EAP/EDP tools

Operator's Manual

N° 6159936510-00

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1 - SCOPE

This tool has been designed to assemble and disassemble screws in wood, metal and plastic materials. No other use will be permitted. For professional use only.

2 - GENERAL INSTRUCTIONS

To reduce risk of injury, everyone using, installing, repairing, maintaining, changing accessories on, or working near this tool must read and understand the safety instructions before performing any such task. Failure to follow all instructions listed below, may result in electric shock, fire and/or serious personal injury.

General safety instructions are collected in the **6159930690** safety booklet.
Specific instructions are given below.

SAVE THESE INSTRUCTIONS CAREFULLY

3 - PERSONAL SAFETY

3.1 - Earthing connection

WARNING: this power tool must be earthed.

3.2 - Differential circuit-breaker

Always use a differential circuit breaker to protect the operator from electric shock. A differential circuit breaker in the power supply to the tool detects any insulation defect between the phases of the network and the earth and immediately cuts off the power supply to the tool.

3.3 - Power supply

Always use the cord supplied with the tool to connect to the mains power supply or CP Data Transfer Unit. Do not modify the cord or use it for other purposes. Use only genuine CP replacement parts. Failure to follow these instructions may result in electric shock.

4 - TOOL USE HAZARDS

The selection of the tool takes account of the operating conditions as stated by the user, who shall not exceed the operating limits as specified by the manufacturer at the time of the selection (see "Max duty cycle" file on the CDRom supplied).
Any excessive internal temperature of the tool electric motor if higher than 60°C is detected and stops the tool. It can start again only if the temperature decreases to under 50°C.
Although our cables are designed to work under drastic conditions, we recommend that you check the following points for longer service life:

- bending radii should not be lower than 10 times the cable diameter,
- friction with the outer sheath should be restricted,
- any direct pull on the cable should be avoided.

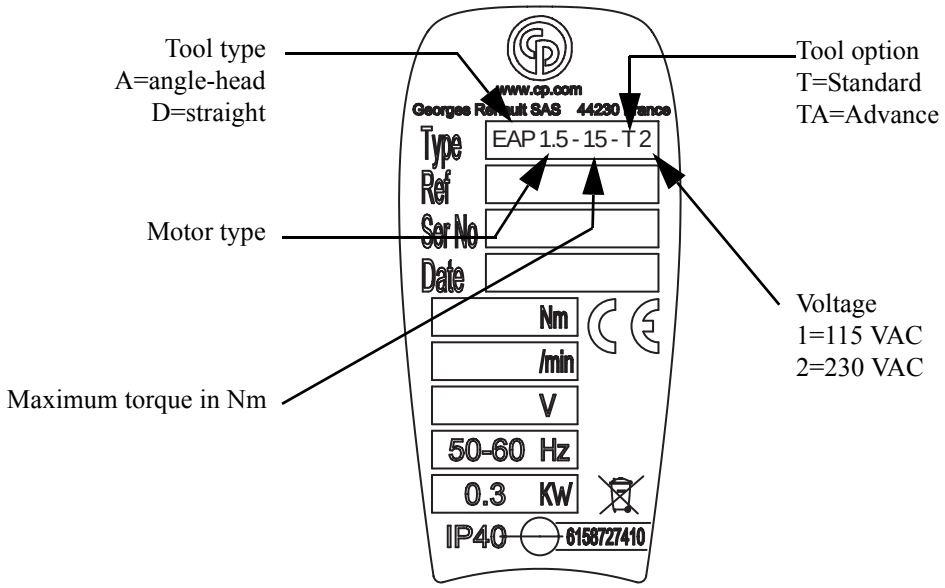
5 - TOOL CARE AND SERVICE

Only experienced and qualified personnel (authorised electricians) are entitled to open and have access to the inside of the tool. If in doubt, return the tool to a CP-authorized service centre (contact your local CP Sales for details).
Disconnect from power supply and wait one minute before commencing service operations. Failure to wait one minute may result in electric shock from undischarged capacitors.
Beware hot components. There is a risk of burning by internal components which can reach 75°C (170°F). Allow to cool before handling.

CHAPTER 2 - DESCRIPTION AND OPERATION

1 - GENERAL

EAP/EDP tools are electric fastening tools directly supplied by mains. They are fitted with a torque transducer for high-precision torque control. Main parameters (torque; speed) can be adjusted directly on the tool using a display and 3 programming keys. It is also possible, whatever the option, to completely programme the tool and to save the parameters using a PDA (Personal Digital Assistant) via a wireless connection between the tool and the PDA.



There are several options:

"Standard" (T)	screwing with a preset torque value, informing the user that the assembly has been properly carried out.
"Advance" (TA)	ensuring that the assembly has been properly carried out through: • torque control, • checking rotation angle, informing the user that the assembly has been properly carried out.
"Data Transfer Unit" (DTU)	controller which allows to control the "Advance" tool via a programmable automate: • for collecting tightening reports via Ethernet, • for performing fastening sequence including up to 7 different cycles.

1.1 - Mains supply

There are 2 types of tools:
- one tool which works with 230 VAC mains voltage, ± 8%, 50/60Hz
- one tool which works with 115 VAC mains voltage, ± 8%, 50/60Hz

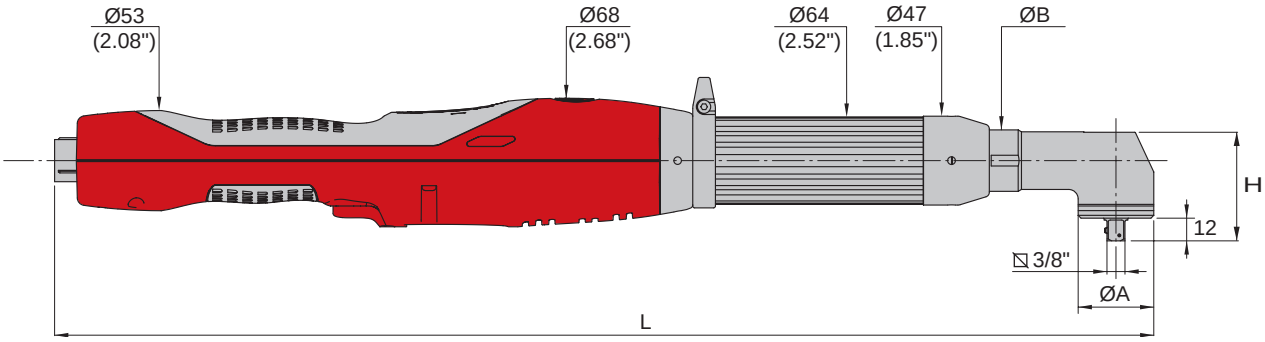
Although the peak power can reach 2 kVA during the final speed phase, it is recommended to adjust the power circuits according to the maximum average power.
The average power input depends on the tool type, the assembly type and the tightening rate. However, for heat dissipation reasons, the maximum average power can not exceed 0.3 kVA.

1.2 - Features

	Protection level	IP40
EN 60745	Noise level	< 70 dBA
EN 60745	Vibration level	< 2.5 m/s²

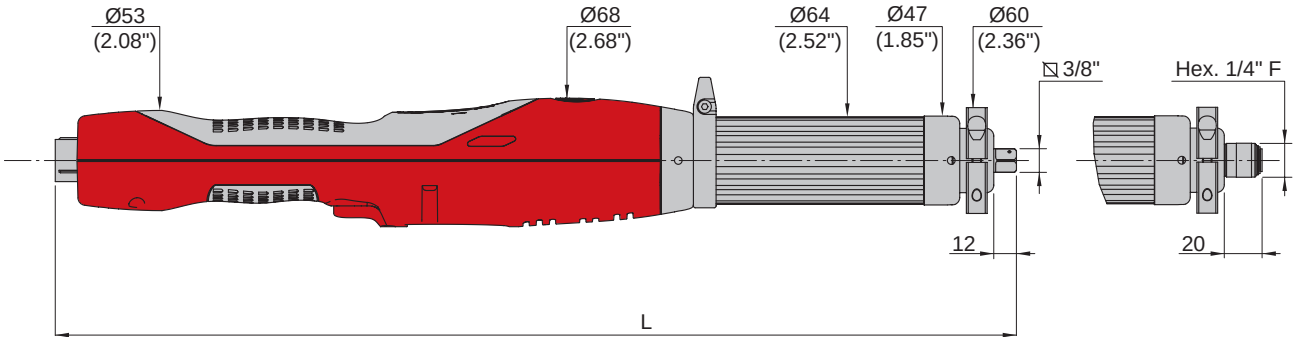
These declared values were obtained by laboratory type testing in compliance with the stated standards and are not adequate for use in risk assessments. Values measured in individual work places may be higher than the declared values. The actual exposure values and risk of harm experienced by an individual user are unique and depend upon the way the user works, the workpiece and the workstation design, as well as upon the exposure time and the physical condition of the user.

We, CP, cannot be held liable for the consequences of using the declared values, instead of values reflecting the actual exposure, in an individual risk assessment in a work place situation over which we have no control.



Models	Torque (Nm)		Maximum speed (rpm)		A		B		H		L		Out-put	Weight	
	min	max	115VAC	230VAC	mm	"	mm	"	mm	"	mm	"		kg	lb
EAP1.5-15-*	3	15	690	1020	28	1.103	27	1.064	45.5	1.793	534.5	21.059	Ø 3/8"	1.85	4.07
EAP1.5-20-*	5	20	540	800	28	1.103	27	1.064	45.5	1.793	534.5	21.059	Ø 3/8"	1.85	4.07
EAP1.5-26-*	7	26	340	510	28	1.103	27	1.064	45.5	1.793	534.5	21.059	Ø 3/8"	1.85	4.07
EAP2-20-*	5	20	890	1320	28	1.103	27	1.064	45.5	1.793	559.5	22.044	Ø 3/8"	2.0	4.40
EAP2-30-*	7	30	690	1020	28	1.103	27	1.064	45.5	1.793	559.5	22.044	Ø 3/8"	2.0	4.40
EAP2-40-*	10	40	540	800	35	1.379	27	1.064	51.5	2.029	570	22.458	Ø 3/8"	2.1	4.62
EAP2-65-*	15	65	340	510	40	1.576	30.5	1.202	57.5	2.266	581.5	22.911	Ø 3/8"	2.2	4.84

* = T for "Standard", TA for "Advance"



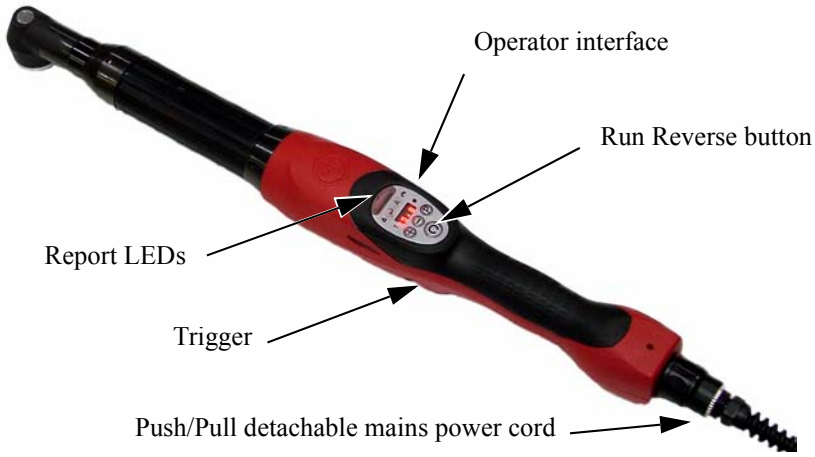
230VAC model	Torque (Nm)		Maximum speed (rpm)		L		Output	Weight	
	min	max	115VAC	230VAC	mm	"		kg	lb
EDP1.5-15-*	3	15	680	1010	491.5	19.3651	Hex 1/4" F	1.7	3.74
EDP2-24-*	5	24	940	1390	516.5	20.3501	Hex 1/4" F	1.8	3.96
EDP2-33-*	7	33	680	1010	508.5	20.0349	Ø 3/8"	1.85	4.07
EDP2-43-*	8	43	525	780	508.5	20.0349	Ø 3/8"	1.85	4.07

* = T for "Standard", TA for "Advance"

1.3 - Operating temperature

Considering its technology, the temperature of the tool naturally increases during tightening cycles. Best tightening rates are reached with an ambient temperature of 20°C. The performance of the tool is decreased by approximately 50% for an ambient temperature of 40°C. The maximum operating temperature is 45°C. For further information, refer to "Max duty cycle" file on documentation CD-ROM.

1.4 - Description



1.4.1 - Report LEDs

The operator is informed at a glance of the tightening results through report LEDs. They can have three colours (green, yellow and red) and are located on the upper part of the tool and on both sides of the tool. They are off during the tightening and turn on after the tightening.

1.4.2 - Operator interface

Description	Function
Direction of rotation	Modifying the direction of rotation. When the tightening direction is enabled, the lights are off. When the run reverse direction is enabled, the red and green lights are flashing.
Programming button	Entering the programming mode and validate.
Button +	Changing parameter or increasing the value.
Button -	Changing parameter or decreasing the value.
Maintenance warning light	Showing that the number of cycles is higher than the number programmed and that it is time to perform control or maintenance operations.
Access code parameter light	Showing that the parameter is selected. For safety reasons an access code must be entered before modifying the parameters.
Torque parameter light	Showing that the parameter for displaying and modifying the final torque value and the torque unit is selected.

Description	Function
A Learning parameter light	Showing that the parameter which, when a torque value has been entered, is used for measuring the assembly specifications and for optimising all the adjustment parameters (rundown threshold, speed, angle tolerance) is selected. Tightening time and overheating are then optimised for tightening accuracy.
Speed parameter light	Showing that the parameter is selected. 10 speed levels for adjusting speed got by learning. The rundown speed and the tightening speed are adjusted at the same time.
Communication light	All parameters can be programmed and saved using a PDA (Pocket PC). The data transfer between both devices is made through radio frequency waves using Bluetooth protocol; the light is flashing as long as the communication lasts.
Display	Displaying the tightening reports (OK, NOK, tightening faults, operating errors) and the main parameters of the tool.

1 - ON RECEIVING THE TOOL

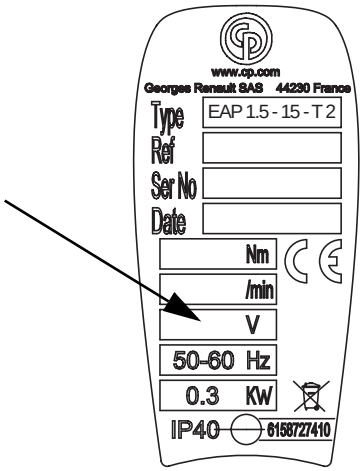
Check that the following items are included in the kit supplied with the tool:
- the certificate of conformity,
- the safety instructions,
- the CDROM,
- the operator's manual.

On delivery, a separate kit can be provided according to the country of destination. The kit includes the following items:
- the mains cord.

2 - INSTALLATION

Install the necessary accessories:
- rotating suspension device
- double safety device
- …

Make sure that the operating voltage specified on the tool corresponds to the voltage of the electric network.



Make sure that the protection devices of the line are appropriate to the tool and that the safety instructions are respected.
The Standard and Advance tools are directly connected to the mains. No other connection is required.
Advance tools connected to the Data Transfer Unit controller have the same functions as the Data Transfer Unit. See corresponding documents.
Switch on, adjust the tool:
- enter the access code,
- set the torque,
- carry out the learning sequence directly on the assembly,
- check and validate the adjustment (see “PROGRAMMING”, page 24).

The tool is ready to operate.
This is the easier and the faster method; however the tool can be programmed from a PDA.

The factory access code is 122.

1 - PROGRAMMING DIRECTLY ON THE TOOL

1.1 - Description

The tool has been designed for an easy, optimum, fast and secured start-up. The parameters directly programmable from the tool are:

- the access code which authorises parameter modification,
- the tightening torque and its unit,
- the learning mode for the Advance and Data Transfer Unit tools,
- the speed adjustment.

1.2 - Main programming procedure

1.2.1 - Programming mode

1 Press Ⓟ for at least 3s to reach the programming mode. The access code parameter is displayed (set up to 0).

⚠ This step is disabled if the "Locked in programming" option has been selected through the PDA; in this case the parameters cannot be modified directly from the tool.

2 Change this value using ⊖ or ⊕ until the access code is displayed (122 by default).

- continuous action -> fast scrolling
- short action -> step by step modification.

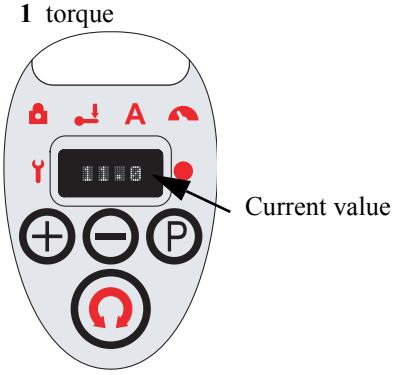
The access code can be changed using the PDA (see corresponding manual).

3 Press Ⓟ to validate.

1.2.2 - Parameter choice

From the programming mode, press ⊖ or ⊕ to scroll the parameters.
When you press ⊕ they are displayed in the following order:

1 torque



2 unit

3 learning

4 speed

5 to quit without saving parameters.

To modifiy the parameter, press (P).
The flashing display shows that the value can be modified.

1.2.3 - Torque

By default the torque unit is the Nm. If the unit is different, it is recommended to modify it before programming the torque.

1 From the torque mode, press (⊖) or (⊕) to programme the value (between 0 and the maximum torque of the tool).

2 Press (P) to validate.

1.2.4 - Unit

1 From the unit mode, press (⊖) or (⊕) to programme the unit (Nm;Ftlb;Inlb).

2 Press (P) to validate.



1.2.5 - Learning

It is recommended to use the learning function to programme the tool. This function is used to easily optimise all the tightening parameters, including parameters which can only be reached through the PDA (run down torque, angle tolerance, etc.). If at the end of the learning you are not satisfied with the speed level, you can change it by selecting the speed parameter.

Learning begins.

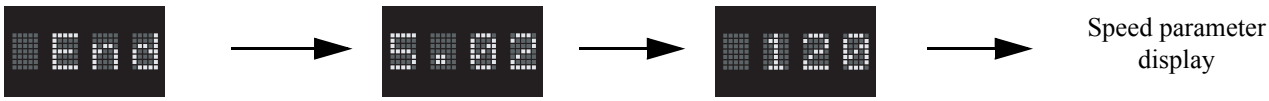
1. Tighten the first assembly. Result 1:

End of step 1 — Torque — Angle

2. Tighten the second assembly. Result 2:

End of step 2 — Torque — Angle

3. Tighten the third and last assembly. Result 3:



Learning is done. — Torque — Angle — Speed parameter display

Then you can:

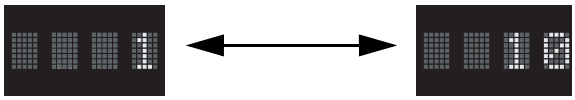
- either press (P) for at least 3s to go back in tightening mode,
- or briefly press (P) to modify the speed parameter.

If you perform the learning with only one assembly, you can loose it using .
If during the learning the result is not OK, the tool goes back to the beginning of the learning process.
If after the 1st or the 2nd tightening you do not want to go on, press (P). Then the tool goes back to the beginning of the learning process.

1.2.6 - Speed

The speed level is set automatically when the assembly is learnt. It is modified when the speeds learnt are not completely satisfactory.
The speed level can be set between 1 and 10 (1=slow, 10=fast). For each speed level there are one rundown speed and one final tightening speed. These speed pairs are optimised for each tool type and to match all types of assembly. Thus the tightening is more precise, the operator comfort is improved, the operation shocks are reduced, the cycle time is optimised and the tool overheating is reduced.

1 From the speed mode, press (−) or (+) to choose the speed level.



2 Press (P) to validate.

1.2.7 - Parameter validation

To save the parameters, press (P) for at least 3 seconds.
The tool goes back in tightening mode and is ready to tighten.
By default, if no key is pressed during 60s, the tool goes back in tightening mode without saving parameters.
To quit quickly the programming mode without saving parameters:

1 From the parameter choice mode, press (−) or (+) until "ESC" is displayed.

2 Press (P) to validate.

2 - PROGRAMMING USING THE CVIP Pocket SOFTWARE

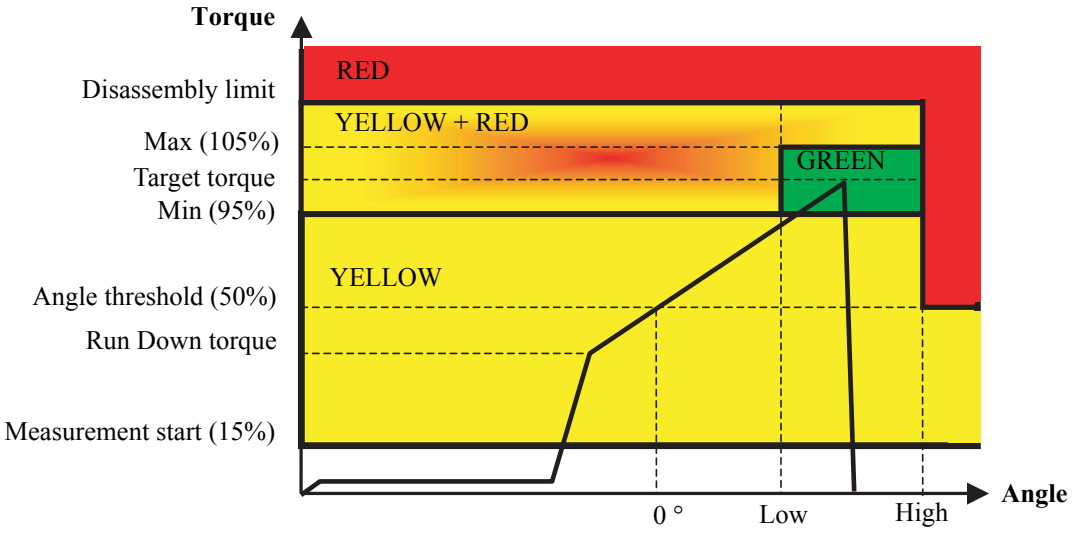
You can programme the tool using a PDA with the CVIP Pocket software. With the PDA, you can read, modify and save all the tool parameters, as well as create new tightening programmes and download a programme in the tool.
With the CVIP Pocket software, you can also read the tightening results from a tool.
The wireless communication between the tool and the PDA is made using a Bluetooth protocol.
For further information, refer to the Logiciel CVIP Pocket manual supplied with the software CD-ROM.

1 - TIGHTENING RESULTS ON THE TOOL

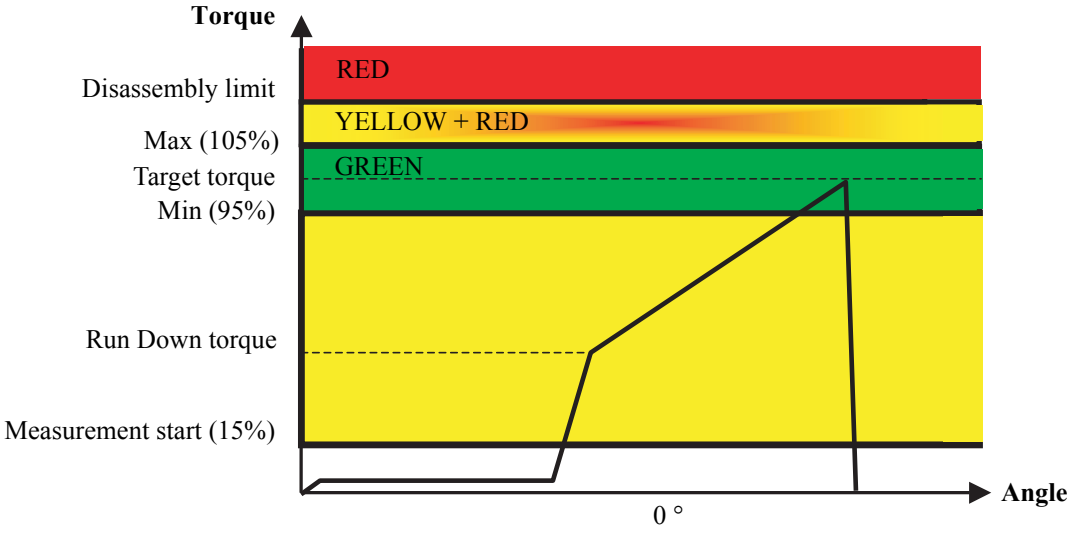
1.1 - Report LEDs

The operator is informed at a glance of the tightening results through report LEDs (green, yellow and red).

Advance tool (TA) - Torque control + Angle monitoring



Standard tool (T) - Torque control



LEDs colour	Interpretation	Action
Green	The torque and the angle are inside the programmed limits.	None (tightening correct)
Yellow	The minimum torque value has not been exceeded. The screw has undergone no stress, the tightening operation has been stopped too soon.	The operator can tighten again.
Yellow + red	The torque and angle results are near the desired values. The screw has undergone no stress.	The operator can unscrew then tighten the assembly again.
Red	The torque has reached the disassembly limit (assembly damage limit) or the angle is greater than the maximum angle when the torque is correct. There is a great risk that the screw has undergone permanent strain.	Loosen the assembly and repair

1.2 - Buzzer

At the end of each tightening, a sound informs the operator of the tightening result:
- 1 beep -> tightening correct
- 2 beeps -> tightening not correct or faulty operation
- 3 beeps -> end of tightening sequence ("Data Transfer Unit" only)

Each user will estimate if these sounds are useful for him/her. They can be disabled separately using the CVIP software (see CVIP Pocket software manual).

1.3 - Display

At the end of each tightening, tightening results and possible faulty operations are displayed.

1.3.1 - Tightening results


Tightening correct


Torque low


Torque high


Angle low


Angle high

1.3.2 - Faulty operations

Faulty operations are coded so that the operator can efficiently locate the default. To know the signification of each code, see “ERROR TABLE”, page 31.

2 - TIGHTENING RESULTS ON THE PDA

When the CVIP software is installed on the PDA and when the Bluetooth communication is initialised, you can read the tightening result:
- overall result,
- torque value (reminder of minimum and maximum tolerances),
- angle value (reminder of minimum and maximum tolerances).

This function is used to compare tool results with a reference torquemeter, particularly in tightening adjustment. Results are not stored in the PDA. For further information, refer to Logiciel CVIP Pocket manual.

3 - TIGHTENING RESULTS VIA Data Transfer Unit

When an Advance tool is connected to a "Data Transfer Unit" the tightening results are sent and stored in this controller. 10,000 results can be stored. They can be sent on request and at any time on the Ethernet network.
These results are also available in order of occurrence on the serial link.
A control and report box can be connected to the Data Transfer Unit controller in order to display tightening result (correct/not correct) and sequence report, if necessary.
For further information, refer to the Data Transfer Unit controller manual.

CHAPTER 6 - MAINTENANCE

1 - MAINTENANCE LIGHT

The tool is fitted with a maintenance alarm which goes on as soon as the tool has performed a programmed number of cycles. This means that it is time to perform maintenance operation.
This alarm does not stop the tool, the operator can go on working but he/she is to inform the maintenance department.
The number of cycles is set to 250,000 by default; it can be modified using CVIP Pocket software.
However, you are advised to perform the following operations:

every 250,000 cycles	• disassemble the angle-head • clean the pinions and lubricate • check the tool torque transducer calibration
every 1,500,000 cycles	• disassemble the planetary reduction gears • clean and lubricate
every 2,000,000 cycles	• change the engine bearings

When the maintenance operation is done, reset the counter using the CVIP software in order to turn off the light.

2 - TORQUE TRANSDUCER CALIBRATION

The tool can be only calibrated using the CVIP Pocket software (see corresponding manual).

3 - ERRORS

In the case of tool faulty operation, error codes are displayed. These error codes can also be read on the CVIP Pocket result screen, which specifies the error type plaintext.
For further information, see “ERROR TABLE”, page 31.

4 - TOOL OVERVIEW

For disassembly and part replacement, see “PART LIST”, page 193.

5 - ELECTRICAL CONNECTIONS

See “PART LIST”, page 193.

Error	Description	Checking/Actions
E1	Overcurrent on the power circuit. The hardware limit has been reached. As soon as the fault appears, the tool stops	Turn off the tool and turn it on again in order to reset the fault. This problem can result from programmed power too big for the tool. Try to reduce the speed to make sure the fault has disappeared. If the fault still appears when the tool is switched on and without pressing the trigger, the power stage is faulty => contact your customer service.
E2	Tool waiting for SEQUENCE AKNOWLEDGEMENT	After performing a sequence with the "sequence OK locking on" function enabled, you have to activate the "sequence acknowledgement" signal. This operation mode is available only with the Data Transfer Unit.
E3	Programming fault. The torque value for the selected cycle is 0	For the Standard and the Advance tools, the tool performs one cycle. Press ⊕ to display the target torque. It must be different from 0. If it is 0, programme a torque value according to the manual instructions. When the tool is connected to a Data Transfer Unit controller, a sequence with several cycles can be performed. Using the PDA check the sequencing and the programming of each cycle.
E4	Tool waiting for FAULT ACKNOWLEDGEMENT following a faulty tightening report	When the fault acknowledgement function is enabled and after a faulty tightening, you have to activate the fault acknowledgement signal. This operation mode is available only with the Data Transfer Unit.
E5	Cycle request not validated	The external cycle start is activated but the external start cycle is not enabled in the tool parameters. This operation mode is available only with the Data Transfer Unit.
E6	Run reverse request not validated	The run reverse is activated but the run reverse authorisation is not enabled in the tool parameters.
E7	Waiting for run reverse spindle validation	When the tool is connected to a Data Transfer Unit controller, the run reverse spindle validation function is systematically enabled. To authorise the tool to operate in run reverse mode, the run reverse spindle validation signal must be enabled.
E8	Waiting for spindle validation (tightening)	When the tool is connected to a Data Transfer Unit controller, the spindle validation function is systematically enabled. To authorise the tool to operate in tightening mode, the spindle validation signal must be enabled.
E10	The connection with the Data Transfer Unit controller having already been set up, inexplicable communication error with the Data Transfer Unit controller	The Data Transfer Unit controller is still on but does not communicate with the tool anymore. Faulty serial link => faulty cable/faulty Data Transfer Unit/faulty tool.
E11	Bus voltage fault	The bus voltage reflects the mains voltage after rectifying and filtering. E11 fault means that the mains voltage is not appropriate for the voltage announced in the tool. Make sure that the tool is adapted for the mains voltage. Check the mains voltage.
E12	Overheating of IGBT	The IGBT dissipator temperature is higher than 80°C. Wait for the tool to cool down. The tool can tighten again when the temperature is lower than approximately 60°C. Usually this fault is preceded by the E411 fault and only occurs whent the IGBT fan is faulty. Check the fan functionning.
E302	No communication with the Bluetooth module	The tool does not work. The bluetooth module is faulty, contact your customer service.
E403	Bus voltage out of limits by +/- 15%	The bus voltage reflects the mains voltage after rectifying and filtering. The tool has detected a brief overvoltage or undervoltage of the mains.
E404	Exceeding of the current threshold forced in the power bus. Overcurrent on the power circuit (software cut)	The power programmed is too large for the tool. For instance you can reduce the speed. Turn off the tool and turn it on again in order to reset the fault.

ERROR TABLE

Error	Description	Checking/Actions
E405	Exceeding of the engine temperature limit (80°) - The tool stops instantaneously	Wait for the tool to cool down. The tool can tighten again when the temperature is lower than 55°C. Usually this fault is preceded by the E411 fault and only occurs when the engine temperature varies from less than 60°C to more than 80°C in one cycle.
E407	Torque transducer compensation fault. The measurement is out of limits	A torque transducer compensation measurement (offset) is performed at the beginning of each tightening. This fault means that the compensation is out of limits by +/- 10% of the nominal load. That shows a torque transducer zero drift. Make sure the tool is not under stress at the beginning of the tightening.
E408	Torque transducer unbalance value measurement fault	A torque transducer unbalance measurement (torque simulation) is performed at the beginning of each tightening. This fault shows a large drift of the amplifier gain, or fault of the transducer against a reference value that has been stored in factory. The unbalance measured is different by +/- 10% from the reference value. Make sure the tool is not under stress at the beginning of the tightening. Make sure it is not a transducer fault nor a torque board fault. If the drift is acceptable, you can store the new unbalance as the new reference value. Usually this fault is combined with a drift of the actual tightening torque. Check the tool calibration.
E410	ADC reference value measurement error	DSP reference voltage are faulty. This leads to errors in the measurement of engine position, temperature, mains voltage, mains current.
E411	Exceeding of the maximum engine temperature (60°C); the tool completes the cycle in progress	Wait for the tool to cool down. The tool can tighten again when the temperature is lower than 55°C. This means that the tool tightening rate is too big or that the ambient temperature is higher than the usual temperature. Make sure that the tightening rate is adapted to the maximum tightening rate recommended by the manufacturer. Make sure that the tightening parameters (run down torque, speed) have been optimised. Perform a learning for the assembly.
E412	Handle overheating	Never close up ventilation inlet, make sure the fan is in operation (a faint noise is audible). The tool can tighten again when the temperature is back to normal.
>E500	E2PROM access error	The tool data are no longer available (E2PROM access faulty, data partially or totally modified or lost). Contact your customer service.

www.cp.com

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