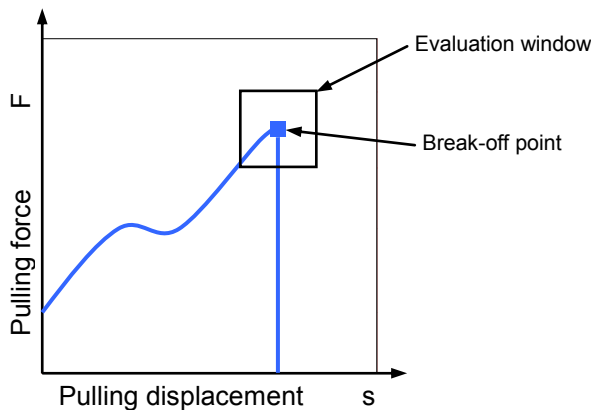
11.1 Functional Principle

Not in GAV-8000 eco

The setting process in GAV is monitored by recording the pulling displacement and pulling force during blind rivet processing and subsequently assessing the break-off point (break-off displacement and break-off force). The position of the break-off point largely depends on the type of blind rivet used, the thickness of the material to be joined and the hole diameter in the material.

To assess the break-off point, the limits for break-off displacement and break-off force are defined in a window system. The limits are visualised in an evaluation window.

Evaluations are shown on the graphic display immediately after each setting process and output via the PLC interface.



Profiles

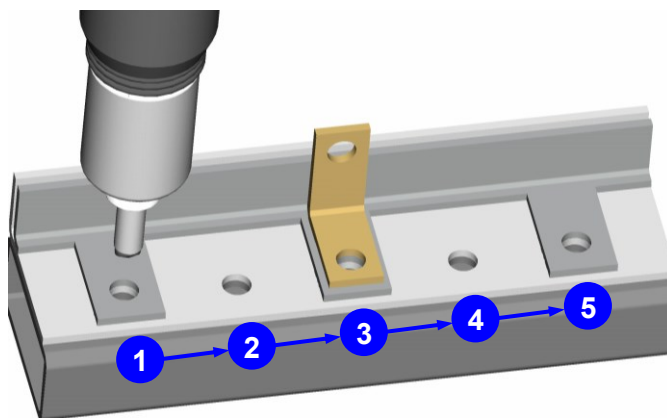
The evaluation parameters defined for individual blind riveting points are stored in profiles. A maximum of 9999 different profiles can be created. Profiles can be changed, a copy of the last profile with the new index is created, a maximum of 9999 changes per profile are possible.

It is necessary to use profile lists for component-related group evaluations.

Profile lists

Profile lists are created for applications with several blind riveting points that need to be assessed in different ways. A profile list can assess each blind riveting point with the profile created for this point. Profiles are automatically called up one after the other from the profile lists or activated directly by the PLC interface. A maximum of 9999 profile lists each with a maximum of 9999 profiles can be created.

Example: Profile list "Test part"		
No.	Material thickness	Profile
1	3 mm	A
2	2 mm	B
3	4 mm	C
4	2 mm	B
5	3 mm	A



Process data

The position of the break-off point and the evaluation of the setting processes are saved with a time stamp in the process data file. The process data file contains the last 1,000,000 processes. The oldest data are overwritten to accommodate the latest data. Evaluation of the process data is described in Section 12 "Process Data".

Process Monitoring

11.2 Settings

Not in GAV-8000 eco

The following information for setting process monitoring is shown in the AUTO main menu:

Designation:

The designation of the current profile list is displayed. The designation of the active profile will be shown if no profile list is active.



Caution!

It is necessary to use profile lists for component-related group evaluations.

Process curve:

The process curve, break-off point and evaluation window are shown after each setting process.

Process evaluation:

The evaluation is output after each setting process:

Monitoring ready text shown after switching on GAV or deleting process curve.

H	A	B
G	0	C
F	E	D

Display of position of break-off point:
 Left: Process OK Break-off point in sector 0
 Right: Process NOK Break-off point in sector F
 (break-off displacement too short, break-off force too low)

H	A	B
G	0	C
F	E	D

No measured values text, e.g. when a no-load cycle was run.

Current profile:

The position of the current profile in the profile list is shown. In the example this is the first profile of 5 from the "Module 02" profile list.

Next profile:

The position of the profile in the profile list, with which the next setting process is to be evaluated, is shown. Any profile can be selected from a profile list for manual selection or PLC activation. In the example this is the second profile of 5 from the "Module 02" profile list.



Process Monitoring

11.2 Settings

Not in GAV-8000 eco

Einstellung Prozessüberwachung

Abrissweg 8.00 mm

Abrisskraft 9490 N

Abrissweg

0

Soll	8.00 mm
Min.	7.24 mm
Max.	8.76 mm
Tol.	±9.6 %
Abrisskraft	
Soll	9490 N
Min.	8579 N
Max.	10401 N
Tol.	±9.6 %

Navigation:

AUTO

▶ MAN

▶ Menu

▶ Process monitoring

Zurück

\bar{x}

Zyklus

Löschen

Kal

Profil

Process monitoring settings

In the "process monitoring settings" menu:

- the current process curve is shown in detail, including the scaling of pulling displacement and pulling force. The break-off point is highlighted in blue. The break-off displacement and break-off force are shown above the process curve and highlighted in green or red depending on the evaluation. When using one single profile the break-off points of the last 20 processes are additionally shown as grey dots.
- the evaluation parameters are shown with the corresponding evaluation window of the blind rivet last processed. The evaluation parameters and the scaling for the pulling displacement can be changed. This means changes to the evaluation parameters are then valid only temporarily and should be saved in a profile. Information on the active profile is shown in grey in the bottom area of the process curve.

The "process monitoring settings" menu is the starting point for all settings of the process monitoring system as well as for creating and managing profiles and profile lists.

\bar{x}	Determines the evaluation window over the break-off points and automatically adapts the evaluation parameters.
Cycle	Executes one processing cycle (see Section 8.7 "Manual Operation" "Cycle" function).
Delete	Deletes the current process curve and all break-off points.
Cal	"Process Monitoring Calibration" menu
Profile	"Profile Settings" menu

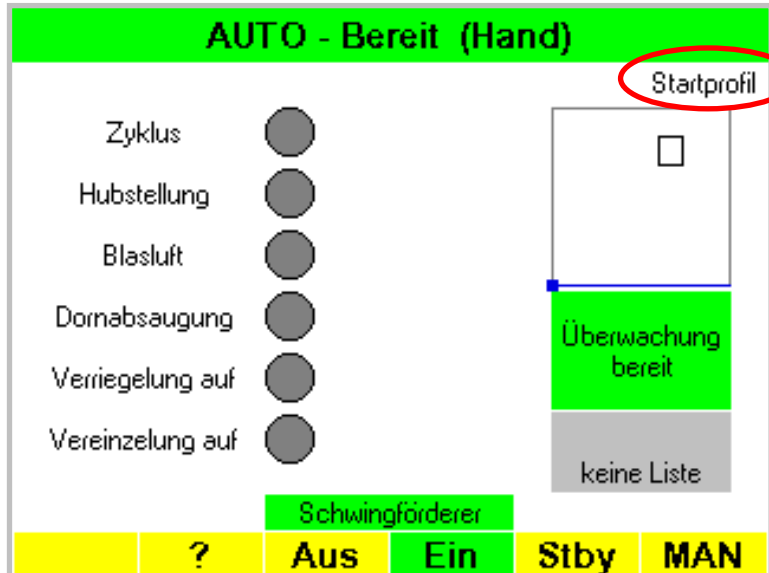
Process Monitoring

11.3 Creating Profile

Not in GAV-8000 eco

Starting situation: AUTO main menu

The profile last used is loaded automatically after GAV is switched on. If no profile has yet been created, a profile with the designation "start profile" will be created.



Step 1: "Profile Settings" menu

The "Profile Settings" menu is accessed from the AUTO main menu with:

- ▶ MAN
- ▶ Menu
- ▶ Process monitoring
- ▶ Profile

The evaluation parameters of the current profile are shown.



A new profile is created with **New.**

Process Monitoring

11.3 Creating Profile

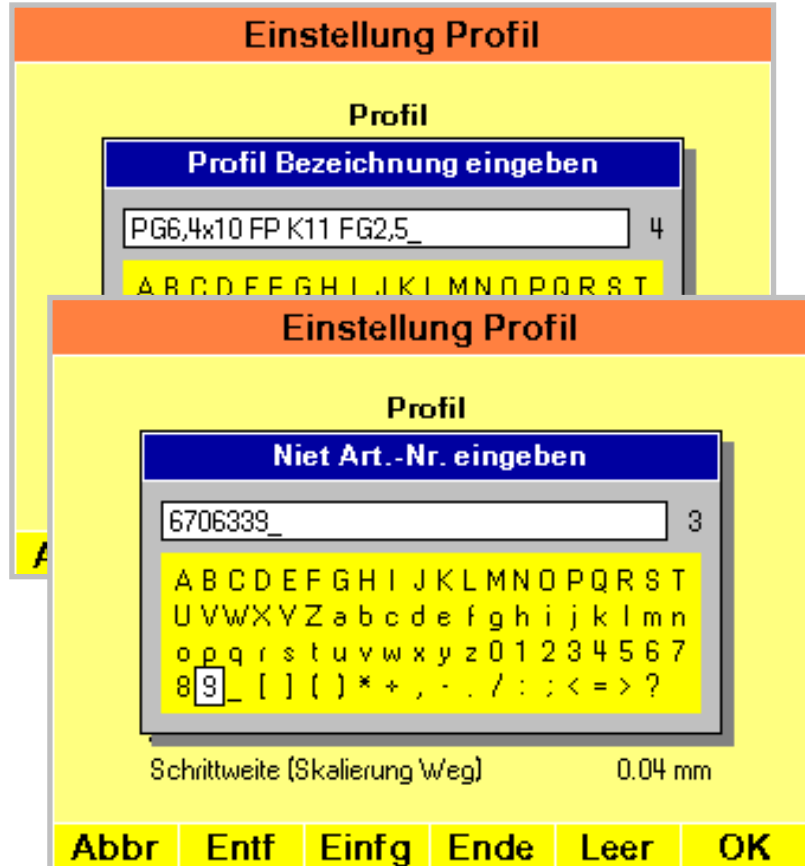
Not in GAV-8000 eco

Step 2: Entering designation and part number

The profile designation and the part number of the blind rivet are now entered one after the other.

The designation of the profile should clearly identify the blind riveting point; the designation of the blind rivet and the thickness of the material to be joined (FG 2.5) are specified in the example.

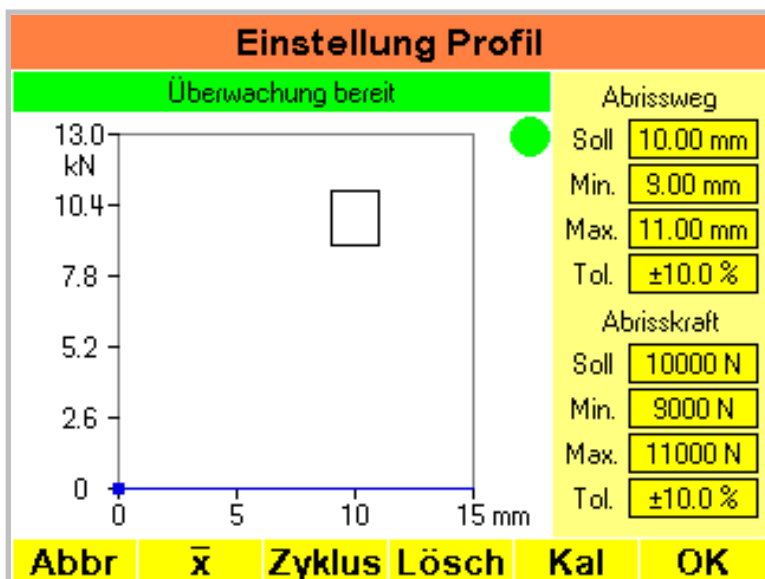
The designations used cannot be transferred to new profiles.



Step 3: Recording process curves

The GAV device is now ready to record process curves.

The evaluation parameters are adopted from the profile last used.



Process Monitoring

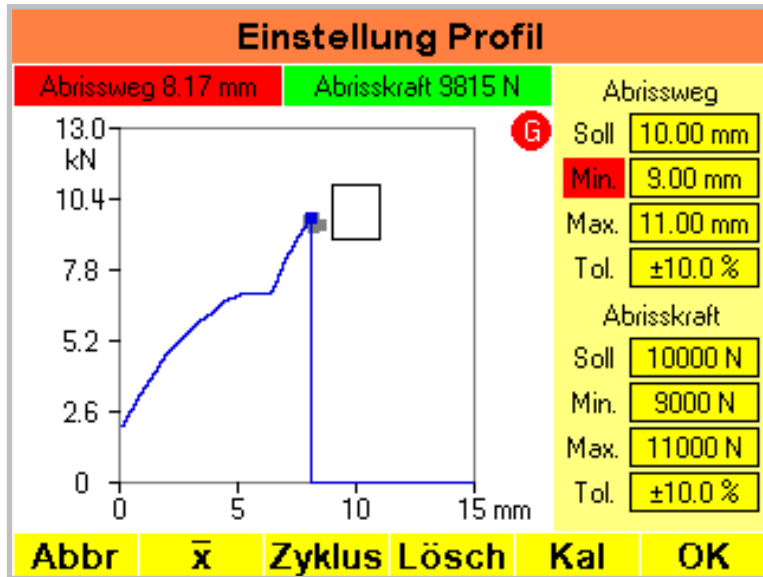
11.3 Creating Profile

Not in GAV-8000 eco

With **Cycle** at least 3 blind rivets are processed in the material.

The break-off point of the current process curve is shown in blue and the maximum last 20 processes in grey.

With **Delete** all recorded data can be deleted and the process curve created again.

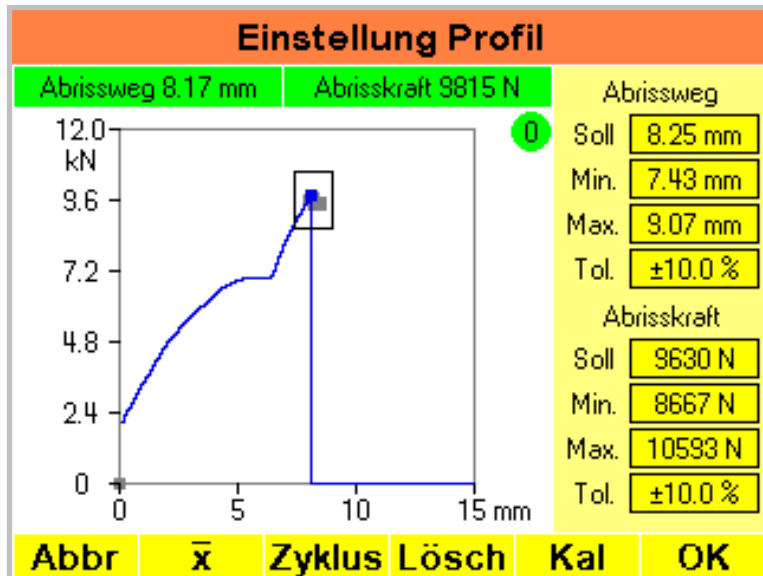


Step 4: Setting evaluation parameters

The evaluation parameters for the break-off displacement and break-off force can now be defined. They are defined by setting the absolute min. and max. values or the set-point and the percentage deviation.

The set limits are represented by a window.

The window over the break-off points can be determined automatically with **x̄**. Nevertheless, the tolerable percentage deviation still needs to be set.



Process Monitoring

11.3 Creating Profile

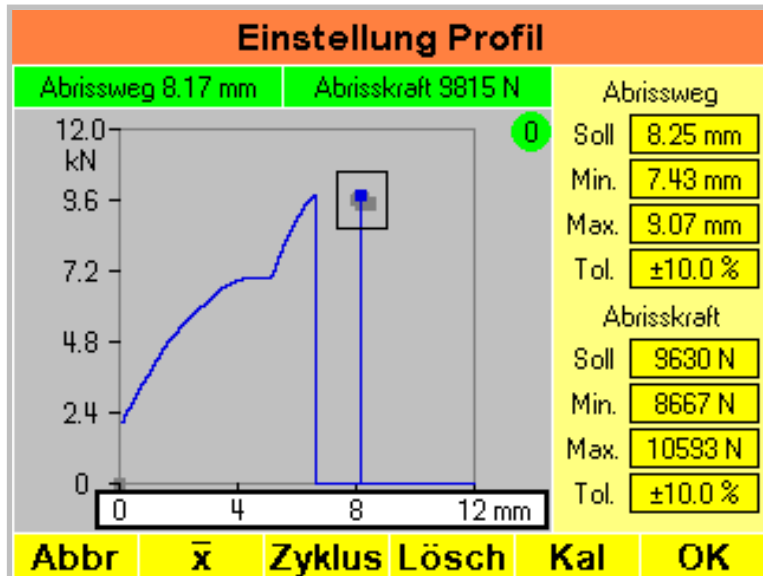
Not in GAV-8000 eco

Step 5: Setting pulling displacement scaling

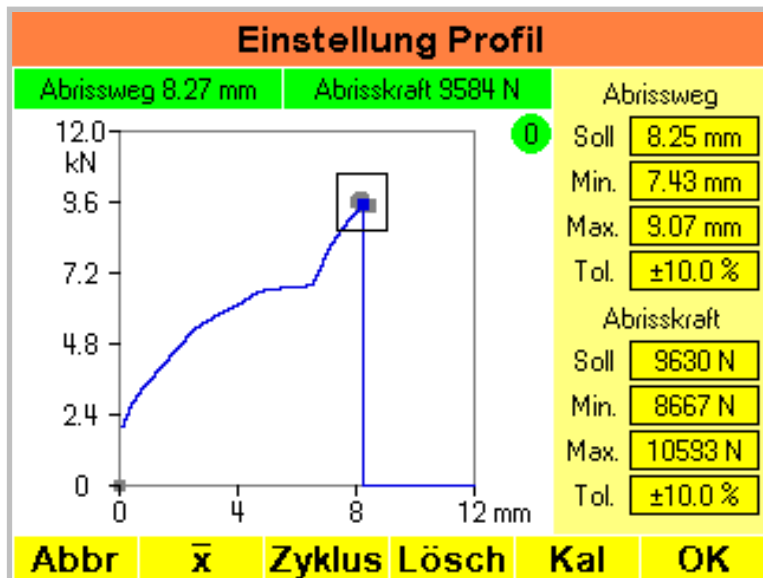
The scaling for the pulling displacement is to be set such that the setpoint for the break-off point is approx. 75% of the total scaling.

When the pulling displacement scaling is changed, the break-off points are updated directly but the curve is updated during the next cycle.

The scaling for the pulling force is adapted automatically after each measurement.



Further process curves can then be run as a check.



Step 6: Saving profile

The new profile is saved with **OK**.

The procedure can be cancelled with **Cancel** and the old profile is loaded again.

Process Monitoring

11.3 Creating Profile

Not in GAV-8000 eco

After saving the profile, the new parameters are adopted automatically...

Einstellung Profil

Neues Profil gespeichert

Bezeichnung	Niet Art.-Nr.
PG6,4x10 FP K11 FG2,5	6706339

Bewertungsparameter


Abrissweg Min.	7.45 mm
Abrissweg Max.	9.05 mm
Abrisskraft Min.	8687 N
Abrisskraft Max.	10573 N
Aufzeichnungsbeginn bei Zugkraft	2000 N
Schrittweite (Skalierung Weg)	0.04 mm

Zurück Laden Speich ..unter Neu Liste

...and activated as a single profile after returning to the main menu.

AUTO - Bereit (Hand)

PG6,4x10 FP K11 FG2,5

Zyklus	<input type="radio"/>	
Hubstellung	<input type="radio"/>	
Blasluft	<input type="radio"/>	
Dornabsaugung	<input type="radio"/>	
Verriegelung auf	<input type="radio"/>	
Vereinzelung auf	<input type="radio"/>	

H	A	B
G	O	C
F	E	D

keine Liste

Schwingförderer

? Aus Ein Stby MAN

Process Monitoring

11.4 Loading Profile

Not in GAV-8000 eco

The "Profile Settings" menu is accessed from the AUTO main menu with:

- ▶ MAN
- ▶ Menu
- ▶ Process monitoring
- ▶ Profile

The evaluation parameters of the current profile are shown.

Load opens the window for selecting a profile.

The required profile can now be selected and loaded with **OK**.

Einstellung Profil

Profil

Bezeichnung	Niet Art.-Nr.
PG6,4x10 FP K11 FG3,0	6706339

Bewertungsparameter

Abrissweg Min.	7.02 mm
Abrissweg Max.	8.52 mm
Abrisskraft Min.	8787 N
Abrisskraft Max.	10673 N
Aufzeichnungsbeginn bei Zugkraft	2000 N
Schrittweite (Skalierung Weg)	0.04 mm

Zurück
Laden
Speich
..unter
Neu
Liste

Profil auswählen

Bezeichnung	Niet Art.-Nr.
PG6,4x10 FP K11 FG2,5	6706339
PG6,4x10 FP K11 FG2,0	6706339
PG6,4x10 FP K11 FG3,0	6706339
PG6,4x10 FP K11 FG4,0	6706339

Profil 2/4 - Index 1/1

Abbr
Erstes
Letztes
OK

In the example, a profile of the same blind rivet was loaded for a smaller material thickness.

On returning to the main menu, the loaded profile is activated automatically as a single profile.

Einstellung Profil

Profil geladen

Bezeichnung	Niet Art.-Nr.
PG6,4x10 FP K11 FG2,0	6706339

Bewertungsparameter

Abrissweg Min.	7.65 mm
Abrissweg Max.	9.31 mm
Abrisskraft Min.	8741 N
Abrisskraft Max.	10639 N
Aufzeichnungsbeginn bei Zugkraft	2000 N
Schrittweite (Skalierung Weg)	0.04 mm

Zurück
Laden
Speich
..unter
Neu
Liste

Process Monitoring

11.5 Saving Profile

Not in GAV-8000 eco

The "Profile Settings" menu is accessed from the AUTO main menu with:

- ▶ MAN
- ▶ Menu
- ▶ Process monitoring
- ▶ Profile

The evaluation parameters of the current profile are shown.

Save saves the changes in the current profile.

Saving the profile with changed parameters must be confirmed with **Yes**.

A profile with changed parameters is saved in the example.

Einstellung Profil

Profil

Bezeichnung	Niet Art.-Nr.
PG6,4x10 FP K11 FG3,0	6706339

Bewertungsparameter

Abrissweg Min.	7.02 mm
Abrissweg Max.	8.52 mm
Abrisskraft Min.	8787 N
Abrisskraft Max.	10673 N
Aufzeichnungsbeginn bei Zugkraft	2000 N
Schrittweite (Skalierung Weg)	0.04 mm

Einstellung Profil

Profil

Bezeichnung	Niet Art.-Nr.
PG6,4x10 FP K11 FG3,0	6706339

Profil speichern

?

Profil mit geänderten
Bewertungsparametern
speichern ?

Abrissweg Min.	7.03 mm
Abrissweg Max.	8.51 mm
Abrisskraft Min.	8787 N
Abrisskraft Max.	10673 N
Aufzeichnungsbeginn bei Zugkraft	2000 N
Schrittweite (Skalierung Weg)	0.04 mm

Nein
Ja

Einstellung Profil

Profil gespeichert

Bezeichnung	Niet Art.-Nr.
PG6,4x10 FP K11 FG3,0	6706339

Bewertungsparameter

Abrissweg Min.	7.03 mm
Abrissweg Max.	8.51 mm
Abrisskraft Min.	8787 N
Abrisskraft Max.	10673 N
Aufzeichnungsbeginn bei Zugkraft	2000 N
Schrittweite (Skalierung Weg)	0.04 mm

Zurück
Laden
Speich
..unter
Neu
Liste

Process Monitoring

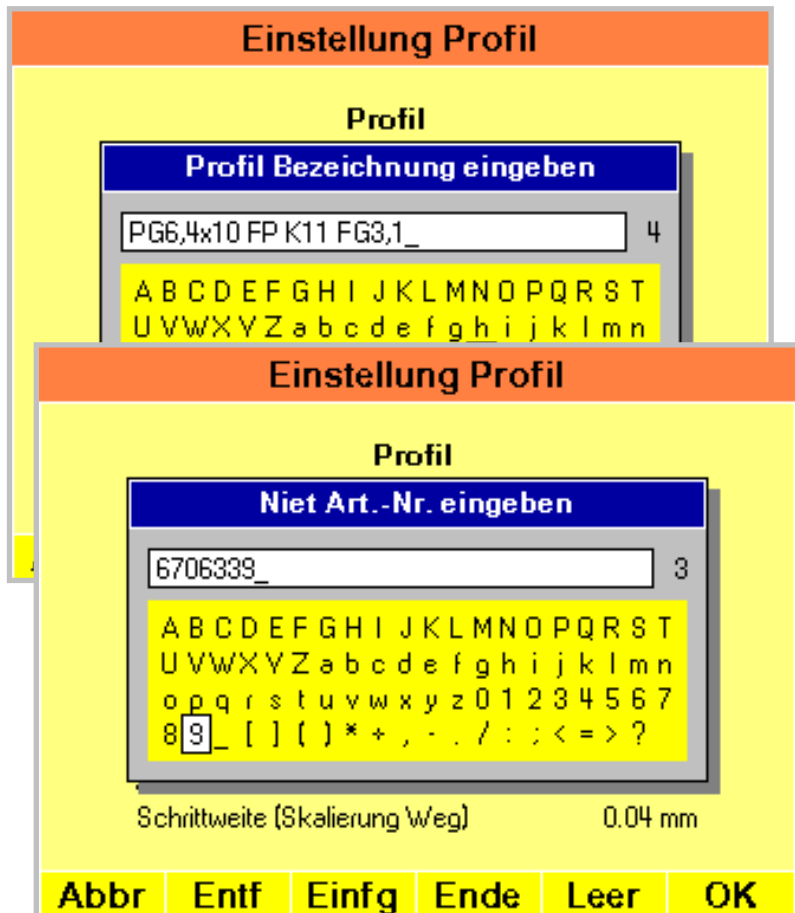
11.5 Saving Profile

Not in GAV-8000 eco

The current profile with new designation and part number is saved with **..As** (Save As).

The original data can be changed or re-entered after deleting the entry line (press and hold **Delete**) for the new designation and part number.

A new designation is required whereas the part number can be retained.



In the example, a new profile was created with the parameters of an existing profile.



Process Monitoring

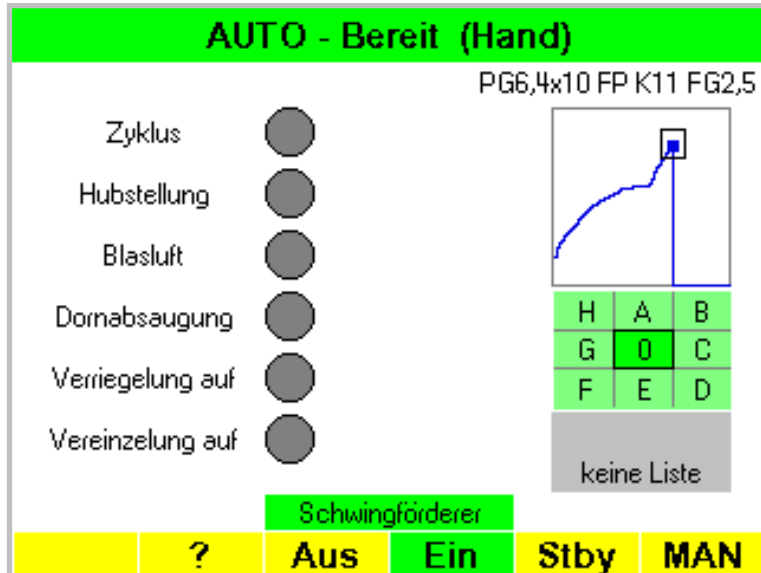
11.6 Creating Profile List

Not in GAV-8000 eco

Starting situation: AUTO main menu

After the GAV device is switched on, the profile last used or the profile list last used with its profile last used are loaded automatically.

If no profile has yet been created, a profile with the designation "start profile" will be created. In this case, at least one profile must first be created (see Section 11.3 "Process Monitoring" - "Creating Profile").

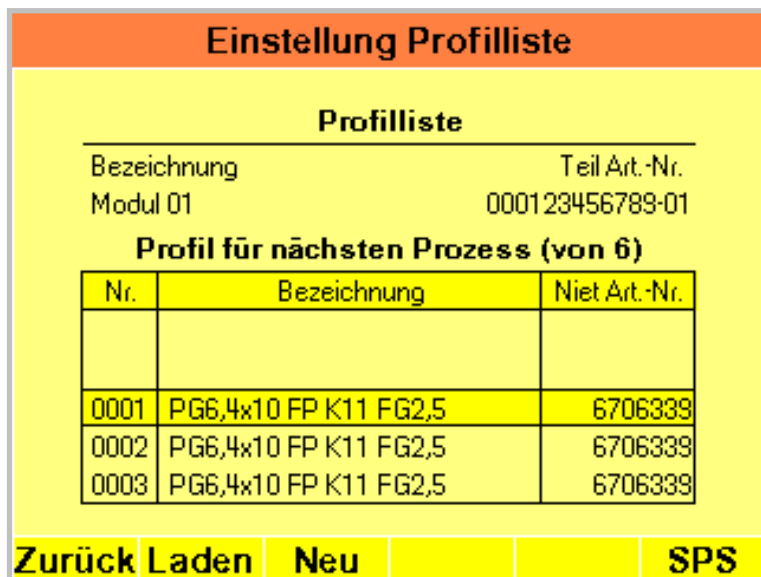


Step 1: "Profile List Settings" menu

The "Profile List Settings" menu is accessed from the AUTO main menu with:

- ▶ MAN
- ▶ Menu
- ▶ Process monitoring
- ▶ Profile
- ▶ List

The profiles of the current profile list or of the profile list last used are shown. The text fields will be blank when no profile list has yet been created.



A new profile list is created with **New.**

Process Monitoring

11.6 Creating Profile List

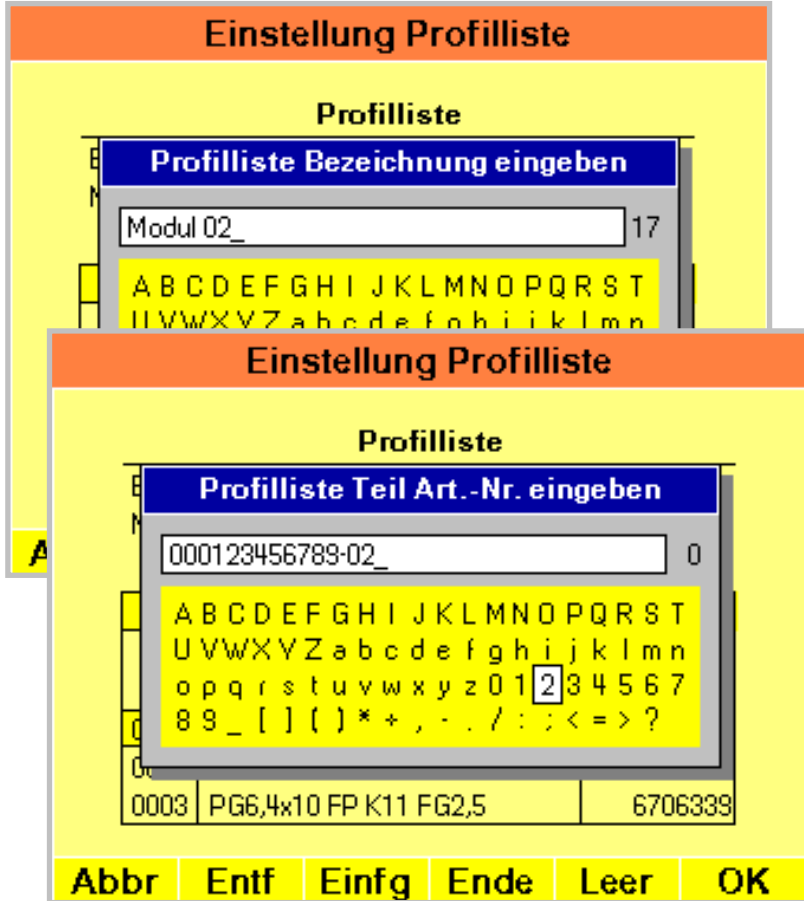
Not in GAV-8000 eco

Step 2: Entering designation and part number

The designation of the profile list and the part number of the component or assembly are now entered one after the other.

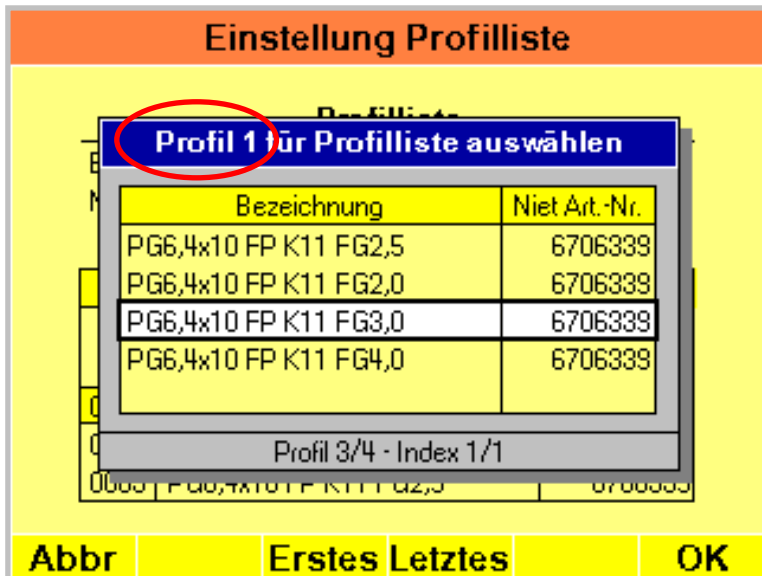
The designation of the profile list should clearly identify the application.

The designations used cannot be transferred to new profile lists.



Step 3: Creating profile list

When creating a profile list it is important that the profiles assigned to the respective blind riveting point are saved in the same order that the blind rivets will later be processed in the component (see Section 11.1 "Process Monitoring" - "Functional Principle" - "Profile Lists").



Process Monitoring

11.6 Creating Profile List

Not in GAV-8000 eco

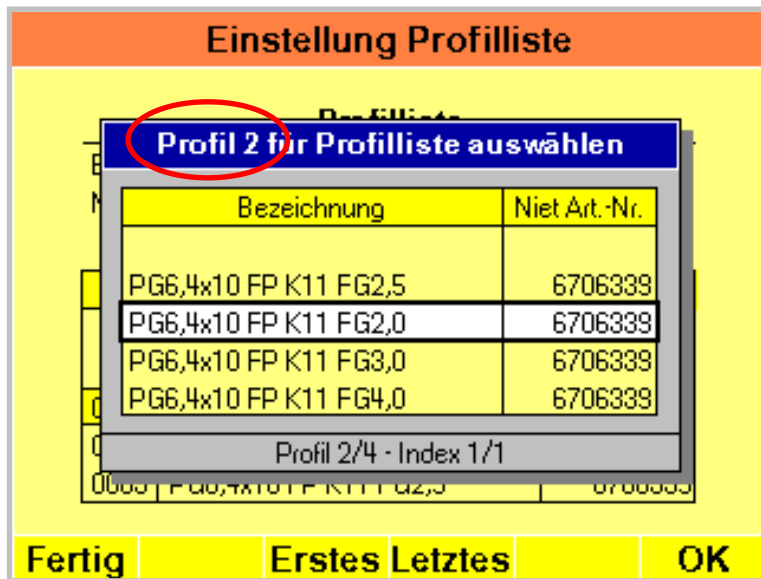
The profiles are now selected in the required order and saved in the profile list with **OK**.

The new profile list is created on saving the first profile and added to with each following profile.



The procedure is now repeated for the required number of profiles in the profile list.

The profile list is finished with **Finish**.



Process Monitoring

11.6 Creating Profile List

Not in GAV-8000 eco

On finishing the list, the new profile list and the first profile in the list are loaded automatically.

Einstellung Profilliste

Neue Profilliste gespeichert

Bezeichnung Teil Art.-Nr.
 Modul 02 000123456789-02

Profil für nächsten Prozess (von 5)

Nr.	Bezeichnung	Niet Art.-Nr.
0001	PG6,4x10 FP K11 FG3,0	6706339
0002	PG6,4x10 FP K11 FG2,0	6706339
0003	PG6,4x10 FP K11 FG4,0	6706339

Zurück Laden
Neu
SPS

In the illustrated example, the profile list for the component "Module 02" with part number "000123456789-02" was created.

Profile No. = riveting point	Profile designation	Blind rivet Part No.	Material thickness
1	PG 6.4x10 FP K11 FG3.0	6706339	3 mm
2	PG 6.4x10 FP K11 FG2.0	6706339	2 mm
3	PG 6.4x10 FP K11 FG4.0	6706339	4 mm
4	PG 6.4x10 FP K11 FG2.0	6706339	2 mm
5	PG 6.4x10 FP K11 FG3.0	6706339	3 mm

The new profile list and the first profile in the list are activated automatically on return to the main menu.

AUTO - Bereit (Hand)

Zyklus

Hubstellung

Blasluf

Dornabsaugung

Verriegelung auf

Vereinzelung auf

Schwingförderer

Modul 02

Überwachung bereit

- (1/5)

?
Aus
Ein
Stby
MAN

Process Monitoring

11.7 Loading Profile List

Not in GAV-8000 eco

The "Profile List Settings" menu is accessed from the AUTO main menu with:

- ▶ MAN
- ▶ Menu
- ▶ Process monitoring
- ▶ Profile
- ▶ List

The profiles of the current profile list or of the profile list last used are shown. The text fields will be blank when no profile list has yet been created.

Load opens the window for selecting a profile list.

The required profile list can now be selected and loaded with **OK**.

The loaded profile list and the first profile in the list are activated automatically on return to the main menu.

Einstellung Profilliste

Profilliste

Bezeichnung	Teil Art.-Nr.
Modul 02	000123456789-02

Profil für nächsten Prozess (von 5)

Nr.	Bezeichnung	Niet Art.-Nr.
0001	PG6,4x10 FP K11 FG3,0	6706339
0002	PG6,4x10 FP K11 FG2,0	6706339
0003	PG6,4x10 FP K11 FG4,0	6706339

Zurück
Laden
Neu
SPS

Einstellung Profilliste

Profilliste auswählen

Bezeichnung	Teil Art.-Nr.
Modul 01	000123456789-01
Modul 02	000123456789-02
Modul 03	000123456789-03

Profilliste 1/6 - 6 Profile in Profilliste

Abbr
Erste
Letzte
OK

Einstellung Profilliste

Profilliste geladen

Bezeichnung	Teil Art.-Nr.
Modul 01	000123456789-01

Profil für nächsten Prozess (von 6)

Nr.	Bezeichnung	Niet Art.-Nr.
0001	PG6,4x10 FP K11 FG2,5	6706339
0002	PG6,4x10 FP K11 FG2,5	6706339
0003	PG6,4x10 FP K11 FG2,5	6706339

Zurück
Laden
Neu
SPS

Process Monitoring

11.8 PLC Profile Lists

Not in GAV-8000 eco

The "PLC Profile Lists Settings" menu is accessed from the AUTO main menu with:

- ▶ MAN
- ▶ Menu
- ▶ Process monitoring
- ▶ Profile
- ▶ List
- ▶ PLC

10 profile lists for direct selection from the PLC interface can be made available here.

After selecting the position to be edited a window with the available profile lists opens. The required profile list can now be selected and assigned with **OK**.

Einstellung Profillisten SPS			
Auswahl Profillisten von SPS-Interface			
Nr.	0123	Bezeichnung	Teil Art.-Nr.
1	1000	Modul 01	000123456789-01
2	0100	Modul 02	000123456789-02
3	1100	Modul 03	000123456789-03
4	0010	Modul 04	000123456789-04
5	1010	Modul 05	000123456789-05
6	0110		
7	1110		
8	0001		
9	1001		
10	0101		

Einstellung Profillisten SPS			
Auswahl Profillisten von SPS-Interface			
Nr.	Profilliste auswählen		
	Bezeichnung	Teil Art.-Nr.	
1			01
2			02
3	Modul 04	000123456789-04	03
4	Modul 05	000123456789-05	04
5	Modul 06	000123456789-06	05
6			
7			
8			
9			
10	0101		

Profilliste 6/6 - 2 Profile in Profilliste

Abbr. Erste Letzte OK

Profile lists selected from the PLC interface are highlighted.

Einstellung Profillisten SPS			
Profilliste für Auswahl SPS zugeordnet			
Nr.	0123	Bezeichnung	Teil Art.-Nr.
1	1000	Modul 01	000123456789-01
2	0100	Modul 02	000123456789-02
3	1100	Modul 03	000123456789-03
4	0010	Modul 04	000123456789-04
5	1010	Modul 05	000123456789-05
6	0110	Modul 06	000123456789-06
7	1110		
8	0001		
9	1001		
10	0101		

Zurück Test

PLC activation is described under "Profile List Selection" in Section 28 "PLC Interface". You can switch directly to the "PLC interface test" menu with **Test**.

Process Monitoring

11.9 Process Monitoring Calibration Menu

Not in GAV-8000 eco

Menü Kalibrierung Prozessüberwachung						
Letzte Kalibrierung						
Datum	Uhrzeit	Typ	Faktor	n	\bar{x}	s
01.09.2008	08:40:38	Weg	99	25	91.1	1.0
01.09.2008	09:24:28	Kraft	5.0	26	9170	53.1
02.09.2008	10:49:44	Weg	99	25	93.0	0.0
02.09.2008	10:51:26	Weg	99	25	92.9	0.0


Zurück Kraft Weg Kal Filter Status

Process monitoring calibration menu

- Navigation:
- AUTO
 - ▶ MAN
 - ▶ Menu
 - ▶ Process monitoring
 - ▶ Cal

Overview of the calibration procedures last executed:

Date, time	Time stamp of the completed calibration procedures
Type	Force or displacement calibration
Factor	System-specific factor for calibrating force and displacement
n	Number of calibration procedures
\bar{x}	Average value for measured displacements or forces
s	Standard deviation of measured displacements or forces

Force	"Force Calibration" menu	
Displacement	"Displacement Calibration" menu	
Cal	"Process Monitoring Calibration" menu	Change system parameters  GESIPA code
Filter	"Process Monitoring Filter" menu	
Status	"Process Monitoring Status" menu	

Process Monitoring

11.9.1 Force Calibration

Not in GAV-8000 eco

Kalibrierung Kraft

1

2

3

4

Kalibrierdorn Abrisskraft einstellen
Kalibrierdorne verarbeitet

10000 N

0 / 25

↓

Zurück
Zyklus
Lösch
Ende

Force calibration menu

Navigation:

- AUTO
- ▶ MAN
- ▶ Menu
- ▶ Process monitoring
- ▶ Cal
- ▶ Force

To perform calibration procedure:	
1	Enter break-off force of calibration mandrels (see calibration mandrel packaging)
2	Insert calibration mandrel into the spreader nosepiece up to the mandrel head and connect the spent mandrel container to the spreader nosepiece
3	
4	Press Cycle button
Repeat steps 2 - 4 up to the specified piece number	
Conclude the calibration procedure with End on reaching the specified piece number	

Cycle	Executes one processing cycle
Delete	Deletes the data recorded during the last processing cycle
End	Ends the calibration procedure on reaching the specified piece number

Process Monitoring

11.9.2 Displacement Calibration

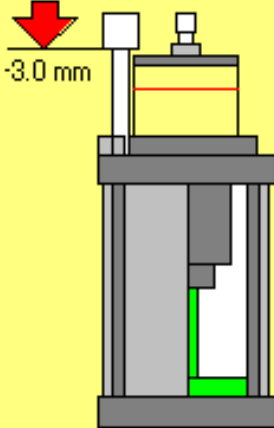
Not in GAV-8000 eco

Kalibrierung Weg

Einstellung WS1
korrigieren!

Wegmessung

0 / 25



Displacement calibration menu

Navigation:

- AUTO
- ▶ MAN
- ▶ Menu
- ▶ Process monitoring
- ▶ Cal
- ▶ Displacement

Zurück
Zyklus
Lösch
Ende

To perform calibration procedure:

- If **Correct WS1 Setting !** is displayed, correct the basic setting of the WS1 displacement sensor by the displayed amount in the displayed direction (refer to Section 9.3 Large Pressure Booster)
- Execute the required number of no-load cycles with the **Cycle** button
- Conclude the calibration procedure with **End** on reaching the specified piece number

Cycle	Executes one processing cycle
Delete	Deletes the data recorded during the last processing cycle
End	Ends the calibration procedure on reaching the specified piece number

Process Data

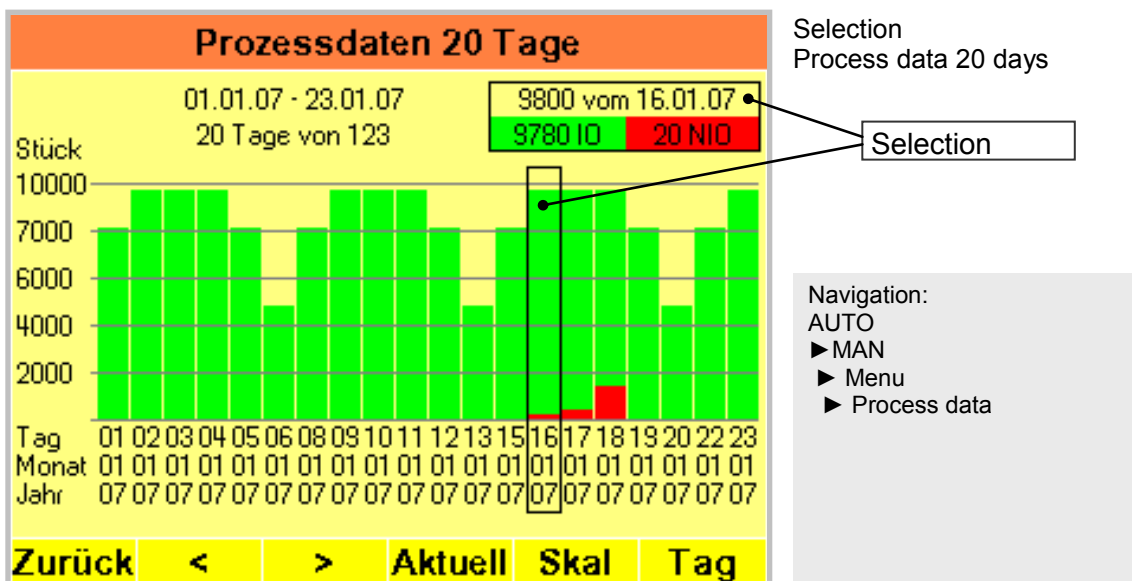
Not in GAV-8000 eco

The following parameters are saved in the process data file after each setting process:

- Date and time (time stamp)
- Profile and profile list used for evaluation
- Break-off displacement and break-off force (break-off point)
- Process evaluation

The process data file contains the last 1,000,000 processes. The oldest data are overwritten to accommodate the latest data.

The recorded process data can be evaluated in the "Process Data" menu.



The "Process Data 20 Days" selection menu shows an overview of 20 days in the form of a bar graph. By selecting individual days, the corresponding date, total number of processes, process OK and process NOK are shown in the selection field. Detailed evaluation can be carried out with **Day**.

The scaling of the piece number representation is adapted automatically to the highest value. In this way, sections with low piece numbers are always shown in the same ratio. Sections with considerably lower piece numbers can be rescaled with **Scale**.

<	Moves the representation back by one day.
>	Moves the representation forward by one day.
Current	Selects 20 days up to the current date.
Scale	Rescales the piece count.
Day	"Day Process Data" menu (detailed evaluation, one day)

Process Counter

With the process counter a number of blind rivets to be processed per component can be specified and the processing displayed and monitored by counting in the AUTO main menu. The function is not to be used together with a profile list. Installation of the required components is described in Section 28.4 "PLC Interface" - "Process Counter".

Prozesszähler Process counter settings

Zu verarbeiten:

23

von 23

Zurück

Prozesszähler

Soll	23
Ist	23
Aktiv	Ja

Navigation:

- AUTO
- ▶ MAN
- ▶ Menu
- ▶ Process counter

The counter display is set to the specified value (setpoint) by pressing a button (to be installed by customer at the workplace).

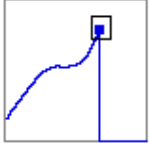
AUTO - Bereit (Hand)

PG6,4x10 FP K11 FG2,5

Zu verarbeiten:

23

von 23



H	A	B
G	0	C
F	E	D

keine Liste

Schwingförderer

? Aus Ein Stby MAN

A signalling device (lamp, buzzer) can be activated and additionally the GAV stopped when the specified number of blind rivets has been processed (counter reading 0).


AUTO - Bereit (Hand)

PG6,4x10 FP K11 FG2,5

Zu verarbeiten:

0

von 23



H	A	B
G	0	C
F	E	D

keine Liste

Schwingförderer

? Aus Ein Stby MAN

Access Codes

Access authorisation is described in Section 8.6 "Operation" - "Access Authorisation".

Changing access codes:

Service codes and GESIPA codes can be changed in the "Access Codes" menu.

The corresponding access authorisation must be assigned in order to change the Service code or GESIPA code. The new code is then entered twice. The new code will be saved if both entries are identical. The date and time of the last code change are also saved and shown in the "Access Codes" menu.

As standard, entry of the access codes is concealed, asterisks * are shown in the input window instead of the entered digits. To show the digits, the "Enter Access Codes Concealed" function can be set to **No** in the "Access Codes" menu.

The Service code default is 1111.

Example: Code entry Service code

Navigation:
 AUTO
 ▶ MAN
 ▶ Menu
 ▶ Access Codes

Abbr	1	2

Example:
 In the illustrated example, the Service code is changed, access authorisation was assigned and the new Service code can now be entered. On successful entry, the date and time of the "last change" are shown.

Time and Language

Zeit und Sprache	
Systemzeit (GMT)	
Datum	Jahr
23.01.2007	Monat
	Tag
Uhrzeit	Stunde
09:49:03	Minute
	Sekunde
	Sync. 60s 09:49:00 09:49:01
Zurück	

Time and language settings

Navigation:
AUTO
▶ MAN
▶ Menu
▶ Time and language

← 0 GESIPA code

The system time is mainly required for the time stamp of the data recording for the setting process monitoring and operating data acquisition applications.

The global time reference GMT (Greenwich Mean Time) should generally be set in order to simplify data matching (e.g. process or operating data).

System Information

Systeminfo			
Systemzeit (GMT)	26.01.2007 11:58:59		
Zählwerk	1234		
<hr/>			
Version Software Steuerung und Display	V01.70.20070124		
Version Betriebssystem Display	TS4	V4.0.0	
Zykluszeit Display	20.4 ms		
Zykluszeit Steuerung	7.9 ms		
RAM-Speicher	10647 kB	RAM	99 %
TMP-Speicher	1024 kB	TMP	0 %
Flash-Speicher	8192 kB	Flash	32 %
Card-Speicher	124778 kB	Card	56 %
IP-Adresse	192.168.82.247		
Zurück	Aktuell		

System information

- Navigation:
- AUTO
 - ▶ MAN
 - ▶ Menu
 - ▶ System Information

In addition to the current system time and the count reading of the electronic counter the "System Information" menu shows important internal system parameters.

- Version number of installed controller and display software.
- Controller and display cycle times.
- Total capacity and utilisation of various storage areas in the display.

GRivCheck

Not in GAV-8000 eco

In the "GRivCheck" menu the connection between the GAV dialogue unit and PC is prepared with the GRivCheck operating software via the RS232 interface and communication shown after the connection has been set up. A connection can be established between the PC and GAV directly or via the PLC interface. Detailed information can be found in the description of the GRivCheck operating software.

The screenshot shows the GRivCheck interface. At the top, it says "PC-Modus über SPS-Interface". Below this, there is a yellow box containing the text "PC-Modus bereit". To the right of this box is a grey button labeled "RS232". At the bottom left, there is a yellow button labeled "Abbr". At the bottom right, there is a yellow box containing the text "PC-Modus wird von GRivCheck beendet!". To the right of the main interface is a grey box with the text "Navigation: AUTO", "▶ MAN", "▶ Menu", and "▶ GRivCheck".

Example (see screens):

The "PC mode ready" message shows that the GAV is ready to set up the connection.

After the connection has been set up, the GAV will only respond to commands from GRivCheck, the current status is shown directly.

In the illustrated example, process data are transferred from GAV to GRivCheck, the command, a short description and the status are displayed.

The screenshot shows the GRivCheck interface. At the top, it says "PC-Modus über SPS-Interface". Below this, there is a yellow box containing the text "SIL Status auslesen... Fertig", "SIL Status auslesen... Fertig", "DDL Prozessdaten Anzahl Tage lesen... Fertig", and "DVL Prozessdaten Tage lesen... 60%". To the right of this box is a green button labeled "RS232". At the bottom left, there is a yellow button labeled "Abbr". At the bottom right, there is a yellow box containing the text "PC-Modus wird von GRivCheck beendet!".

Fault - Supply Unit

<u>GAV will not trigger</u> ("AUTO" main menu, no error message)	
Cause	Corrective measures
Corresponding triggering option not selected or inhibited.	Select triggering option, see Section 9.9 "GAV Settings" - "Additional Functions".
Pressure sensor DS2 1-8040.2 set incorrectly.	Set pressure sensor DS2 1-8040.2, see Section 9.2 "GAV Settings" - "Pressure Sensors".
Large pressure booster 3-8060 not in home position.	Press "ON" button to set GAV in home position, check basic setting of large pressure booster 3-8060, see Section 9.3 "GAV Settings" - "Large Pressure Booster".
<u>GAV is self-activating</u>	
Cause	Corrective measures
Leaks at the valve terminal 1-8030, at the cover of the blind riveting gun 2-8002 or at the air supply to the blind riveting gun.	Rectify leaks.
Pressure sensors DS1 1-8040.1 and DS2 1-8040.2 set incorrectly.	Set pressure sensors DS1 1-8040.1 and DS2 1-8040.2, see Section 9.2 "GAV Settings" - "Pressure Sensors".
<u>Blind rivet is not set or mandrel does not break off</u>	
Cause	Corrective measures
Jaws worn.	Replace jaws, see Section 10.1 "Maintenance" - "Maintenance Information".
Air in hydraulic system.	Bleed hydraulic system for blind riveting process, see Section 24 "Filling Hydraulic Systems".
<u>Blind rivet is not separated</u>	
Cause	Corrective measures
Stop damping control valve 4-8029 for separator 4-8000 closed.	Basic setting separator 4-8000, see Section 9.5 "GAV Settings" - "Separator".
Separator cylinder 4-8125 defective.	Replace separator cylinder 4-8125.
Separator scoop 4-8002 damaged.	Replace separator scoop 4-8002.
Sensor NS2 4-8044 screwed in too far.	Basic setting separator 4-8000, see Section 9.5 "GAV Settings" - "Separator".

Fault - Blind Riveting Gun

Observe safety and environmental information!



Wear safety goggles!



Caution!

Always disconnect the compressed air supply from the device and turn off the master switch before unscrewing the spreader nosepiece or with the nosepiece spread.

Blind rivet is not conveyed out of the spreader nosepiece or spreader nosepiece will not close	
<ul style="list-style-type: none"> - Press OFF button - Unscrew spreader nosepiece 2-80 - Remove blind rivet - Screw on and lock spreader nosepiece 2-80 - Press ON button - Execute "Cycle" function in "MAN" menu. 	
Cause	Corrective measures
Blind riveting gun was held too close to the workpiece while loading.	Make sure there is sufficient spacing between the spreader nosepiece and workpiece while loading.
Insufficient mandrel protrusion.	Blind rivet must correspond to the specification.
Air pressure too low or pressure drop too high during riveting process.	A compressed air supply to the blind riveting system of at least 6 bar must be secured.
Broken-off mandrel jammed in jaw mechanism (jaws jammed).	Maintain jaws, see Section 10.1 "Maintenance Information" - "Lubricating Jaws"
Lock spring 2-8033 bent or broken	Replace lock spring 2-8033, see Section 21 "Riveting Gun Repair Instructions" - "Replacing Lock Spring".
Insufficient grip of closing sleeve 2-8022 on closing tube 2-8011 (spreader nosepiece is not released).	Replace closing sleeve 2-8022. (The riveting gun can be lifted with the closing sleeve 2-8022 when the grip is correct.)
Holding force of O-rings 2-50 on spreader nosepiece 2-80 too great.	Remove one O-ring 2-50 from spreader nosepiece 2-80.
Snap ring 2-40 was deformed by blind riveting without closing sleeve 2-22 (release stroke for spreader nosepiece is not fully executed).	<ul style="list-style-type: none"> - Unscrew spreader nosepiece 2-80. - Remove closing sleeve 2-22. - Push back stop ring 2-6021. - Replace snap ring 2-40. - Reassemble in reverse order.

Fault - Blind Riveting Gun

Blind rivet is conveyed too far out of spreader nosepiece

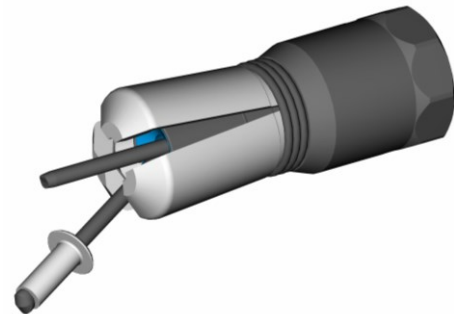
- Press OFF button
- Remove blind rivet
- Press ON button
- Execute "Cycle" function in "MAN" menu.



Cause	Corrective measures
Jaws jammed and/or broken-off mandrel was not ejected.	Maintain (or replace) jaws, see Section 10.1 "Maintenance Information" - "Lubricating Jaws".
	Check blow air setting, for basic setting see Section 9.6 "GAV Settings" - "Blow Air".
Lock spring 2-8033 broken.	Replace lock spring 2-8033, see Section 21 "Riveting Gun Repair Instructions" - "Replacing Lock Spring".
Jaw tube 2-6032 stiff.	Replace jaw tube 2-6032, see Section 21 "Riveting Gun Repair Instructions" - "Replacing Jaw Tube".
Holding force of O-rings 2-50 on spreader nosepiece 2-80 too low.	Fit additional O-ring 2-50 on spreader nosepiece 2-80 (use genuine part).
Jaw housing 2-8005 or 8205 broken out of inlet cone.	Replace jaw housing 2-8005 or 8205, for procedure see Section 21 "Riveting Gun Repair Instructions" - "Replacing Jaws".

Blind rivet and broken-off mandrel in spreader nosepiece

- Press OFF button
- Remove blind rivet and mandrel
- Press ON button
- Execute "Cycle" function in "MAN" menu.

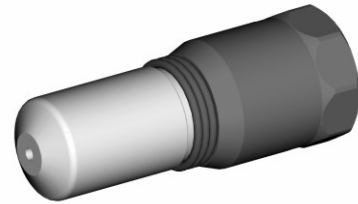


Cause	Corrective measures
Broken-off mandrel jammed in jaws.	Maintain (or replace) jaws, see Section 10.1 "Maintenance Information" - "Lubricating Jaws"
Jaw tube 2-6032 stiff (bent).	Replace jaw tube 2-6032, see Section 21 "Riveting Gun Repair Instructions" - "Replacing Jaw Tube".
Leaf spring 2-6093 bent or broken	Replace leaf spring 2-6093, see Section 21 "Riveting Gun Repair Instructions" - "Replacing Leaf Spring".

Fault - Blind Riveting Gun

Blind rivet does not reach blind riveting gun

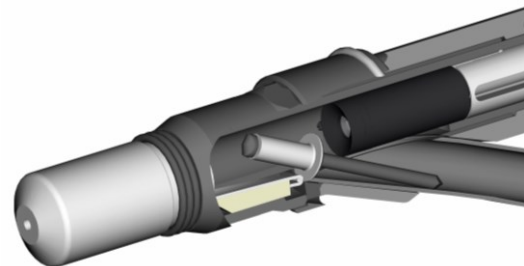
Execute "Cycle" function in "MAN" menu.



Cause	Corrective measures
Blind rivet jammed in rivet feed hose.	Release jammed blind rivets by bending the rivet feed hose back and forth and remove.
Blind rivet jammed in separator 4-8000.	Open separator 4-8000 with "open separator" function in "MAN" menu, pull back separator tongue 4-8007 by hand, remove blind rivet.
- Separator tongue 4-8007 maladjusted.	Adjust separator tongue 4-8007 such that only one blind rivet at a time is separated.
- Control valve 4-8029 for separator stop damping closed.	For basic setting of control valve 4-8029, see Section 9.5 "GAV Settings" - "Separator".
- Separator scoop damaged.	Replace separator scoop.
- Separator cylinder faulty.	Replace separator cylinder.

Blind rivet jammed in transfer mechanism of riveting gun

- Execute "Stroke Position" function in "MAN" menu.
- Switch off master switch, unscrew spreader nosepiece and remove closing sleeve.
- Release lock spring, point blind riveting gun downward and shake out blind rivet
- Reassemble blind riveting device in reverse order, connect and switch on
- Execute "Cycle" function in "MAN" menu.

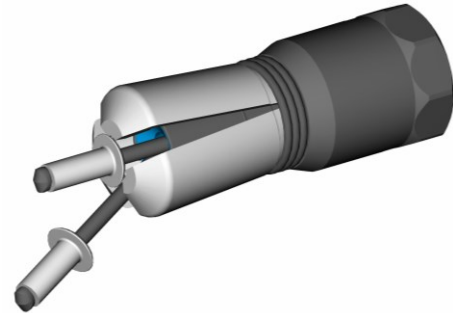


Cause	Corrective measures
Feed hose dry	Refill central lubrication, see Section 10.1 "Maintenance Information" - "Refilling Central Lubrication" and "Oiling Rivet Feed Hose".
	Correct setting of central lubrication system, see Section 9.6 "GAV Settings" - "Blow Air".
Installation radius of rivet feed hose too small.	Increase installation radius of rivet feed hose.
Lock spring 2-33 broken or spring rubber detached.	Replace lock spring 2-8033, see Section 21 "Riveting Gun Repair Instructions" - "Replacing Lock Spring".
Blow air set incorrectly.	Set blow air, for basic setting see Section 9.6 "GAV Settings" - "Blow Air".
Rivet feed hose too large.	Refer to device specification.

Fault - Blind Riveting Gun

Two blind rivets in spreader nosepiece

- Press OFF button
- Remove blind rivets
- Press ON button
- Execute "Cycle" function in "MAN" menu.



Cause	Corrective measures
Separator tongue 4-8007 maladjusted.	Adjust separator tongue 4-8007 such that only one blind rivet at a time is separated.
A second blind rivet entered the separator after opening the separator manually.	Press "OFF" button. Remove second blind rivet. Press "ON" button.
The blind rivet was not conveyed up to the nosepiece during the previous operating cycle.	
Installation radius of rivet feed hose too small.	Increase installation radius of rivet feed hose.
Rivet feed hose excessively worn.	Replace rivet feed hose.
Rivet feed hose too dry.	Refill central lubrication, see Section 10.1 "Maintenance Information" - "Refilling Central Lubrication" and "Oiling Rivet Feed Hose".
	Correct setting of central lubrication system, see Section 9.6 "GAV Settings" - "Blow Air".
Lock spring 2-33 broken or spring rubber detached.	Replace lock spring 2-8033, see Section 21 "Riveting Gun Repair Instructions" - "Replacing Lock Spring".
Blow air set incorrectly.	Set blow air, for basic setting see Section 9.6 "GAV Settings" - "Blow Air".

Blind Riveting Gun Repair Instructions

Observe safety and environmental information!



Wear safety goggles!

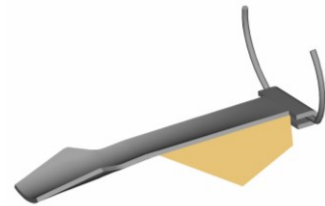


Caution!

Switch off master switch and disconnect compressed air supply from device!

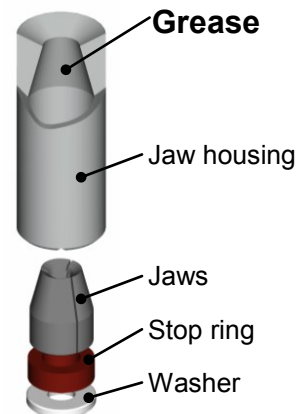
To replace lock spring 2-33

- Unscrew spreader nosepiece 2-80.
- Remove closing sleeve 2-22.
- Pull lock spring 2-33 out of latch.
- Install in reverse order of removal.



To replace jaws

- Unscrew spreader nosepiece 2-80.
- Remove closing sleeve 2-22.
- Unscrew jaw mechanism.
- Remove set of jaws complete with washer, stop ring and opening springs.
- Coat sliding surface of jaw housing with grease before re-installing the complete set of jaws.
- Fit jaw housing over the set of jaws.
- Insert stop ring and washer.
- Install in reverse order of removal.



To replace leaf spring 2-6093

Installation aid: Assembly pin E9-20 (accessory)

- Disconnect compressed air supply from device.
- Switch off master switch.
- Unscrew spreader nosepiece 2-80.
- Remove closing sleeve 2-22.
- Unscrew cover 2-2 and threaded plug 2-6003.
- Use assembly pin E9-20 (pin facing downward) to push back lock activator 2-6009 up to the stop face.
- Remove feather key 2-6023 with pliers.
- Remove leaf spring and replace. After reinstalling feather key 2-6023 push lock activator 2-6009 forward by pressing with the thumb such that the feather key fits in the keyway.
- Reinstall threaded plug 2-6003 and cover 2-2.



Caution!

Do not reconnect the compressed air supply before threaded plug 2-6003 and cover 2-2 have been reinstalled!

Blind Riveting Gun Repair Instructions

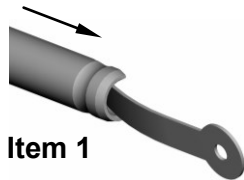
To replace jaw tube 2-6032

- Unscrew spreader nosepiece 2-80.
- Remove closing sleeve 2-22.
- Unscrew jaw mechanism.
- Pull jaw tube 2-6032 out of latch.

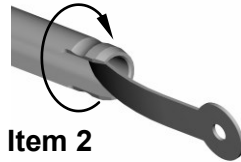


Caution!

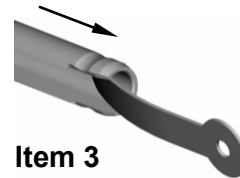
To avoid damaging the leaf spring, install the jaw tube as shown in **Item 1 - Item 3**.



Item 1



Item 2



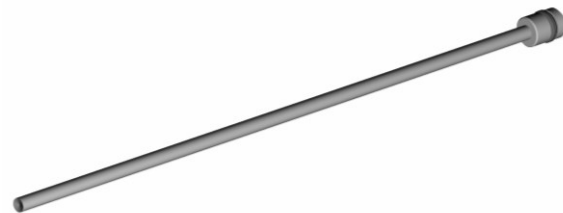
Item 3

- Initially insert jaw tube 2-6032 with the slotted side facing the leaf spring 2-6093 (**Item 1**).
- Holding leaf spring 2-6093 carefully turn jaw tube 2-60032 by 180° (**Item 2**) while moving back and forth by 1-2 mm and lock in the end position (**Item 3**).

To replace stop piston 2-6020

Installation aid: Assembly pin E9-20 (accessory)

- Switch off master switch and disconnect device from compressed air supply!
- Unscrew spreader nosepiece 2-80.
- Remove closing sleeve 2-22.
- Use assembly pin E9-20 (pin facing upward) to push back lock activator 2-6009 until the pin engages.
- Unscrew cover 2-2 and threaded plug 2-6003.
- Remove circlip 2-6043. Take care that the inner parts under spring force do not spring out.
- Remove reset piston 2-6013, stop piston 2-6020, compression spring 2-35 and cylinder sleeve 2-6012.
- Install new stop piston 2-6020 with O-ring 2-55.



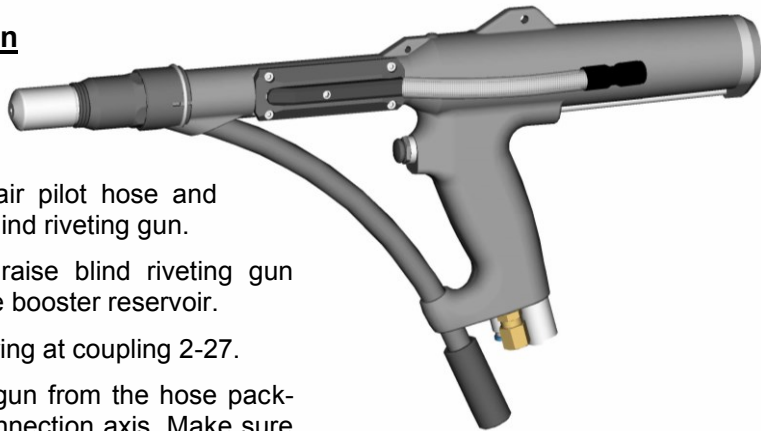
When installing, make sure that

- O-ring 2-55 on stop piston 2-6020 is greased.
- the parts are fitted in the correct order.
- cylinder sleeve 2-6012 with control holes is installed correctly.
- the threaded plug 2-6003 protrudes by approx. 2 mm at the end of the housing.

Blind Riveting Gun Repair Instructions

To replace blind riveting gun

- Switch off master switch and disconnect compressed air supply from device.
- Disconnect rivet feed hose, air pilot hose and hydraulic pilot hose from the blind riveting gun.
- Undo bleeder screw 2-28a, raise blind riveting gun above the level of the pressure booster reservoir.
- Push back the sprung stop spring at coupling 2-27.
- Disconnect the blind riveting gun from the hose package by turning it about the connection axis. Make sure that the end of the hydraulic hose is held at same height or higher than the supply unit.



Caution!

When unscrewing the riveting gun, the escaping approx. 0.02 l of hydraulic oil should be collected in a suitable way and disposed of in an environmentally acceptable manner.

- Install new riveting gun in reverse order.



Caution!

- Check that the O-ring in the coupling of the riveting gun is installed in the correct position.
- Connect air pilot hose to the blue screw connection.

To fill blind riveting gun with hydraulic oil

• Hydraulic system for blind rivet setting

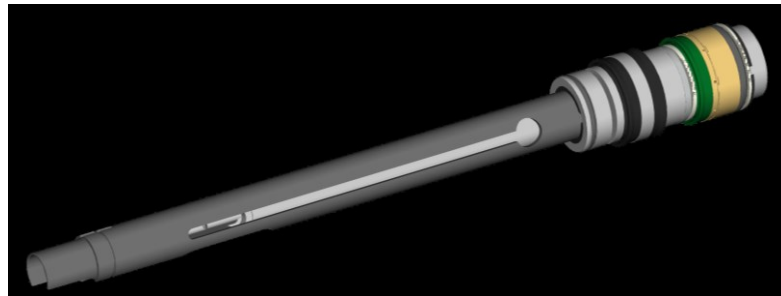
- Undo bleeder screw 2-28a.
- Lower the blind riveting gun to below the level of the pressure booster reservoir, oil begins to flow out of the bleeder hole after a short time.
- Screw in bleeder screw 2-28a with seal 2-57.

• Hydraulic system for releasing nosepiece

- Undo bleeder screw 2-28b.
- Using an oil can, refill small pressure booster 3-8030 with hydraulic oil via the refill connection until oil emerges from the bleeder hole in the blind riveting gun.
- Screw in bleeder screw 2-28b with seal 2-57.

Blind Riveting Gun Repair Instructions

21



To replace piston unit 2-6190

Installation aids:

- Assembly cone E9-18 (accessory)
- Assembly pin E9-21 (accessory)
- Drift E9-22 (accessory)

Removal:

- Remove spreader nosepiece 2-80 and closing sleeve 2-22.
- Unscrew cover 2-2 and threaded plug 2-6003.
- Press back stop ring 2-6021 by approx. 2 mm (pretensioned) and remove exposed snap ring 2-40.
- Remove stop ring 2-6021.
- Pull off coupling sleeve 2-6151 and corrugated ring 2-6155, remove feather key 2-6153 with pliers.
- With light taps with a plastic-headed hammer, release piston unit 2-6190 from its press-fit and push out with drift E9-22, avoid damaging the cylinder surface.

Installation:

- Check cylinder surface of riveting gun housing for damage.
- To avoid damaging the seals, fit assembly cone E9-18 to the end of the housing.
- Lightly grease grooved ring 2-47, 2-6147 and O-ring 2-6082.
- Using assembly pin E9-21 and with the riveting gun housing in vertical position, press piston unit 2-6190 into the riveting gun cylinder and tap in with light hammer blows as far as it will go (press-fit approx. 4 mm long).
- Continue reassemble in the reverse order of removal.
- Check that the spacing between the stop ring and threaded collar of the riveting gun housing is approx. 2.5 mm.

Removing and Installing Pressure Booster

22

Observe safety and environmental information!



Wear safety goggles!

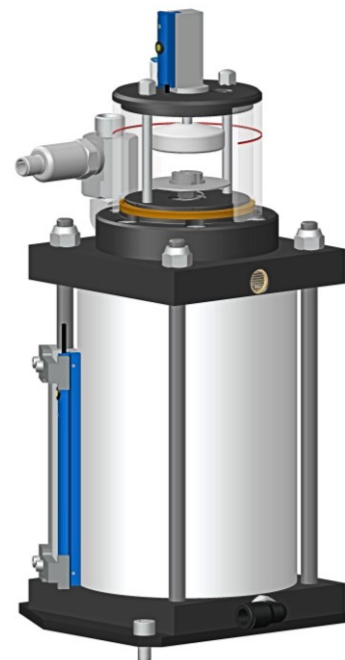
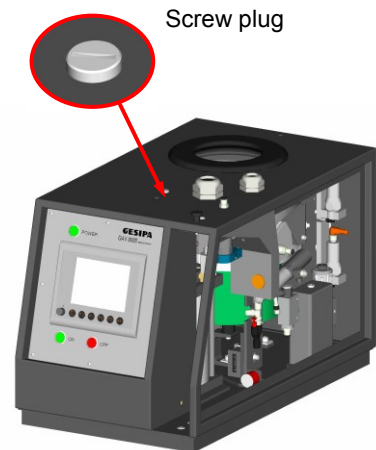


Caution!

The device must be disconnected from the power and compressed air supply!

Large pressure booster

- Remove cover on left and right and detach spent mandrel container from housing.
- Remove screw plug (see figure on right) from housing and extract hydraulic oil through the opening.
- Release the two plug connections of the two displacement sensors (WS1 + WS2) and of the pressure sensor (DS3), paying attention to the identification marking and mark if necessary.
- Detach air supply line from valve terminal to pressure booster.
- Position GAV riveting gun with hose assembly lower than the supply unit.
- Holding a rag under the connection, detach hydraulic hose from pressure booster, to drain off and collect the oil still in the hose.
- Unscrew the mounting screws from baseplate in base of housing.
- Slightly raise the pressure booster and tilt such that it can be removed from the housing baseplate first towards the right.
- Install in reverse order of removal. (For basic setting see Section 9.3 "GAV Settings" - "Large Pressure Booster".)
- The hydraulic system for blind rivet setting must then be bled
- (see Section 24 "Filling Hydraulic Systems".)



Removing and Installing Pressure Booster

22

Observe safety and environmental information!



Wear safety goggles!



Caution!

The device must be disconnected from the power and compressed air supply!

Small Pressure Booster

- Remove cover on left from housing.
- Release plug connection from displacement sensor (WS3) and screw connections, hold a rag under the hydraulic pilot hose to collect the escaping oil.
- Unscrew mounting screw from mounting plate in base of housing.
- Raise pressure booster and remove from housing.
- Install in reverse order of removal. The hydraulic system for releasing the nosepiece must then be bled (see Section 24 "Filling Hydraulic Systems").



Removing and Installing pressure booster

Pressure Booster Repair Instructions

Observe safety information!



Wear safety goggles!

To replace compression spring in large pressure booster

- Remove pressure booster (see Section 22 "Removing and Installing Pressure Booster").
- Extract hydraulic oil through hole in cover in designated oil reservoir and dispose of in an environmentally acceptable manner.
- After undoing the stud bolts, remove cover with sensor, float and sight glass.
- Undo locking socket from valve plate and remove compression spring with plate.
- Remove barrel seal.
- After releasing the hexagon head cap screws, detach flange.
- Pull out throttle cylinder.
- Using metered compressed air (2 bar) via the air connection in the baseplate, move the plunger into the upper end position.
- Unscrew valve plate together with O-ring from valve stem.
- Release collar screw with pin wrench and unscrew.



Note!



Collar screw is secured with Loctite.

- Remove barrel and converter piston as well as valve stem.
- Shut off compressed air.
- Release hexagon nuts on tie rod (do not completely unscrew)

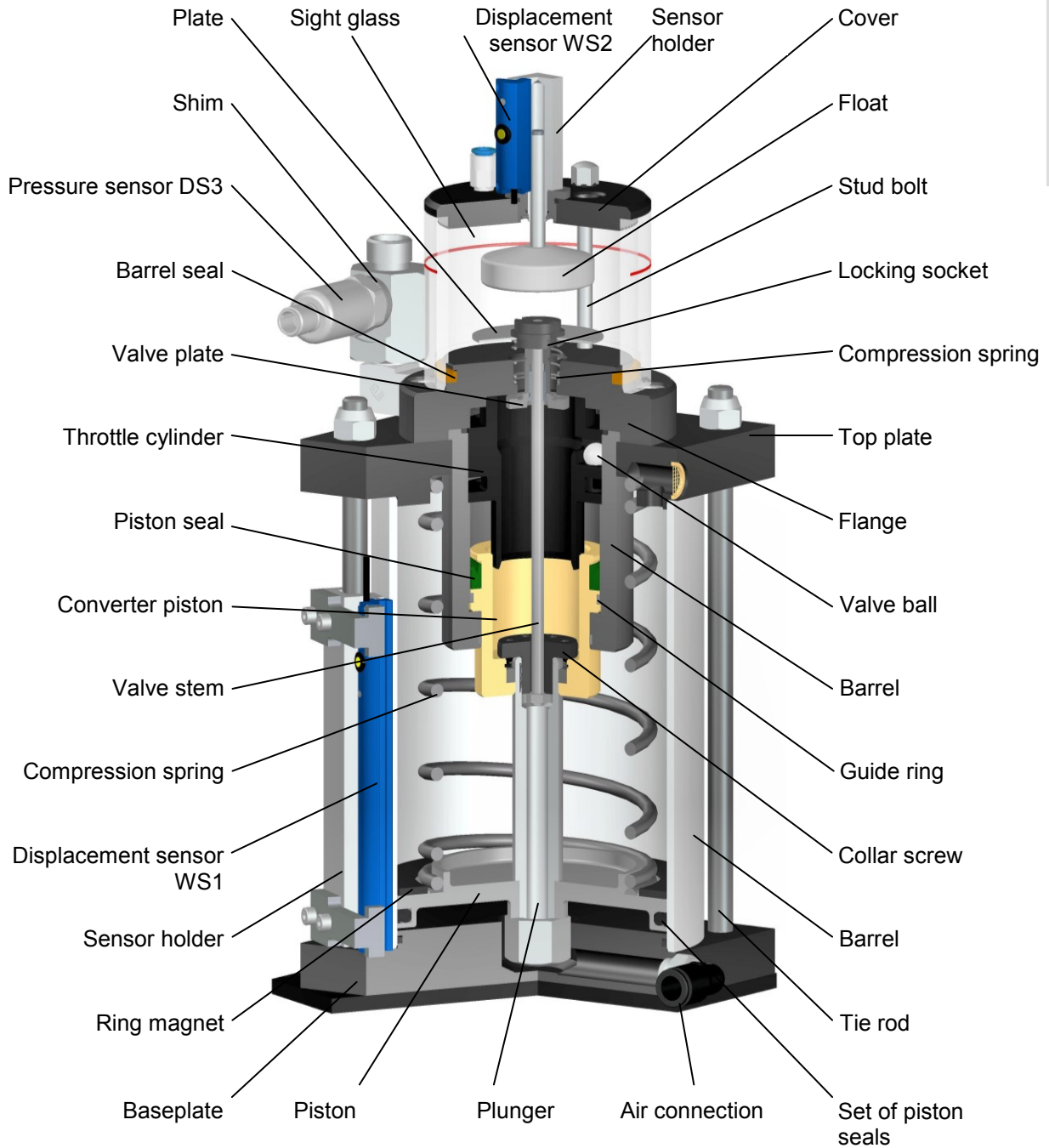


Caution!

The top plate is under powerful spring pressure! While unscrewing the tie rods press against the top plate to take up the spring force.

- Detach top plate.
- Replace compression spring.
- Reassemble in reverse order.
- When installing the locking socket, use a bar magnet to pull the valve stem with valve plate through the opening in the flange. The valve plate is to be adjusted in this position such that, by applying compressed air (2 bar) via the air connection in the baseplate, the locking socket moves by 1.5 - 1.9 mm to the end position.

Pressure Booster Repair Instructions



Filling Hydraulic Systems

Observe safety and environmental information!



Wear safety goggles!

Hydraulic system for blind riveting, large pressure booster 3-8060

Installation aid: Non-return bleeder valve E9-7 (accessory)

- Close both throttle silencers 3-8082 down to one turn on the valve terminal.
- Switch on master switch and select "MAN" menu.
- Reduce operating pressure to 4 bar at pressure reducer valve 1-8002, check pressure at pressure gauge 1-8046.
- To set piston unit 2-6190 to its starting position, insert a blind rivet into spreader nosepiece 2-80.
- Press "ON" button.
- Remove rear bleeder screw 2-28a on riveting gun and screw in non-return bleeder valve E9-7. (Connect a bleeder hose with 8 mm outside diameter to the valve to drain off and collect the excess hydraulic oil.)

Note!



To facilitate bleeding, the riveting gun should be positioned such that the hose assembly is on an upward incline from the supply unit to the riveting gun.

- Remove screw plug (see figure on right) from housing and re-fill oil reservoir of pressure booster 3-8060 with hydraulic oil through the opening as required. The hydraulic system fills up by alternately activating the "stroke position" function. The oil level must not drop below the minimum mark. 6 to 8 refilling operations are generally required.
- The refilling procedure is completed when bubble-free hydraulic oil flows out of the bleeder hose.
- Lower the riveting gun to the level of the oil reservoir of the pressure booster. Unscrew non-return bleeder valve from the riveting gun.



Note!



Before screwing in the bleeder screw with seal, make sure that the oil level is visible at the bleeder hole. The oil level can be raised by further lowering the riveting gun.

- Screw in bleeder screw with seal.

Filling Hydraulic Systems

Hydraulic system for releasing nosepiece, large pressure booster 3-8030

- Unscrew bleeder screw 2-28b at front of riveting gun.

Note!



To facilitate bleeding, the riveting gun should be positioned such that the hose assembly is on an upward incline from the supply unit to the riveting gun.

- Using an oil can, refill small pressure booster with hydraulic oil via the refill connection until bubble-free oil flows from the bleeder hole into the oil collection bottle.
- The hydraulic oil in the oil collection bottle can be used for both hydraulic systems.
- Screw bleeder screw back in.

Hydraulic lines and screw connections

- Regularly check all lines, hoses and screw connections for leaks and external signs of damage. Rectify any damage immediately. Oil spraying out can cause injuries and fires!
- The operating company must ensure that the hose lines are changed at appropriate intervals (max. 6 years, including a maximum storage time of 2 years) even if there are no signs of damage on the hose lines that could impair safety.

Replacing Controller Components

Observe safety information!



Caution!

The device must be disconnected from the power and compressed air supply!

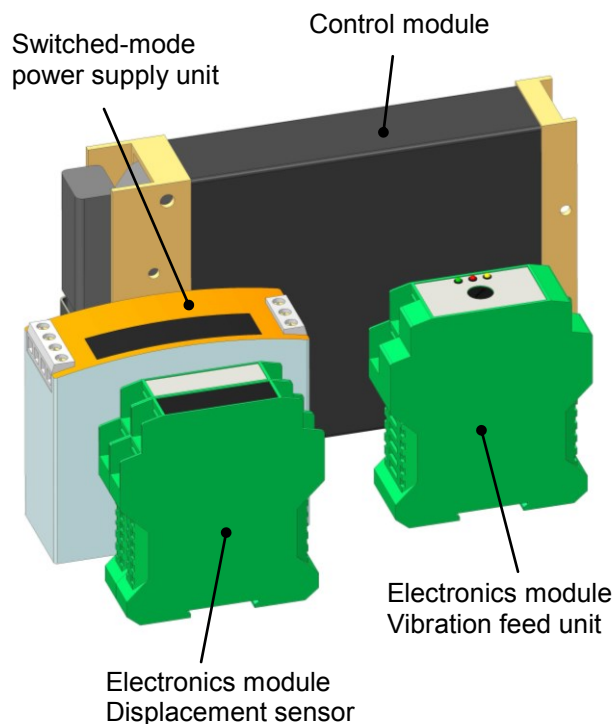
- Undo 8 screws on the front panel and carefully detach the front panel.
- Disconnect 2 cables leading from the front panel to the device.

• Control module

- The control module is installed in two holders on the base of the rear panel of the enclosure and is removed by carefully pulling upwards.
- The 28-pin central connector on the control module is secured by a clip which is released to remove the module.
- Take particular care when reinstalling in reverse order to ensure that the retaining clip is fully engaged on the central connector and the control module is correctly plugged in to both holders.

• Switched-mode power supply unit and electronics module

- The plug connections are carefully released with a screwdriver.
- The switched-mode power supply unit and the electronics module are plugged onto the mounting rails (top hat rails) on the base of the enclosure and can be released with a screwdriver.
- When reinstalling, the module and connectors are plugged in in reverse order.

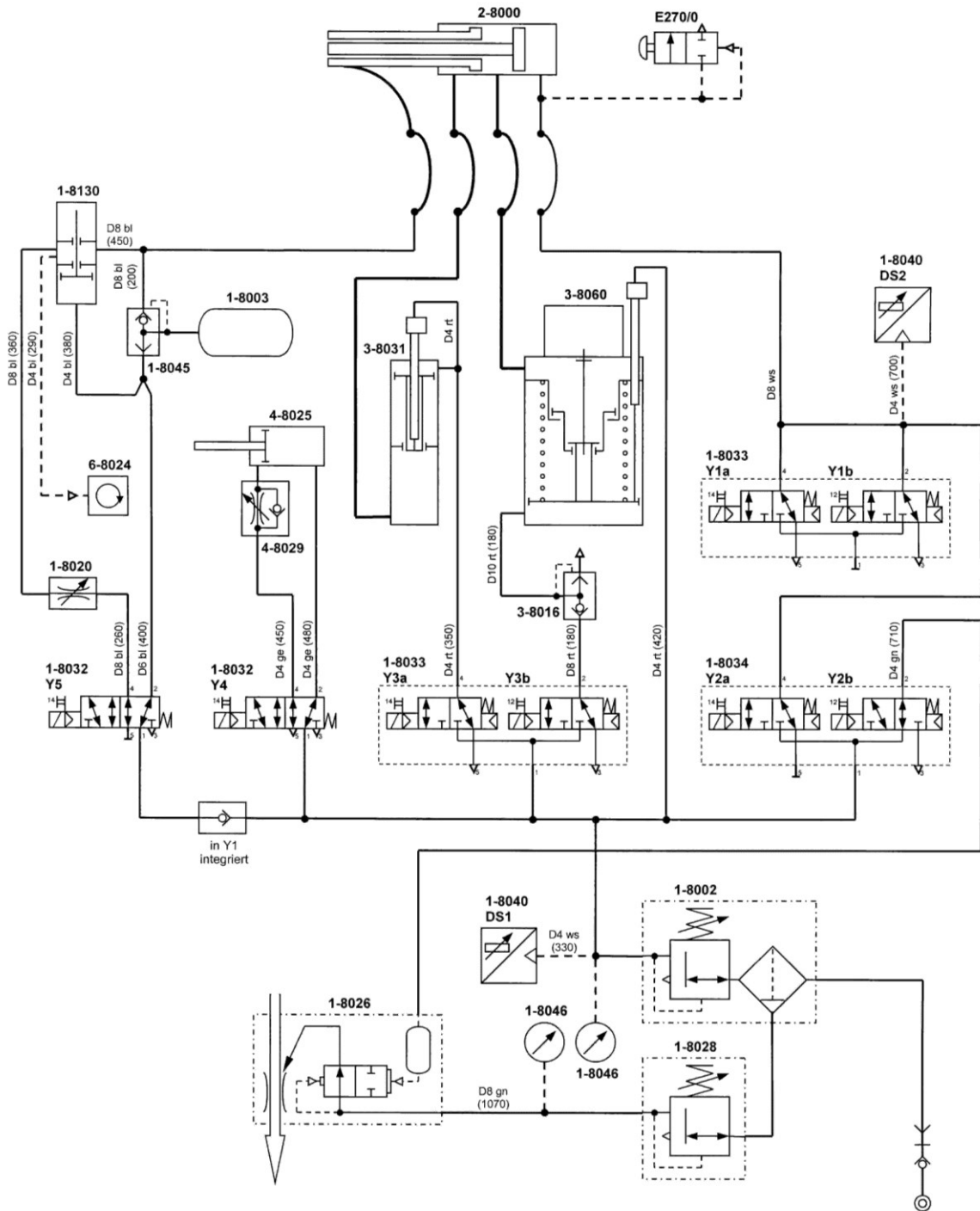


Note!

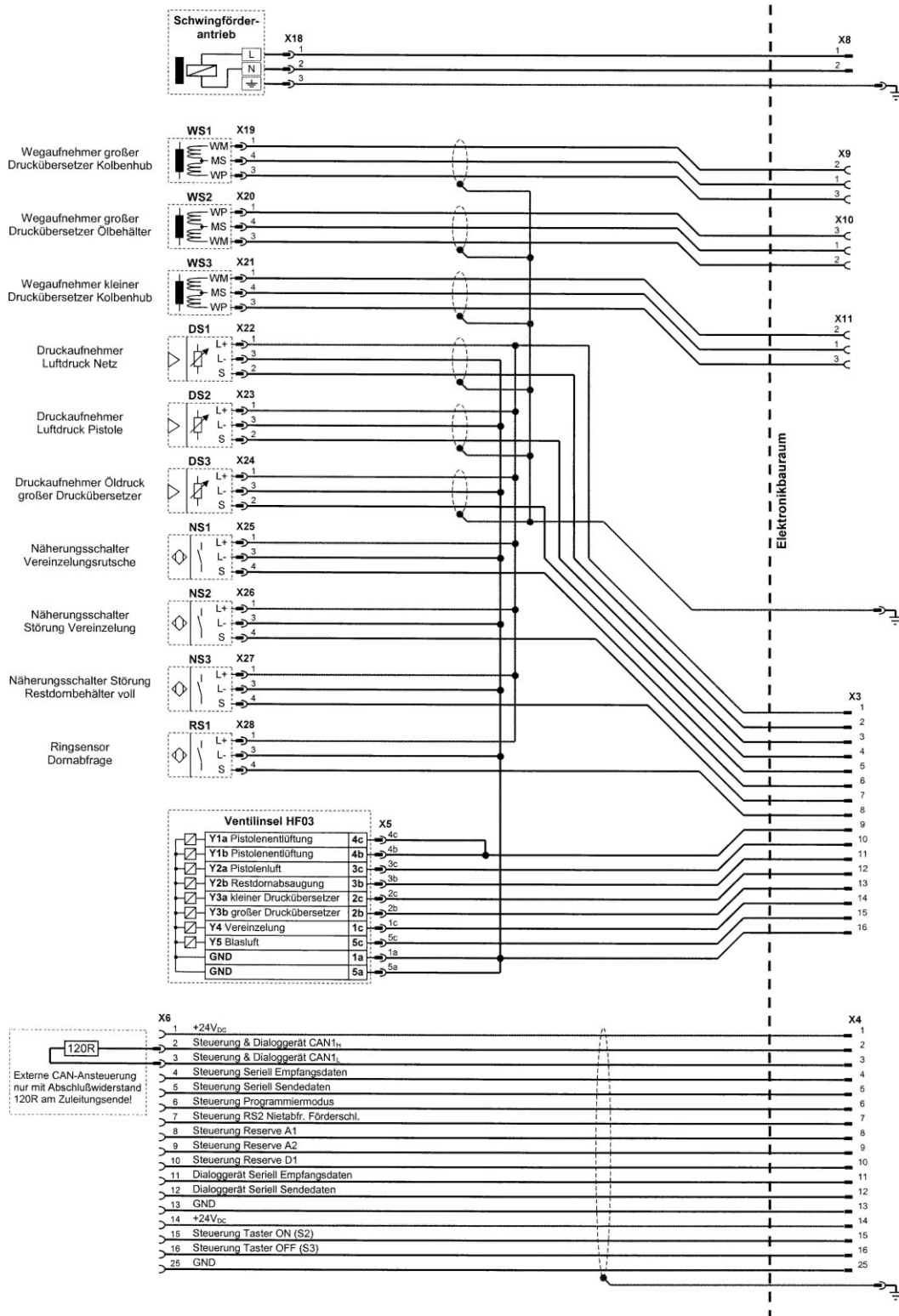


Particular care must be taken to ensure that the connector locks in correctly when reinstalling the plug connections!

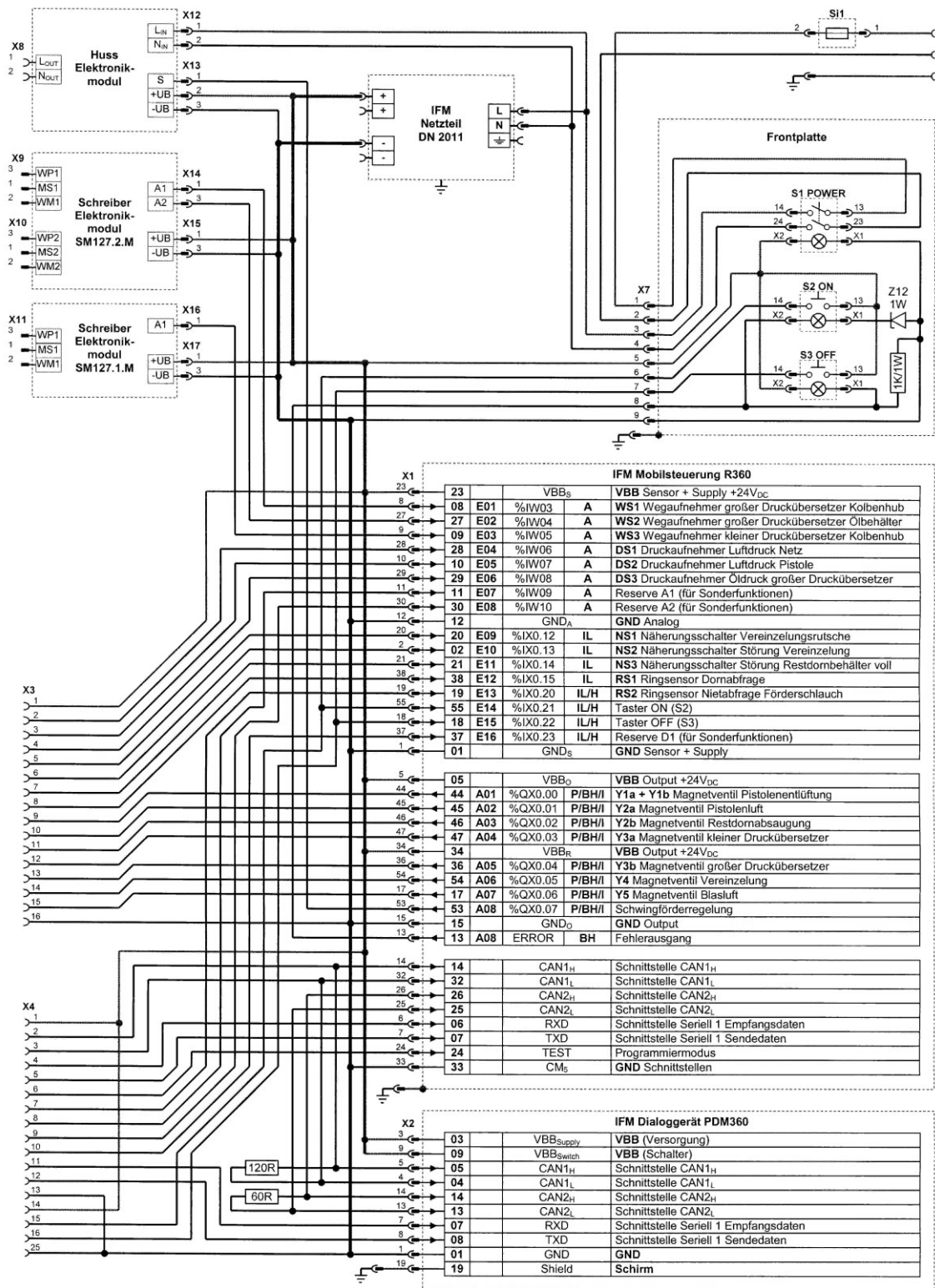
Pneumatic Circuit Diagram



Electrical Circuit Diagram



Electrical Circuit Diagram



PLC Interface

28.0 Overview

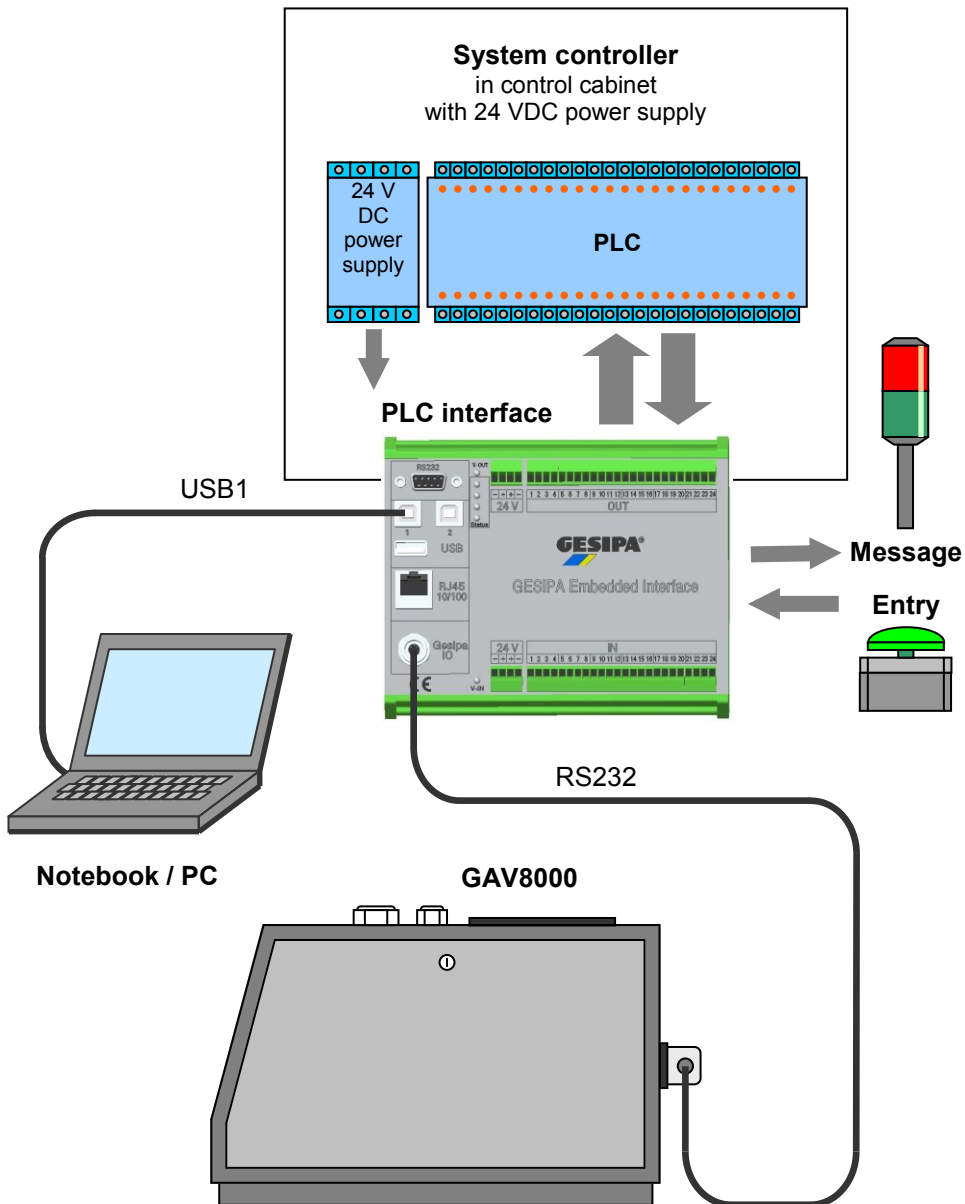


- 28.1 Technical Description**
- 28.2 PLC Interface Test**
- 28.3 PLC Activation**
- 28.4 Process Counter**
- 28.5 Profile List Selection**
- 28.6 Profile Selection (direct)**
- 28.7 Profile Selection (in steps)**
- 28.8 Process Evaluation**
- 28.9 Component Evaluation**
- 28.10 Other Functions**

PLC Interface

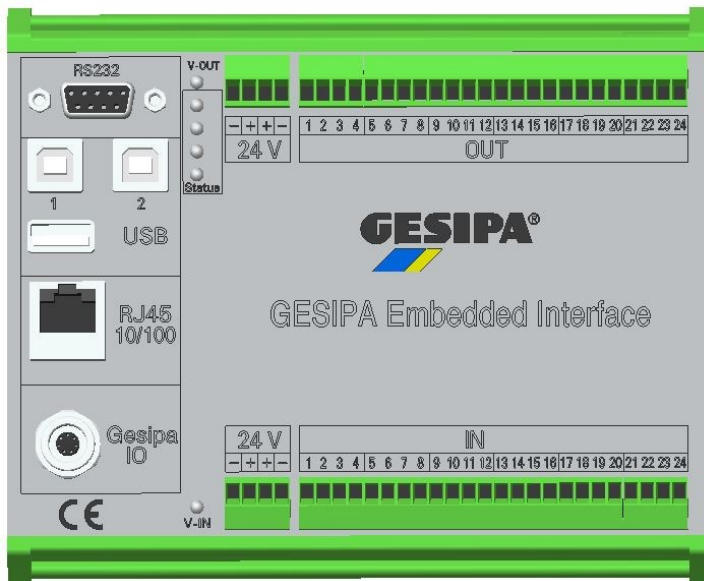
28.1 Technical Description

The PLC interface is an interface with an external PLC, an external operating and evaluation unit or with external input and signalling devices and, with suitable PC software, enables the connection of a Notebook/PC. The PLC interface is designed for installation in a control cabinet that has a 24 VDC power supply.



PLC Interface

28.1 Technical Description



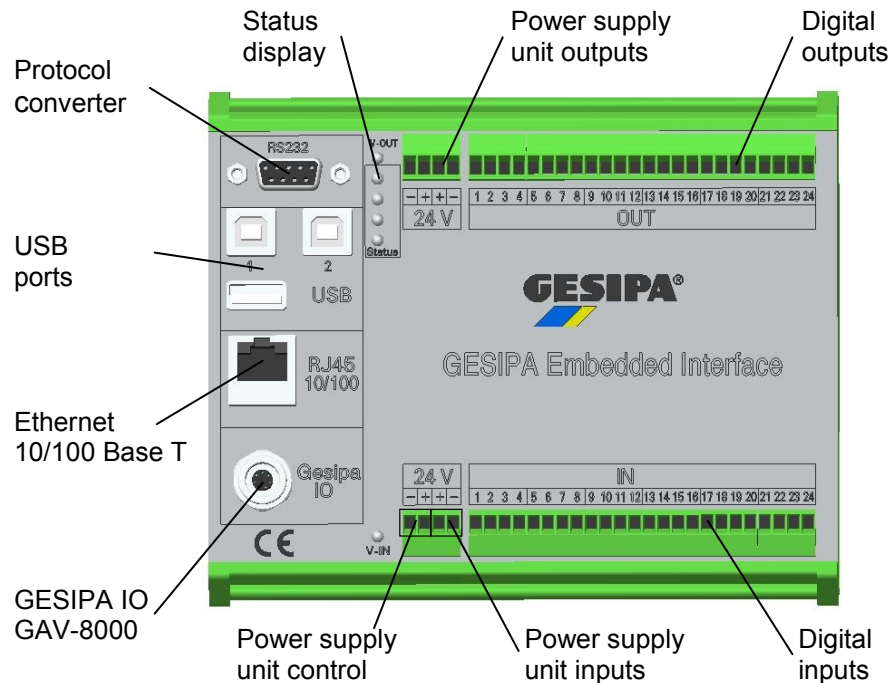
Technical data	
Dimensions	approx. 153 mm x 126 mm x 55 mm
Weight	approx. 320 g
Installation	on mounting rail as per DIN (EN 60715)
Operating voltage	24 VDC (permissible voltage range 20 - 30 VDC)
Maximum current consumption	Interface: approx. 800 mA Inputs: approx. 100 mA Outputs: depending on loads to be switched
Temperature range	permissible ambient temperature -20 °C to +70 °C
Protection class	IP 20
24 PLC inputs of which only pins 1-16 available	Switching level 1: > 8 VDC Switching level 0: < 8 VDC Input current: typ. 1.4 mA at 24 VDC - Current limitation - Overvoltage protection - Galvanic isolation
24 PLC outputs of which only pins 1-16 available	Permissible voltage range: 20 - 30 VDC Maximum switching current: 250 mA/per output at 24 VDC - Current limitation - Overheating protection - Overvoltage protection - Galvanic isolation
Interfaces	1x RS232 1x USB 2.0 Type A (PC) 2x USB Type B 1x RJ45 10/100 1x GESIPA IO (GAV)
Plug connector and connecting cable	- Connectors for power supply, inputs and outputs (included in scope of delivery) - RS232 interface cable (Part No. 719 1133)



PLC Interface

28.1 Technical Description

PLC interface connection assignments:



GAV8000 function assignments:

Zyklus Start	1		1	Zyklus Bereit	
Zyklus Rücklauf	2		2	Zyklus Hubstellung	
Nietabfr. Mundstück	3		3	Störung GAV	R1
Zyklus Start sperren	4		4	Störung Zyklus	
Zähler Start	5		5	Zähler/Teil Fertig	R2
	6		6	MAN	
Profil 1	7	E I N	7	Prozess/Teil IO	R3
Nächstes Profil	8		8	Prozess/Teil NIO	R4
Auswahl Profil	9		9	Fehlercode Bit 0	
Profilliste/Profil Bit 0	10		10	Fehlercode Bit 1	
Profilliste/Profil Bit 1	11		11	Fehlercode Bit 2	
Profilliste/Profil Bit 2	12		12	Fehlercode Bit 3	
Profilliste/Profil Bit 3	13		13		
Bewertung Teil	14		14	Wartung	R5
	15		15		R6
	16		16		

Inputs and outputs with dual function:

- Output 5 "Counter/Part Finished" signals that the set values has been reached with the "process counter" function activated or the finished part with the "profile list" activated.
- With inputs 10 to 13 "Profile List/Profile Bit 0" to "Bit 3" both profile lists (see Section 28.5 "Profile List Selection") as well as profiles with the "profile selection" (24 V) active can be selected from the active profile list (see Section 28.6 "Direct Profile Selection").
- The outputs 8 to 13 "Process/Part OK" and "NOK" can output the evaluation of the last process (see Section 28.8 "Process Evaluation") as well as the evaluation of the component (see Section 28.9 "Component Evaluation") with the "part evaluation" (24 V) input active.

PLC Interface

28.2 PLC Interface Test

The input and output assignments of the PLC interface are shown and the connection from the GAV to the interface tested in the PLC interface test menu. Communication with a connected PLC, an operating and evaluation unit or input and signalling devices can be additionally tested individually for each input and output.

Entry	Function
OFF	No test function active.
Button	Output test active, outputs 1 to 16 can be selected with the rotary knob and switched on/off with the button function.
Switch	Output test active, outputs 1 to 16 can be selected with the rotary knob and switched on/off with the switch function.
C	Outputs 1 to 16 are reset when the output test is active.

PLC interface test

Navigation:

- AUTO
- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ PLC interface test

Example:

- Input 1 "Start Cycle" is set to 1 (24 V) by a connected PLC.
- Output test **Switch** is active, output 3 "GAV Fault" was set to 1 (24) and the associated relay R1 switched.

PLC Interface

28.3 PLC Activation

SPS-Interface-Test				PLC activation
Zyklus Start	1	E I N A U S	1	Zyklus Bereit
Zyklus Rücklauf	2		2	Zyklus Hubstellung
Nietabfr. Mundstück	3		3	Störung GAV R1
Zyklus Start sperren	4		4	Störung Zyklus
Zähler Start	5		5	Zähler/Teil Fertig R2
	6		6	MAN
Profil 1	7		7	
Nächstes Profil	8		8	Prozess/Teil IO R3
Auswahl Profil	9		9	Prozess/Teil NIO R4
Profilliste/Profil Bit 0	10		10	Fehlercode Bit 0
Profilliste/Profil Bit 1	11		11	Fehlercode Bit 1
Profilliste/Profil Bit 2	12		12	Fehlercode Bit 2
Profilliste/Profil Bit 3	13		13	Fehlercode Bit 3
Bewertung Teil	14		14	
	15		15	Wartung R5
	16		16	R6

Navigation:

- AUTO
- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ PLC interface test

Zurück Aus Tast Schalt C

Preconditions:

- PLC interface connected to GAV.
- PLC connected to PLC interface.
- PLC activation active: **AUTO ▶ MAN ▶ Menu ▶ GAV Settings ▶ PLC Activation.**

Inputs:

- | | | |
|---------|--------------------------|--|
| Input 1 | "Start Cycle" | Cycle up to stroke position (process blind rivet). |
| Input 2 | "Return Cycle" | Return cycle (load new blind rivet). |
| Input 3 | "Rivet Check, Nosepiece" | Sensor for monitoring loading procedure. |

Input 3 "Rivet Check, Nosepiece" is used for operating the GAV in a fully automatic blind riveting system. A suitable sensor (24 VDC N/O contact, e.g. light barrier) must be installed in the blind riveting system such that a blind rivet loaded in the spreader nosepiece is detected with the blind riveting system in home position. The sensor signal is evaluated by the GAV controller during the loading procedure and, if necessary, sent to output 3 as "GAV Fault". This function is optional and must be activated during setup in

AUTO ▶ MAN ▶ Menu ▶ GAV Settings ▶ PLC Activation

Outputs:

- | | | |
|----------|--------------------------|--|
| Output 1 | "Cycle Ready" | GAV in home position, no fault. |
| Output 2 | "Cycle, Stroke Position" | Cycle, stroke position reached, spent mandrel evacuated. |
| Output 3 | "GAV Fault" | GAV fault. |
| Output 4 | "Cycle Fault" | Cycle stopped due to fault. |

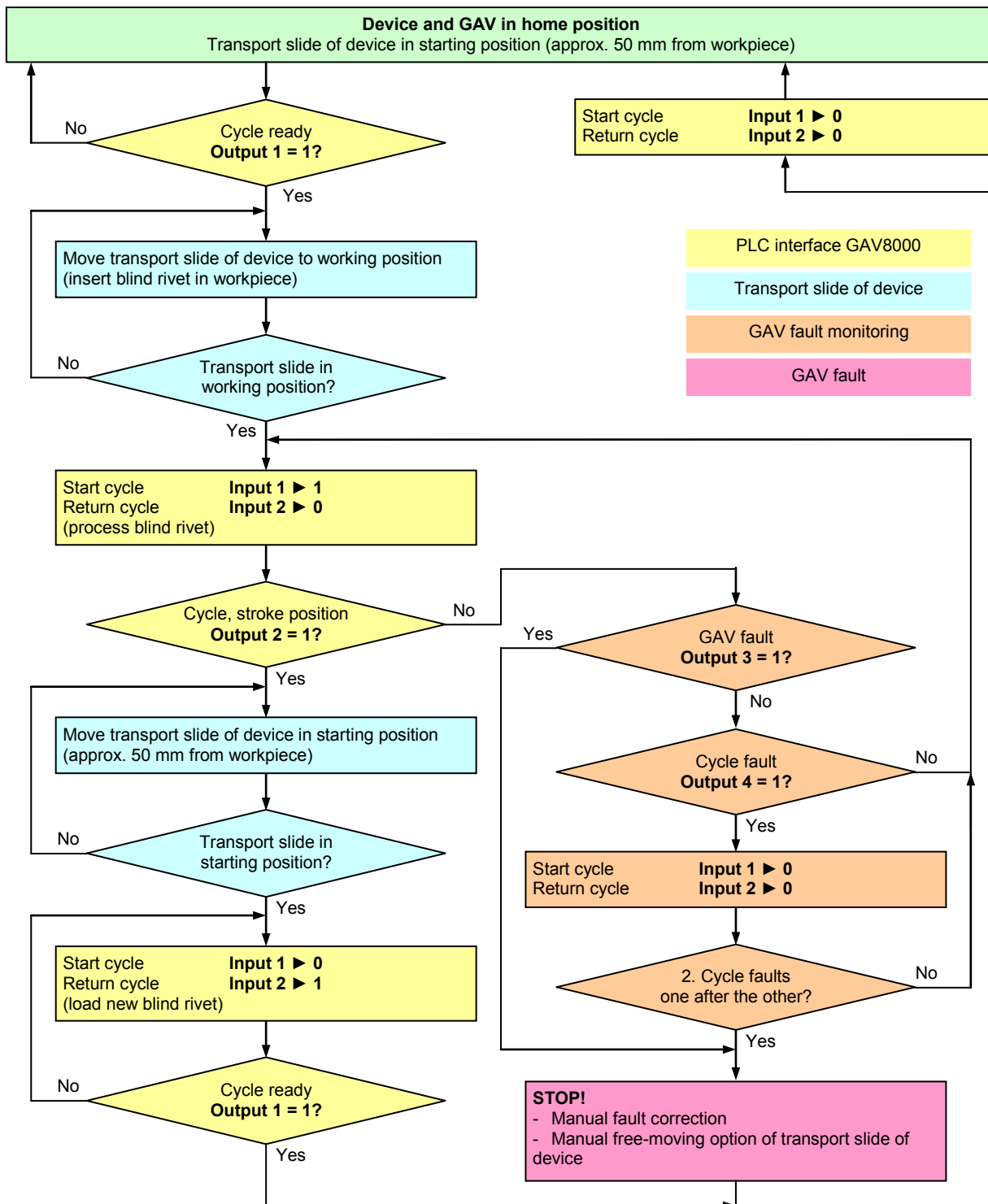
Relay:

Relay R1 is switched when output 3 "GAV Fault" is 1 (24 V).

PLC Interface

28.3 PLC Activation

The flowchart shows the typical communication of a GAV8000 with the PLC of a device via the PLC interface. Here for example, the GAV riveting gun is mounted on the transport slide of a device such that it can move axially, the slide can reach its end position in two positions, at a distance of approx. 50 mm from the workpiece and the blind rivet is inserted in the workpiece. For maintenance and troubleshooting, the transport slide should additionally feature a free-moving option so that the nosepiece area and mandrel ejection are well accessible.



PLC Interface

28.4 Process Counter

SPS-Interface-Test					
Zyklus Start	1	E I N	A U S	1	Zyklus Bereit
Zyklus Rücklauf	2			2	Zyklus Hubstellung
Nietabfr. Mundstück	3			3	Störung GAV R1
Zyklus Start sperren	4			4	Störung Zyklus
Zähler Start	5			5	Zähler/Teil Fertig R2
	6			6	MAN
Profil 1	7			7	
Nächstes Profil	8			8	Prozess/Teil IO R3
Auswahl Profil	9			9	Prozess/Teil NIO R4
Profilliste/Profil Bit 0	10			10	Fehlercode Bit 0
Profilliste/Profil Bit 1	11			11	Fehlercode Bit 1
Profilliste/Profil Bit 2	12			12	Fehlercode Bit 2
Profilliste/Profil Bit 3	13			13	Fehlercode Bit 3
Bewertung Teil	14			14	
	15			15	Wartung R5
	16			16	R6

Process Counter

Navigation:

AUTO

- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ PLC interface test

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C

Preconditions:

- PLC interface connected to GAV.
- Process counter active (see Section 13 "Process Counter").
- No profile list active (see Section 11 "Process Monitoring").

Inputs:

The counter is set to the setpoint (number of blind rivets to be processed) when the leading edge at input 5 "Start Counter" is 1 (24 V).

Outputs:

Output 5 "Counter/Part Finished" becomes 1 (24 V) when the set number of blind rivets has been processed (counter reading 0).

After reaching the set number of riveting operations, the GAV device can be stopped with a jumper from output 5 "Counter/Part Finished" to input 4 "Block Start Cycle" (see Section "Other Functions").

Relay:

Relay R2 is switched when output 5 "Counter/Part Finished" is 1 (24 V).

Example (see screen):

Output 5 "Counter/Part Finished" signals that the set number of blind rivets has been processed. The process counter must now be reset with input 5 "Start Counter" in the next step.

PLC Interface

28.5 Profile List Selection

Not in GAV-8000 eco

SPS-Interface-Test					
Zyklus Start	1	E I N A U S	1	Zyklus Bereit	
Zyklus Rücklauf	2		2	Zyklus Hubstellung	
Nietabfr. Mundstück	3		3	Störung GAV	R1
Zyklus Start sperren	4		4	Störung Zyklus	
Zähler Start	5		5	Zähler/Teil Fertig	R2
	6		6	MAN	
Profil 1	7		7		
Nächstes Profil	8		8	Prozess/Teil IO	R3
Auswahl Profil	9		9	Prozess/Teil NIO	R4
Profilliste/Profil Bit 0	10		10	Fehlercode Bit 0	
Profilliste/Profil Bit 1	11		11	Fehlercode Bit 1	
Profilliste/Profil Bit 2	12		12	Fehlercode Bit 2	
Profilliste/Profil Bit 3	13		13	Fehlercode Bit 3	
Bewertung Teil	14		14		
	15		15	Wartung	R5
	16		16		R6

Profile list selection

- Navigation:
- ▶ AUTO
 - ▶ MAN
 - ▶ Menu
 - ▶ Process monitoring
 - ▶ Profile
 - ▶ List
 - ▶ PLC
 - ▶ Test

Preconditions:

- PLC interface connected to GAV.
- Process monitoring and profile list active (see Section 11 "Process Monitoring").
- Profile lists provided for selection (see Section 11 "Process Monitoring").

Inputs:

Input 9 "Profile Selection" must be 0 (0 V). One of maximum 10 available profile lists can be selected with the inputs 10 to 13 "Profile List". The profile list last selected remains active when 0 (0000) is selected.

Einstellung Profillisten SPS			
Auswahl Profillisten von SPS-Interface			
Nr.	0123	Bezeichnung	Teil Art.-Nr.
1	1000	Modul 01	000123456789-01
2	0100	Modul 02	000123456789-02
3	1100	Modul 03	000123456789-03
4	0010	Modul 04	000123456789-04
5	1010	Modul 05	000123456789-05
6	0110	Modul 06	000123456789-06
7	1110		
8	0001		
9	1001		
10	0101		

Profile lists available for selection

- Navigation:
- ▶ AUTO
 - ▶ MAN
 - ▶ Menu
 - ▶ Process monitoring
 - ▶ Profile
 - ▶ List
 - ▶ PLC

Example (see screens):

Selection 5 (1010) at the inputs 10 to 13 "Profile List" activates the profile list "Module 05".



PLC Interface

28.7 Profile Selection, In Steps

Not in GAV-8000 eco

SPS-Interface-Test					
Zyklus Start	1	E	I	N	1 Zyklus Bereit
Zyklus Rücklauf	2				2 Zyklus Hubstellung
Nietabfr. Mundstück	3				3 Störung GAV R1
Zyklus Start sperren	4				4 Störung Zyklus
Zähler Start	5				5 Zähler/Teil Fertig R2
	6				6 MAN
Profil 1	7	A	U	S	7 Prozess/Teil IO R3
Nächstes Profil	8				8 Prozess/Teil NIO R4
Auswahl Profil	9				9 Fehlercode Bit 0
Profilliste/Profil Bit 0	10	10 Fehlercode Bit 1			
Profilliste/Profil Bit 1	11	11 Fehlercode Bit 2			
Profilliste/Profil Bit 2	12	12 Fehlercode Bit 3			
Profilliste/Profil Bit 3	13	13	14	14	14
Bewertung Teil	14	15	15	15	15
	15	16	16	16	16
	16				16

Profile selection in steps

Navigation:

AUTO

- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ PLC interface test

Zurück
Aus
Tast
Schalt
C

Preconditions:

- PLC interface connected to GAV.
- Process monitoring and profile list active (see Section 11 "Process Monitoring").

Inputs:

Input 9 "Profile Selection" must be 1 (24 V).

The first profile in the current profile list is activated for the next process with leading edge at input 7 "Profile 1" is 1 (24 V). The next profile in the current profile list is activated for the next process with leading edge at input 8 "Next Profile" is 1 (24 V). It is necessary to begin again with input 7 "Profile 1" when the end of the profile list is reached.

In this procedure, automatic step enabling within a profile list is deactivated and is used when the order of the profiles in a profile list is to be retained, step enabling however is to be controlled by an external PLC.

Example (see screen):

The first profile of the current profile list was selected for the next process with leading edge at input 7 "Profile 1".

PLC Interface

28.8 Process Evaluation

Not in GAV-8000 eco

SPS-Interface-Test

Zyklus Start	1	E I N A U S	1	Zyklus Bereit	
Zyklus Rücklauf	2		2	Zyklus Hubstellung	
Nietabfr. Mundstück	3		3	Störung GAV	R1
Zyklus Start sperren	4		4	Störung Zyklus	
Zähler Start	5		5	Zähler/Teil Fertig	R2
	6		6	MAN	
Profil 1	7		7		
Nächstes Profil	8		8	Prozess/Teil IO	R3
Auswahl Profil	9		9	Prozess/Teil NIO	R4
Profilliste/Profil Bit 0	10		10	Fehlercode Bit 0	
Profilliste/Profil Bit 1	11		11	Fehlercode Bit 1	
Profilliste/Profil Bit 2	12		12	Fehlercode Bit 2	
Profilliste/Profil Bit 3	13		13	Fehlercode Bit 3	
Bewertung Teil	14		14		
	15		15	Wartung	R5
	16		16		R6

Zurück Aus Tast Schalt C

Process evaluation

Navigation:

- AUTO
- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ PLC interface test

Preconditions:

- PLC interface connected to GAV.
- Process monitoring active (see Section 11 "Process Monitoring").

Inputs:

Input 9 "Profile Selection" and input 14 "Part Evaluation" must be 0 (0 V).

Outputs:

- Output 8 "Process IO" evaluation, output 9 "Process NOK" evaluation and the outputs 10 to 13 "Error Code" are set to 0 (0 V) at the beginning of each process.
- At the end of each process the evaluation "Process OK" is output at output 8 or "Process NOK" at output 9 with 1 (24 V). The error code for "Process NOK" evaluation is output at outputs 10 to 13.

Error code (outputs 10 to 13)						
Code	Break-off force	Break-off displacement	Bit 0	Bit 1	Bit 2	Bit 3
0	OK	OK	0	0	0	0
A	Overshot	OK	1	0	0	0
B	Overshot	Overshot	0	1	0	0
C	OK	Overshot	1	1	0	0
D	Undershot	Overshot	0	0	1	0
E	Undershot	OK	1	0	1	0
F	Undershot	Undershot	0	1	1	0
G	OK	Undershot	1	1	1	0
H	Overshot	Undershot	0	0	0	1
9	No measured values		1	0	0	1
10	Monitoring ready		0	1	0	1

H	A	B
G	0	C
F	E	D

Relay:

Relay R3 is switched when output 8 "Part OK" evaluation is 1 (24 V).
 Relay R4 is switched when output 9 "Part NOK" evaluation is 1 (24 V).

Example (see screen):

"Process NOK" evaluation, error code 6 "Break-off force and break-off displacement undershot".



PLC Interface

28.9 Component Evaluation

Not in GAV-8000 eco

SPS-Interface-Test					
Zyklus Start	1			1	Zyklus Bereit
Zyklus Rücklauf	2			2	Zyklus Hubstellung
Nietabfr. Mundstück	3			3	Störung GAV R1
Zyklus Start sperren	4			4	Störung Zyklus
Zähler Start	5			5	Zähler/Teil Fertig R2
	6			6	MAN
Profil 1	7			7	
Nächstes Profil	8			8	Prozess/Teil IO R3
Auswahl Profil	9			9	Prozess/Teil NIO R4
Profilliste/Profil Bit 0	10			10	Fehlercode Bit 0
Profilliste/Profil Bit 1	11			11	Fehlercode Bit 1
Profilliste/Profil Bit 2	12			12	Fehlercode Bit 2
Profilliste/Profil Bit 3	13			13	Fehlercode Bit 3
Bewertung Teil	14			14	
	15			15	Wartung R5
	16			16	R6

Zurück
Aus
Tast
Schalt
C

Component evaluation

Navigation:

- ▶ AUTO
- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ PLC interface test

Preconditions:

- PLC interface connected to GAV.
- Process monitoring active (see Section 11 "Process Monitoring").
- Profile list active (see Section 11 "Process Monitoring").

Inputs:

Input 9 "Profile Selection" must be 0 (0 V) and input 14 "Part Evaluation" must be 1 (24 V).

Outputs:

- Output 8 "Part OK" evaluation is set to 1 (24 V), output 9 "Part NOK" evaluation to 0 (0 V) and output 5 "Part Finished" to 0 (0 V) at the beginning of the first process (first profile in profile list).
- If a fault occurs during blind rivet processing, output 8 "Part OK" evaluation is set to 0 (0 V) and output 9 "Part NOK" evaluation to 1 (24 V).
- Output 5 "Part Finished" is set to 1 (24 V) at the end of the last process (last profile in profile list) and on reaching home position.

The outputs error code 10 to 13 are 0 (0 V). The error code always refers to the evaluation of a process and is not output while the component is being evaluated.

Relay:

Relay R2 is switched when output 5 "Part Finished" is 1 (24 V).
 Relay R3 is switched when output 8 "Part OK" evaluation is 1 (24 V).
 Relay R4 is switched when output 9 "Part NOK" evaluation is 1 (24 V).

Example (see screen):

Message "Part Finished", "Part NOK" evaluation, no error code.

PLC Interface

28.10 Other Functions

SPS-Interface-Test					
Zyklus Start	1	E I N A U S	1	Zyklus Bereit	
Zyklus Rücklauf	2		2	Zyklus Hubstellung	
Nietabfr. Mundstück	3		3	Störung GAV	R1
Zyklus Start sperren	4		4	Störung Zyklus	
Zähler Start	5		5	Zähler/Teil Fertig	R2
	6		6	MAN	
Profil 1	7		7	Prozess/Teil IO	R3
Nächstes Profil	8		8	Prozess/Teil NIO	R4
Auswahl Profil	9		9	Fehlercode Bit 0	
Profilliste/Profil Bit 0	10		10	Fehlercode Bit 1	
Profilliste/Profil Bit 1	11		11	Fehlercode Bit 2	
Profilliste/Profil Bit 2	12		12	Fehlercode Bit 3	
Profilliste/Profil Bit 3	13		13		
Bewertung Teil	14		14		
	15		15	Wartung	R5
	16		16		R6

Other functions

Navigation:
 AUTO
 ▶ MAN
 ▶ Menu
 ▶ GAV settings
 ▶ PLC interface test

Zurück Aus Tast Schalt C

Inputs:

Input 4 "Block Start Cycle".

With input 4 "Block Start Cycle" is 1 (24 V), all triggering options (hand, foot, PLC, etc.) can be blocked in "AUTO" mode (automatic).

Outputs:

Output 6 "MAN".

Output 6 "MAN" is 1 (24 V) indicates that GAV8000 is in "MAN" mode (manual operation, set-up, troubleshooting, maintenance, etc.).

Output 15 "Maintenance".

Output 15 "Maintenance" is 1 (24 V) indicates that maintenance work is required for GAV8000 (see Section 10 "Maintenance").

Relay:

Relay R5 is switched when output 15 "Maintenance" is 1 (24 V).

Displacement sensor (WS1) teach-in

29.0 Defining measuring range at displacement sensor

Note on teach-in procedure:

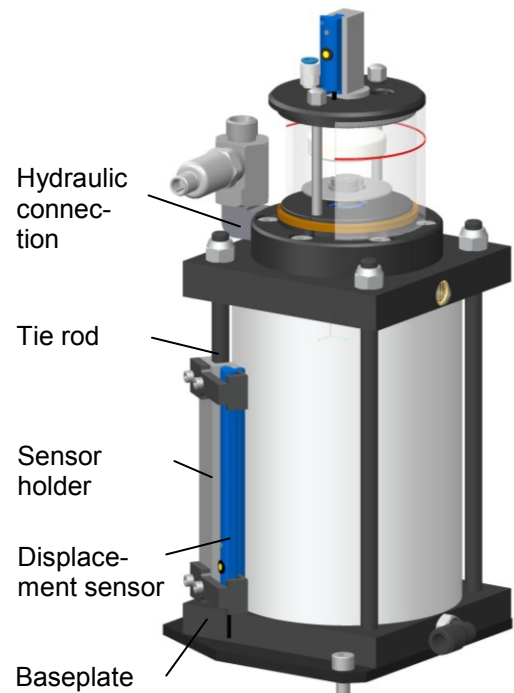
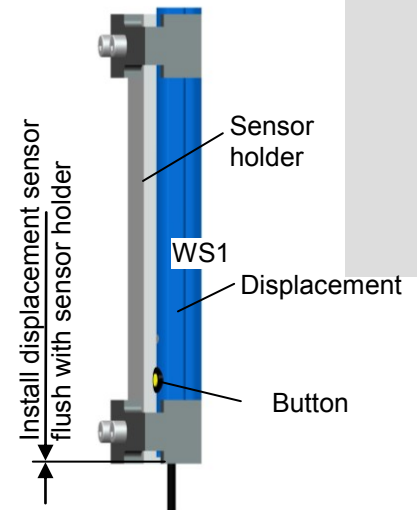
The teach-in procedure for the displacement sensor serves the purpose of setting a precisely predefined measuring range at the large pressure booster of the GAV 8000. The procedure precisely sets the start and end points (= measuring range). Teach-in of the measuring range is important in order to avoid faults and malfunctions as the control software of the GAV 8000 evaluates the measured values of the displacement sensor and refers them to predefined, programmed values.

Quick guide:

- The measuring range must be taught in at the displacement sensor WS1.
- The displacement sensor WS2 on the large pressure booster and displacement sensor WS3 on the small pressure booster are not taught in. They remain set to the factory setting. For safety reasons, the calibration must be checked and reset to the factory setting if necessary (see "Resetting to factory setting").

Adjustment:

- The displacement sensor (WS1) teach-in procedure must be carried out at the large pressure booster in the GAV supply unit.
- Assemble the displacement sensor with the cable end facing downward flush with the bottom face of the sensor holder outside the supply unit and secure.
- Plug the displacement sensor into the socket of the wiring harness at the supply unit. Switch on supply unit, operating voltage is now supplied to the displacement sensor.
- Select "Calibration WS1, large pressure booster calibration" on the display (see Section 9 "GAV Settings - Large Pressure Booster").
- Press the sensor holder with the cable end facing downward onto the right-hand tie rod, as viewed from the hydraulic connection.



Displacement sensor (WS1) teach-in

29.0 Defining measuring range at displacement sensor

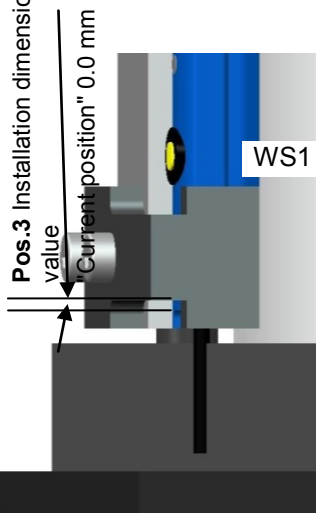
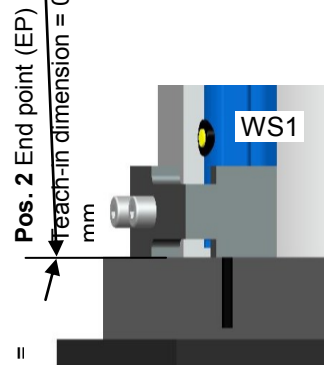
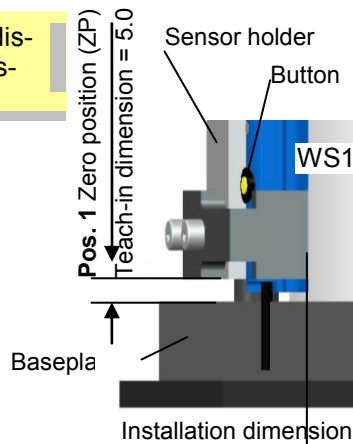
During each step in the further procedure, the long side of the displacement sensor must rest against the cylinder wall of the pressure booster.

- Align the bottom of the sensor holder unit with the top of the baseplate with a gap of 5.0 mm (use shim if necessary) (see Pos. 1).
- Keep the yellow button on the displacement sensor pressed until the LED flashes. Release the yellow button; the zero point is stored.
- With the LED still flashing, fit the sensor holder unit onto the top of the baseplate (remove shim if necessary) (see Pos. 2).
- Press **"Stroke" button F4** on the display (piston in pressure booster moves up), press yellow button on the displacement sensor again until the flashing LED switches to steady light. The end position is now stored and the measuring range of the displacement sensor set.
- Press the **"Stroke" button F4** again on the display, the piston in the pressure booster moves back into its initial position.
- To set the installation dimension, the sensor holder unit must be moved upward until 0.00 mm is shown for the "Current Position" on the display. Now secure the sensor holder in this position (Pos. 3).

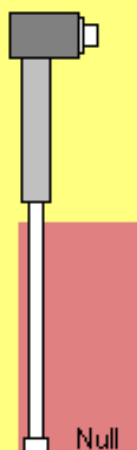
If the adjustment procedure is not completed, a timeout will take place after 90 s and the measuring range last stored will be active. Readjustment will be required and the teach-in procedure must be repeated.

Resetting to factory setting:

- Keep the yellow button on the displacement sensor pressed for > 5 s until the LED lights continuously. This resets the displacement sensor to the factory setting (= max. possible measuring range).



Kalibrierung WS1 grosser Druckübersetzer



Kalibrierung WS1

Signaltyp	0-10 V
Messbereich 0 bis	100 mm
Nullpunkt bei	3.0 mm

Aktuelle Position

0.0 mm

Zurück
Strd
Zyklus
Hub

Navigation:

- AUTO
- ▶ MAN
- ▶ Menu
- ▶ GAV settings
- ▶ Large pressure booster
- ▶ Cal

←
GESIPA code



Automatic Blind Riveting Unit

GAV electronic

Model 8000

Model 8000 eco

Spare Parts and Accessories



GESIPA Blindniettechnik GmbH
Nordendstraße 13-39
64546 Mörfelden-Walldorf
Germany

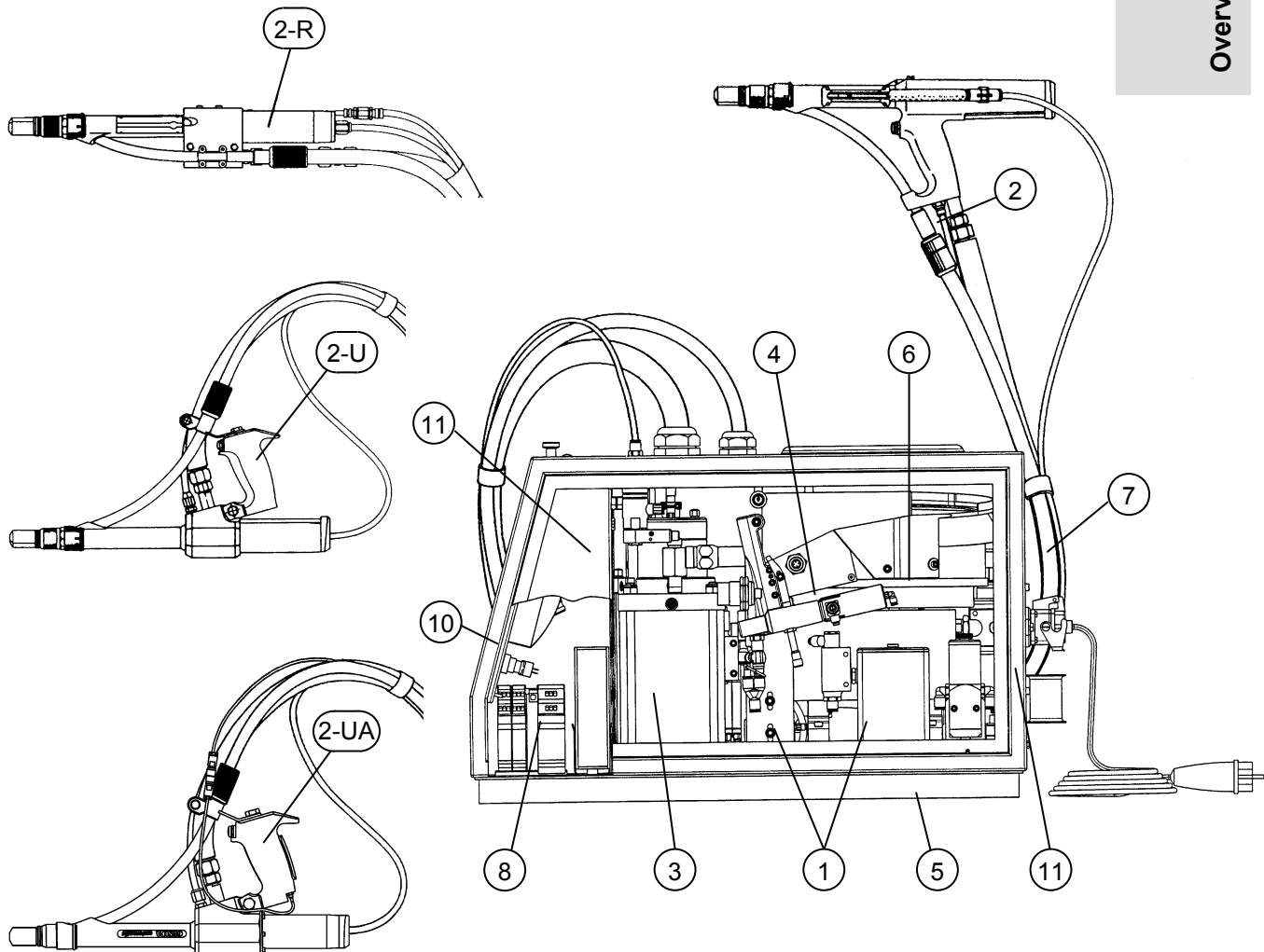
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Spare Parts

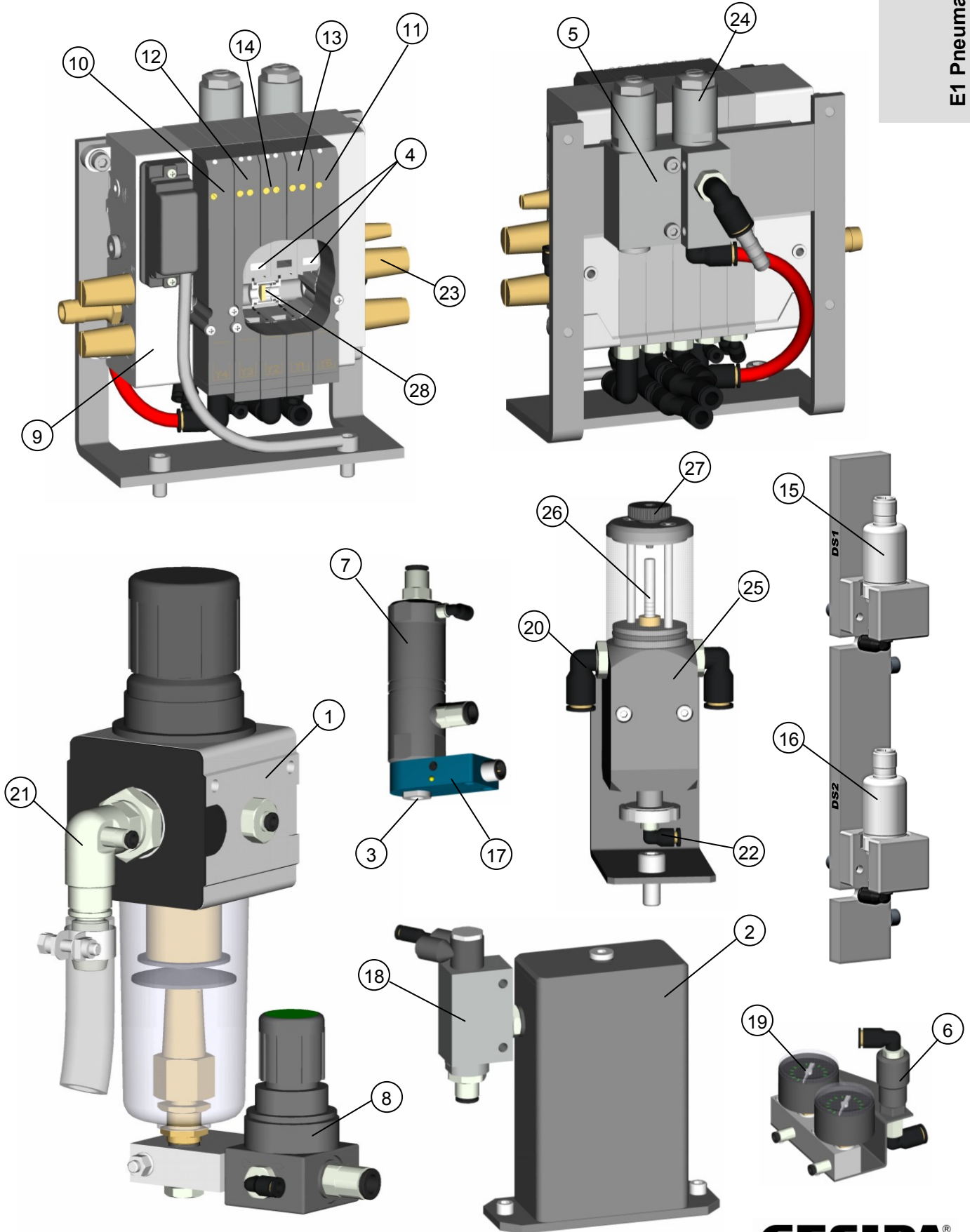
Overview of Assemblies



Assembly No.	Description	Page
1	Pneumatics control block	3 - 4
2	Blind riveting gun, Standard	5 - 11
2-R	Robotic	5-R - 11-R
2-U	Overhead	5-U - 11-U
2-UA	Overhead with spring-loaded trigger	5-UA - 11-UA
3	Hydraulic booster unit	12 - 13
4	Separator	14
5	Housing unit	15
6	Vibration feed unit	16
7	Supply line assembly	17
8	Electronic controller unit	18
9	Accessories	19 - 20
10	Front panel	21
11	Wiring harness	22 - 23

Spare Parts

E1 Pneumatics Assembly



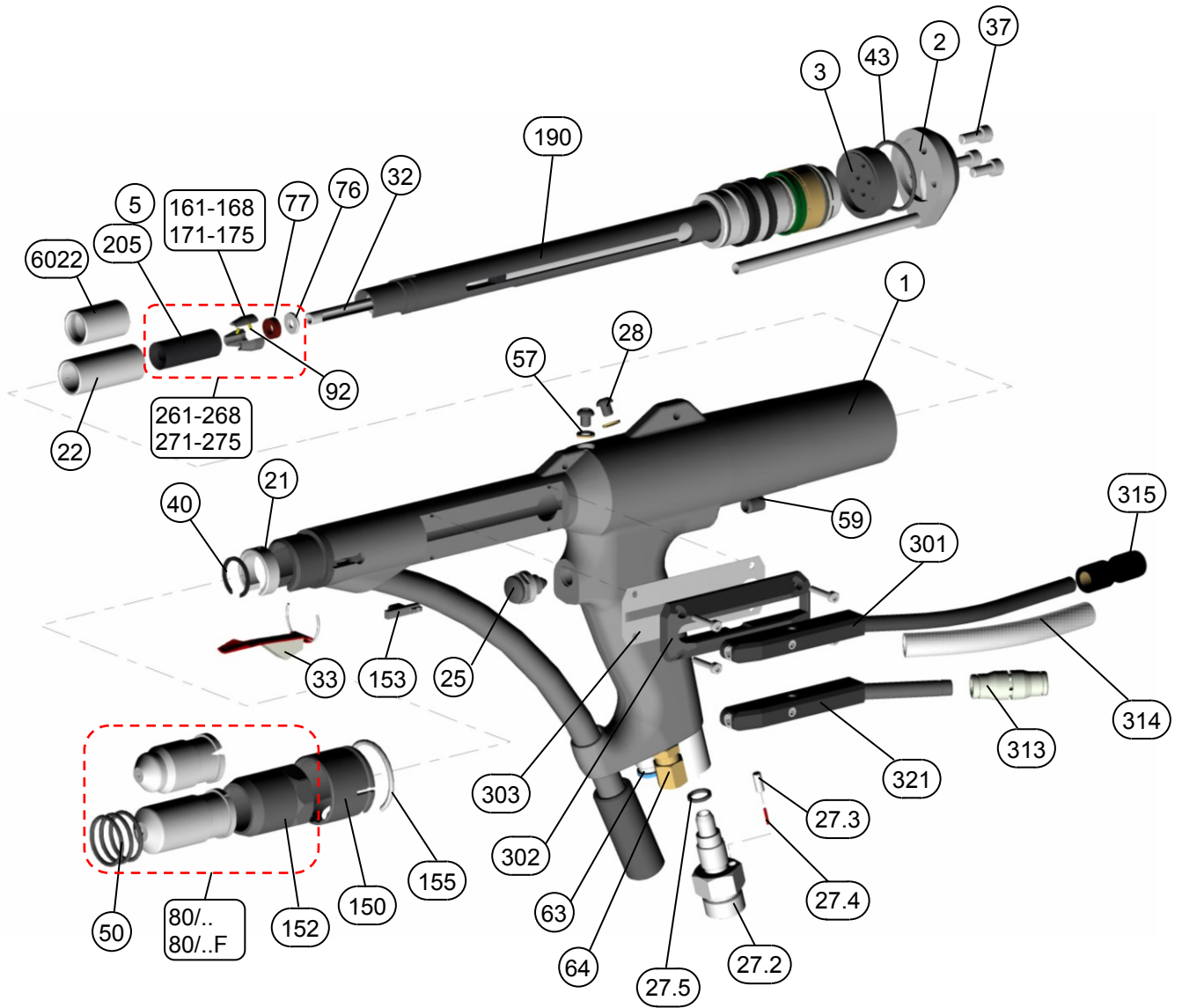
Spare Parts

E1 Pneumatics Assembly

Item	Part No.	Description
1	1456899	Maintenance unit (without Item 8)
2	1434521	Pressure reservoir (without Item 18)
3	1434524	Banjo bolt
4	7191112	Sealing plate
5	1434672	Dual vent valve
-	1462875	Set of seals for Item 5 (2x)
6	1456907	Blow air throttle
7	1456938	Vacuum head (without Item 17)
-	1456863	Vacuum head - set of wearing parts
8	1445523	Pressure control valve
9	1456886	Valve terminal assy
10	1462865	5/2 changeover valve AR Y4
11	1462865	5/2 changeover valve AR Y5
12	1462866	3/2 dual valve GR Y3
13	1462866	3/2 dual valve GR Y1
14	1462867	3/2 dual valve IR Y2
15	1445480	Pressure sensor DS1
16	1445480	Pressure sensor DS2
17	1445481	Ring sensor
18	1445722	Quick-action vent valve
19	1445411	Pressure gauge (2x)
20	1445656	Angle threaded connection
21	1446566	Angle threaded connection assy
22	1445586	Angle threaded connection
23	1445461	Silencer
24	1445626	Throttle silencer
25	1457063	Piston dispenser assy
26	1436711	Piston rod assy
27	1456844	Screw plug assy
28	7191119	Non-return valve assy

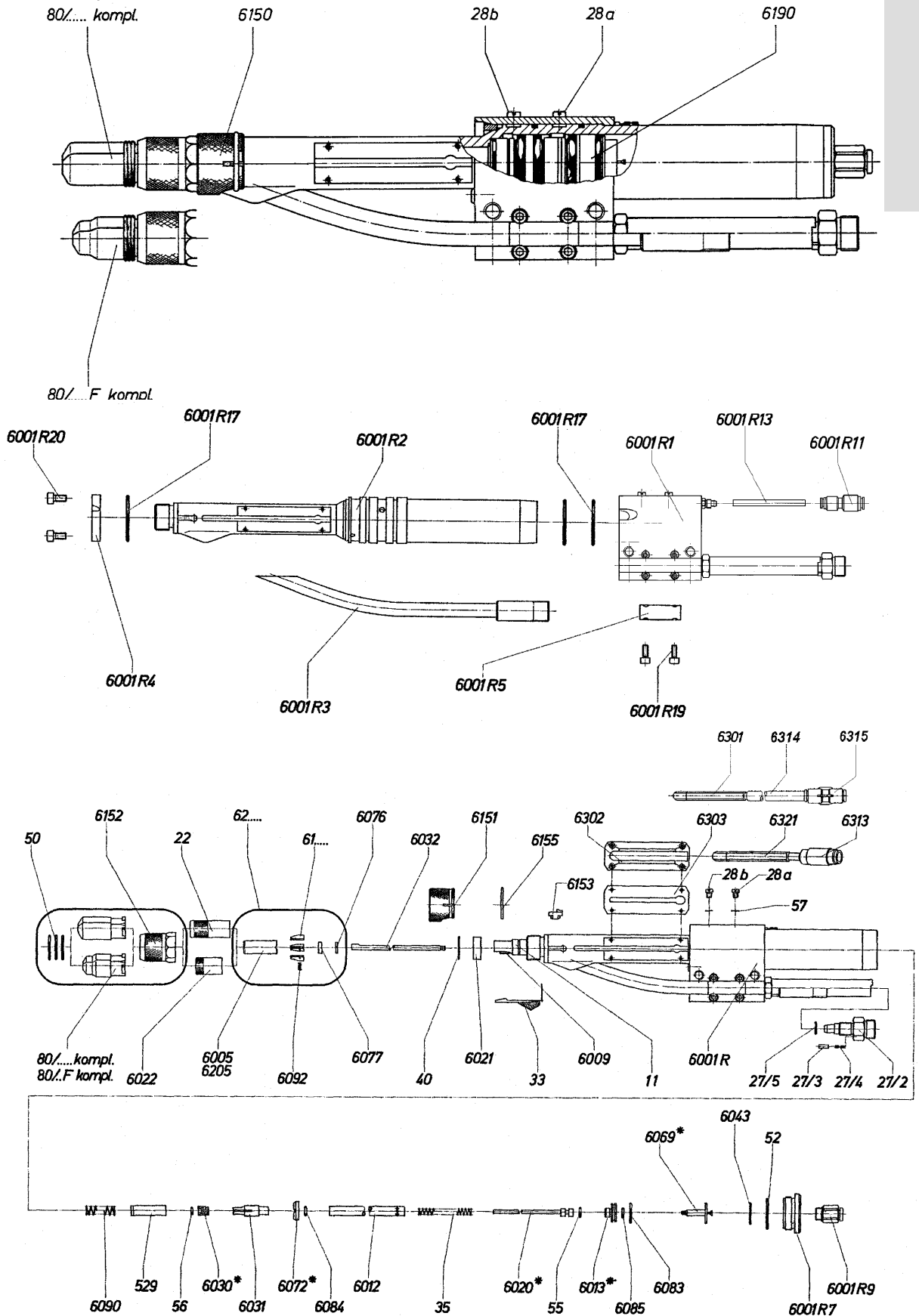
Spare Parts

E2 Blind Riveting Gun



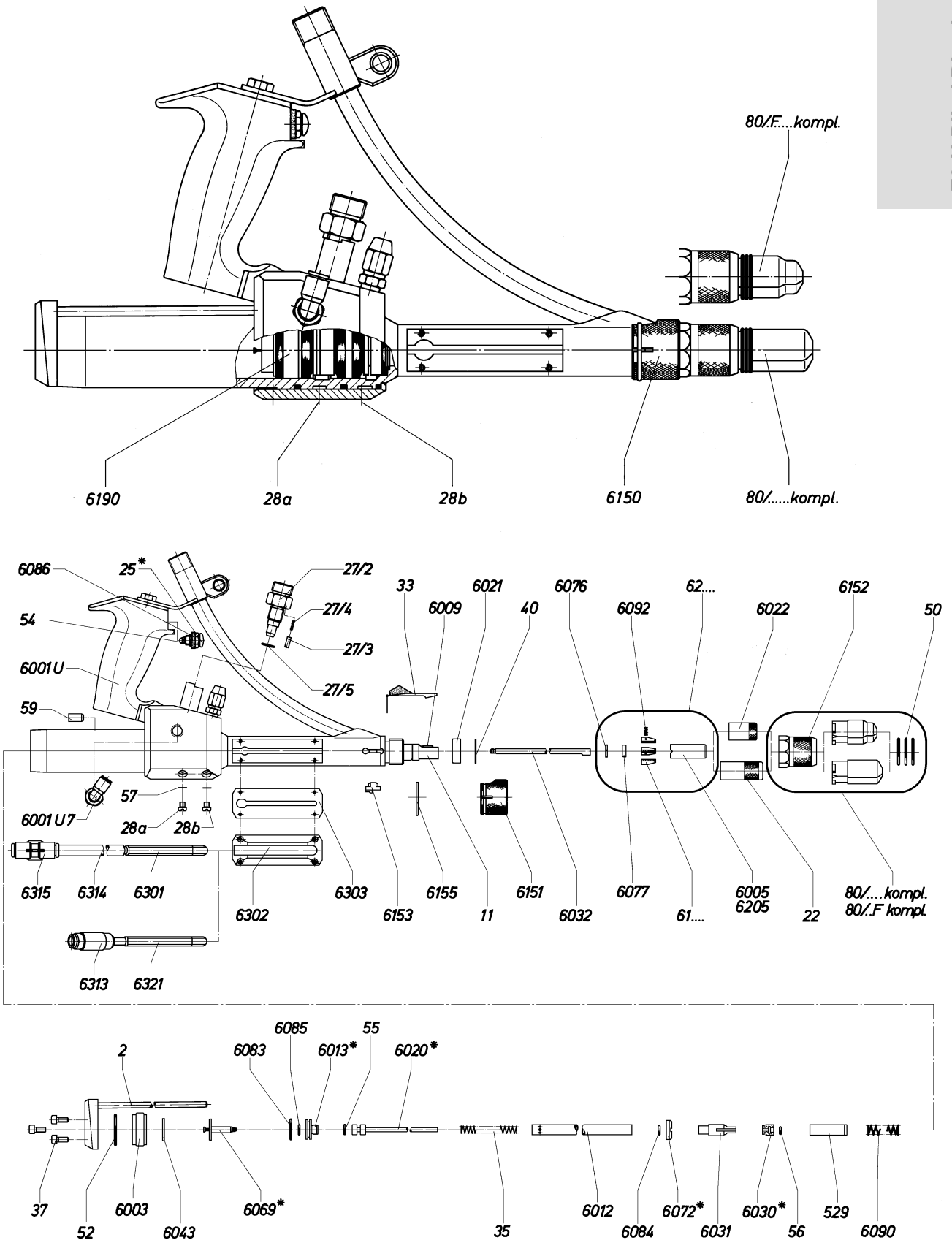
Spare Parts

E2-R Blind Riveting Gun Robotic



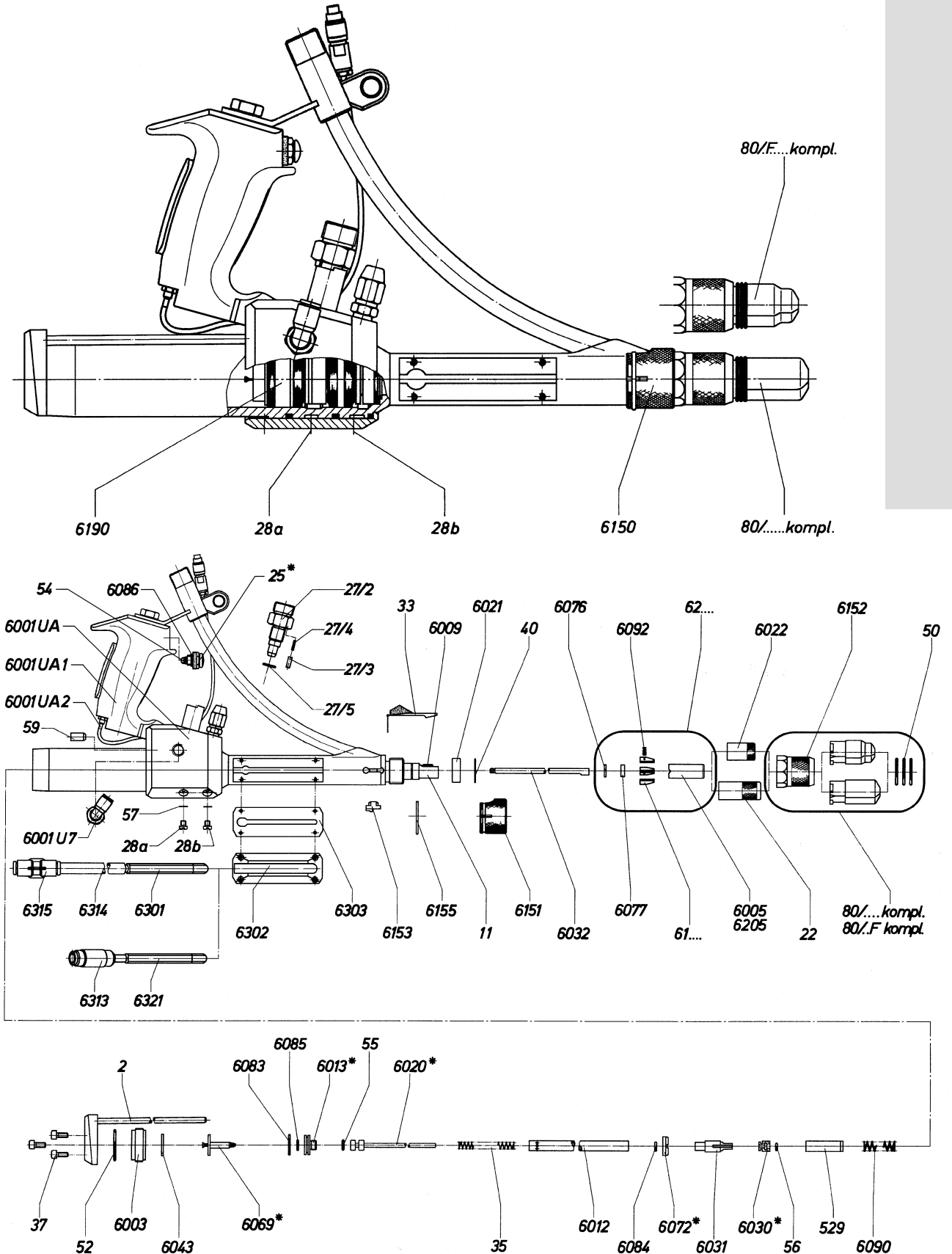
Spare Parts

E2-U Blind Riveting Gun Overhead



Spare Parts

E2-UA Blind Riveting Gun Overhead with Spring-Loaded Trigger



T Only available as assembly

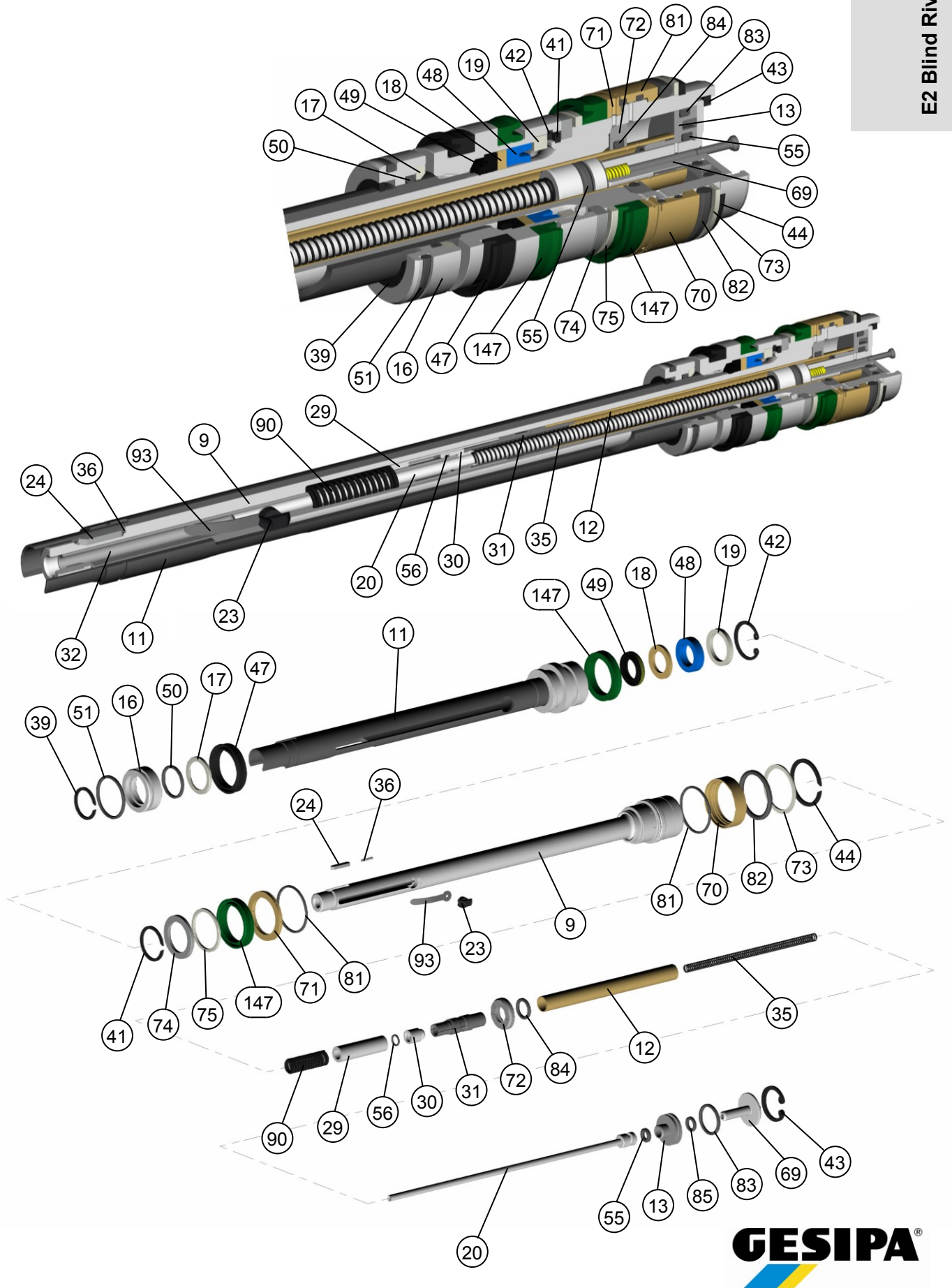


Spare Parts

E2 Blind Riveting Gun

E2

E2 Blind Riveting Gun

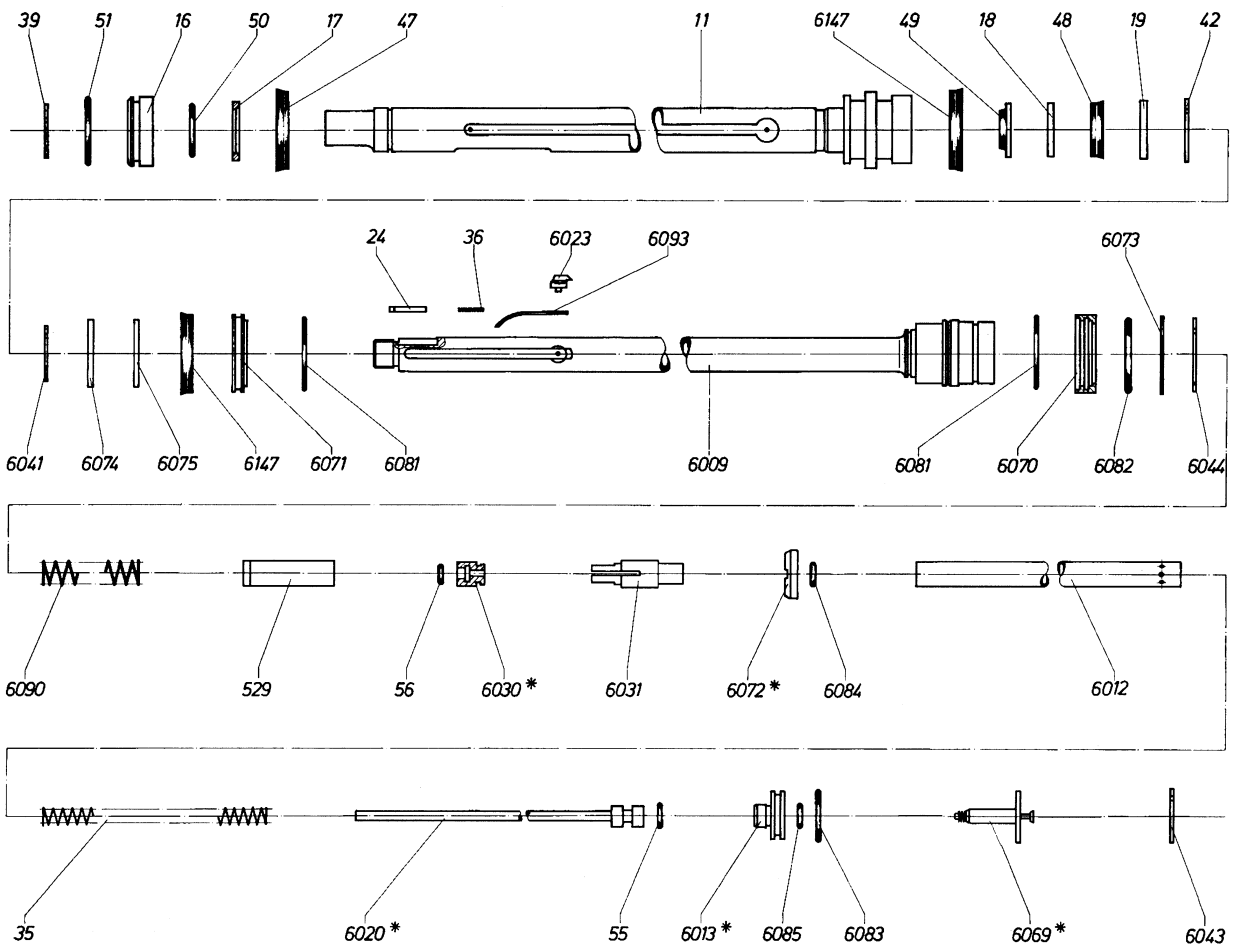
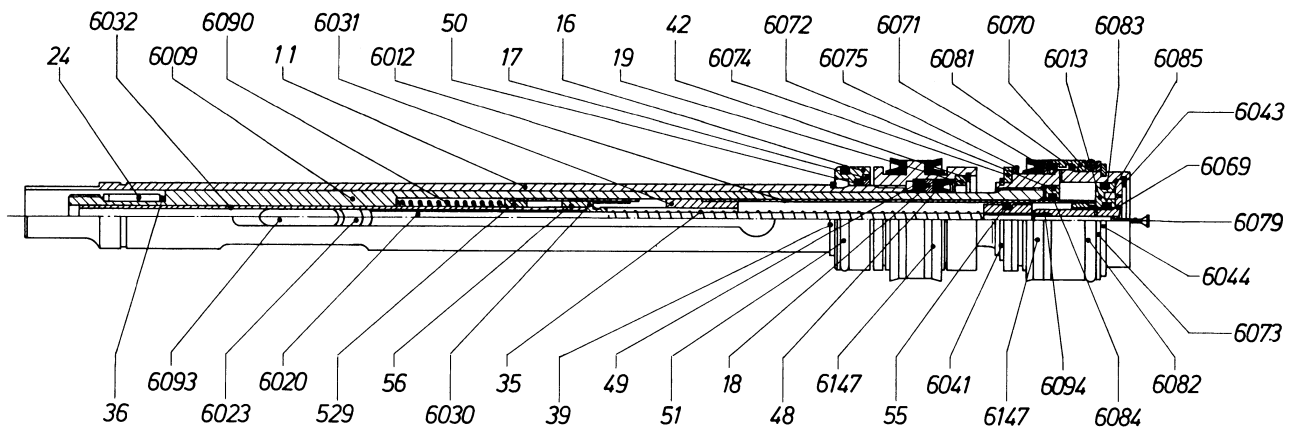


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Spare Parts

E2-UA Blind Riveting Gun Overhead with Spring-Loaded Trigger

E2-UA Blind Riveting Gun Overhead with Spring-Loaded Trigger

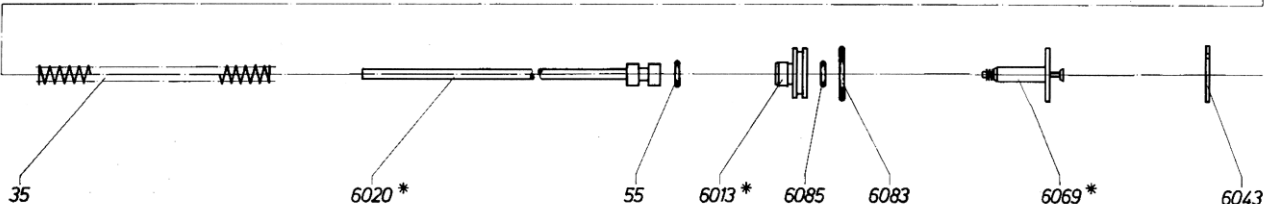
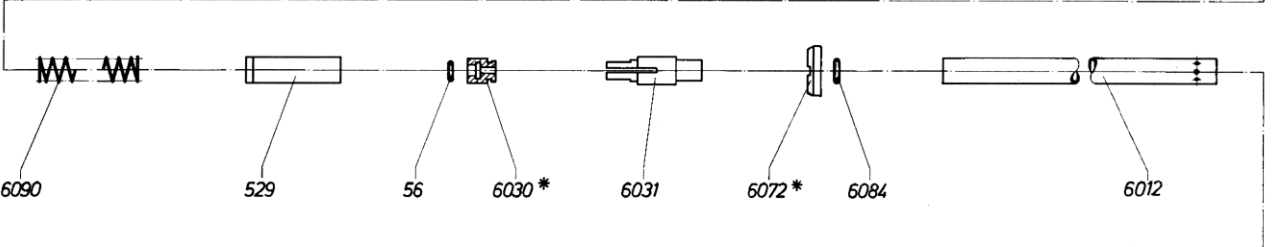
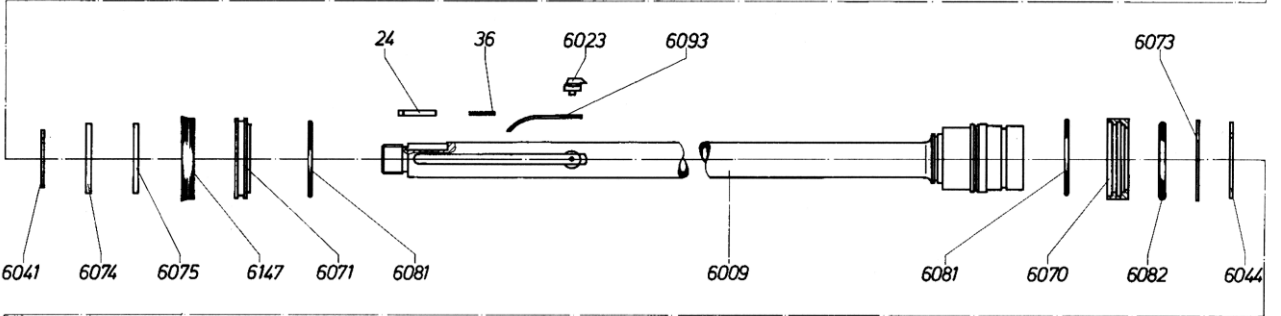
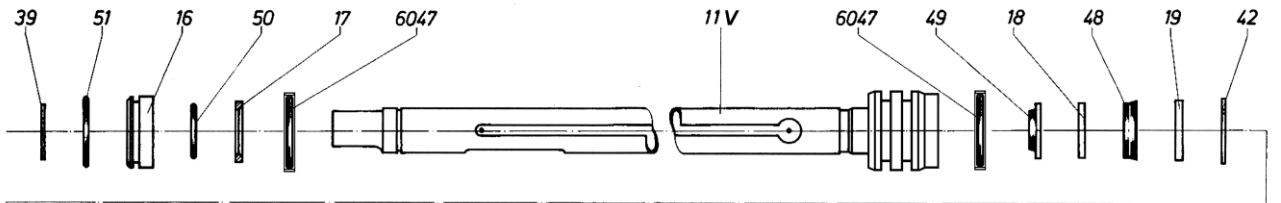
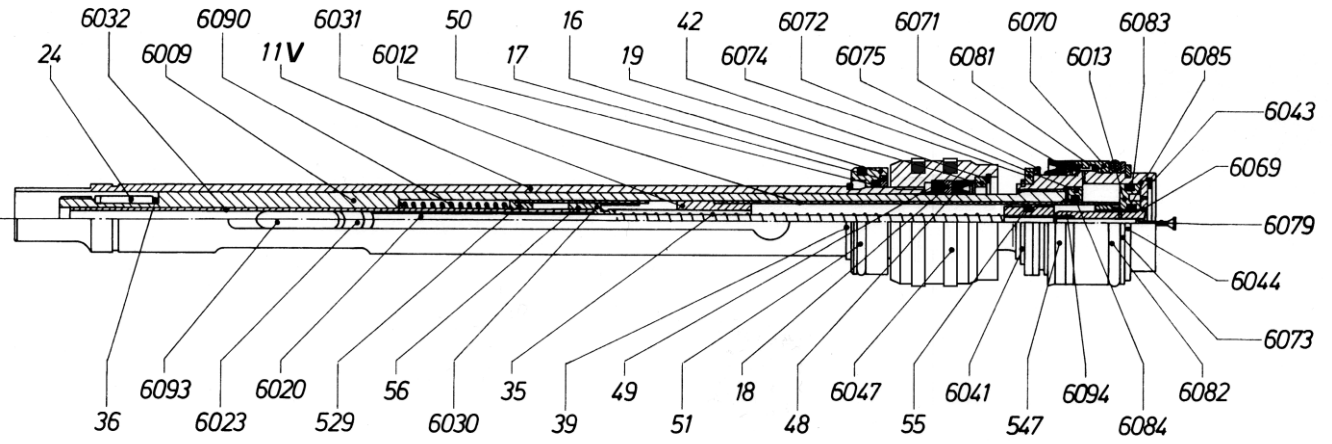


T Only available as assembly



Spare Parts

E2-V Blind Riveting Gun, Reinforced



* Nur als Baugruppe lieferbar



Spare Parts

E2 Blind Riveting Gun

Item	Component No.	Part No.	Description
0	2-6000	1434742	Blind riveting gun assy
1	2-6001	1456875	Housing assy
2	2-0002	1434557	Cover
3	2-6003	1434495	Threaded plug
205	2-6205	1434737	Jaw housing 36° (identification: 1 ring)
5	2-6005	1434535	Jaw housing 28° (identification: 2 rings)
9 •	2-6009	1456909	Lock activator assy
10	2-6010	1457004	Lock activator assy, assembled
11	2-0011	1456928	Closing tube assy
11.1		1457075	Closing tube assy, assembled
12 •	2-6012	1434494	Cylinder sleeve
13 • *	2-6013	1456874	Reset piston assy with component No. 6083 + 6085
16	2-0016	1434587	Casing ring
17 °	2-0017	1434588	Washer
18	2-0018	1434589	Washer
19	2-0019	1434590	Washer
20 • *	2-6020	1456910	Stop piston assy with component No. 2-55
20.1 *	2-6020.1	1456919	Stop piston assy with component No. 2-55, extended by 4 mm
21	2-6021	1434517	Stop ring
22	2-0022	1434591	Closing sleeve
6022	2-6022	1456917	Closing sleeve for spreader nosepiece 2-80/F
23 •	2-6023	1434525	Feather key
24 •	2-0024	1434592	Slide
25 *	2-0025	1457034	Actuator assy
27.2	2-0027.2	1434593	Coupling piece
27.3	2-0027.3	1434549	Pin
27.4	2-0027.4	1445505	Compression spring
27.5 °	2-0027.5	1434677	O-ring 8.5 x 2
28	2-0028	1434594	Bleeder screw (2x)
529 •	2-0529	1434595	Sleeve
30 * •	2-6030	1456866	Driver bush assy with component No. 2-56
31 •	2-6031	1434490	Stop bush
31.1	2-6031.1	1434741	Stop bush, shortened by 2 mm
<ul style="list-style-type: none"> • Included in lock activator assy No. 10 * Only available as assembly ° Included in set of seals No. 191 			

Spare Parts

E2-R Blind Riveting Gun Robotic

<u>Part No.</u>	<u>Component No.</u>	<u>Description</u>
1434536	GAV 2 - 6000R	Blind riveting gun assy
1457003	GAV 2 - 6000R/1	Set of seals
1456999	GAV 2 - 6001R 1	Casing
1457000	GAV 2 - 6001R 2	Housing
1457001	GAV 2 - 6001R 3	Pipe elbow
1434660	GAV 2 - 6001R 4	Clamping ring
1434661	GAV 2 - 6001R 5	Pipe clamp
1457002	GAV 2 - 6001R 7	Cover
1445657	GAV 2 - 6001R 9	Straight screw connection
1457062	GAV 2 - 6001R 11	Reducer
1445604	GAV 2 - 6001R 13	Plastic hose
1434663	GAV 2 - 6001R 17 °	O-ring 40x2.5 (3x)
1445506	GAV 2 - 6001R 19	Hexagon socket head cap screw M5x12
1445563	GAV 2 - 6001R 20	Hexagon socket head cap screw M6x12
1434737	GAV 2 - 6205	Jaw housing 36° (identification: 1 ring)
1434535	GAV 2 - 6005	Jaw housing 28° (identification: 2 rings)
1456909	GAV 2 - 6009 •	Lock activator assy
1457004	GAV 2 - 6010	Lock activator assy, assembled
1456928	GAV 2 - 11	Closing tube assy
1457075	GAV 2 - 11.1	Closing tube assy, assembled
1434494	GAV 2 - 6012 •	Cylinder sleeve
1456874	GAV 2 - 6013 * •	Reset piston assy with component No. 6083 + 6085
1434587	GAV 2 - 16	Casing ring
1434588	GAV 2 - 17 °	Washer
1434589	GAV 2 - 18	Washer
1434590	GAV 2 - 19	Washer
1456910	GAV 2 - 6020 * •	Stop piston assy with component No. 55
1456919	GAV 2 - 6020.1*	Stop piston assy with component No. 2-55 extended by 4 mm
1434517	GAV 2 - 6021	Stop ring
1434591	GAV 2 - 22	Closing sleeve
1456917	GAV 2 - 6022	Closing sleeve F for spreader nosepiece 2-80/F
1434525	GAV 2 - 6023 •	Feather key
1434592	GAV 2 - 24 •	Slide
1434593	GAV 2 - 27/2	Coupling piece
1434549	GAV 2 - 27/3	Pin
1445505	GAV 2 - 27/4	Compression spring
1434677	GAV 2 - 27/5 °	O-ring 8.5 x 2
1434594	GAV 2 - 28	Bleeder screw (2x)
1434595	GAV 2 - 529 •	Sleeve

- Included in lock activator assy No. 2-6010
- * Only available as assembly
- ° Included in set of seals No. 2-6000R/1

Spare Parts

E2-U Blind Riveting Gun Overhead

<u>Part No.</u>	<u>Component No.</u>	<u>Description</u>
1434407	GAV 2 – 6000U	Blind riveting gun assy
719 7535	GAV 2 – 6001U	Housing assy
1445656	GAV 2 – 6001U7	Screw connection
1434557	GAV 2 - 2	Cover
1434495	GAV 2 - 6003	Threaded plug
1434737	GAV 2 - 6205	Jaw housing 36° (identification: 1 ring)
1434535	GAV 2 - 6005	Jaw housing 28° (identification: 2 rings)
1456909	GAV 2 - 6009 •	Lock activator assy
1457004	GAV 2 - 6010	Lock activator assy, assembled
1456928	GAV 2 - 11	Closing tube assy
1457075	GAV 2 - 11.1	Closing tube assy, assembled
1434494	GAV 2 - 6012 •	Cylinder sleeve
1456874	GAV 2 - 6013 * •	Reset piston assy with component No. 6083 + 6085
1434587	GAV 2 - 16	Casing ring
1434588	GAV 2 - 17 °	Washer
1434589	GAV 2 - 18	Washer
1434590	GAV 2 - 19	Washer
1456910	GAV 2 - 6020 * •	Stop piston assy with component No. 2-55
1456919	GAV 2 - 6020.1 *	Stop piston assy with component No. 2-55 extended by 4mm
1434517	GAV 2 - 6021	Stop ring
1434591	GAV 2 - 22	Closing sleeve
1456917	GAV 2 - 6022	Closing sleeve for spreader nosepiece 2-80/F
1434525	GAV 2 - 6023 •	Feather key
1434592	GAV 2 - 24 •	Slide
1457034	GAV 2 - 25 *	Actuator assy
1434593	GAV 2 - 27/2	Coupling piece
1434549	GAV 2 - 27/3	Pin
1445505	GAV 2 - 27/4	Compression spring
1434677	GAV 2 - 27/5 °	O-ring 8.5 x 2
1434594	GAV 2 - 28	Bleeder screw (2x)
1434595	GAV 2 - 529 •	Sleeve
1456866	GAV 2 - 6030 * •	Driver bush assy with component No. 2-56
1434490	GAV 2 - 6031 •	Stop bush
1434741	GAV 2 - 6031.1	Stop bush, shortened by 2 mm

• Included in lock activator assy No. 2-6010

* Only available as assembly

° Included in set of seals No. 2-6191

Spare Parts

E2-UA Blind Riveting Gun Overhead with Spring-Loaded Trigger

<u>Part No.</u>	<u>Component No.</u>	<u>Description</u>
143509	GAV 2 – 6000UA	Blind riveting gun assy
719 1012	GAV 2 – 6001UA	Housing assy
719 1077	GAV 2 – 6001UA 1	Handle
1434506	GAV 2 – 6001UA 2	Proximity switch
1445656	GAV 2 – 6001U7	Screw connection
1434557	GAV 2 - 2	Cover
1434495	GAV 2 - 6003	Threaded plug
1434737	GAV 2 - 6205	Jaw housing 36° (identification: 1 ring)
1434535	GAV 2 - 6005	Jaw housing 28° (identification: 2 rings)
1456909	GAV 2 - 6009 •	Lock activator assy
1457004	GAV 2 - 6010	Lock activator assy, assembled
1456928	GAV 2 - 11	Closing tube assy
1457075	GAV 2 - 11.1	Closing tube assy, assembled
1434494	GAV 2 - 6012 •	Cylinder sleeve
1456874	GAV 2 - 6013 * •	Reset piston assy with component No. 6083 + 6085
1434587	GAV 2 - 16	Casing ring
1434588	GAV 2 - 17 °	Washer
1434589	GAV 2 - 18	Washer
1434589	GAV 2 - 19	Washer
1456910	GAV 2 - 6020 * •	Stop piston assy with component No. 2-55
1456919	GAV 2 - 6020.1 *	Stop piston assy with component No. 2-55, extended by 4 mm
1434517	GAV 2 - 6021	Stop ring
1434591	GAV 2 - 22	Closing sleeve
1456917	GAV 2 - 6022	Closing sleeve for spreader nosepiece 2-80/F
1434525	GAV 2 - 6023 •	Feather key
1434592	GAV 2 - 24 •	Slide
1457034	GAV 2 - 25 *	Actuator assy
1434593	GAV 2 - 27/2	Coupling piece
1434549	GAV 2 - 27/3	Pin
1445505	GAV 2 - 27/4	Compression spring
1434677	GAV 2 - 27/5 °	O-ring 8.5 x 2
1434594	GAV 2 - 28	Bleeder screw (2x)
1434595	GAV 2 - 529 •	Sleeve
1456866	GAV 2 - 6030 * •	Driver bush assy with component No. 2-56
1434490	GAV 2 - 6031 •	Stop bush
1434741	GAV 2 - 6031.1	Stop bush, shortened by 2 mm

• Included in lock activator assy No. 2-6010

* Only available as assembly

° Included in set of seals No. 2-6191

Spare Parts

E2-V Blind Riveting Gun, Reinforced

<u>Part No.</u>	<u>Component No.</u>	<u>Description</u>
1434405	GAV 2 – 6000V	Blind riveting gun assy
1457035	GAV 2 – 6001.1V	Housing assy
1434557	GAV 2 - 2	Cover
1434495	GAV 2 - 6003	Threaded plug
1434737	GAV 2 - 6205	Jaw housing 36° (identification: 1 ring)
1434535	GAV 2 - 6005	Jaw housing 28° (identification: 2 rings)
1456909	GAV 2 - 6009 •	Lock activator assy
1457004	GAV 2 - 6010	Lock activator assy, assembled
1457040	GAV 2 – 11V	Closing tube assy
1434494	GAV 2 - 6012 •	Cylinder sleeve
1456874	GAV 2 - 6013 * •	Reset piston assy with component No. 6083 + 6085
1434587	GAV 2 - 16	Casing ring
1434588	GAV 2 - 17 °	Washer
1434589	GAV 2 - 18	Washer
1434590	GAV 2 - 19	Washer
1456910	GAV 2 - 6020 * •	Stop piston assy with component No. 2-55 Total length 186 mm
1456919	GAV 2 - 6020.1 * •	Stop piston assy with component No. 2-55 Total length 190 mm
1434517	GAV 2 - 6021	Stop ring
1434591	GAV 2 - 22	Closing sleeve
1456917	GAV 2 - 6022	Closing sleeve for spreader nosepiece 2-80/F
1434525	GAV 2 - 6023 •	Feather key
1434592	GAV 2 - 24 •	Slide
1457034	GAV 2 - 25 *	Actuator assy
1434593	GAV 2 - 27/2	Coupling piece
1434549	GAV 2 - 27/3	Pin
1445505	GAV 2 - 27/4	Compression spring
1434677	GAV 2 - 27/5 °	O-ring 8.5 x 2
1434594	GAV 2 - 28	Bleeder screw (2x)
1434595	GAV 2 - 529 •	Sleeve
1456866	GAV 2 - 6030 * •	Driver bush assy with component No. 2-56
1456866	GAV 2 - 6031 •	Stop bush, total length 38 mm
1434741	GAV 2 - 6031.1	Stop bush, total length 36mm

• Included in lock activator assy No. 2-6010

* Only available as assembly

° Included in set of seals No. 2-6191

Spare Parts

E2 Blind Riveting Gun

Item	Component No.	Part No.	Description
32	2-6032	1434740	Jaw tube
33	2-33	1434596	Lock spring
33 B	2-33 B	1456861	Lock spring (shortened by 9 mm)
33 C	2-33 C	1456868	Lock spring (90° notch)
33 D	2-33 D	1457029	Lock spring (without scoop)
35 •	2-35	1434597	Compression spring
36	2-36	1445505	Compression spring
37	2-37	1445506	Hexagon socket head cap screw M5 x 12
39 °	2-39	1445507	Snap ring SW 18
40 °	2-40	1434598	Snap ring SW 18, shortened
41 •	2-6041	1445417	Snap ring SW 20
42	2-42	1445508	Circlip SB 24
43 • °	2-6043	1445462	Circlip (22 x 1.5)
44 • °	2-6044	1445416	Snap ring SW 27
47	2-47	1434600	Grooved ring, black
48 °	2-48	1434601	Grooved ring, blue, assembly tool E9-19 (accessory)
49 °	2-49	1434602	Wiper
50 °	2-50	1434603	O-ring 18 x 2 (4x)
51 °	2-51	1434604	O-ring 24 x 2
52 °	2-52	1434605	O-ring 32 x 2
54 °	2-54	1435244	O-ring 3.68 x 1.78 (for 2-25) 2x
55 °	2-55	1434609	O-ring 4.3 x 2.4
56 °	2-56	1434607	O-ring 6 x 1
57 °	2-57	1434608	USIT ring (2x)
59 °	2-59	1456929	Nipple
63	2-63	1445661	Plug connection
64	2-64	1457064	Screw connection
<ul style="list-style-type: none"> • Included in lock activator assy No. 10 * Only available as assembly ° Included in set of seals No. 191 			

Spare Parts

E2-R Blind Riveting Gun Robotic

<u>Part No.</u>	<u>Component No.</u>	<u>Description</u>
1456866	GAV 2 - 6030 * •	Driver bush assy with component No. 56
1434490	GAV 2 - 6031 •	Stop bush
1434741	GAV 2 - 6031.1	Stop bush, shortened by 2 mm
1434740	GAV 2 - 6032	Jaw tube
1434596	GAV 2 - 33	Lock spring
1456861	GAV 2 - 33 B	Lock spring (shortened by 9 mm)
1456868	GAV 2 - 33 C	Lock spring (90° notch)
1457029	GAV 2 - 33 D	Lock spring (without scoop)
1434597	GAV 2 - 35 •	Compression spring
1445505	GAV 2 - 36	Compression spring
1445506	GAV 2 - 37	Hexagon socket head cap screw M5 x 12
1445507	GAV 2 - 39 °	Snap ring SW 18
1434598	GAV 2 - 40 °	Snap ring SW 18, shortened
1445417	GAV 2 - 6041 •	Snap ring SW 20
1445508	GAV 2 - 42	Circlip SB 24
1445462	GAV 2 - 6043 ° •	Circlip (22 x 1.5)
1445416	GAV 2 - 6044 ° •	Snap ring SW 27
1434600	GAV 2 - 47 °	Grooved ring, black
1434601	GAV 2 - 48 °	Grooved ring, blue → assembly tool 9-19 required, see Accessories, Page 19 and 20
1434602	GAV 2 - 49 °	Wiper
1434603	GAV 2 - 50 °	O-ring 18 x 2 (4x)
1434604	GAV 2 - 51 °	O-ring 24 x 2
1434605	GAV 2 - 52 °	O-ring 32 x 2
1434609	GAV 2 - 55 °	O-ring 4.3 x 2.4
1434607	GAV 2 - 56 °	O-ring 6 x 1
1434608	GAV 2 - 57 °	USIT ring (2x)
1445661	GAV 2 - 63	Plug connection
1457064	GAV 2 - 64	Screw connection

- Included in lock activator assy No. 2-6010
- * Only available as assembly
- ° Included in set of seals No. 2-6000R/1

Spare Parts

E2-U Blind Riveting Gun Overhead

<u>Part No.</u>	<u>Componen</u>	<u>Description</u>
1434740	GAV 2 - 6032	Jaw tube
1434596	GAV 2 - 33	Lock spring
1456861	GAV 2 - 33 B	Lock spring (shortened by 9 mm)
1456868	GAV 2 - 33 C	Lock spring (90° notch)
1457029	GAV 2 - 33 D	Lock spring (without scoop)
1434597	GAV 2 - 35 •	Compression spring
1445505	GAV 2 - 36	Compression spring
1445506	GAV 2 - 37	Hexagon socket head cap screw M5 x 12
1445507	GAV 2 - 39 °	Snap ring SW 18
1434598	GAV 2 - 40 °	Snap ring SW 18, shortened
1445417	GAV 2 - 6041 •	Snap ring SW 20
1445508	GAV 2 - 42	Circlip SB 24
1445462	GAV 2 - 6043 ° •	Circlip (22 x 1.5)
1445416	GAV 2 - 6044 ° •	Snap ring SW 27
1434600	GAV 2 - 47	Grooved ring, black
1434601	GAV 2 - 48 °	Grooved ring, blue → assembly tool 9-19 required, see Accessories, Page 19 and 20
1434602	GAV 2 - 49 °	Wiper
1434603	GAV 2 - 50 °	O-ring 18 x 2 (4x)
1434604	GAV 2 - 51 °	O-ring 24 x 2
1434605	GAV 2 - 52 °	O-ring 32 x 2
1435244	GAV 2 - 54 °	O-ring 3.68 x 1.78 (for 2-25) 2x
1434609	GAV 2 - 55 °	O-ring 4.3 x 2.4
1434607	GAV 2 - 56 °	O-ring 6 x 1
1434608	GAV 2 - 57 °	USIT ring (2x)
1456929	GAV 2 - 59 °	Nipple
1445661	GAV 2 - 63	Plug connection
1457064	GAV 2 - 64	Screw connection

- Included in lock activator assy No. 2-6010
- * Only available as assembly
- Included in set of seals No. 2-6191

Spare Parts

E2-UA Blind Riveting Gun Overhead with Spring-Loaded Trigger

<u>Part No.</u>	<u>Component No.</u>	<u>Description</u>
1434740	GAV 2 - 6032	Jaw tube
1434596	GAV 2 - 33	Lock spring
1456861	GAV 2 - 33 B	Lock spring (shortened by 9 mm)
1456868	GAV 2 - 33 C	Lock spring (90° notch)
1457029	GAV 2 - 33 D	Lock spring (without scoop)
1434596	GAV 2 - 35 •	Compression spring
1445505	GAV 2 - 36	Compression spring
1445506	GAV 2 - 37	Hexagon socket head cap screw M5 x 12
1445507	GAV 2 - 39 °	Snap ring SW 18
1434598	GAV 2 - 40 °	Snap ring SW 18, shortened
1445417	GAV 2 - 6041 •	Snap ring SW 20
1445508	GAV 2 - 42	Circlip SB 24
1445462	GAV 2 - 6043 ° •	Circlip (22 x 1.5)
1445416	GAV 2 - 6044 ° •	Snap ring SW 27
1434600	GAV 2 - 47	Grooved ring, black
1434601	GAV 2 - 48 °	Grooved ring, blue → assembly tool 9-19 required, see Accessories, Page 19 and 20
1434602	GAV 2 - 49 °	Wiper
1434603	GAV 2 - 50 °	O-ring 18 x 2 (4x)
1434604	GAV 2 - 51 °	O-ring 24 x 2
1434605	GAV 2 - 52 °	O-ring 32 x 2
1434607	GAV 2 - 54 °	O-ring 3.68 x 1.78 (for 2-25) 2x
1434609	GAV 2 - 55 °	O-ring 4.3 x 2.4
1434607	GAV 2 - 56 °	O-ring 6 x 1
1434608	GAV 2 - 57 °	USIT ring (2x)
1456929	GAV 2 - 59 °	Nipple
1445661	GAV 2 - 63	Plug connection
1457064	GAV 2 - 64	Screw connection

- Included in lock activator assy No. 2-6010
- * Only available as assembly
- ° Included in set of seals No. 2-6191

Spare Parts

E2-V Blind Riveting Gun, Reinforced

<u>Part No.</u>	<u>Component No.</u>	<u>Description</u>
1434740	GAV 2 - 6032	Jaw tube
1434596	GAV 2 - 33	Lock spring
1456861	GAV 2 - 33 B	Lock spring (shortened by 9 mm)
1456868	GAV 2 - 33 C	Lock spring (90° notch)
1457029	GAV 2 - 33 D	Lock spring (without scoop)
1434597	GAV 2 - 35 •	Compression spring
1445505	GAV 2 - 36	Compression spring
1445506	GAV 2 - 37	Hexagon socket head cap screw M5 x 12
1445507	GAV 2 - 39 °	Snap ring SW 18
1434598	GAV 2 - 40 °	Snap ring SW 18, shortened
1445417	GAV 2 - 6041 •	Snap ring SW 20
1445508	GAV 2 - 42	Circlip SB 24
1445462	GAV 2 - 6043 ° •	Circlip (22 x 1.5)
1445416	GAV 2 - 6044 ° •	Snap ring SW 27
1443469	GAV 2 - 6047	Set of cylinder seals (2x)
1434601	GAV 2 - 48 °	Grooved ring, blue → assembly tool 9-19 required, see Accessories, Page 19 and 20
1434602	GAV 2 - 49 °	Wiper
1434603	GAV 2 - 50 °	O-ring 18 x 2 (4x)
1434604	GAV 2 - 51 °	O-ring 24 x 2
1434605	GAV 2 - 52 °	O-ring 32 x 2
1435244	GAV 2 - 54 °	O-ring 3.68 x 1.78 (for 2-25) 2x
1434609	GAV 2 - 55 °	O-ring 4.3 x 2.4
1434607	GAV 2 - 56 °	O-ring 6 x 1
1434608	GAV 2 - 57 °	USIT ring (2x)
1456929	GAV 2 - 59 °	Nipple
1445661	GAV 2 - 63	Plug connection
1457064	GAV 2 - 64	Screw connection

- Included in lock activator assy No. 2-6010
- * Only available as assembly
- Included in set of seals No. 2-6191

Spare Parts

E2 Blind Riveting Gun

Item	Component No.	Part No.	Description
69 • *	2-6069	1456873	Valve piston assy with component No. 6079 + 6094
70 •	2-6070	1434487	Switching ring
71 •	2-6071	1434485	Support ring
72 * °	2-6072	1456872	Casing ring assy with component No. 6084
73 • °	2-6073	1434437	Spacer ring
74 •	2-6074	1434484	Stop ring
75 •	2-6075	1434481	Spacer ring
76	2-6076	1434531	Washer
77	2-6077	1434533	Jaw stop ring
81 • °	2-6081	1434499	O-ring 28 x 1.5 (2x)
82 • °	2-6082	1434498	O-ring 26 x 3
83 °	2-6083	1434497	O-ring 16 x 2
84 • °	2-6084	1434496	O-ring 10 x 2
85 °	2-6085	719 7768	O-ring 6 x 2
86 °	2-6086	1434746	O-ring 6.75 x 1.78
90 •	2-6090	1445414	Compression spring
92	2-6092	1445464	Jaw spring (3x)
93 •	2-6093	1445463	Leaf spring
147 • °	2-6147	1434551	Grooved ring, green (2x)
150	2-6150	1457069	Nosepiece lock assy
151	2-6151	1434441	Coupling sleeve
152	2-6152	1434442	Union nut
153	2-6153	1434443	Feather key
155	2-6155	1445368	Corrugated ring
190	2-6190	1456876	Piston unit
191	2-6191	1456877	Set of seals
300	2-6300	1434678	Mandrel transfer unit
301	2-6301	1462893	Mandrel guide assy
302	2-6302	1434685	Baseplate
303	2-6303	1434686	Base
313	2-6313	1434579	Adapter
314	2-6314	1462853	Plastic hose
315	2-6315	1445566	Plug connection
321	2-6321	1457017	Mandrel guide assy
<ul style="list-style-type: none"> • Included in lock activator assy No. 10 * Only available as assembly ° Included in set of seals No. 191 			

Spare Parts

E2-R Blind Riveting Gun Robotic

<u>Part No.</u>	<u>Component No.</u>	<u>Description</u>
1456873	GAV 2 - 6069 • *	Valve piston assy with component No. 6079 + 6094
1434487	GAV 2 - 6070 •	Switching ring
1434485	GAV 2 - 6071 •	Support ring
1456872	GAV 2 - 6072 ° *	Casing ring assy with component No. 6084
1434437	GAV 2 - 6073 ° •	Spacer ring
1434484	GAV 2 - 6074 •	Stop ring
1434481	GAV 2 - 6075 •	Spacer ring
1434531	GAV 2 - 6076	Plate
1434533	GAV 2 - 6077	Jaw stop ring
1434499	GAV 2 - 6081 ° •	O-ring 28 x 1.5 (2x)
1434498	GAV 2 - 6082 ° •	O-ring 26 x 3
1434497	GAV 2 - 6083 °	O-ring 16 x 2
1434496	GAV 2 - 6084 ° •	O-ring 10 x 2
719 7768	GAV 2 - 6085 °	O-ring 6 x 2
1445414	GAV 2 - 6090 •	Compression spring
1445464	GAV 2 - 6092	Jaw spring (3x)
1445463	GAV 2 - 6093 •	Leaf spring
1434551	GAV 2 - 6147 ° •	Grooved ring, green (2x)
1457069	GAV 2 - 6150	Nosepiece lock assy
1434441	GAV 2 - 6151	Coupling sleeve
1434442	GAV 2 - 6152	Union nut
1434443	GAV 2 - 6153	Feather key
1445368	GAV 2 - 6155	Corrugated ring
1456876	GAV 2 - 6190	Piston unit
1456877	GAV 2 - 6191	Set of seals
1434721	GAV 2 - 6320	Mandrel transfer unit
1462893	GAV 2 - 6301	Mandrel guide assy
1434685	GAV 2 - 6302	Baseplate
1434686	GAV 2 - 6303	Base
1434679	GAV 2 - 6313	Adapter
1462853	GAV 2 - 6314	Plastic hose
1445566	GAV 2 - 6315	Plug connection
1457017	GAV 2 - 6321	Mandrel guide assy

- Included in lock activator assy No. 2-6010
- * Only available as assembly
- ° Included in set of seals No. 2-6000R/1

Spare Parts

E2-U Blind Riveting Gun Overhead

<u>Part No.</u>	<u>Component No.</u>	<u>Description</u>
1456873	GAV 2 - 6069 • *	Valve piston assy with component No. 6079 + 6094
1434487	GAV 2 - 6070 •	Switching ring
1434485	GAV 2 - 6071 •	Support ring
1456872	GAV 2 - 6072 ° *	Casing ring assy with component No. 6084
1434437	GAV 2 - 6073 ° •	Spacer ring
1434484	GAV 2 - 6074 •	Stop ring
1434481	GAV 2 - 6075 •	Spacer ring
1434531	GAV 2 - 6076	Washer
1434533	GAV 2 - 6077	Jaw stop ring
1434499	GAV 2 - 6081 ° •	O-ring 28 x 1.5 (2x)
1434498	GAV 2 - 6082 ° •	O-ring 26 x 3
1434497	GAV 2 - 6083 °	O-ring 16 x 2
1434496	GAV 2 - 6084 ° •	O-ring 10 x 2
719 7768	GAV 2 - 6085 °	O-ring 6 x 2
1434746	GAV 2 - 6086 °	O-ring 6.75 x 1.78
1445414	GAV 2 - 6090 •	Compression spring
1445464	GAV 2 - 6092	Jaw spring (3x)
1445463	GAV 2 - 6093 •	Leaf spring
1434551	GAV 2 - 6147 ° •	Grooved ring, green (2x)
1457069	GAV 2 - 6150	Nosepiece lock assy
1434441	GAV 2 - 6151	Coupling sleeve
1434442	GAV 2 - 6152	Union nut
1434443	GAV 2 - 6153	Feather key
1445368	GAV 2 - 6155	Corrugated ring
1456876	GAV 2 - 6190	Piston unit
1456877	GAV 2 - 6191	Set of seals
1434678	GAV 2 - 6300	Mandrel transfer unit
1462893	GAV 2 - 6301	Mandrel guide assy
1434685	GAV 2 - 6302	Baseplate
1434686	GAV 2 - 6303	Base
1434679	GAV 2 - 6313	Adapter
1462853	GAV 2 - 6314	Plastic hose
1445566	GAV 2 - 6315	Plug connection
1457017	GAV 2 - 6321	Mandrel guide assy

- Included in lock activator assy No. 2-6010
- * Only available as assembly
- ° Included in set of seals No. 2-6191

Spare Parts

E2-UA Blind Riveting Gun Overhead with Spring-Loaded Trigger

<u>Part No.</u>	<u>Component No.</u>	<u>Description</u>
1456873	GAV 2 - 6069 • *	Valve piston assy with component No. 6079 + 6094
1434487	GAV 2 - 6070 •	Switching ring
1434485	GAV 2 - 6071 •	Support ring
1456872	GAV 2 - 6072 ° *	Casing ring assy with component No. 6084
1434437	GAV 2 - 6073 ° •	Spacer ring
1434484	GAV 2 - 6074 •	Stop ring
1434481	GAV 2 - 6075 •	Spacer ring
1434531	GAV 2 - 6076	Washer
1434533	GAV 2 - 6077	Jaw stop ring
1434499	GAV 2 - 6081 ° •	O-ring 28 x 1.5 (2x)
1434498	GAV 2 - 6082 ° •	O-ring 26 x 3
1434497	GAV 2 - 6083 °	O-ring 16 x 2
1434496	GAV 2 - 6084 ° •	O-ring 10 x 2
719 7768	GAV 2 - 6085 °	O-ring 6 x 2
1434746	GAV 2 - 6086 °	O-ring 6.75 x 1.78
1445414	GAV 2 - 6090 •	Compression spring
1445464	GAV 2 - 6092	Jaw spring (3x)
1445463	GAV 2 - 6093 •	Leaf spring
1434551	GAV 2 - 6147 ° •	Grooved ring, green (2x)
1457069	GAV 2 - 6150	Nosepiece lock assy
1434441	GAV 2 - 6151	Coupling sleeve
1434442	GAV 2 - 6152	Union nut
1434443	GAV 2 - 6153	Feather key
1445368	GAV 2 - 6155	Corrugated ring
1456876	GAV 2 - 6190	Piston unit
1456877	GAV 2 - 6191	Set of seals
1434678	GAV 2 - 6300	Mandrel transfer unit
1462893	GAV 2 - 6301	Mandrel guide assy
1434685	GAV 2 - 6302	Baseplate
1434686	GAV 2 - 6303	Base
1434679	GAV 2 - 6313	Adapter
1462853	GAV 2 - 6314	Plastic hose
1445566	GAV 2 - 6315	Plug connection
1457017	GAV 2 - 6321	Mandrel guide assy

- Included in lock activator assy No. 2-6010
- * Only available as assembly
- ° Included in set of seals No. 2-6191

Spare Parts

E2-V Blind Riveting Gun, Reinforced

<u>Part No.</u>	<u>Component No.</u>	<u>Description</u>
1456873	GAV 2 - 6069 • *	Valve piston assy with component No. 6079 + 6094
1434487	GAV 2 - 6070 •	Switching ring
1434485	GAV 2 - 6071 •	Support ring
1456872	GAV 2 - 6072 ° *	Casing ring assy with component No. 6084
1434437	GAV 2 - 6073 ° •	Spacer ring
1434484	GAV 2 - 6074 •	Stop ring
1434481	GAV 2 - 6075 •	Spacer ring
1434531	GAV 2 - 6076	Washer
1434533	GAV 2 - 6077	Jaw stop ring
1434499	GAV 2 - 6081 ° •	O-ring 28 x 1.5 (2x)
1434498	GAV 2 - 6082 ° •	O-ring 26 x 3
1434497	GAV 2 - 6083 °	O-ring 16 x 2
1434496	GAV 2 - 6084 ° •	O-ring 10 x 2
719 7768	GAV 2 - 6085 °	O-ring 6 x 2
1434746	GAV 2 - 6086 °	O-ring 6.75 x 1.78
1445414	GAV 2 - 6090 •	Compression spring
1445464	GAV 2 - 6092	Jaw spring (3x)
1445463	GAV 2 - 6093 •	Leaf spring
1434551	GAV 2 - 6147 ° •	Grooved ring, green
1457069	GAV 2 - 6150	Nosepiece lock assy
1434441	GAV 2 - 6151	Coupling sleeve
1434442	GAV 2 - 6152	Union nut
1434443	GAV 2 - 6153	Feather key
1445368	GAV 2 - 6155	Corrugated ring
1457033	GAV 2 - 6190 V	Piston unit
1456839	GAV 2 - 6191 V	Set of seals
1434678	GAV 2 - 6300	Mandrel transfer unit
1462893	GAV 2 - 6301	Mandrel guide assy
1434685	GAV 2 - 6302	Baseplate
1434686	GAV 2 - 6303	Base
1434679	GAV 2 - 6313	Adapter
1462853	GAV 2 - 6314	Plastic hose
1445566	GAV 2 - 6315	Plug connection
1457017	GAV 2 - 6321	Mandrel guide assy

- Included in lock activator assy No. 2-6010
- * Only available as assembly
- ° Included in set of seals No. 2-6191

Spare Parts

E2 Blind Riveting Gun

Item	Component No.	Part No.	Description	Hole Ø mm
80/..	80/ 16	1456860	Spreader nosepiece assy	1.6
	80/ 18	1456934		1.8
	80/ 20	719 2800		2.0
	80/ 23	1456935		2.3
	80/ 27	1456937		2.7
	80/ 29	1456939		2.9
	80/ 32	719 2924		3.2
	80/ 34	1456867		3.4
	80/ 36	1456942		3.6
	80/ 38	7191596		3.8
	80/... SL ...	719		Spreader nosepiece assy, extended

Item	Component No.	Part No.	Description	Hole Ø mm
80/..F	80/ 16 F	1446557	Spreader nosepiece assy	1.6
	80/ 18 F	1456936		1.8
	80/ 20 F	719 2797		2.0
	80/ 23 F	1456914		2.3
	80/ 27 F	7191723		2.7
	80/ 29 F	1446554		2.9
	80/ 32 F	1456915		3.2
	80/ 34 F	1456870		3.4
	80/ 36 F	7191650		3.6
	80/ 38 F	7191006		3.8
	80/...F SL...	719		Spreader nosepiece assy, extended

Item	Component No.	Part No.	Description
152	2-6152	1434442	Union nut

Spare Parts

E2 Blind Riveting Gun

Item	Component No.	Part No.	Description	Division mm	Mandrel Ø mm
161	2-6161	1434479	Jaws 3-piece / 28°	1.25	1.5 - 2.0
162	2-6162	1434526		1.25	2.1 - 2.6
163	2-6163	1434530		1.25	2.7 - 3.2
164	2-6164	1434534		1.25	3.3 - 3.65
165	2-6165	1434748	Jaws 3-piece / 36°	1.25	1.5 - 2.0
166	2-6166	1434750		1.25	2.1 - 2.6
167	2-6167	1434751		1.25	2.7 - 3.2
168	2-6168	1434529		1.25	3.3 - 3.65
171	2-6171	1434545	Jaws F / 3-piece / 36°	0.8	1.5 - 2.0
172	2-6172	1434546		0.8	2.1 - 2.6
173	2-6173	1434547		0.8	2.7 - 3.2
174	2-6174	1434550		0.9	3.3 - 3.65
175	2-6175	1434656		0.8	3.5 - 3.65

Item	Component No.	Part No.	Description	Division mm	Mandrel Ø mm
261	2-6261	1456847	Jaw mechanism assy 3-piece / 28°	1.25	1.5 - 2.0
262	2-6262	1456848		1.25	2.1 - 2.6
263	2-6263	1456849		1.25	2.7 - 3.2
264	2-6264	1456850		1.25	3.3 - 3.65
265	2-6265	1456851	Jaw mechanism assy 3-piece / 36°	1.25	1.5 - 2.0
266	2-6266	1456852		1.25	2.1 - 2.6
267	2-6267	1456853		1.25	2.7 - 3.2
268	2-6268	1456854		1.25	3.3 - 3.65
271	2-6271	1456855	Jaw mechanism assy F / 3-piece / 36°	0.8	1.5 - 2.0
272	2-6272	1456856		0.8	2.1 - 2.6
273	2-6273	1456857		0.8	2.7 - 3.2
274	2-6274	1456858		0.9	3.3 - 3.65
275	2-6275	1456989		0.8	3.5 - 3.65

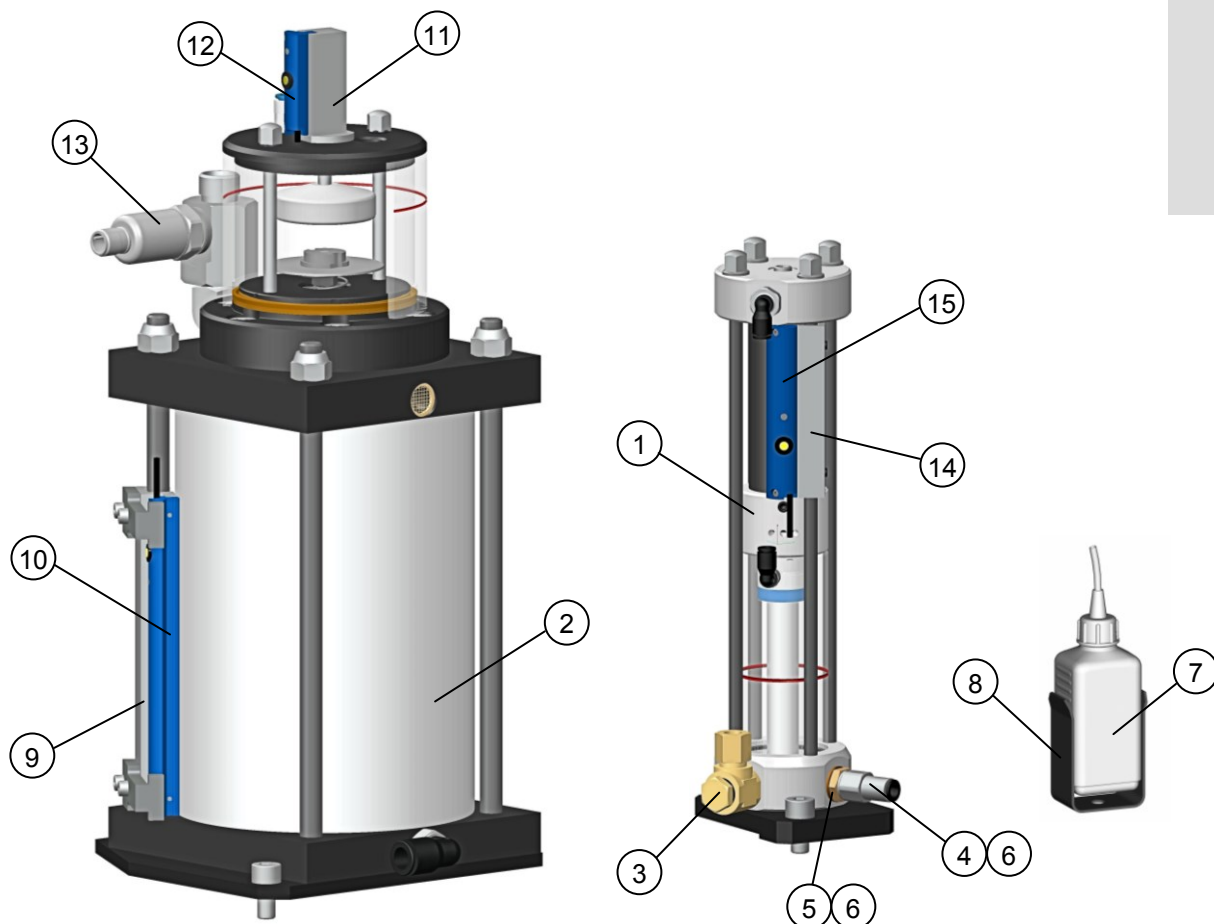
Remark: Jaw housing identification

36° jaw housing GAV 2-6205 = 1 ring

28° jaw housing GAV 2-6005 = 2 rings

Spare Parts

E3 Hydraulic Booster Unit

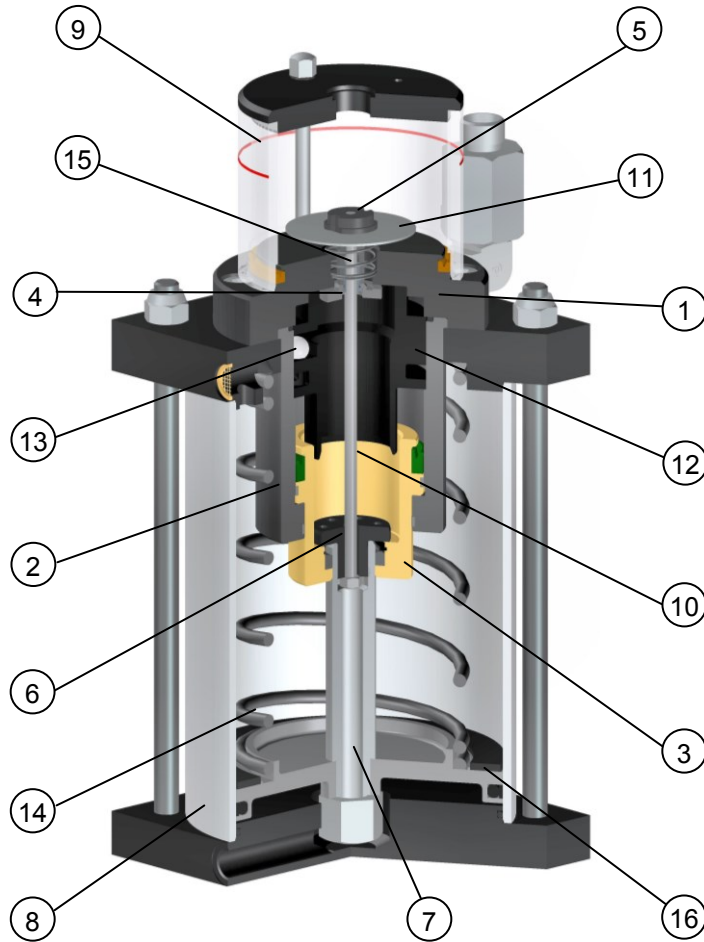


Item	Part No.	Description
1	1456890	Small pressure booster assy
-	1456966	Pressure booster - set of seals
2	1456891	Large pressure booster assy
3	1445471	Ring screw plug
4	1445540	Screw connection
5	1445529	Refill nipple
6	1445673	Seal
7	1446562	Oil collection bottle assy
8	1434624	Holder
9	1456902	Sensor holder for WS1 assy
10	1462877	Displacement sensor WS1
11	1456900	Sensor holder for WS2 assy
12	1462879	Displacement sensor WS2
13	1450594	Pressure sensor unit
14	1456901	Sensor holder for WS3 assy
15	1462878	Displacement sensor WS3
-	1456780	Hydraulic oil 250 cm ³

Not included in GAV-8000 eco

Spare Parts

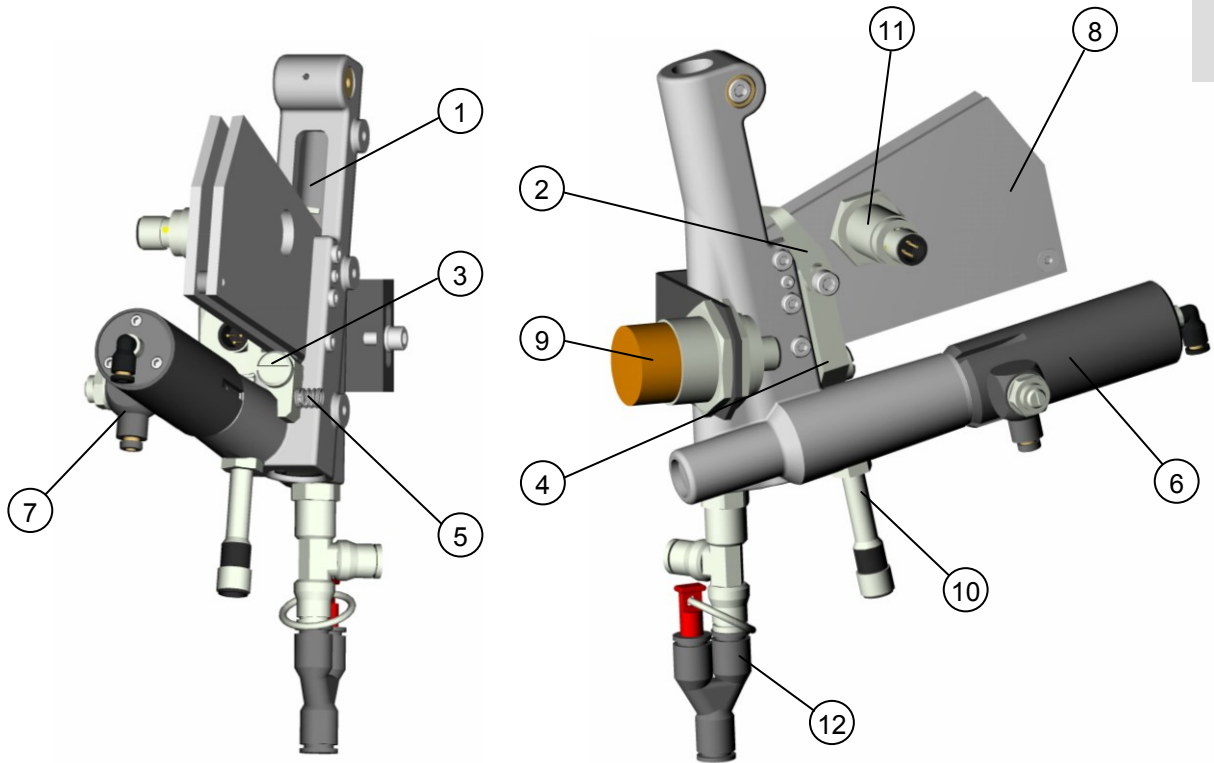
E3 Hydraulic Booster Unit



Item	Part No.	Description
-	7191130	Pressure booster (with no add-on parts)
-	1456925	Pressure booster - set of seals
1	1434578	Flange
2	1434651	Barrel
3	1434656	Converter piston
4	1456998	Valve plate assy
5	1434627	Locking socket
6	1434657	Collar screw
7	1456971	Plunger assy with air piston
8	1434632	Barrel
9	1434692	Sight glass
10	1434653	Valve stem
11	1434674	Plate
12	1434658	Throttle cylinder
13	1445562	Valve ball (2x)
14	1445560	Compression spring
15	1434655	Compression spring
16	1462881	Ring magnet

Spare Parts

E4 Separator



Item	Part No.	Description
-	1434693	Separator assy
1	1456978	Scoop assy
2	1456979	Separator tongue
3	1446567	Collar screw
4	1456980	Spacer ring
5	1462883	Compression spring
6	1462884	Pneumatic cylinder assy
7	1456950	One-way restrictor assy
8	1457041	Chute assy
9	1445548	Proximity switch NS5
10	1456973	Proximity switch NS4
11	1445682	Proximity switch NS1
12	1457050	Y-connection assy

Spare parts

E5 Case unit

E5

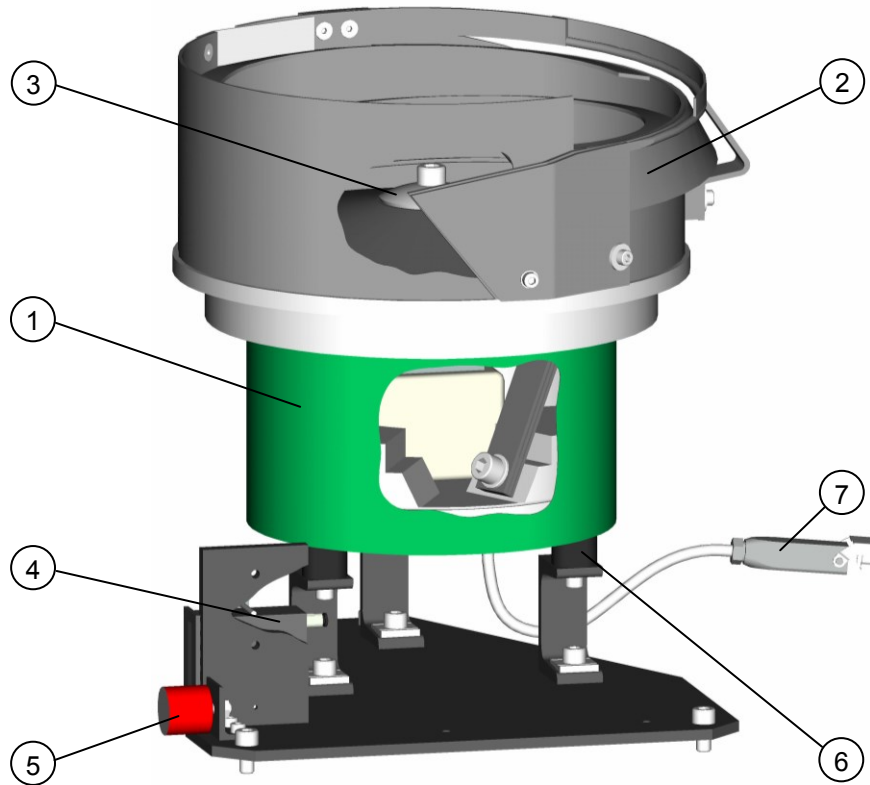
E5 Case unit



Pos.	Artikel-Nr.	Bezeichnung
1	1508586	Case unit assambly
2	1494957	Container
3	1456975	Cover assembly
4	1456859	Cover left assambly
5	1456871	Cover right assambly
6	1434542	Insolation board
7	1445580	Lock
8	1510476	Spare key

Spare Parts

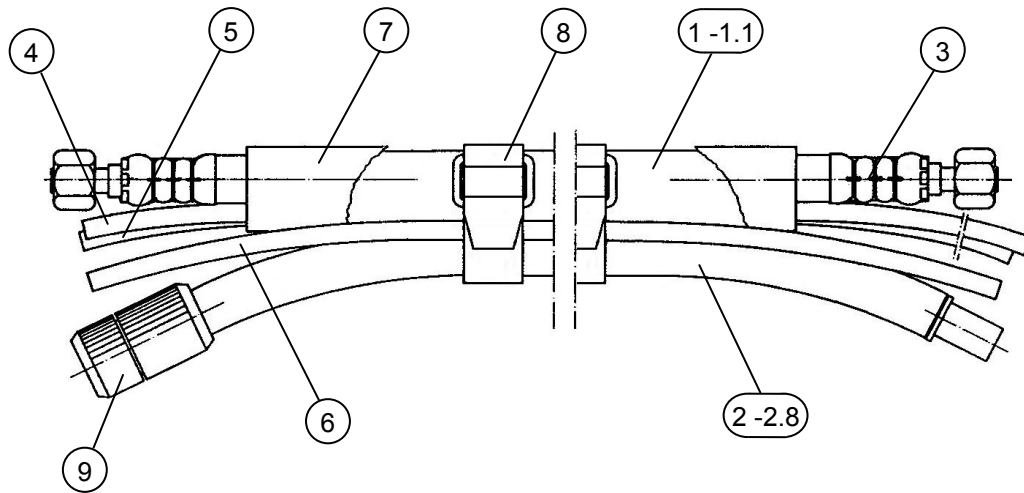
E6 Vibration Feed Unit



Item	Part No.	Description	
-	1434694	Vibration feed unit assy	230 V/50 Hz
	1485869		115 V/60 Hz
1	1462888	Vibration feed unit drive	230 V/50 Hz
	1462889		115 V/60 Hz
2	1462890	Vibration feed container	
3	1494960	Container mounting assy	
4	1457042	Counter assy	
5	1445616	Container magnet	
6	1457051	Rubber mount	
7	1445666	Connector	

Spare Parts

E7 Supply Line Assembly



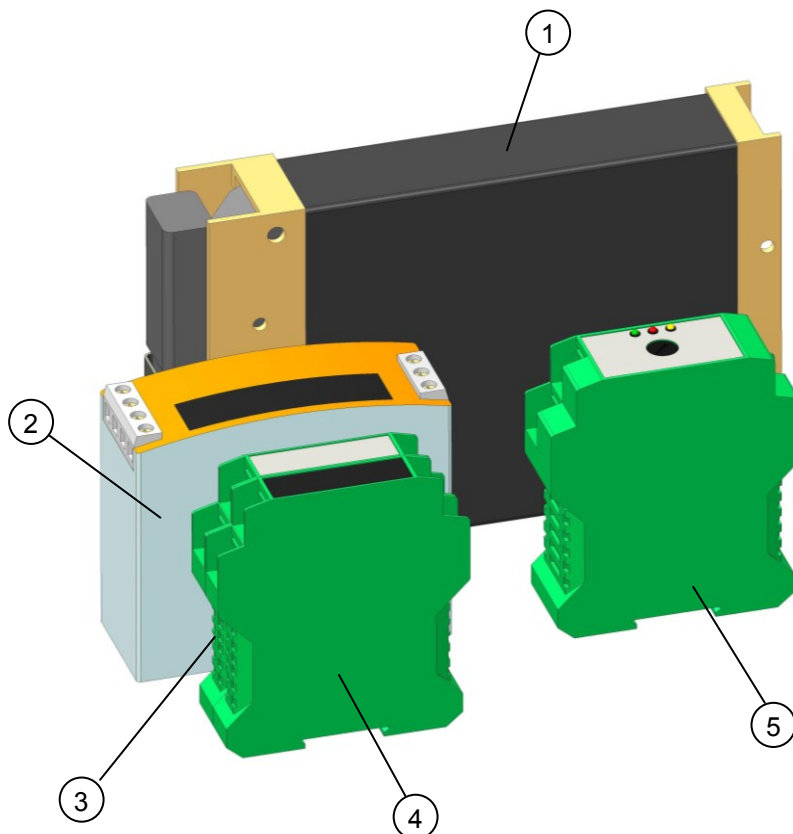
Item	Part No.	Description
1	1456897	Supply line assembly without rivet feed hose
1.1	1494945	Supply line assembly without rivet feed hose SL . . m
2	1487596	Rivet feed hose assy Ø 6 / 3.8 m
2.1	1457044	Rivet feed hose assy Ø 8 / 3.8 m
2.2	1457048	Rivet feed hose assy Ø 9 / 3.8 m
2.3	1457045	Rivet feed hose assy Ø10 / 3.8 m
2.4	1457046	Rivet feed hose assy Ø11 / 3.8 m
2.5	1457047	Rivet feed hose assy Ø12 / 3.8 m
2.6	1457028	Rivet feed hose assy Ø13 / 3.8 m
2.7	1457049	Rivet feed hose assy Ø14 / 3.8 m
2.8	1457054	Rivet feed hose assy SL . . m
3	1445617	Hydraulic hose assy / 3.75 m
4	1456880	Air pilot hose / 4.6 m
5	1456879	Hydraulic hose / 5 m
6	1456879	Mandrel evacuation hose / 5 m
7	1456881	Neoprene protective sheathing / 3.7 m
	1445648	
8	1457060	Velcro strap
9	1526060	Adapter ring

Ersatzteile

E8

E8 Controller

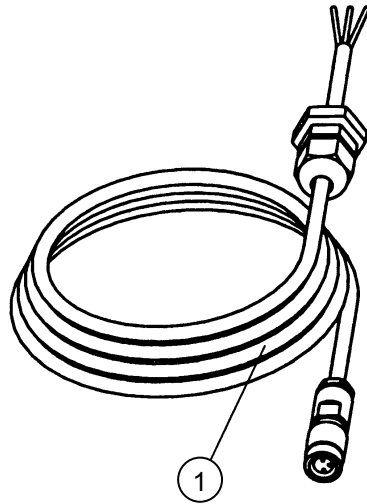
E8 Controller



Pos.	Artikel-Nr.	Bezeichnung
1.1	1502032	Control module with 24 I/O
1.2	1502033	Control module with 24 I/O eco
2	1445478	Switched-mode power supply unit 24 VDC 2.5 A
3	1514700	Electronics module, gr. Druckübersetzer, identification white
4	1514712	Electronics module,, small pressure booster , identification black
5	1445474	Electronics module, vibration feed control

Spare Parts

E8.1-UA Proximity Switch



Item	Part No.	Description
1	1445426	Sensor cable assy

Spare Parts

E9 Accessories

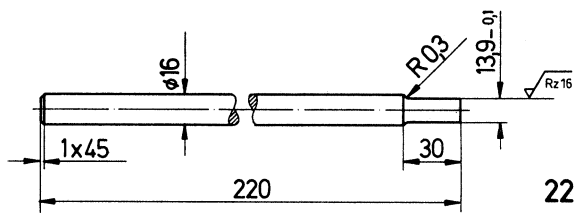
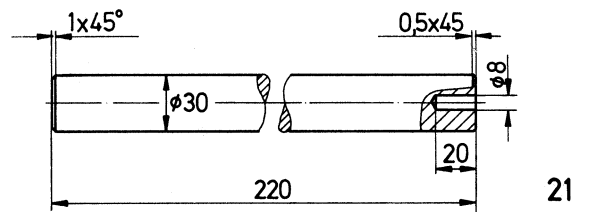
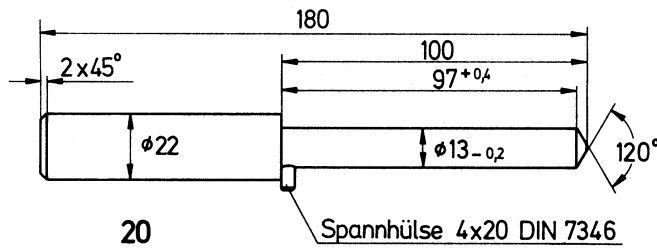
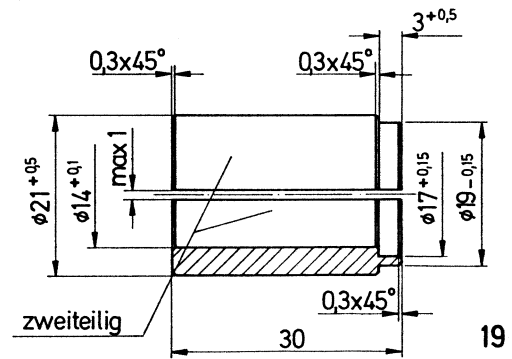
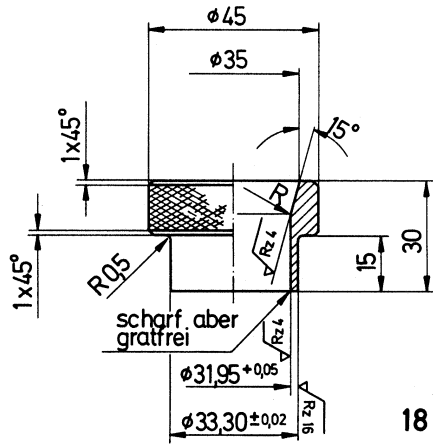
Item	Part No.	Description
1	1434734	Balancer for riveting gun
3	1457070	GAV trolley with extension arm
7	1457071	Non-return bleeder valve
8	1457072	Riveting gun holder
18	1434736	Assembly cone for piston unit
19	1434673	Assembly tool for grooved ring 2-48
20	1434700	Assembly mandrel - lock activator
21	1434701	Assembly pin - piston unit
22	1434702	Drift
27	1457076	Bow handle for Standard riveting gun
30	719 9430	Guide handle for Robotic riveting gun
32	1457081	Bow handle for Robotic riveting gun
46	1457080	Riveting gun hanger - vertical
49	1494966	Riveting gun hanger - horizontal
50	1494967	Riveting gun hanger for horizontal and vertical riveting
52	1494954	Trolley
53	1498313	Disassembly tool, hose Ø8
54	1457063	Central lubrication (to increase service life of wearing parts)
55	1494965	Collection container (for refilling with blind rivets)
56	7197799	Hose assembly hanger
57	7197918	Cable guard for balancer
59	1494964	Maintenance unit, lockable
60	1456922	PLC Interface
61	1462869	RS232 interface cable
62	7191123	Foot trigger

Spare Parts

E9 Assembly Tools

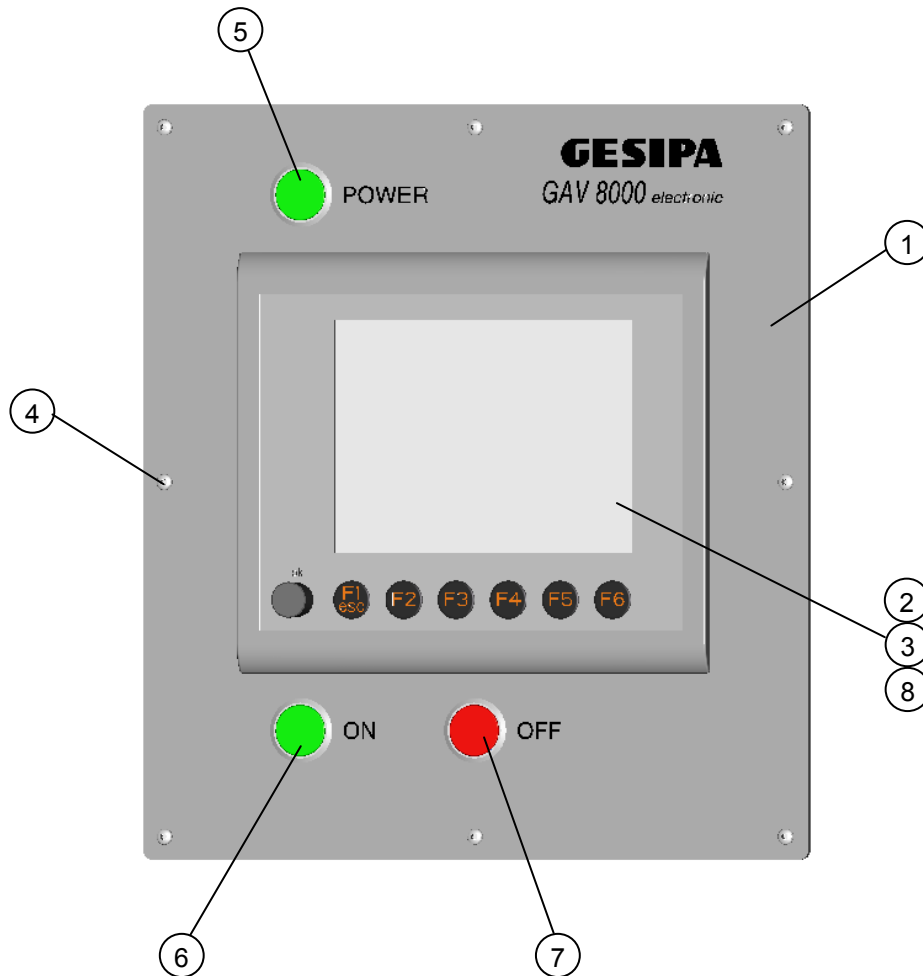
E9

E9 Assembly Tools



E10 Spare Parts, Front Panel

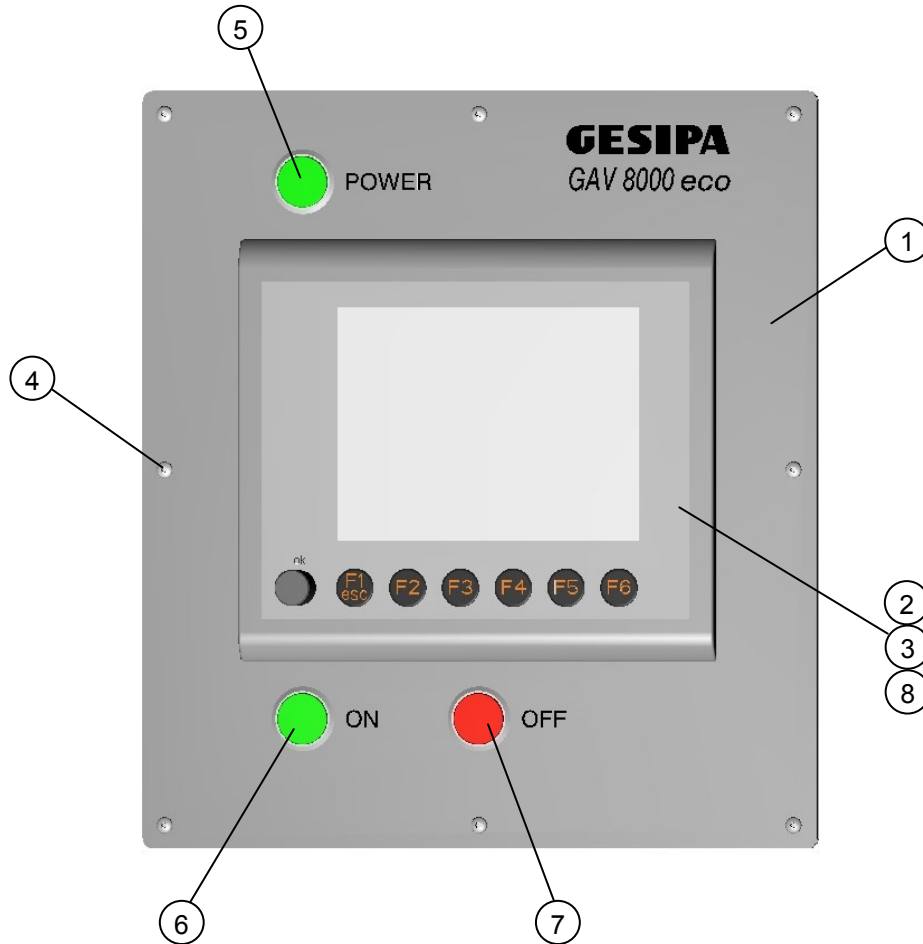
E10 Front Panel



Pos.	Artikel-Nr.	Bezeichnung
-	1456841	Front panel assy
1	1434558	Front panel
2	1502030	Process and dialogue
3	1445477	Fixing kit
4	1526059	Set of screws
5	1456887	Pushbutton assy POWER green
6	1456888	Pushbutton assy ON green
7	1456889	Pushbutton assy OFF red
8	1526071	SD-Card
9	1445501	Front panel wiring harness assy

Spare Parts, Front Panel eco

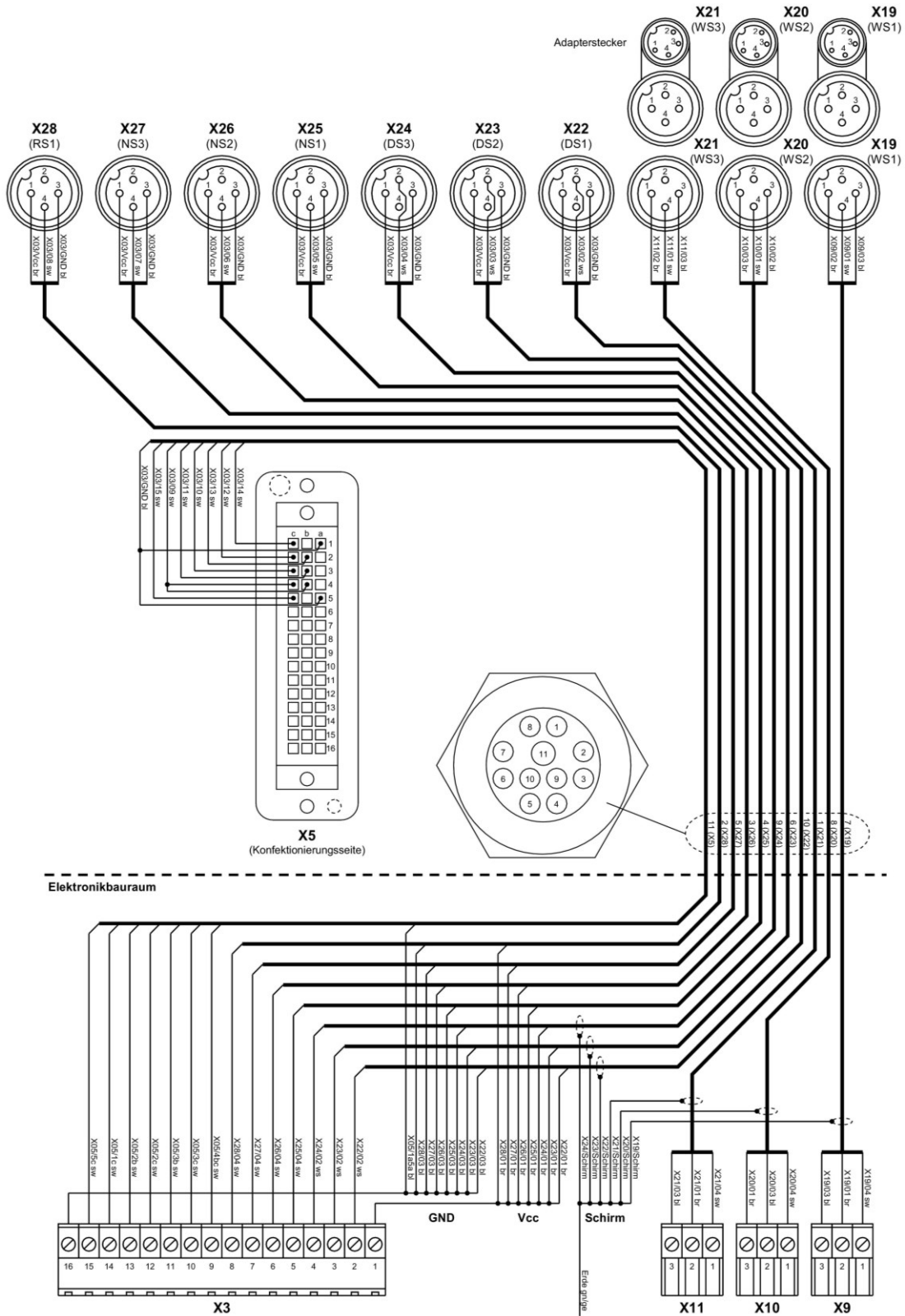
E10 Front Panel eco



Pos.	Artikel-Nr.	Bezeichnung
-	1456842	Front panel eco assy
1	1434516	Front panel eco
2	1502031	Process and dialogue display eco
3	1445477	Fixing kit
4	1526059	Set of screws
5	1456887	Pushbutton assy POWER green
6	1456888	Pushbutton assy ON green
7	1456889	Pushbutton assy OFF red
8	1526072	SD-Card eco
9	1445501	Front panel wiring harness assy

Spare Parts, Wiring Harness

E11 Wiring Harness



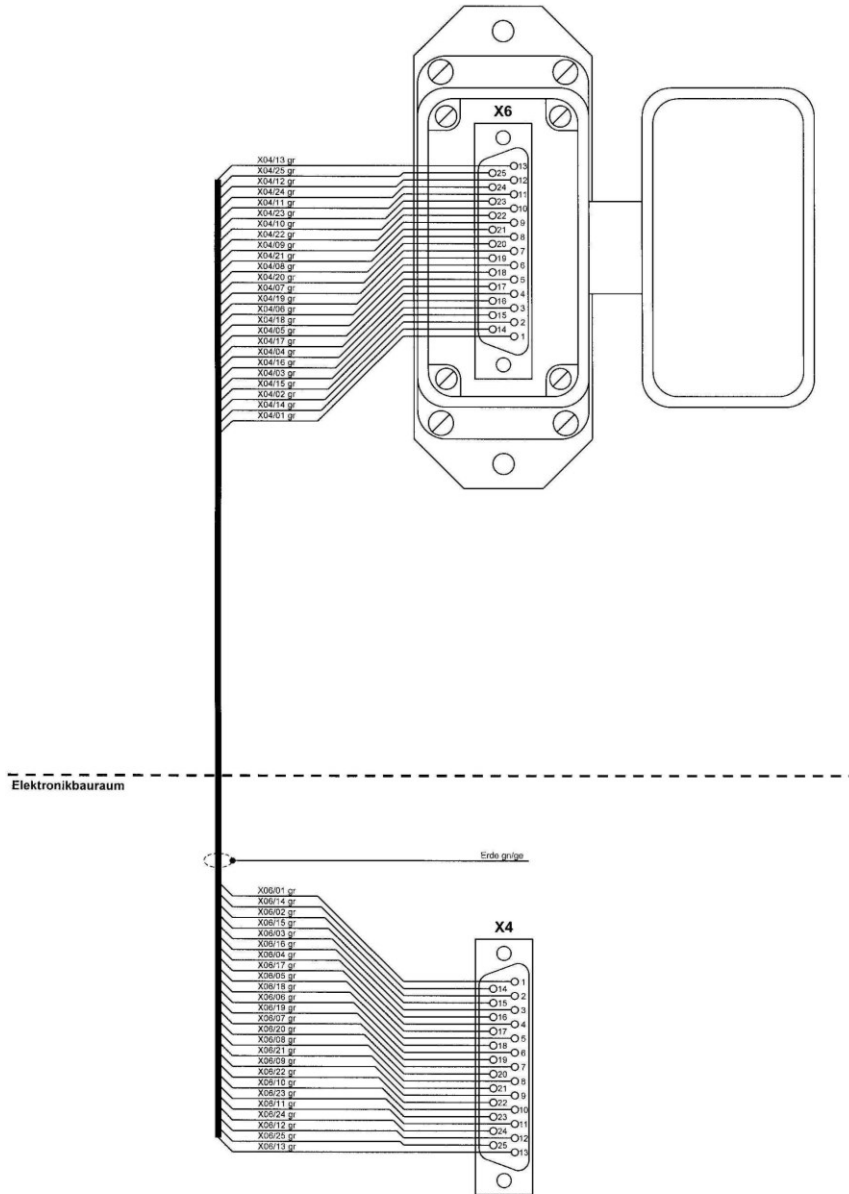
Item	Part No.	Description
2	1434556	Wiring harness Part-2 assy

Spare Parts, Wiring Harness

E11

E11 Interface Cable

E11 Interface Cable



Item	Part No.	Description
3	1434556	Interface cable Part-3 assy