EN

Manual

High Precision Drilling Unit BE 11

BE 11

Read this manual before installation and commissioning of the product.
Keep for future reference.

MAN021 - Manual BE 11, ORIGINAL, EN, Rev. 02.doc

E2 Systems
A DIVISION OF TUBEX AB
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DECLARATION OF INCORPORATION OF PARTLY COMPLETED MACHINERY ORIGINAL
According to the EC's Machinery Directive 2006/42/EC, Annex 2B

We,

E2 Systems a division of Tubex AB
Strömslundsgatan 3
507 62 Borås
Sweden,

declare that the partly completed machinery:

Model: BE11

* Is designed to be embedded in a larger machinery or assembled with another machine, which together will constitute machinery covered by Directive 2006/42/EC "Machinery Directive" and which shall be constructed in compliance with this directive, and
* Must not be put into service until the machinery, which the partly completed machinery must be part of, has been found and thus as a whole is declared in accordance with the "Machinery Directive" and national legislation. We also confirm:
* That the item 1 and 2.3 from the "Machinery Directive" Annex 1 concerning essential health and safety issues in the design of machines, which are reported in the manual for the above partly completed machinery, have been performed, and
* That the relevant technical documentation is compiled in accordance with Annex 7, Section B of the Directive 2006/42/EC

At the substantiated request of national authorities will relevant documents on the partly completed machinery be handed over.

Following other directive and harmonized standards, including appendix, has been applied:
EN ISO 12100:2010 Safety of machinery -- General principles for design -- Risk assessment and risk reduction.
SIS ISO TR 14121-2:2007 Safety of machinery -- Risk assessment -- Part 2: Practical guidance and examples of methods.
SS EN ISO 4414:2010 Pneumatic fluid power -- General rules and safety requirements for systems and their components.

Borås: 2009-12-18

Krister Johansson
CEO Tubex AB

Andreas Gabrielsson
responsible for the technical file

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Safety

WARNING!

- Ensure that the operator/user has read and understood this manual before the unit is in use.

- For security reasons, any modification of the unit and it's accessories, which may affect product safety, must be approved by the manufacturers technical manager.

The BE 11 unit is intended for 11 drilling and should not be used for any other application, unless approved by the manufacturers technical manager.

- Always follow local security regulations regarding installation, operation and maintenance.

- The BE 11 drilling unit must be securely fixed and the installation instructions must be strictly observed.

- The unit must be protected against splash of emulsions, etc. This is to ensure the drilling units function as the lid for is not sealed against liquid.

- When installing the BE 11 drilling unit on a stand or in a complete machine tool, necessary protective devices must be fitted to prevent injury caused by crushing (squeezing) or any other type of personal injury that might be caused by the unit or its rotating tool.

- All protective devices that are designed to prevent personal injury must be mounted in their intended position during the operation.

- When servicing or repairing the unit, the air supply must be switched off and the pneumatic system depressurized.

- Beware of hands, hair and loose fit clothing – Watch out for rotating parts.
  The spindle rotates up to 80 000 rpm.

- Never operate the unit without any eventual safety arrangements.

- Make sure that all hoses are safely fastened.

- Ignoring the instruction may invalidate the warranty.

More detailed information regarding risks related to the unit described below.

According to Machinery Directive 2006/42/EC the unit is a "partly completed machine". Thereby the manufacturer of the machine is responsible for the overall safety. This device should not be operational within EU before the machine, in which the device must be integrated in, assured to meet the Machinery Directive 2006/42/EC. This manual is developed according to Machinery Directive and also includes additional information to make it easy for the manufacturer of the machine to meet the Machinery Directive and the end user to maintain a high level of security

The machine is intended for use by a person with knowledge and experience of using a machine of this type, and without limited physical ability in arms and hands as well as fully sighted. The machine is designed to be serviced by a trained / qualified operator following the instructions provided in the manual. The accidents that are likely still might occur is when the machine is running without protection or with inadequate protection, without a fence, clamps or jigs. Ill health may arise from issues or material used, for example:

- Noise generated during the drilling / threading;
- Drilling dust / chips;
- Fumes and substances released during drilling of impregnated or treated material.

General recommendations

- Apply a system for monitoring the tool in the machine. If no such system is at hand, we recommend user/operator to frequently control the tool. To ensure that no damages occurred

Thorough review of the unit

Visual control of any external damages. Ensure there is possibility to quickly turn off the motor and air-supply and run a normal cycle without tool and material (to avoid further damages at the material and unit). Listen for noise from bearings and also control the run-out at the spindle nose. If not ok, unit has to be repaired and a new control for damages will be necessary. If a unit seems ok, perform a normal cycle and evaluate the processed result.

If accident or breakdown occurs:

When accident or breakdown occurs as results in damages, or risk for accident, should the unit be transferred to workshop or similar to ensure that unit can be repaired in a safe place. An accident or breakdown will assume that the entire machine is affected. Therefor is it up to the machine supplier to describe the work method when accident or breakdown occurs. E2Systems will with this manual make it easy to achieve a safe design of the machine.

Information about the manufacturer

Drill and thread unit is manufactured and supplied by E2 Systems a division of Tubex AB. E2 Systems are specialized in constructing and manufacturing drill and thread units. The units are compact and have a robust design constructed to be easy to use and have a long life-span with high precision. More of E2 Systems collection you will find at www.e2systems.com. If you would like to come in contact with E2 Systems regarding questions or comments on our products or documentation, our contact information follows:

E2 Systems
Strömslundsgatan 3
507 62 BORÅS
Telefon: 033-20 88 40
Fax: 033-20 88 49
E-mail: e2@e2systems.com

Description of the units

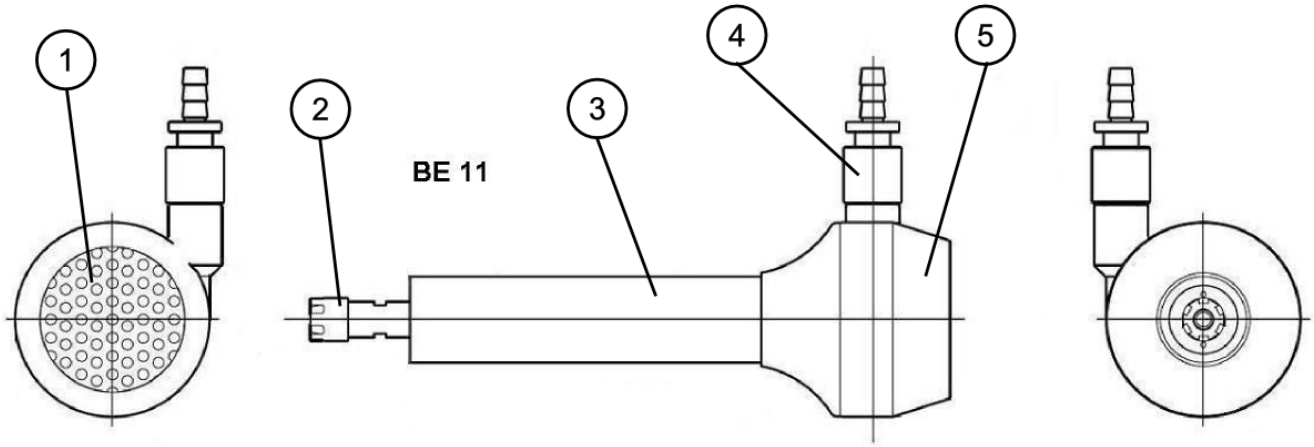
High Precision Drilling Unit **BE 11** with a basic design based on a patented air-driven turbine motor. The drive unit is powered without intermediate gears and features variable speed control up to 80 000 rpm. A special high-speed precision bearing makes the units extremely quiet.

BE 11

Type and Serial no.: See data label on unit.

Description:

1. Air exhaust with silencer.
2. Spindle with Collet Chuck ER 8, Ø1,0 – 5,0 mm (.039 - .197 In).
3. Housing.
4. Connection with Start / Stop / Speed regulating valve.
5. End cap.



Installation

The BE 11 drilling unit is only intended to be used in machines that meet the machinery directive 2006/42/EC.

WARNING!

Never use the BE 11 drilling unit without being securely fastened and that appropriate security arrangements have been organised.
Be careful with rotating and moving parts, to avoid personal injuries.
Ensure that the drilling unit is disconnected from the main air-supply, before any change of tool or maintenance.

Air supply:

A complete air preparation unit (FR unit) with a flow capacity exceeding 0,12 Nm^3/min (12 Cfm), air-filter with 5 µm (2500 mesh) filtration and pressure regulator shall be placed within 5 meters (16.4 Ft) of the unit to provide clean and dry air to the unit.

We recommend that this unit is installed in a place with clean air and an ambient temperature between +10º - +40º C. (+50º - +104º F.).

Connection:

Drilling unit BE 11: The unit is connected via a 3/2 valve, 1/4'', connected directly to the FR unit.

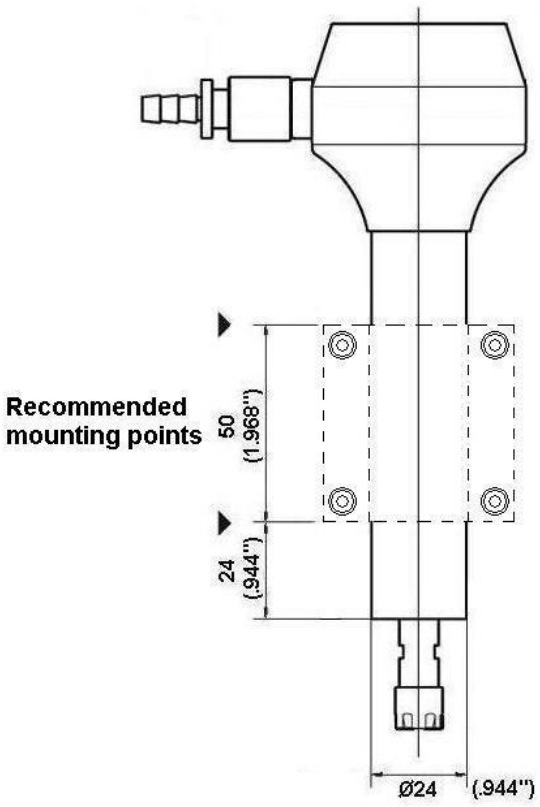
Grinding unit HFS 100: The unit is connected directly to the FR unit with supplied the hose.

Hoses and couplings must maintain a flow area equivalent to at least an inside diameter of ø6 mm (1/4'').

Before start up, check that the FR unit (set at 4 – 6 Bar (58 – 87 Psi)) is connected correctly and a filter cartridge is mounted in the air-filter.

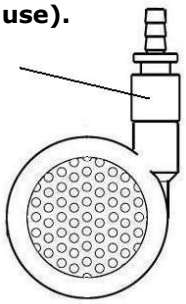
Mounting of BE 11

Mount the BE 11 drilling unit according to the below example. The drilling unit can be mounted vertically or horizontally. Optional mounting points should be discussed with E2's technician.



Running-in instruction

Running-in instruction: (before using the first time or after a long period without use).



1. Check that the unit is shut off.
2. Connect the unit to the air supply.
3. Turn on the unit, start at a slow speed, and adjust with the shut-off valve.
4. Start the running-in period with 3 minutes at a slow speed. Gradually increase the speed so that the maximum speed is achieved after approx. 10 minutes.
5. Shut off the unit and let the spindle rotate until stopped.
6. Rotate the spindle by hand. Listen that the ball bearings sounds OK.
7. The running-in is finished. Disconnect the unit.

Tool maintenance

Tools which are bent, damaged or otherwise suspected out of balance should immediately be rejected. The tools shall be pressed fully home in the chuck. Replacement grinding pins (new or used) should, before use at full speed, be trued with a sharpening tool or burr for smooth running. Full speed should although be utilized for final trimming off. Read tool manufacturers instructions for speed and choice of drill and grinding pin. For best results with grinding pins and hard metal files a reasonable working pressure should not be exceeded.

Maintenance instructions

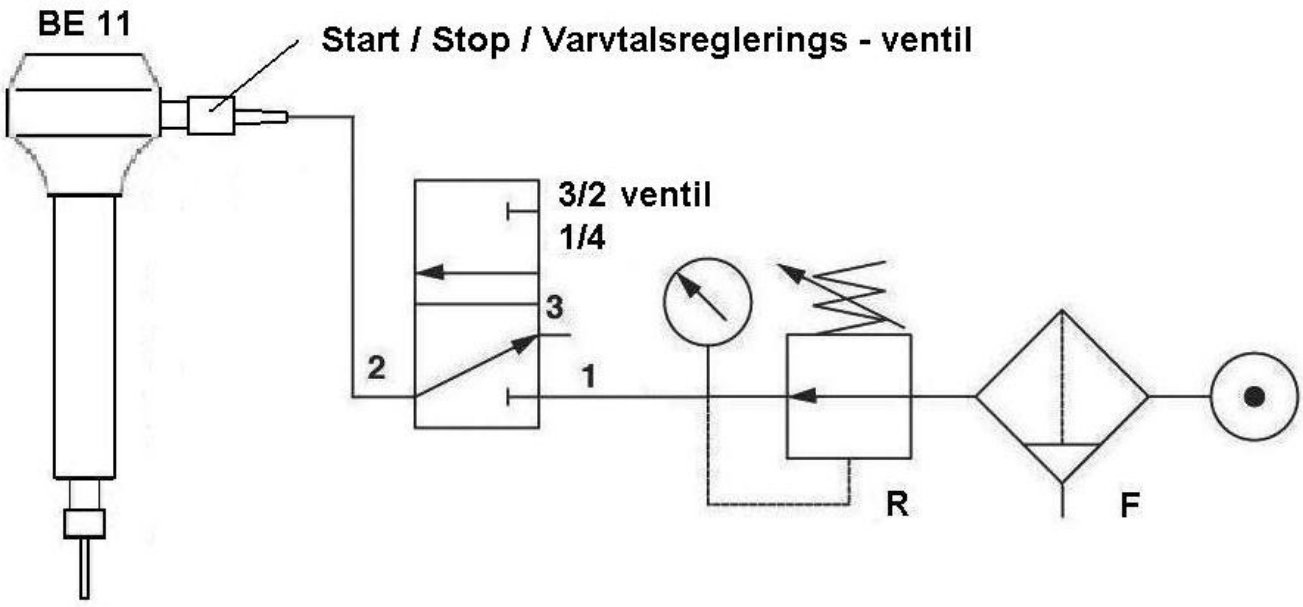
The unit has a very high rotation rate, approx. 60 000 – 80 000 rpm at around 4 - 6 Bars (58 - 87 Psi).
With proper care the unit has an exceptionally high durability.
Following instructions should therefore be closely observed.
For repairs consult only your authorized dealer.

The FR unit: Check that the air filter is working or replace the air filter.

Warning.

To repair the unit without supervision from authorized dealer means increased health and safety risk as well as impaired function. The balancing of the unit is of great importance after changing parts.

Example of connection



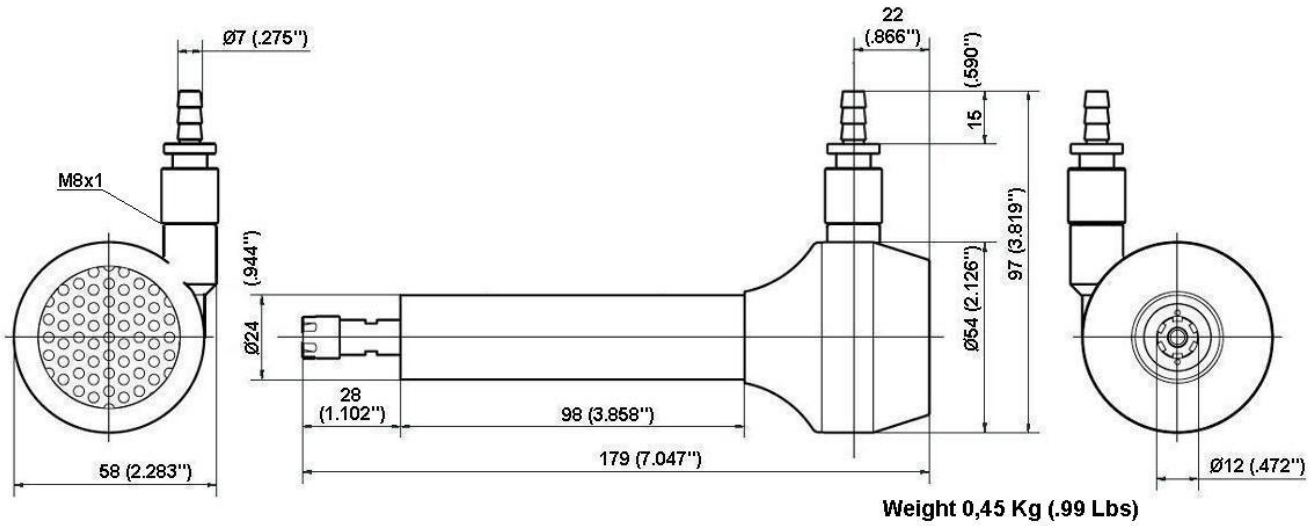
Technical information

Technical features, at 6 Bar (87 Psi):

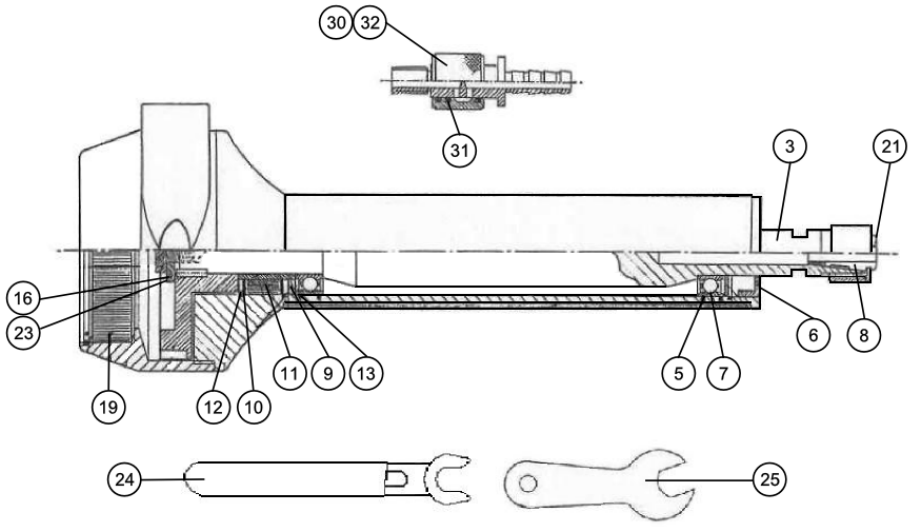
Power, air-turbine :	0,08 kW (.11 Hp)
Speed:	< 80 000 rpm
Torque:	0,02 Nm
CC spindle spacing:	Min. 54 mm (2 1/8'')
Run-out at spindle nose:	Max. 0,007 mm (.0003 In)
Working pressure range:	4 – 6 bar. Max 6 bar (58 – 87 Psi. Max. 87 Psi)
Air consumption :	< 0,12 Nm^3/min (2.8 – 4.2 Cfm)
Ambient temperature:	+10º - +40º C. (+50º - +104º F.)
Sound level:	67 dB(A)
Chuck:	ER 8 collet chuck

For other data such as drilling capacity we refer to our website www.e2systems.com.

Dimensional drawing



Spare parts drawing and Spare parts list



BE 11 / HFS 100			
Pos.	**Qty**	**Description**	**Part no.**
		Maintenance kit, BE 11 / HFS 100	041R000012
7	2	Ball bearing	
5	4	O-ring, Ø19,2x1,6 Nitril	
6	1	Dust guard	
9a	1	Spring washer	
11	1	Gasket	
12	3	Circlip	
9b, 13	3	Schim 0,3 mm	
10, 11, 13	3	Schim 0,3 mm	
13	1	Schim 0,2 mm	
16	1	Washer	
19	1	Exhaust filter	
23	1	Cylindric pin	
		(All above parts must be replaced at all repairs.)	
		Other spare parts:	
3	1	Spindle BE 11/HFS 100	041V300322
8	1	Nut for collet ER 8	041J004080
24	1	Wrench for collet nut ER 8.	041J004082
25	1	Wrench for spindle.	041V400493
30	1	Shut off valve	041V400487
31	3	O-ring for shut off valve, Ø10,1x1,6 Nitril	418A210048
32	1	Shut off valve with hose and connection.	041J004090
-	1	Hose 1/4'', length 1000 mm.	057G000085
-	1	Hose clamp	420A000111
		Collets:	
21	1	Collet ER 8, Ø1,0 mm (.039)	041J008001
21	1	Collet ER 8, Ø1,5 mm (.059)	041J008002
21	1	Collet ER 8, Ø2,0 mm (.079)	041J008003
21	1	Collet ER 8, Ø2,5 mm (.098)	041J008004
21	1	Collet ER 8, Ø3,0 mm (.118)	041J008005
21	1	Collet ER 8, Ø3,5 mm (.138)	041J008006
21	1	Collet ER 8, Ø4,0 mm (.157)	041J008007
21	1	Collet ER 8, Ø4,5 mm (.177)	041J008008
21	1	Collet ER 8, Ø5,0 mm (.197)	041J008009

Warranty conditions

The warranty period for the product is 12 months after installation/ commissioning or 18 months after delivery, which of these occurs first, and provided that the product installed/stored in a satisfactory manner and that the product is used in normal operation, the mounting/ clamping and handling conditions. The warranty is not valid if unauthorized change/modification have been performed on the product and that this may make the product unsafe.

Environmental declaration

Drilling / Grinding unit, Type BE 11 / HFS 100

Housing : Aluminium
End cap : Plastic
Other parts : Aluminium and steel
Gaskets : Rubber

Housing and other metallic parts : Dispose as metal waste; Aluminium and steel.
End cap and gaskets : Dispose as combustable waste.

All information contained in this manual is intended to be correct; however information and data in this manual are subject to change without notice. E2systems makes no warranty of any kind of regard to this information or data. Further, E2systems is not responsible for any omissions or errors or consequential damaged caused by the user of the product. E2systems reserves the right to make manufacturing changes which may not be included in this manual.