E2 SYSTEMS

**EN**

# Manual

## Electro Hydraulic Drilling And Tapping Unit

## Series BE 55 and BEG 55

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

MAN055 - Manual BE 55 and BEG 55, EN, ORIGINAL, Rev. 02.doc

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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 machine:

## Model: BE55X or BEG55X

* 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
2004/108/EC Electromagnetic Compatibility (EMC)
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 4413:2010 Hydraulic fluid power -- General rules and safety requirements for systems and their components.
SS EN ISO 60204-1 Safety of machinery - Electrical equipment of machines - Part 1: General requirements

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 has read and understood this manual before the drilling unit is in use.

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

- The unit is intended for drilling, countersinking, reaming and tapping and should not be used for any other application, unless approved by the manufacturer's technical manager.

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

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

- The drilling/tapping unit must be protected against splash of emulsions, etc. This is to protect the units control system and ensure the units function.

- When installing the 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 electrical system must be switched off and the hydraulic system depressurized.

- Beware of hands, gloves, hair and loose fit clothing – Watch out for rotating parts.

- Never operate the unit without any eventual safety arrangements – Beware of risk for crushing.

- Make sure that all hoses and electrical wires are safely fastened – Beware of risk for crushing.

- 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 according to the above**

- 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.
- Secure that electric motor is supplied with overload protection.

**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. Therefore 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:

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

## Device management

The BE(G)55-series weight in most cases between 25-35kg and always lesser than 51kg (BE558 with largest possible multi-spindle head VH184D). Which means that units should be carried with two persons standing towards each other and walking sideways? All models should be carried in minimum 2 attachment points, both considering the safety for the persons lifting the unit and also considering the safety for the unit. Hands as well as other lifting devices which are used as carrying device should be attached at feeding house/-control (to the left on drawing in the end of the manual) in front of the unit as well as transmission housing at the units rear position (to the left at drawing) to ensure best possible grip and balance of weight. The unit can be lifted around the electric motor as one lifting point if it is done carefully and for a shorter time. The same applies for the spindle/chuck for units with integrated ER chuck or mounted multi-spindle head.

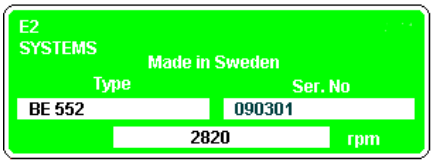
BE(G)55- series weight is laterally symmetric, but not in any other direction. Because of unit compact laterally it may, with the engine in the standard mode up, easily obtained from tipping sideways from a stable standing position. There is a risk for squeezing damages and other not direct damages occurring from the heaviness from the falling unit. Therefore should the unit be mounted or put in sideways position before installing adjustments of electric motor and pneumatic air. When motor are mounted in 90° degree are unit stabile standing. When the unit are mounted in 180° degree should the unit be placed on a surface which the motor can be hanging outside table edge. Therefore should the unit always be placed as long from the edge possible.

# Description of the Drilling and Tapping unit

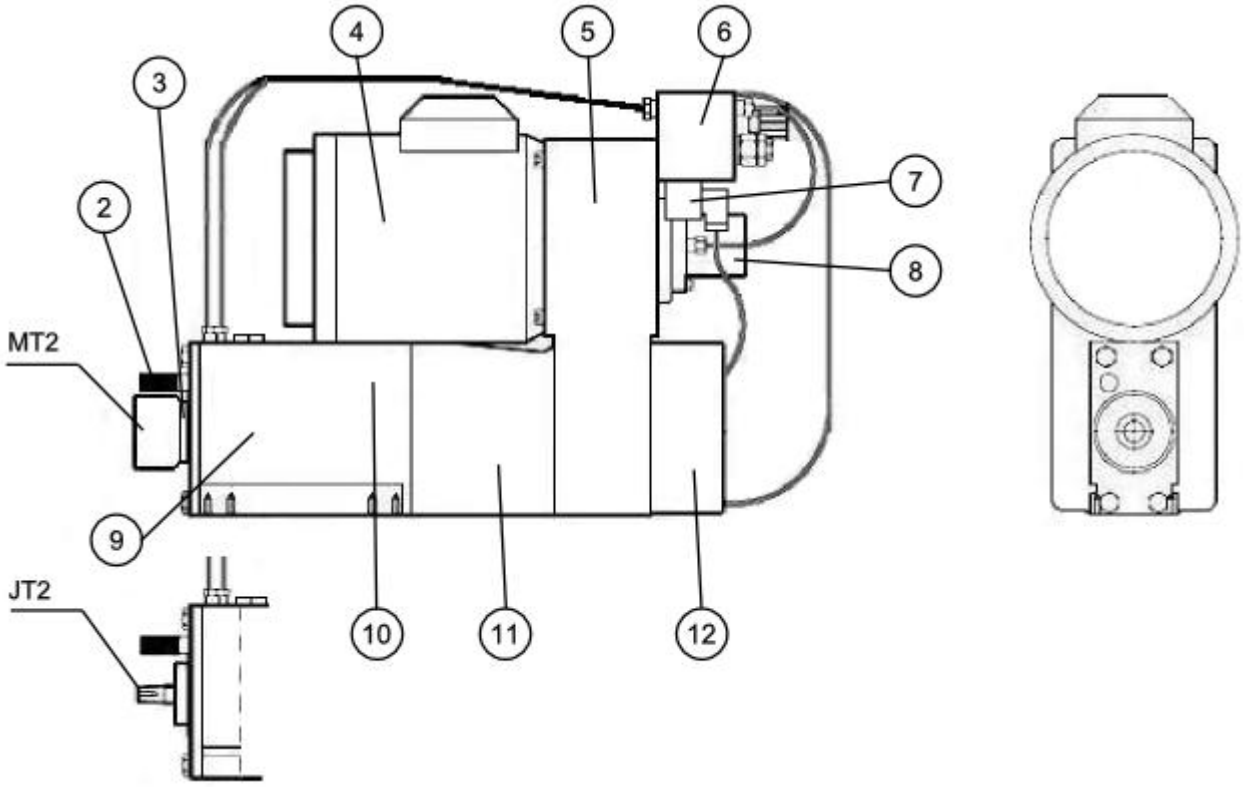
The **BE 55** series is a powerful and yet compact electro-hydraulic drilling unit of a modular design. The electric motor runs the spindle while the feed is both hydraulically powered and controlled. The hydraulic feed control together with position switches make it possible to include functions such as multi wall drilling, peck drilling, rapid advance and automatic chip removal.

The **BEG 55** series is a powerful and yet very compact electro-hydraulic tapping unit of a modular design. The electric motor runs the spindle while the feed is both hydraulically powered and controlled. A tapping spindle gives the unit the necessary length compensation. The hydraulic feed control together with position switches makes it possible to include functions such as rapid advance.

Type and speed: See data label on unit
Serial number: See data label on unit




1. Spindle with MT2 or JT2 taper.
2. Setting screw for stroke length limit.
3. Pinole
4. Electric motor. Forward or backward mounted.
5. Transmission housing with transmission between electric motor and drive shaft.
6. Hydraulic valve block.
7. Solenoid valves.
8. Hydraulic gear wheel pump, reversible.
9. Feed housing.
10. Clips sensor with clip ruler and clips.
11. Mid section.
12. Electronic box with control system.



# Installation

This Drilling and Tapping Unit is only intended for use in machinery which applies to the Machine Directive 2006/42/EC. This Drilling and Tapping Unit is designed for normal drilling, countersinking, reaming and tapping. In applications requiring high-precision hole placement or when drilling into rounded or slanted surfaces, drill bushings must be used.

To be able to use the unit, it must first be installed and fitted with control equipment. Regardless of how simple the installation is performed, the unit must be fitted with necessary protective devices to avoid personal injury. Special precaution must be taken to eliminate the risk of clothing, gloves, hair, etc. being caught in the rotating tool. The unit should always be mounted to a flat surface and be attached to a stable construction. Avoid adjacent parts enhancing resonance noise and vibrations wherever it is possible, which can create a resonance box effect.

The unit consists of many components and preassembled parts, the reliability of which is dependent upon proper maintenance. The pneumatic and hydraulic systems include a number of seals. It is essential to keep moving seal surfaces clean and free of marks and scratches

**WARNING!**

Never use the unit without being securely fastened and that appropriate security arrangements have been organized.
Be careful with rotating and moving parts, to avoid personal injuries.
Ensure that the unit is disconnected from the main air-supply, before any maintenance.
If the user feels the need to control the operation of this unit before it is installed in the machine, this is done AT YOUR OWN RISK
If test will be done anyway beware of following risk
Attached the unit to something very stable
Keep hair, clothes and other loose things away from the rotating spindle.
Keep everything away from spindle when feeds forward and back – for risk for clamping
Give space so that the feeding can feed all stroke (100mm) add safety distance for clamping risk

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

2. The unit must not be exposed to vibrations.

3. The control system may not be exposed to direct spraying of water, coolant or the like.

4. The unit must always be mounted on a flat surface (machined) and attached with belonging brackets or own arrangements. See Fig 1a and Fig 1b.

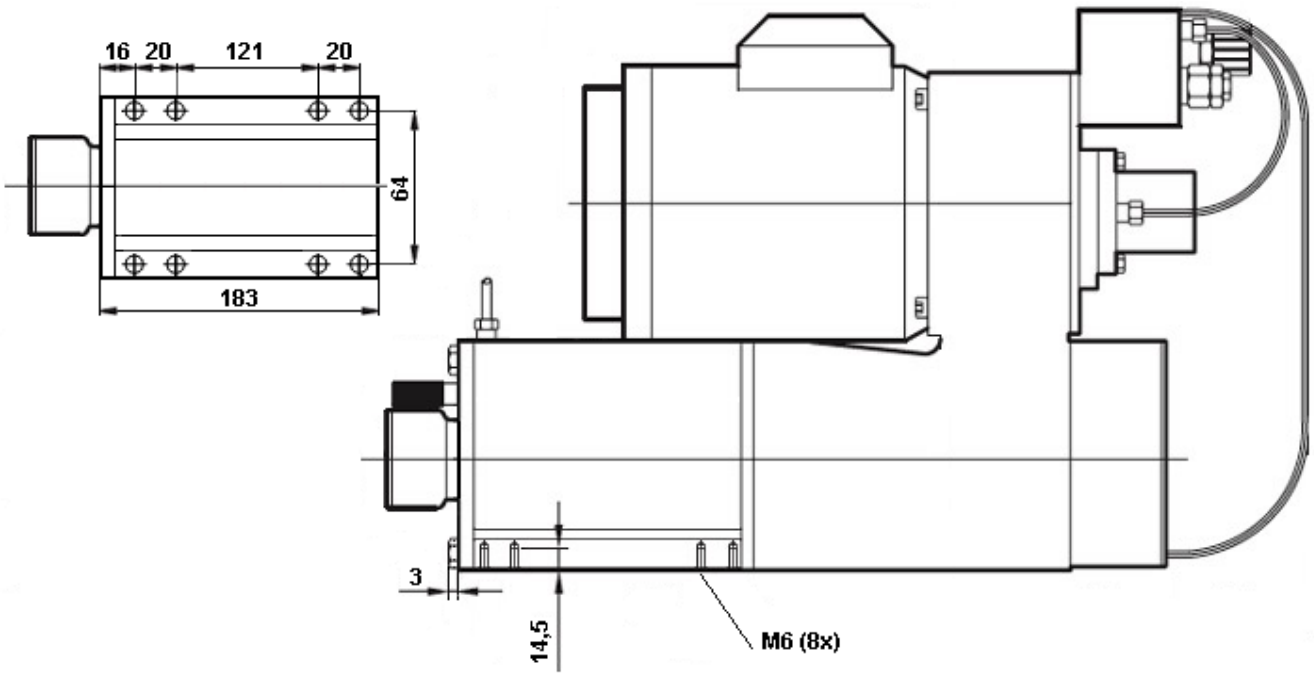



Fig. 1a.

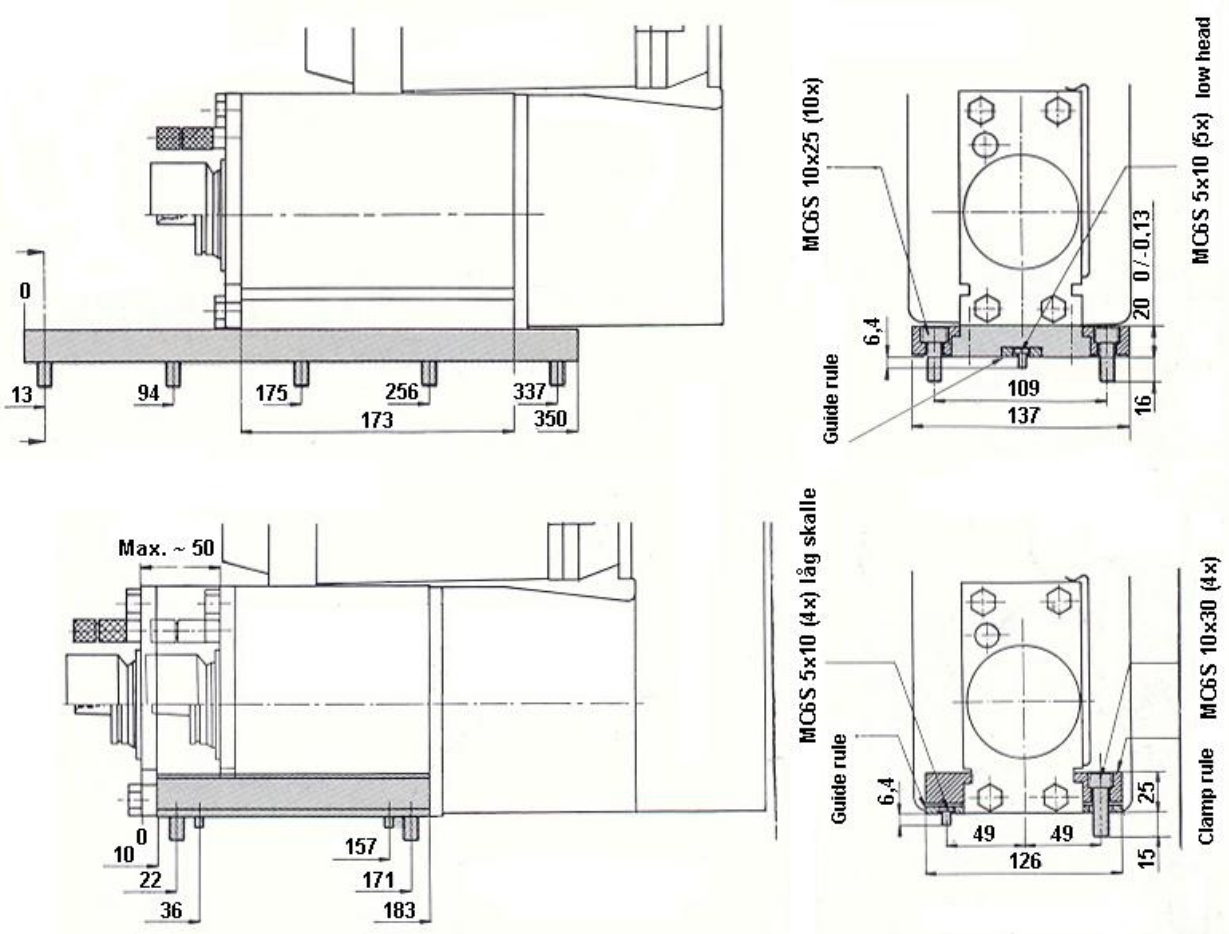

0
13
94
175
256
337
173
350
MC6S 10x25 (10x)
MC6S 5x10 (5x) low head
20 0/-0.13
6,4
Guide rule
109
137
16
Max. ~ 50
MC6S 5x10 (4x) låg skalle
MC6S 10x30 (4x)
Guide rule
Clamp rule
6,4
25
49
49
126
15
0
10
22
36
157
171
183

Fig. 1b.

5. Connection of the electric motor is done as shown in Fig. 2. and depending on which 3-phase voltage is available. Check all the data on the electric motors data label to ensure that motor protection and connection are properly carried out. The electric motor must be equipped with a suitable control circuit and motor protection. Different brands of motors may be present. See the enclosed manual from the engine manufacturer, and follow its installation instructions. Specifically for this unit: The connection cable must have an area of at least 1.5 $mm^2$. Ensure that the motor rotation direction is correct.

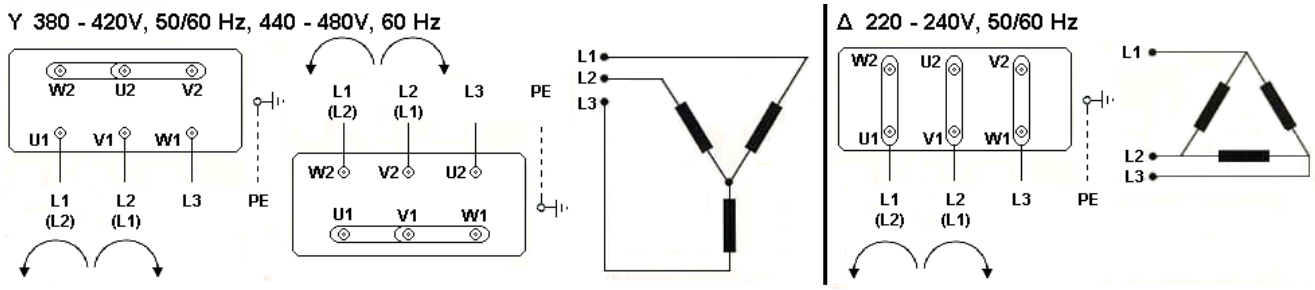
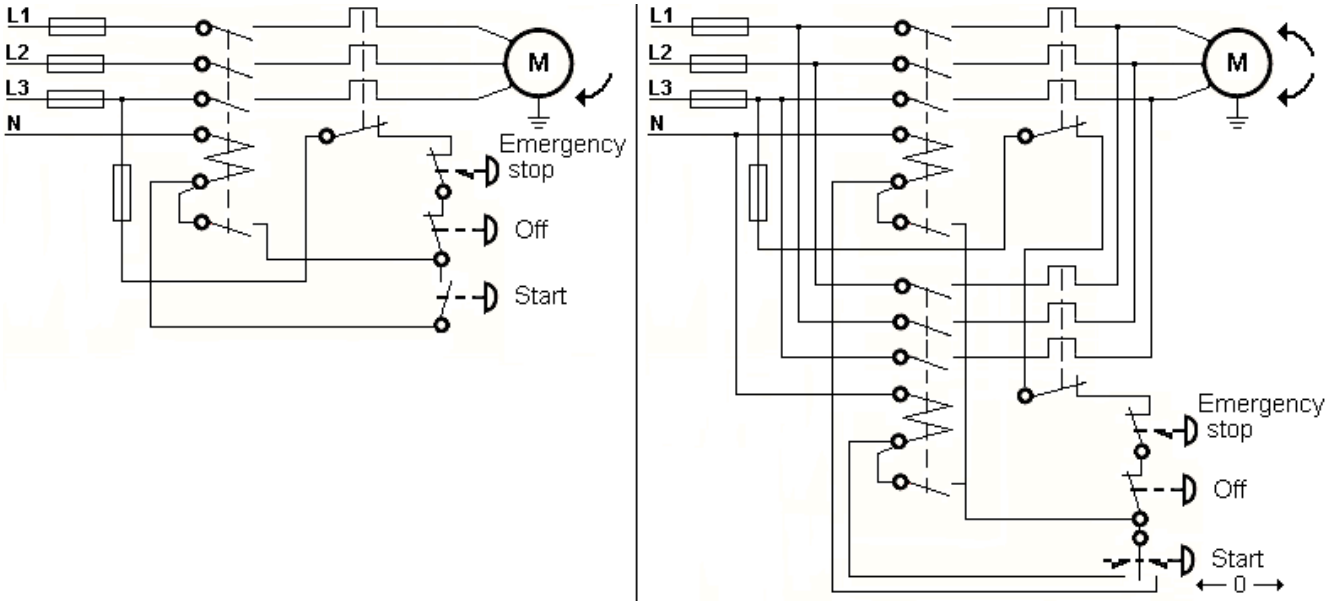



Fig. 2.

If the phases L1, L2 and L3 are connected to the terminals as shown in Fig. 2 the motor shaft rotates clockwise, seen against the shaft end on the drive side. Let two of the phase cables change place if the direction of rotation needs to be changed.

Example of control circuit: One way rotation for drilling and two way rotation for tapping.



6. Connection of the power supply to the control system. See Fig. 3.

(A) Control card C1:A is supplied with either 220 VAC or 110 VAC ±15V.
(B) Control card C1:A is supplied with 24 VDC (From the external control system, PLC.).
(C) and (D) Solenoid valves A and B are connected to the control card at factory.

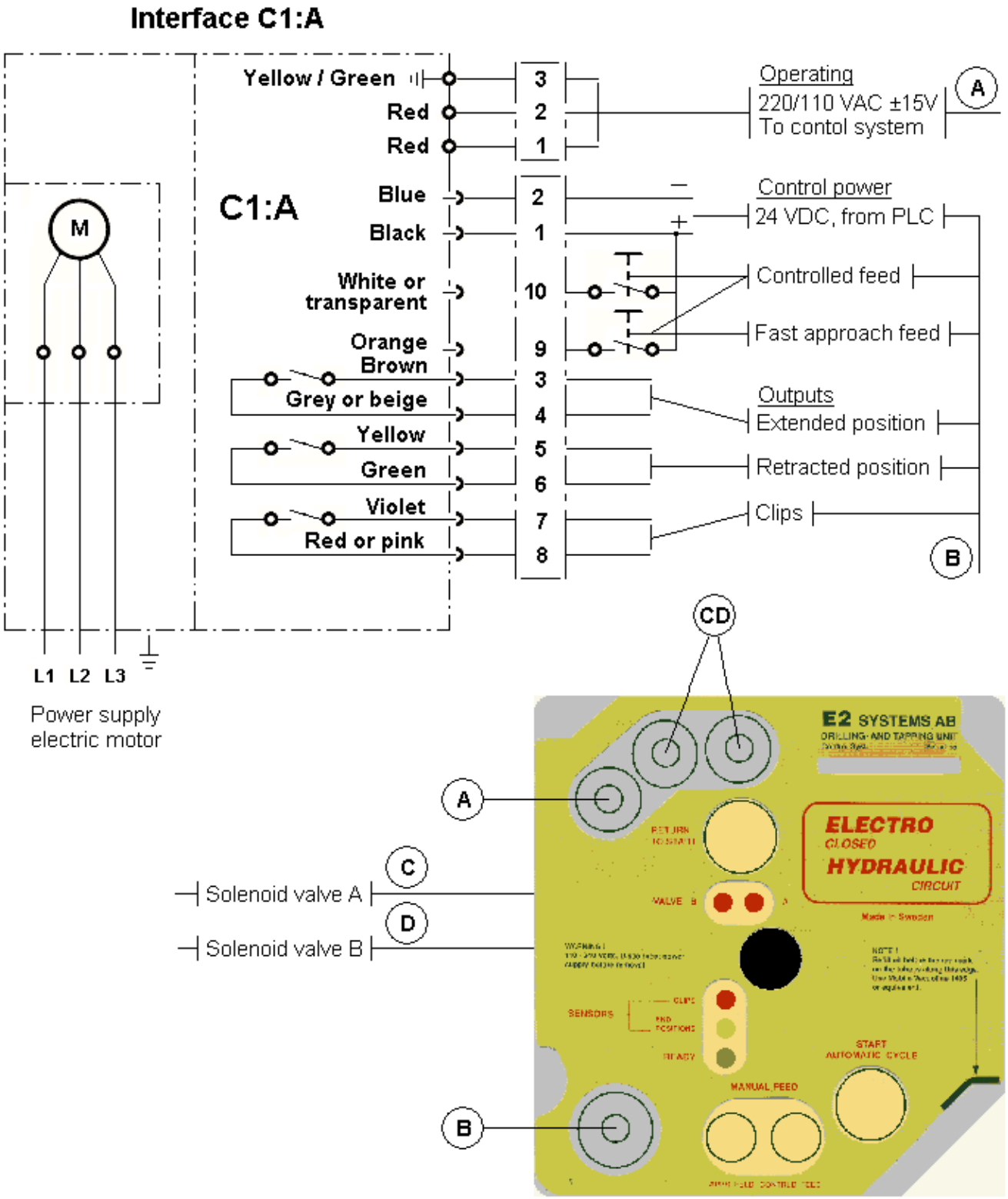
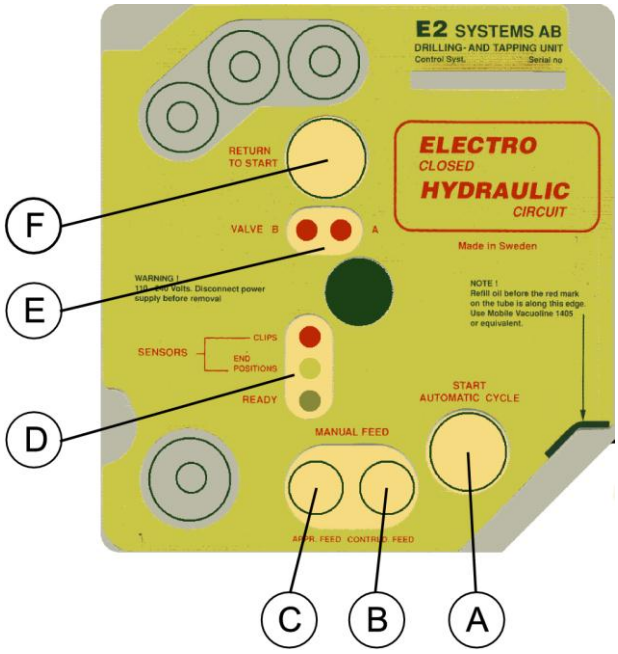



Fig. 3.

## Start-up

1. Ensure that the responsible operator has read and understood the manual before start-up of the unit.
2. Ensure that the unit's safety in paragraph ”Security” is met before starting the unit.
3. Possible local safety regulations must be followed.
4. Ensure that the installation of the unit is performed as described in paragraph "Installation".
5. Check that the unit's hoses and cables have not been damaged during shipment or installation.
6. Check the unit so that no other damage has occurred, which may cause oil leakage.
7. Start the electric motor and immediately check that it runs in the right direction and that the drill spindle in the right direction for drilling.

   **NOTE!** Some units for tapping are provided with a valve block for the function of reversing the electric motor.
8. Press the push-button for working feed **"CONTRLD FEED”** (located on the unit's control system, **"MANUAL FEED"**) and hold it there. When the push-button is released the spindle returns to its rear end position.
9. This procedure is repeated with approach feed **”APPR. FEED”**.
10. Check that the green LED lights when (located on the control system) the drill spindle is in its rear end position, **”READY”**.
11. Check that the red LED lights when (located on the control system) the drill spindle is in its front end position, **”END POSITIONS”**.
12. Check that there are clips on the clip ruler and (located on the control system) the clip LED lights when a clips is passing the clips sensor, **”CLIPS”**.




**The control panels push-buttons and functions.** Fig. 4

A. **”START AUTOMATIC CYCLE”**. Push-button for start of automatic cycle.

B. **”MANUAL FEED” / ”CONTROLLED FEED”**. Push-button for manual operation of the spindle with controlled feed.

C. **”MANUAL FEED” / ”APPR. FEED”**. Push-button for manual operation of the spindle with approach feed.

D. **”SENSORS” / ”CLIPS”**. Red LED, for indication of activation (signal) for clips sensor.
**”SENSORS” / END POSITION”**. Yellow LED, for indication of spindle in end position.
**”SENSORS / READY”**. Green LED, for indication of spindle in ready position.

E. **”VALVE B A”**. Red, LED for indication of activation for solenoid valves A and B.

F. **”RETURN TO START”**. Push-button for return to end position.

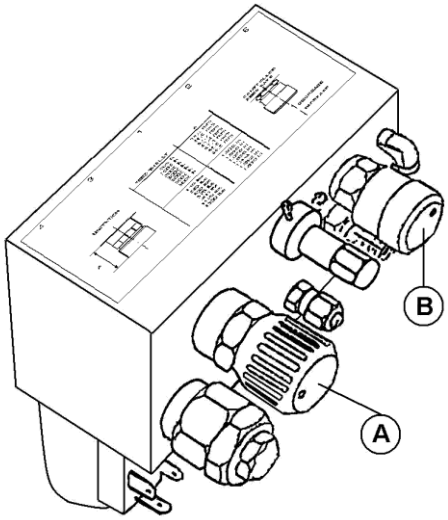
# Settings

**Thrust force "LIMITATION OF FEED THRUST":**

The thrust force for the units spindle is adjusted with knob **"A"**.
On top of the valve block is a table with dimensions for different settings of the thrust force.

- Set a caliper to the desired dimension of the desired thrust.
- Then adjust the knob "A" until the desired dimension measured.

Clockwise adjustment provides increased and anti-clockwise adjustment provides reduced thrust.
Max. thrust is 6000 N.




**Working feed "CONTROLLED FEED":**

The working feed rate is adjusted with knob **"B"**.
Clockwise adjustment provides reduced and anti-clockwise adjustment provides increased working feed rate.
Min. and max. working feed rate is between 0,04 – 0,65 m/min (1.6 – 25 In/min.).

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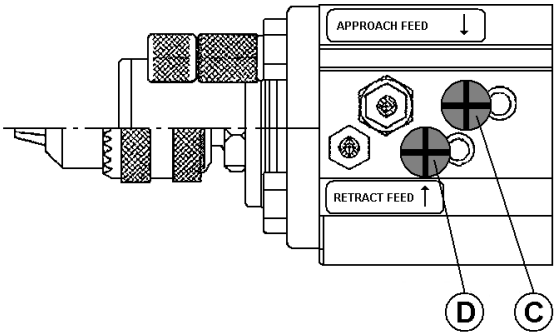
**Rapid advance "APPROACH FEED":**
**"RAPID ADVANCE RATE"**

The rapid advance feed rate is set by setting screw **"C"**.
Clockwise adjustment provides reduced and anti-clockwise adjustment provides increased rapid advance rate.
Max. rapid advance rate is 6 m/min (230 In/min).



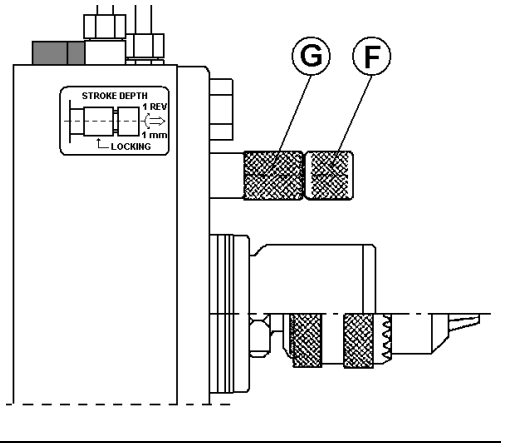

**Retract feed "RETRACT FEED":**

The retract feed rate is set by setting screw **"D"**.
Inwards adjustment provides reduced and outwards adjustment provides increased retract feed rate.
Max. retract feed rate is 6 m/min (230 In/min).

---

**Feed depth "STROKE DEPTH":**

The feed depth is set by setting screw **"F"**.
Clockwise adjustment provides shorter and anti-clockwise adjustment provides longer feed depth.
1 revolution correpeonds to 1 mm (.039") feed depth.
Adjutment screw **"F"** is locked with locking nut **"G"**.

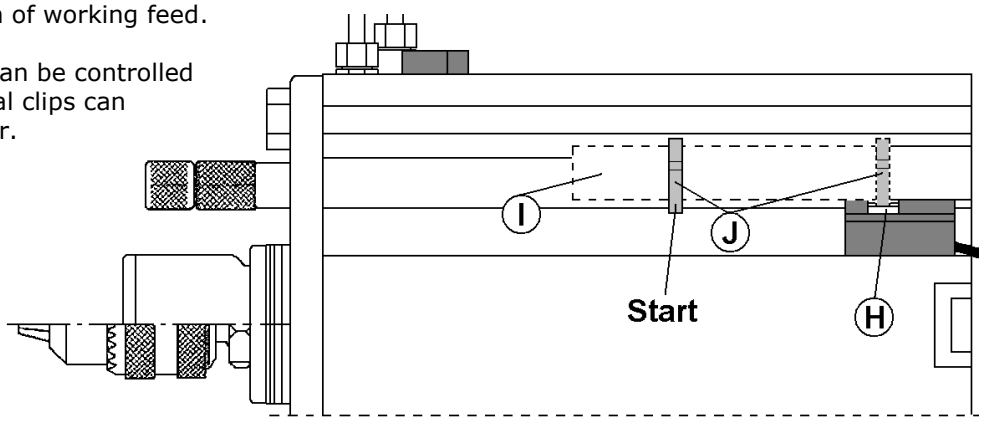



**The working feed start position:**

Clips sensor **"H"**, clip ruler **"I"** and clips **"J"**.

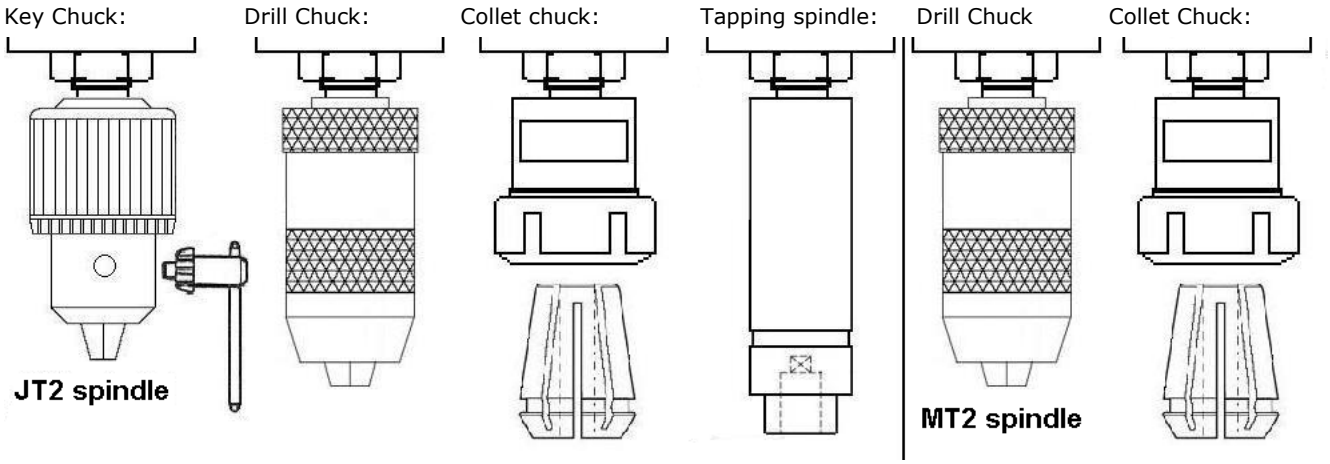
The unit comes with 3 pcs clips. One clip must be mounted on the clip ruler **"I"** for the desired starting position of working feed.

If desired, other functions can be controlled via clips sensor **"H"**. Several clips can be mounted on the clip ruler.



## Tool holders and Cutting tools

The unit can be equipped with the following tool holder types: (Choosen when ordering.)



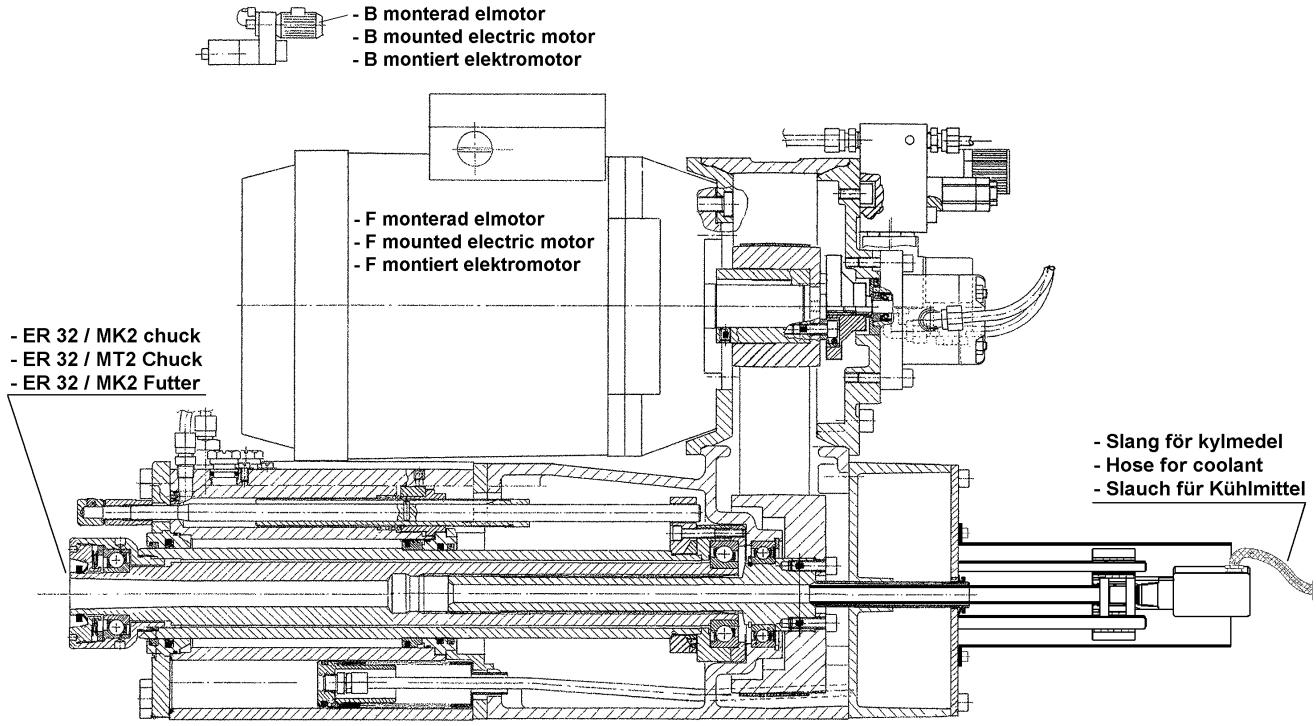

The following cutting tools can be used with drilling or tapping unit:

Drilling unit BE 55: Drills, Core Drills, Shank Mills, Counter sinkers or Reamers.
Tapping unit BEG 55: Cutting Taps or forming Taps.

## Coolant feed through spindle for BE 55 with ER32/MT2 chuck

The ER32/MT2 collet chuck to be used is of special design to seal around the drill.

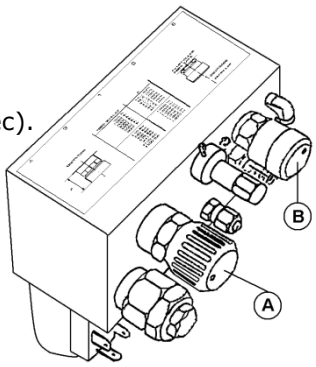
- Max. pressure 70 Bars (up to 3000 rpm). Operation at max pressure with max speed is not permissible.
- Max. speed 7000 rpm (at pressure 40 Bars).
- Straight shaft drills with internal cooling fitting in an ER32/MT2 chuck.
  Ranges from Ø5 - 20 mm (3/16 – 13/16'').
- Drills with internal cooling ranges from Ø1,5-4 mm (.05 - .157'')(Ø5 mm (3/16'') on request).



## Drilling, counter sinking and reaming

1. Open the regulating valve for the feed thrust marked **"LIMITATION"**, knob **"A"**, on the valve block.

2. Set the desired drilling depth by setting screw **"F"** located at the front of the feed housing. Set depth is locked with lock nut **"G"**.



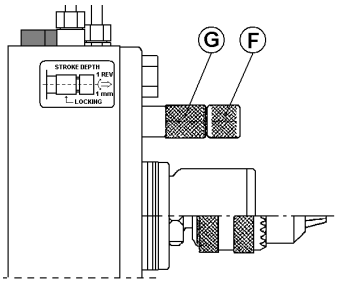

3. Measure the length of feeding (drilling depth) carefully ..... mm (inch).

4. According to table of feed rates, the feed rate shall be ..... mm/s (inch/sec).

5. Calculate the time it takes for the spindle to move the entire feed length, use a stop watch:

$$\text{Time} = \frac{\text{Feed length in mm (inch)}}{\text{Feed rate in mm/sec (inch/sec)}} = \text{..... Sec}$$

6. Open or close the regulating valve marked **"CONTROLLED FEED RATE"**, knob **"B"**, for working feed rate until the time is the same as calculated in paragraph 5.




7. The drilling can now start in the intended material.

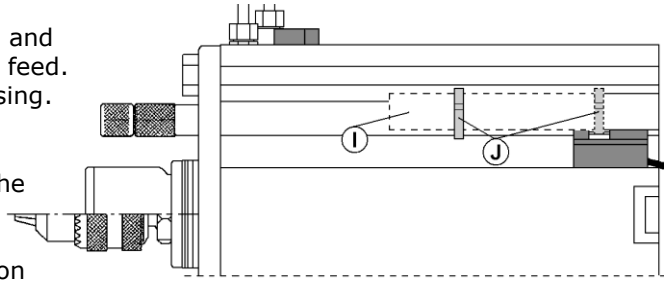
8. When the drill or the drills reaches the material, begin to adjust the feed thrust rate, this is done with knob **"A"**. Adjust until the preset feed thrust is obtained.

9. To obtain a constant feed rate even when the drill begins to become worn, regulating valve, knob **"B"**, can be screwed in 1 revolution extra.

   **Note!** In automatic cycle mode the drilling depth is 0,4 mm (.015") shorter than for manual feed.

10. Remove the protection plate on the feed housing and press the push-button for approach or controlled feed. The clip ruler comes out of the transmission housing.

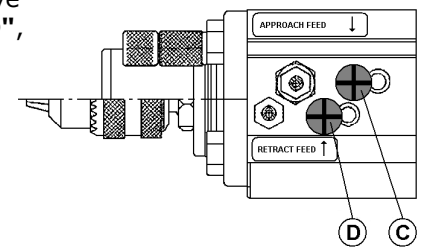
    When the clip ruler **"I"** is in its front position, clips **"J",** can be placed on the clip ruler where the unit shall enter into work feed and vice versa.




11. When the spindle has been in its front end position and returned to the start position **"READY"** signal is indicated.

13. The rapid advance feed rate of the spindle is set by the throttle-valve located at the front of the feed housing marked **"APPROACH FEED"**, setting screw **"C"**.

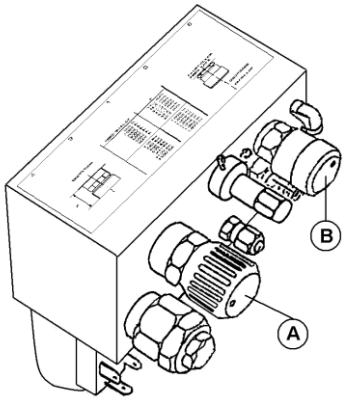
14. The retract feed of the spindle speed is set by the throttle-valve located at the front of the feed housing marked **"RETRACT FEED"**, setting screw **"D"**.



# Tapping

Tapping can be performed with a reversible tapping head or by reversing the unit's electric motor.
**Note!** When reversal of the units electric motor, an axial floating tapping spindle must be used.

1. The regulating valve for thrust feed marked **"LIMITATION"**, knob **"A"**, is set to as low thrust feed as possible.




2. Set the desired tapping depth by setting screw **"F"** located at the front of the feed housing. Set depth is locked with lock nut **"G"**.

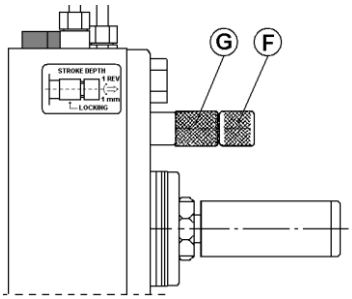
3. Measure the length of feeding (tapping depth) carefully ..... mm (inch)

4. Use the following formula to calculate the feed rate:

$$\text{Feed rate} = \frac{\text{Rpm/min}}{60} \times \text{thread pitch} = \text{.....mm/s (inch/sec)}$$

5. Calculate the time it takes for the spindle to move the entire feed length, use a stop watch:

$$\text{Time} = \frac{\text{Feed length in mm (inch)}}{\text{Feed rate in mm/sec (inch/sec)}} = \text{..... Sec}$$




6. Open or close the regulating valve marked **"CONTROLLED FEED RATE"**, knob **"B"**, for working feed rate until the time is the same as calculated in paragraph 5.

   **Note!** When the feed rate is insufficient the rapid feed rate is used, which is reduced down to the right speed by the throttle-valve located at the front of the feed housing marked, **"APPROACH FEED"**, setting screw **"C"**.

   **Note!** The spindle feed rate must be somewhat lesser than the axial speed of the tap. The difference in distance is absorbed by the reversible tapping head or the axial floating tapping spindle which must be used when reversal of the units electric motor.

7. The retract speed of the spindle must always be adjusted by the throttle-valve located at the front of the feed housing marked **"RETRACT SPEED"**, setting screw **"D"**.

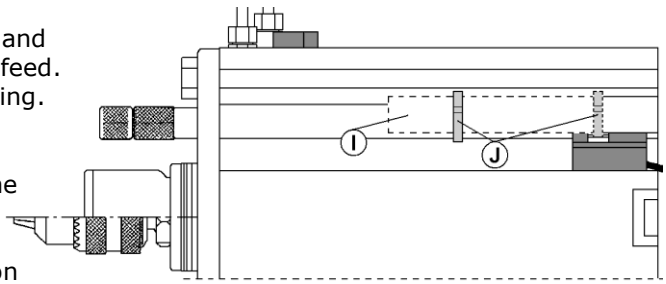
   **Note!** The retract rate when using reversible tapping heads should be slightly higher than the taps axial retract rate.

   **Note!** When using axial floating tapping spindle, the spindle retract feed rate should be as close to the taps axial speed as possible, the difference in distance is absorbed by the floating spindle.

8. The tapping can now start in the intended material.

9. Remove the protection plate on the feed housing and press the push-button for approach or controlled feed. The clip ruler comes out of the transmission housing.

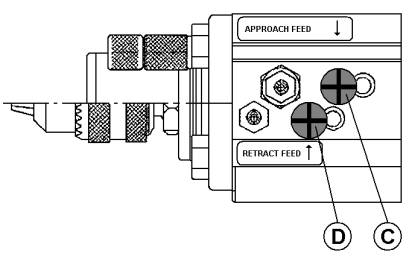
   When the clip ruler **"I"** is in its front position, clips **"J",** can be placed on the clip ruler where the unit shall enter into work feed and vice versa.




10. When the spindle has been in its front end position and returned to the start position **"READY"** signal is indicated.

11. The rapid advance feed rate of the spindle is set by the throttle-valve located at the front of the feed housing marked **"APPROACH FEED"**, setting screw **"C"**.

12. The retract feed of the spindle speed is set by the throttle-valve located at the front of the feed housing marked **"RETRACT FEED"**, setting screw **"D"**.



# Maintenance instructions

**Daily inspection:**

1. Ensure that the unit is free from chips and dirt that can cause malfunctions.

2. Ensure that the unit operates smoothly and that no dissonance exists. In the event of discords or other disturbances stop the operation immediately and call for service personnel to fix the error as soon as possible.

3. Check that the unit is functioning properly with regard to;

   - Smooth operation of the feed spindle
   - Sound level
   - Oil temperature

4. Check that no oil leakage and that no hoses are damaged. If the event of leakage immediately stop the operation and call the service personnel. At leakage check the oil level in accordance with chapter "Monthly inspection", paragraph 1. Call for service personnel to fix the leak as soon as possible.

**Monthly inspection:**

1. Check the oil level;

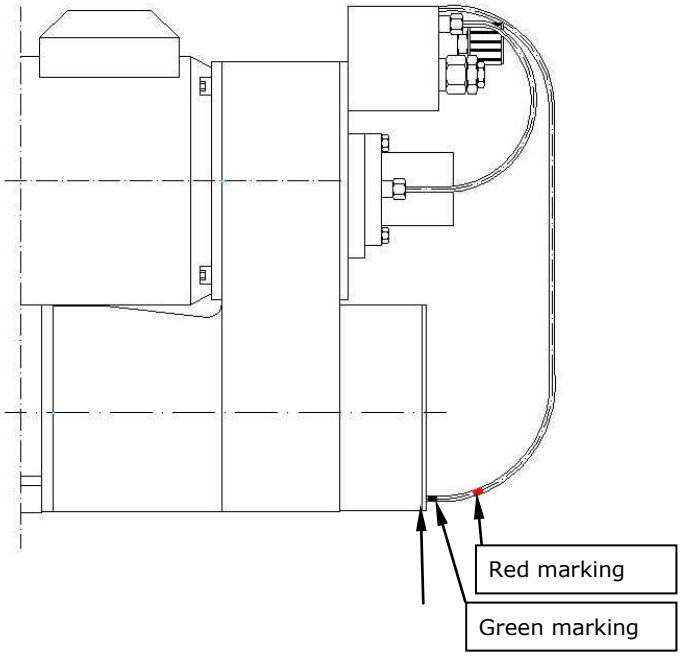
   - Electronic box rear edge of box (see arrows). The oil level should be between the green and red marking of the hose to the tank piston. if oil refilling is required, see paragraph ”Hydraulic oil change”.

2. Check the condition of the oil regarding;

   - Air bubbles
   - Color (if the oil is black, change the oil)

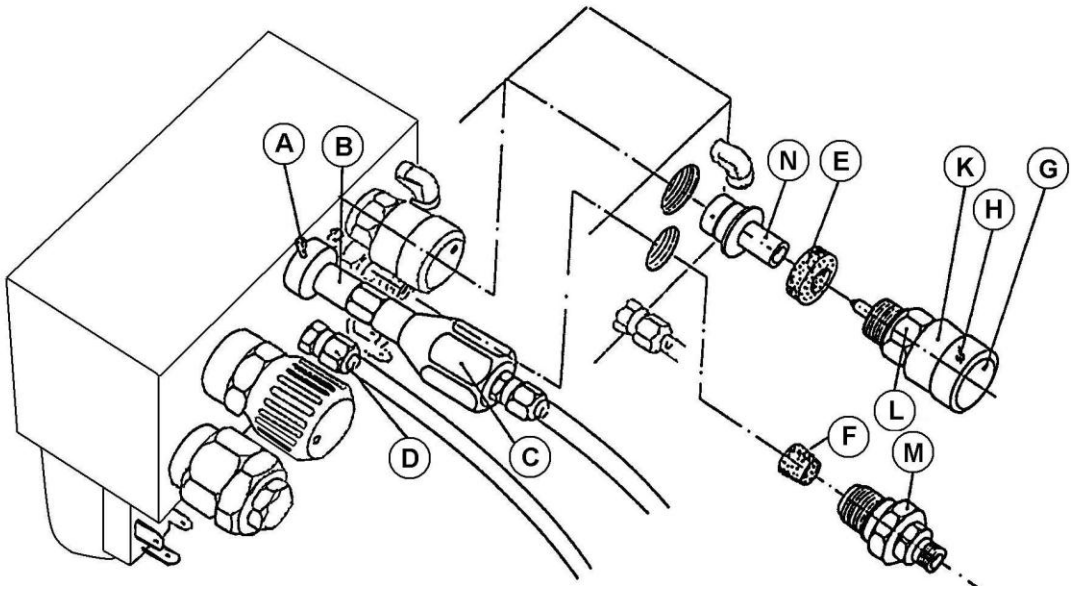
3. Check the locking of the settings regarding;

   - Drill depth
   - Thrust
   - Controlled feed rate



**Annual inspection:**

Change of return filter **"E"**, pressure filter **"F"** and oil.




1. Instead of valve **"C"** (See chapter, ”Hydraulic oil change”, paragraph 1), connect the “third” supplied hose.

2. Connect hose **"D"**. **Important!** Tighten the coupling so that air is not drawn into the hydraulic system.

3. Put the two hose ends in a vessel for the collection of the waste oil.

4. Unscrew the locking screw **"A"** and pull the valve sleeve **"B"** to its outer position, to drain the oil from the oil tank. The red marking should reach the rear edge of the electronic control box.
   See chapter, ”Monthly inspection”, paragraph 1.

5. **Change of pressure and return filter:**

   - Loosen locking screw **"G"**.

   - Loosen grub screw **"H"**.

   - Screw of knob **"K"**.

   - Remove valve adaptor **"L"**.

   - Loosen the locking nut on the hose coupling to filter adapter **"M"**.

   - Remove adaptor **"M"**.

   - Change pressure filter **"F"** placed inside adaptor **"M"**.

   - Put back adapter **"M"** and reconnect the pressure hose.

   - Pull out reduction seat **"N"**. **Note!** Be careful not to damage the hole when removing the reduction seat.

   - Change return filter **"E"**.

   - Put back reduction seat **"N"** in the valve block.

   - Put back valve adaptor **"L"** in the valve block.

   - Screw on knob **"K"** completely.

   - Secure knob **"K"** with grub screw **"H"**.

6. **Refilling the hydraulic system with oil.**

   See chapter, ”Hydraulic oil change”.

7. **Inspection of the drive belt and pump coupling.**

   - Remove the two connectors **"A"** from the solenoid valves.

   - Loosen the screw **"B"** for attachment of the valve block to the hydraulic lid.

   - Loosen the four screws **"C"** for attachment of the hydraulic lid to the transmission housing.

   - Expose the drive belt **"D"** by moving the hydraulic lid and valve block to the side.

   - Check the drive belt **"D"** for wear and other eventual damages.

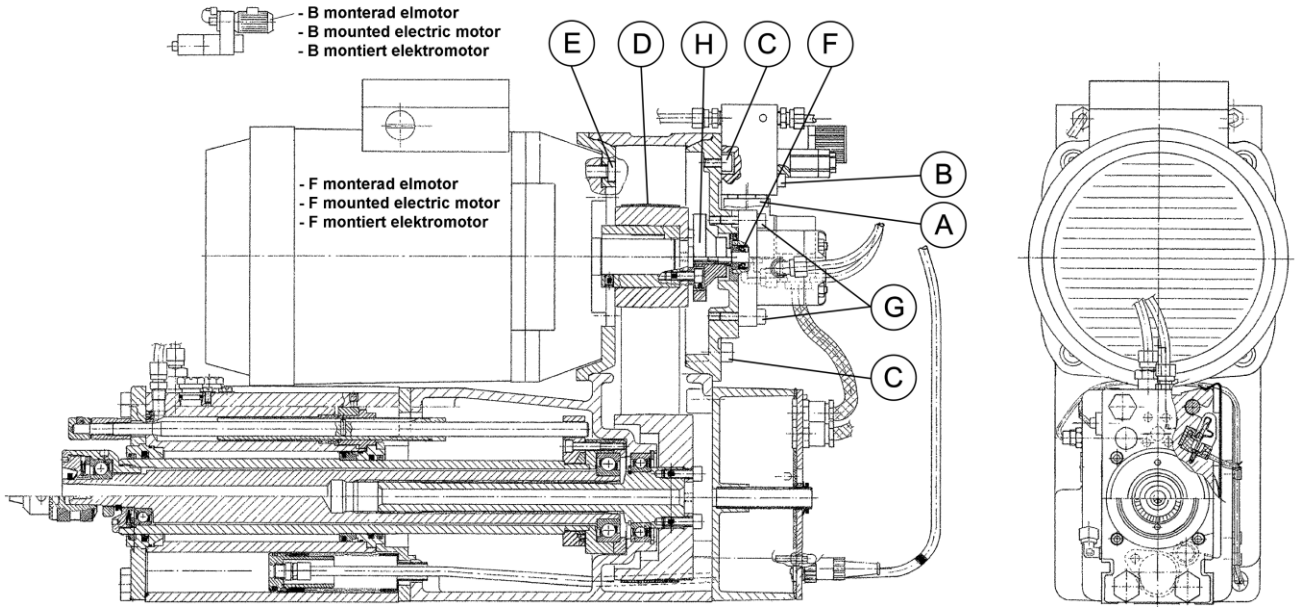
     In the event of wear or other damage, replace the drive belt:

     - Loosen the four screws **"E"** for the attachment of the electric motor, but not completely.
     - Lift the motor slightly upwards so that the drive belt can be detached.
     - Replace the drive belt.
     - Put back the electric motor and tighten the four screws **"E"**.
     - Make sure the drive belt has been correctly fitted.
     - Reassemble the hydraulic lid and valve block. Check that the pumps shaft coupling and the electric motor coupling are fitted in correctly.

   - Check the pump couplings shaft gasket **"F"** (radial gasket) regarding leakage, wear and other eventual damage. In the event of leakage, wear or damage, replace the shaft gasket.

     In the event of leakage, wear or damage, replace the shaft gasket:

     - Loosen shaft coupling **"H"** from the pump shaft.
     - Loosen the two screws **"G"** for the attachment of the pump in the hydraulic lid.
     - Replace the shaft gasket.
     - Reassemble the pump and shaft coupling. Check that the pumps shaft coupling and the electric motor coupling are fitted in correctly.
       Reassemble the hydraulic lid and valve block.

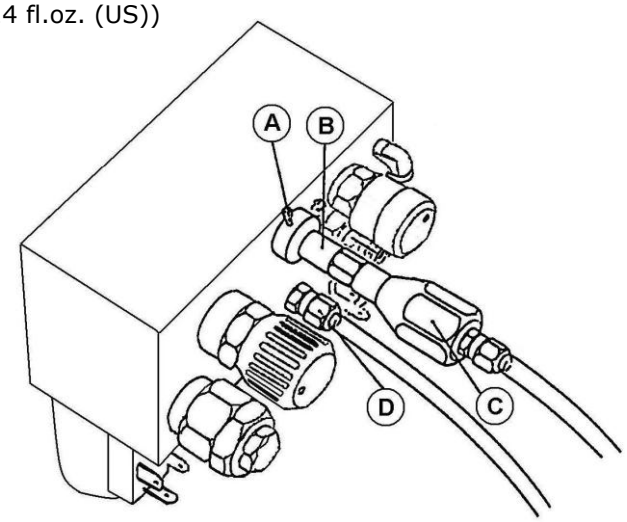


## Hydraulic oil change

Suitable oil quality: Hydraulic oil with a viscosity of e.g 32 cSt at +40º C (+104 F ) and a high viscosity index e.g. 345. Recommended oil: Castrol, Hyspin VG46 SS acc. to ISO VG46.

Oil quantity (filled): Approx. 3 dl (10.56 fl.oz. (UK), 10.14 fl.oz. (US))

Oil refilling equipment: Part no. 040J000038




1. Connect valve **"C"** incl. the associated hose.
2. Connect hose **"D"**.
   **Important!** Tighten the coupling so that air is not drawn into the hydraulic system.
3. Put the two hose ends in a container with clean hydraulic oil.
4. Unscrew the locking screw **"A"** and pull the valve sleeve **"B"** by the help of valve **"C"**.
5. Start the units electric motor and forward run the spindle the whole feed length by pressing the push-button **"CONTRLD FEED"** located on the control system. To return the push-button is released. Repeat this several times for about 1 minute. For oil level see chapter, "Monthly inspection", paragraph 1.
6. Make sure that are no air bubbles in the transparent hoses. In the presence of air bubbles run the spindle back and forth, until the air bubbles have disappeared. When operating the spindle, use the push-buttons located on the units control system.
7. Push in valve sleeve **"B"** to it's inner operating position and lock it with screw **"A"**.
8. Remove the hoses from the clean hydraulic oil container.
9. Remove valve **"C"** incl. the associated hose.
10. Loosen the coupling for hose **"D"** and remove the hose. Tighten the coupling.

The oil filling is now done.

## Recommended hydraulic oils

Hydraulic oil with good surface adhesion is recommended to prevent "stick-slip".
The oil should not only distribute the force – it should also prevent corrosion and wear caused by metal-to-metal contact. Oil with a viscosity which is suitable for the prevailing ambient temperature must be selected. The following table indicates suitable oils for various ambient temperatures, and the equivalent products available. If the viscosity of the oil is higher than recommended, cavitations may occur in the pump.

If the viscosity is lower than recommended, the lubrication will not be sufficient.

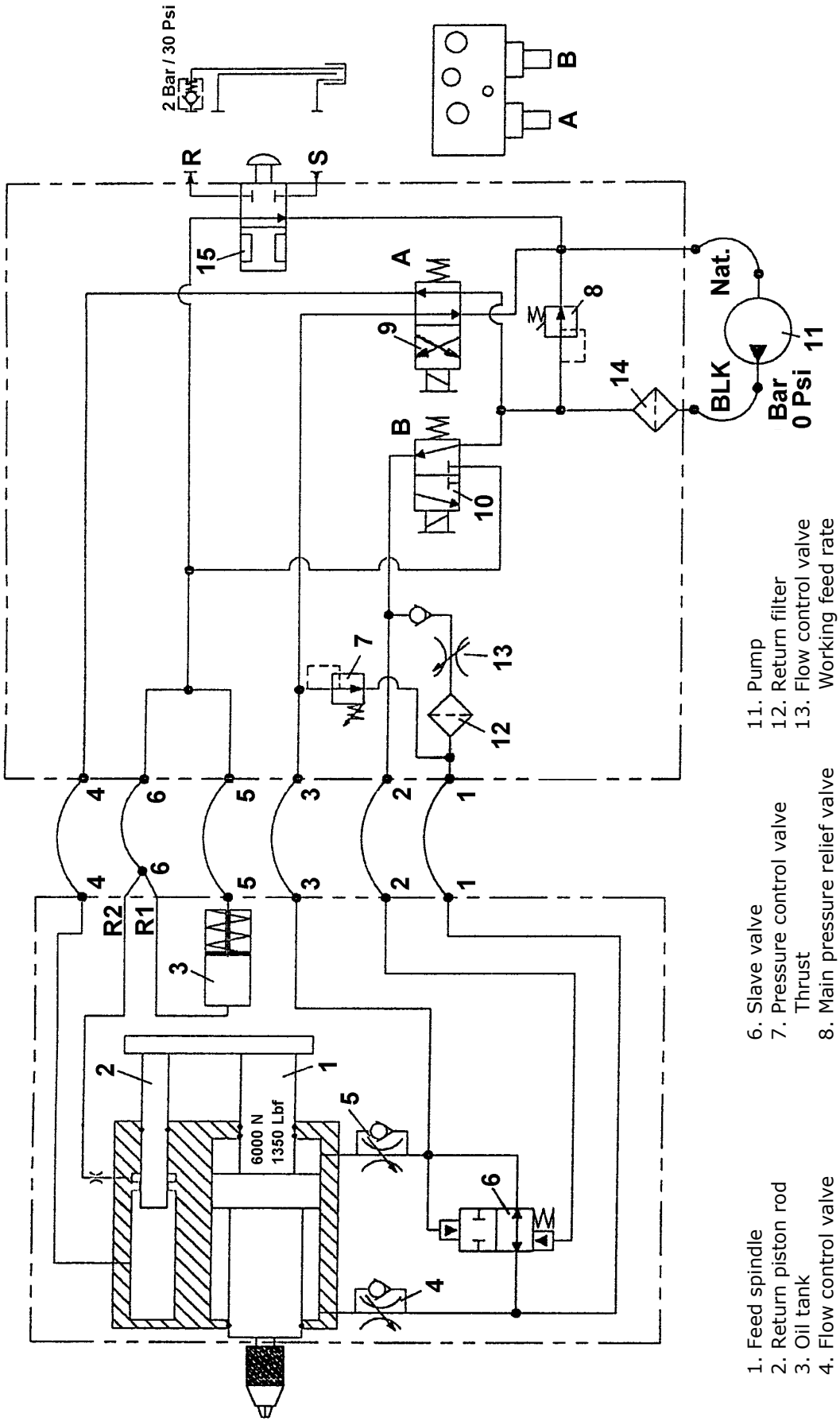
Recommended oils:

Fahrenheit (Fº) = Celsius (Cº) * 1.8 + 32

| Supplier | Type | Ambient temperature Cº. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| Mobil | Vacuoline 1405<br>Vacuoline 1409 | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Shell | Tonna S32<br>Tonna S68 | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Castrol | Hyspin VG 46SS | | | | ■ | ■ | ■ | ■ | | |
| BP | HLP-D 32<br>HLP-D 46<br>HLP-D 68 | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Texaco | Way Lubricant 68 | | | | | ■ | ■ | ■ | ■ | ■ |
| Kuwait Oil | Deve | | | ■ | ■ | ■ | ■ | ■ | | |

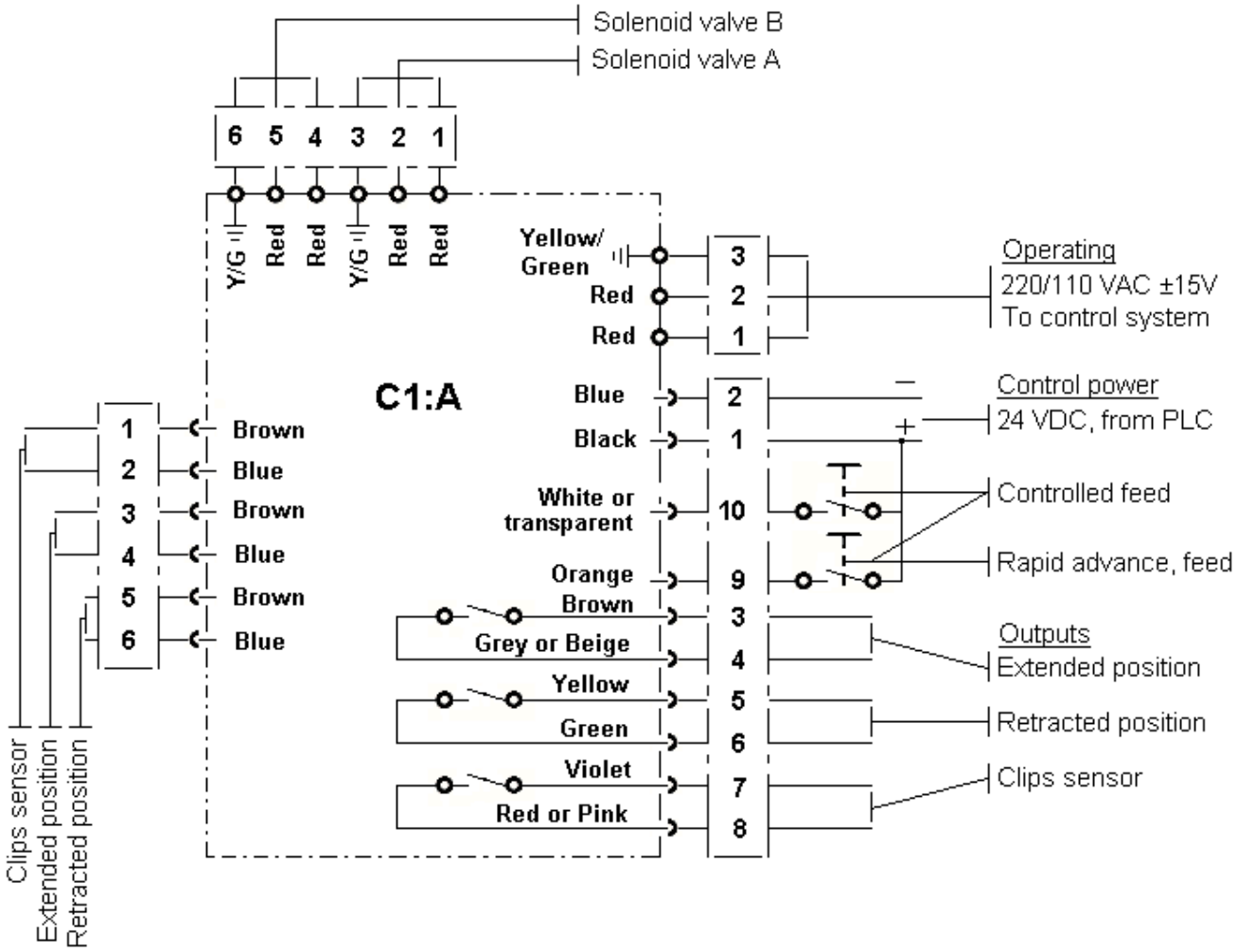
# Hydraulic diagram and components

Hydraulic diagram 300124




1. Feed spindle
2. Return piston rod
3. Oil tank
4. Flow control valve
   Rapid approach
5. Flow control valve
   Return feed rate
6. Slave valve
7. Pressure control valve
   Thrust
8. Main pressure relief valve
   Max. pressure.
9. Solenoid valve, 4/2
10. Solenoid valve, 3/2
11. Pump
12. Return filter
13. Flow control valve
    Working feed rate
14. Pressure filter
15. Filler valve

## Control card C1:A and wiring diagram



# Technical information

## Technical features:

| | | |
|---|---|---|
| Thrust | : | Max. 6000 N |
| Stroke | : | Max. 120 mm (4 3/4''), 100% controlled. |
| Min. center to center spacing | : | Single spindle min. 140 mm (5 1/2'')<br>Double spindle head min. 14 mm (9/16'') |
| Run-out at spindle nose | : | MT2, max. 0,03 mm (.0012 In)<br>JT2, max. 0,02 mm (.0008 In) |
| Depth accuracy | : | +/- 0,01 mm (.0004 In) |
| Rapid advance rate | : | Max. 6 m/min (230 In/min) |
| Controlled feed rate | : | > 0,04 – 0,65 m/min (> 1.6 – 25 In/min) |
| Power, Electric motor | : | See Power, Electric motor specifications below. |
| Ambient temperature | : | +10º - +40º C. (+50 - +104 F.) |
| Sound level | : | 80 dB(A) |
| IP protection | : | N/A |

## Power, Electric motor specifications:

| No. of poles | Unit/Motor at V380-420(Y) / 220-240(Δ) (±5%), 50Hz. kW * | | |
|---|---|---|---|
| | BE(G) 552 | BE(G) 555 | BE(G) 558 |
| 2 | 0,75 | 1,65 | 2,7 |
| 4 | 0,55 | 1,1 | 2,2 |
| 6 | 0,37 | 0,75 | 1,3 |
| 8 | - | 0,4 | 0,75 |

* Motor specifications shown in the tables are valid for 380 – 420V(Y)/220 – 240V(Δ) (±5%), 50 Hz. These motors can also be used at 440 – 480 V(Y) (±5%), 60 Hz. If so the rpm will increase by ~20% and the power by ~15% relative to the data for 50 Hz.

The torque at the spindle for specific rpm is calculated as:
M = ( P(kW) x 9500 ) / rpm

## Transmission specifications:

### Drilling unit BE 55:

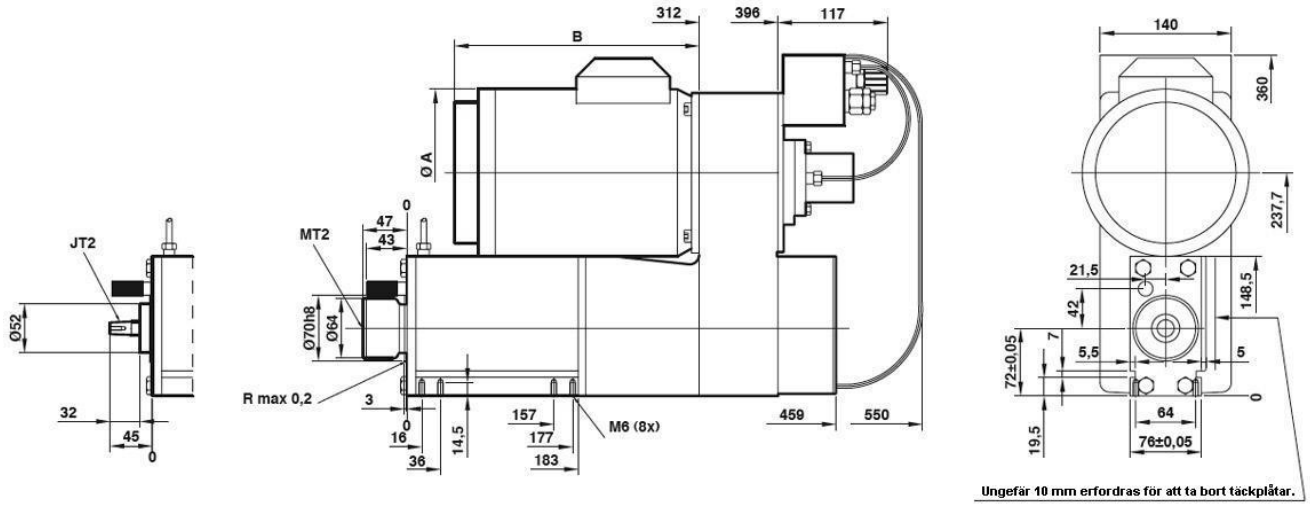
| No. of poles | Spindle rpm at gear ratio and 50Hz. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2,8:1 | 2,2:1 | 1,7:1 | 1,3:1 | 1:1 | 1:1,3 | 1:1,7 | 1:2,2 | 1:2,8 |
| 2 | 1020 | 1300 | 1690 | 2170 | 2820 | 3670 | 4700 | 6130 | 7780 |
| 4 | 500 | 640 | 830 | 1070 | 1390 | 1810 | 2320 | 3020 | 3830 |
| 6 | 330 | 420 | 550 | 700 | 910 | 1180 | 1520 | 1980 | 2510 |
| 8 | 250 | 310 | 410 | 520 | 680 | 880 | 1130 | 1480 | 1880 |

### Tapping unit BEG 55:

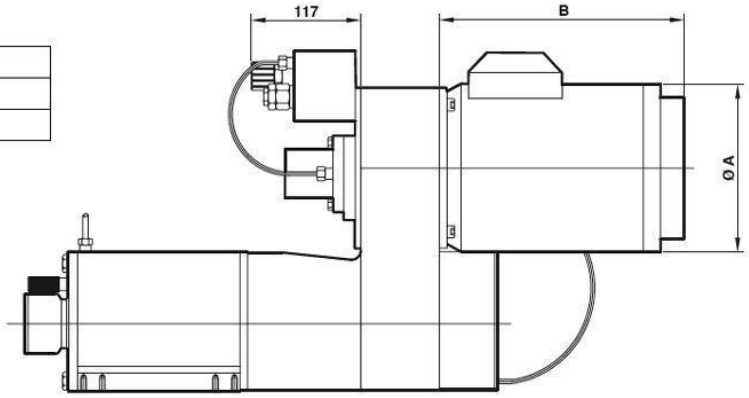
| No. of poles | Spindle rpm at gear ratio and 50Hz. | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2,7:1 | 2,1:1 | 1,7:1 | 1,4:1 | 1:1 | 1:1,4 | 1:1,7 | 1:2,1 |
| 2 | 1040 | 1370 | 1690 | | | | | |
| 4 | 500 | 640 | 830 | 1070 | 1390 | 1810 | | |
| 6 | 330 | 420 | 550 | 700 | 910 | 1180 | 1520 | 1980 |
| 8 | 250 | 310 | 410 | 520 | 680 | 880 | 1130 | 1480 |

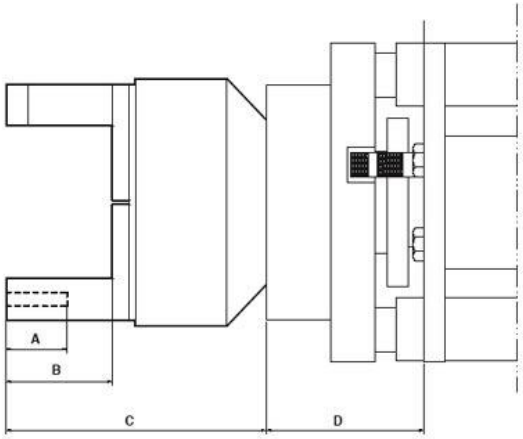
For other data such as drilling capacity we refer to our website www.e2systems.com.

# Dimensional drawing



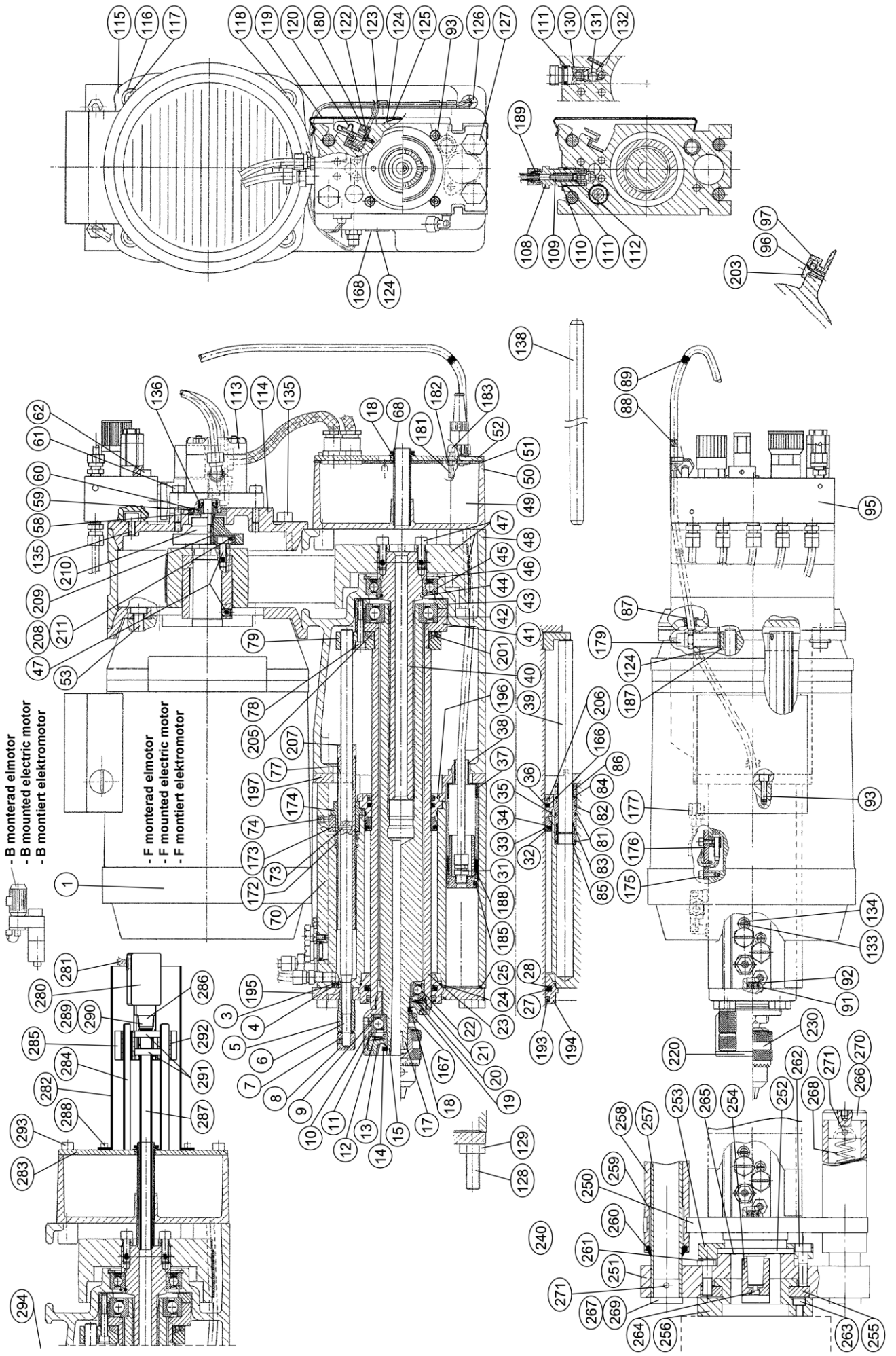

| | BE 552/555 | BE 558 |
|---|---|---|
| A | 150 | 178 |
| B | 221 | 261 |




| Multi-spindle head, typ | A mm | B mm | C mm | D mm | Adaptor, weight Kgs (Lbs) |
|---|---|---|---|---|---|
| **MBK-6V2** | 21 | 56 | 117 | 63 | 3,1 (6.83) |
| **MBK-6V3 / MBK-6V4** | 21 | 56 | 121 | 74 | 3,1 (6.83) |
| **MBK-6VR3** | 21 | 56 | 137 | 60 | 3,1 (6.83) |
| **MBKV-602 / 603 / R603 / 604** | 21 | 35 | 127 | 70 | 3,1 (6.83) |
| **VH 062P / 063P / 063LP / 064P** | 25 | 34 | 136 | 63 | 3,1 (6.83) |
| **MBKV-802 / 803 / R 803 / 804** | 34 | 40 | 144 | 72 | 3,1 (6.83) |
| **VH 082P / 083P / 083LP / 084P** | 28 | 40 | 148 | 63 | 3,1 (6.83) |
| **MBKV-1002** | 27 | 35 | 163 | 86 | 3,1 (6.83) |
| **VH 102P / 103P / 103LP / 104P** | 28 | 40 | 162 | 68 | 3,1 (6.83) |
| **MBKV-1302** | 28-49 | 55 | 174 | 72 | 3,1 (6.83) |
| **MBKV-1302S / 1303 / R1303 / 1304** | 20-49 | 55 | 174 | 79 | 3,1 (6.83) |
| **VH 132P / 133P / 133LP / 134P** | 28 | 46 | 183 | 68 | 3,1 (6.83) |
| **MBKV-1402 / 1402S / 1403 / R1403 / 1404** | - | 94 | 211 | 79 | 3,1 (6.83) |
| **VH 182 / 183 / 183L / 184** | - | 94 | 225 | 68 | 3,1 (6.83) |

# Spare parts drawing



# Spare parts list

| BE(G) 552, BE(G) 555 and BE(G) 558 | | | |
|---|---|---|---|
| **Pos.** | **Qty** | **Description** | **Part no.** |
| 1 | 1 | El. motor, BE(G) 552, 0,75 kW, 2820 Rpm at 50Hz, M2VA 80A | 508A000104 |
| 1 | 1 | El. motor, BE(G) 555, 1,1 kW, 2820 Rpm at 50Hz, M2VA 80B | 508A000105 |
| 1 | 1 | El. motor, BE(G) 555, 1,5 kW, 2820 Rpm at 50Hz, M2VA 90S | 508A000106 |
| 1 | 1 | El. motor, BE(G) 558, 2,7 kW, 2820 Rpm at 50Hz, M2VA 90LB A | 508A000108 |
| 1 | 1 | El. motor, BE(G) 555, 1,5 kW, 2820 Rpm at 50Hz, M2VA 80C | 508A000109 |
| 1 | 1 | El. motor, BE(G) 552, 0,55 kW, 1390 Rpm at 50Hz, M2VA 80A | 508A000113 |
| 1 | 1 | El. motor, BE(G) 552, 0,75 kW, 1390 Rpm at 50Hz, M2VA 80B | 508A000114 |
| 1 | 1 | El. motor, BE(G) 555, 1,1 kW, 1390 Rpm at 50Hz, M2VA 90S | 508A000115 |
| 1 | 1 | El. motor, BE(G) 555, 1,5 kW, 1390 Rpm at 50Hz, M2VA 90L | 508A000116 |
| 1 | 1 | El. motor, BE(G) 555, 1,65 kW, 2820 Rpm at 50Hz, M2VA 80C | 508A000123 |
| 1 | 1 | El. motor, BE(G) 555, 1,1 kW, 1390 Rpm at 50Hz, M2VA 80C | 508A000127 |
| 1 | 1 | El. motor, BE(G) 558, 2,2 kW, 1390 Rpm at 50Hz, M2VA 90LB | 508A000129 |
| 1 | 1 | El. motor, BE(G) 552, 0,37 kW, 910 Rpm at 50Hz, M2VA 80A | 508A000132 |
| 1 | 1 | El. motor, BE(G) 552, 0,55 kW, 910 Rpm at 50Hz, M2VA 80B | 508A000133 |
| 1 | 1 | El. motor, BE(G) 558, 0,75 kW, 910 Rpm at 50Hz, M2VA 80S | 508A000105 |
| 1 | 1 | El. motor, BE(G) 558, 1,1 kW, 910 Rpm at 50Hz, M2VA 90L | 508A000135 |
| 1 | 1 | El. motor, BE(G) 558, 1,3 kW, 910 Rpm at 50Hz, M2VA 90LB A | 508A000136 |
| 1 | 1 | El. motor, BE(G) 555, 0,75 kW, 910 Rpm at 50Hz, M2VA 80C | 508A000137 |
| 1 | 1 | El. motor, BE(G) 558, 0,75 kW, 680 Rpm at 50Hz, M2VA 90LB A | 508A000145 |
| 1 | 1 | El. motor, BE(G) 552, 0,4 kW, 680 Rpm at 50Hz, M2VA 80C | 508A000146 |
| 3 | 4 | O-ring, Ø 3,1x1,6 Nitril. See spare parts for Feed housing. | |
| 4 | 4 | O-ring plug | 040U000111 |
| 5 | 1 | End position nut. See spare parts for Feed housing. | |
| 6 | 1 | End position shaft. See spare parts for Feed housing. | 040U000115 |
| 7 | 1 | Screw, SK6SS 5x5 black. See spare parts for Feed housing. | |
| 8 | 1 | Knob. See spare parts for Feed housing. | 040A000061 |
| 9 | 1 | Ball bearing | 419A100017 |
| 10 | 1 | Bearing holder | 040U000099 |
| 11 | 1 | Support ring | 414A131011 |
| 12 | 4 | Spring washer | 416A111060 |
| 13 | 1 | Spring holder | 040U000100 |
| 14 | 1 | V-ring | 418A230052 |
| 15 | 1 | Spindle, with MT2 taper. | 040U000096 |
| 17 | 1 | Spindle, with JT2 kona. | 040U000178 |
| 18 | 1 | V-ring | 418A230051 |
| 19 | 1 | Spring holder | 040U000098 |
| 20 | 4 | Spring washer | 416A111050 |
| 21 | 1 | Support ring | 414A131010 |
| 22 | 1 | Ball bearing | 419A100016 |
| 23 | 1 | Feed spindle | 040U000094 |
| 24 | 1 | O-ring, Ø64,2x1,6 Nitril. See spare parts for Feed housing. | |
| 25 | 1 | O-ring, Ø31,4x1,6 Nitril. See spare parts for Feed housing. | |
| 27 | 1 | Gasket, PTFE. See spare parts for Feed housing. | |

| Pos. | Qty | Description | Part no. |
|---|---|---|---|
| 28 | 1 | O-ring, Ø55,56x3,53 Nitril. See spare parts for Feed housing. | |
| 31 | 1 | Coupling B5 6/4-1/8", angled | 057B050618 |
| 32 | 1 | Feed piston | 040U000123 |
| 33 | 1 | O-ring, Ø54,6x2,4 Nitril. See spare parts for Feed housing. | |
| 34 | 1 | Piston ring. See spare parts for Feed housing. | |
| 35 | 1 | O-ring, Ø59x1,5 Nitril. See spare parts for Feed housing. | |
| 36 | 1 | Piston rod seal. See spare parts for Feed housing. | |
| 37 | 1 | Pressure spring. See spare parts for Feed housing. | |
| 38 | 1 | Isolation sleeve. See spare parts for Feed housing. | |
| 39 | 1 | Return plunge | 040U000116 |
| 40 | 1 | Drive shaft. See spare parts for Transmission. | |
| 41 | 1 | Bearing seat. See spare parts for Feed housing. | |
| 42 | 1 | Ball bearing. See spare parts for Feed housing. | |
| 43 | 1 | Bearing retainer. See spare parts for Feed housing. | |
| 44 | 1 | Circlip, SGA 35. See spare parts for Transmission. | |
| 45 | 1 | Ball bearing. See spare parts for Transmission. | |
| 46 | 1 | Circlip, SGH 62. See spare parts for Transmission. | |
| 47 | 1 | Transmission. See spare parts for Transmission. | |
| 48 | 1 | Transmission housing. See spare parts for Transmission. | |
| 49 | 1 | Control card C1:A. See spare parts for Control card C1:A. | |
| 50 | 1 | Electronic box | 040U00105 |
| 51 | 1 | Flat gasket. On request only. | |
| 52 | 1 | Electronic panel. On request only. | |
| 53 | 4 | Screw, DIN 7984 6x16 black. See spare parts for Transmission. | |
| 57 | 1 | Screw, MC6S 6x50 8.8 FZB | 411A121141 |
| 58 | 1 | Gasket holder | 040U000120 |
| 59 | 3 | Screw, S6SS 3x5 black | 411A151073 |
| 60 | 1 | Spacer ring | 040U000121 |
| 61 | 2 | Screw, MC6S 6x25 black. See spare parts for Hydraul lid, pump …. | |
| 62 | 1 | Screw, MC6S 6x75 black | 411A122040 |
| 70 | 1 | Feed housing. See spare parts for Feed housing. | 040A000021 |
| 73 | 1 | Cylindric pin, Ø3x12 m6. . See spare parts for Feed housing. | |
| 74 | 1 | Screw, P6SS 6x6 black | 411A151035 |
| 77 | 1 | End position stop. See spare parts for Feed housing. | 040U000125 |
| 78 | 3 | Screw, MC6S 5x35 FZB. See spare parts for Feed housing. | 411A121117 |
| 79 | 1 | Dog | 040U000126 |
| 81 | 2 | O-ring, Ø14,1x1,6 Nitril. See spare parts for Feed housing. | |
| 82 | 1 | Return feed sleeve | 040U000187 |
| 83 | 1 | O-ring, Ø11,1x1,6 Nitril. See spare parts for Feed housing. | |
| 84 | 1 | X-ring, 10,82x1,78. See spare parts for Feed housing. | |
| 85 | 1 | Slide bearing, PDE | 419B200024 |
| 86 | 1 | Slide bearing, PDE | 419B200023 |
| 87 | 1 | Isolation sleeve | 418A230093 |
| 88 | 1 | Marking sleeve, green | 420A000115 |
| 89 | 1 | Marking sleeve, red | 420A000116 |
| 91 | 1 | O-ring, Ø7,1x1,6 Nitril. See spare parts for Feed housing. | |
| 92 | 1 | O-ring plug | 040U000110 |

| Pos. | Qty | Description | Part no. |
|---|---|---|---|
| 93 | 6 | Screw, MC6S 5x16 FZB. See spare parts for Feed housing. | |
| 95 | 1 | Valve block, complete. See spare parts for Valve block. | |
| 96 | 1 | Screw, DIN 7984 4x18 FZB | 411A121017 |
| 97 | 1 | Clip ruler. See spare parts for Feed housing. | |
| 108 | 1 | Slave valve sleeve | 040U000128 |
| 109 | 1 | Slave valve cone | 040U000129 |
| 110 | 1 | Pressure spring | 416A111017 |
| 111 | 3 | O-ring, Ø11,3x2,4 Nitril. See spare parts for Feed housing. | |
| 112 | 1 | O-ring, Ø4,1x1,6 Nitril. See spare parts for Feed housing. | |
| 113 | 1 | Hydraulic pump. See spare parts for Hydraul lid, pump …. | |
| 114 | 1 | Hydraul lid. See spare parts for Hydraul lid, pump …. | |
| 115 | 1 | Motor lid, IEC 80. See spare parts for Transmission. | |
| 115 | 1 | Motor lid, IEC 90. See spare parts for Transmission. | |
| 116 | 4 | Tension washer, DIN 6796 8,4x18x2 See spare parts for Transmission. | |
| 117 | 2 | Screw, MC6S 8x25 FZB | 411A121152 |
| 118 | 2 | Screw, MC6S 8x25 FZB | 411A121152 |
| 119 | 1 | Protection plate. See spare parts for Feed housing. | |
| 120 | 4 | Shaft coupling body | 040U000119 |
| 122 | 1 | Screw, MFS 3x8 FZB. See spare parts for Feed housing. | |
| 123 | 6 | Cable clamp. See spare parts for Transmission housing. | |
| 124 | 6 | Screw, KDS 00x3 FZB | 415A122001 |
| 125 | 1 | Cover plate | 040U000181 |
| 126 | 1 | Isolation sleeve | 418A230093 |
| 127 | 4 | Screw, M6S 10x210 FZB. See spare parts for Feed housing. | |
| 128 | 4 | Tie rod | 040U000151 |
| 129 | 4 | Nut, M6M M10 | 413A112017 |
| 130 | 2 | Throttle-check valve | 040U000277 |
| 131 | 2 | Ball, Ø6 | 419A100024 |
| 132 | 2 | Spiral pin, N 1x10 | 415A111029 |
| 133 | 2 | Washer, BRB 4,3x10x0,8 FZB. See spare parts for Feed housing. | |
| 134 | 2 | Screw, MC6S 4x8 FZB. See spare parts for Feed housing. | |
| 135 | 4 | Screw, MC6S 8x16 FZB | 411A122027 |
| 136 | 1 | Radial seal, 8x16x6 | 418A230091 |
| 138 | 1 | Push out rod, for spindle MT2. | 040J000002 |
| 146 | 4 | Coupling B5 6/4-1/8", angled. See spare parts for Feed housing. | |
| 147 | 1 | Nut, B10 6/4-10x1 | 057B106400 |
| 148 | 1 | Coupling B9 6/4-1/8", T-coupling. See spare parts for Feed housing. | |
| 149 | 1 | Coupling B1 6/4-1/8", rak. See spare parts for Feed housing. | |
| 151 | 2 | Cable strip, 146x3,50 black | 420A000021 |
| 152 | 1 | Plastic hose, PA12 Ø6/4,0 nature. See spare parts for Feed housing. | |
| 153 | | Plastic hose, Ø6/3,2 black. See spare parts for Valve block. | |
| 154 | 1 | Label, for control card C1:A. . See spare parts for Control card C1:A. | |
| 155 | 1 | Label, "STROKE DEPTH" | 417S900016 |
| 156 | 1 | Label, "RETRACT SPEED" | 417S900021 |
| 157 | 1 | Label, "APPROACH FEED" | 417S900025 |
| 159 | 1 | Label, ”LIMITATION” for Valve block | 417S900029 |
| 166 | 2 | O-ring, Ø53,64x2,62 Nitril. See spare parts for Feed housing. | |

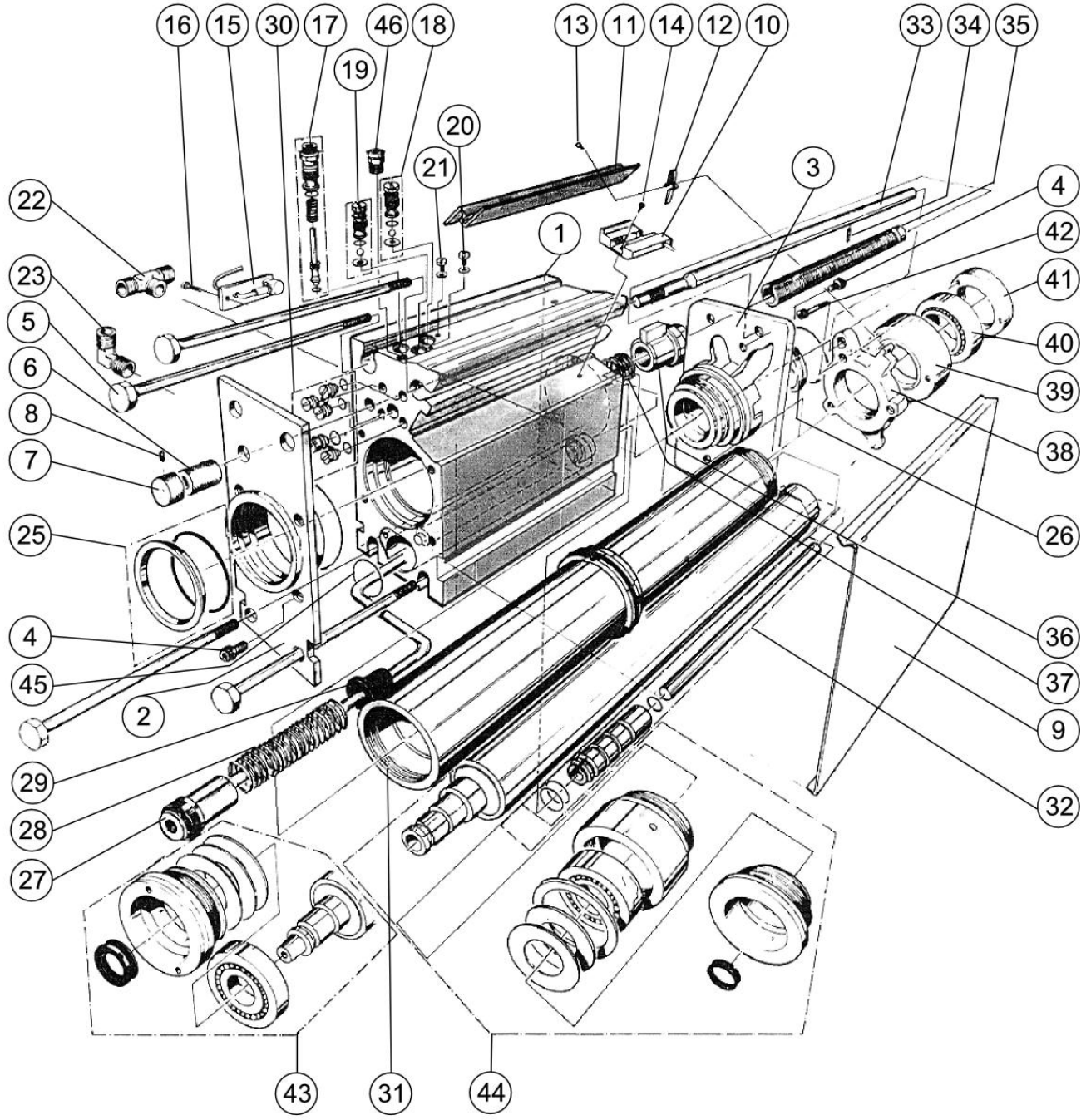
| Pos. | Qty | Description | Part no. |
|---|---|---|---|
| 167 | 1 | Nut, DIN 439 M16x1,5 FZB | 413A112025 |
| 168 | 1 | Type label | 417S900050 |
| 172 | 1 | Pressure spring. See spare parts for Feed housing. | |
| 173 | 1 | Key | 040U000142 |
| 174 | 1 | End position spindle | 040U000143 |
| 175 | 1 | Screw, MC6S 4x10 FZB. See spare parts for Feed housing. | |
| 176 | 1 | Front end position sensor, complete. See spare parts for Feed housing. | |
| 179 | 1 | Rear end position sensor, complete. See spare parts for Transmission housing. | |
| 180 | 1 | Clips sensor, complete. . See spare parts for Feed housing. | |
| 181 | 4 | Pin screw, M5x73  2X10. See spare parts for Transmission housing. | |
| 182 | 1 | Nut, M6M M5. See spare parts for Transmission housing. | |
| 183 | 4 | Dome nut, MhM M5 FZB. See spare parts for Transmission housing. | |
| 185 | 1 | Sleeve gasket. . See spare parts for Feed housing. | |
| 187 | 1 | Indication plate | 040U000145 |
| 188 | 1 | Tank piston. See spare parts for Feed housing.. | |
| 189 | 14 | Support sleeve. See spare parts for Valve block. | |
| 193 | 1 | Wiper, PTFE incl. O-ring. See spare parts for Feed housing. | |
| 194 | 1 | Bushing, front end. See spare parts for Feed housing. | |
| 195 | 1 | Front plate, front end. See spare parts for Feed housing. | |
| 196 | 1 | Bushing, rear end. See spare parts for Feed housing. | |
| 197 | 1 | Rear plate, rear end. See spare parts for Feed housing. | |
| 199 | 2 | Cable gland | 418A260002 |
| 200 | 1 | Cable gland | 418A260003 |
| 201 | 1 | Screw, S6SS 5x5 black | 411A151092 |
| 203 | 1 | O-ring, Ø3,0x1,0 Nitril | |
| 205 | 1 | Nut | 040U000183 |
| 206 | 1 | Wiper, PTFE incl. O-ring. See spare parts for Feed housing. | |
| 207 | 1 | Locking ring, SRA 14 | 415A151024 |
| 208 | 2 | O-ring, Ø12,0x4,0 Nitril | 418A210205 |
| 209 | 1 | Stop sleeve | 040U000288 |
| 210 | 1 | Shaft coupling body | 040U000225 |
| 211 | 2 | Ring | 040U000226 |
| | | | |
| 220 | 1 | Drill chuck (Albrecht), SBF Ø3,0 – 16,0 mm (.4 – 5/8'')MT2 | 041J004013 |
| 220 | 1 | Tapping spindle, GS-24E int. B18 with 40 mm (1 1/2'') length compensation. | 042J000035 |
| | 1 | Tap holder T24 for GS-24E. On request. Specify Ø and #. | 042J100XXX |
| 220 | 1 | Taper shank, B18/MT2. For 042J000035. | 042J000046 |
| | | | |
| 230 | 1 | Key chuck JT2 6A-2A, Ø 0 – 13,0 mm (0 – 1/2''). | 040J000107 |
| | 1 | Chuck key for the above Key chuck. | 041J004073 |
| 230 | 1 | Drill chuck JT2, Ø 1,0 – 10,0 mm (.04 – 3/8''). | 040J000115 |
| 230 | 1 | Drill chuck JT2, Ø 1,0 – 13,0 mm (.04 – 1/2''). | 040J000116 |
| 230 | 1 | Drill chuck JT2, Ø 3,0 – 16,0 mm (.04 - 5/8''). | 040J000117 |
| 230 | 1 | Holder for adjustable adjustable adaptor, JT2 TR 20x2 | 040J000008 |
| 230 | 1 | Holder for adjustable adjustable adaptor, JT2 TR 28x2 | 040J000007 |
| 230 | 1 | Collet chuck ER20/JT2, 1 - 15 mm (.04 – 9/16''), for ER20. | 040J000123 |
| 230 | 1 | Collet. ER20 Ø1,0 – 15,0 mm (.04 – 9/16''). On request. | 040J008XXX |

| Pos. | Qty | Description | Part no. |
|---|---|---|---|
| 230 | 1 | Collet chuck ER40/JT2, 21 – 30 mm (13/16 – 1 3/16''), for ER40. | 040J000110 |
| 230 | 1 | Collet. ER40 Ø21,0 – 30,0 mm (13/16 – 1 3/16''). On request. | 041J010XXX |
| 230 | 1 | Tapping spindle, GS-12E int. JT2 with 25 mm (1'') length compensation. | 042J000034 |
| | 1 | Tap holder T12 for GS-12E. On request. Specify Ø and #. | 042J100XXX |
| | | | |
| | | Complete adaptor kits: | |
| 240 | 1 | Adaptor for multi-spindel head MBK 6V2. | 040A000500 |
| 240 | 1 | Adaptor for multi-spindel heads MBK 600, 6V3, 6V4, VH 06 and VH 08. | 040A000501 |
| 240 | 1 | Adaptor for multi-spindel heads MBK 800, 1300 and 1400. | 040A000502 |
| 240 | 1 | Adaptor for multi-spindel heads MBK V 1002. | 040A000503 |
| 240 | 1 | Adaptor for multi-spindel heads VH 100, VH 130 and VH 180. | 040A000504 |
| | | | |
| 250 | 1 | End plate | 040V300130 |
| 251 | 1 | Yoke | 040V300131 |
| 252 | 1 | Spring holder | 040V400299 |
| 253 | 1 | Anchor ring | 040V400300 |
| 254 | 1 | Dog for MBK 6V2, 600, 6V3, 6V4, VH06 and VH08. | 040V400309 |
| 254 | 1 | Dog for MBK 800, 1300 and 1400. | 040V400327 |
| 254 | 1 | Dog for MBK V 1002. | 040V400219 |
| 254 | 1 | Dog for VH 100, VH130 and VH180. | 040V400327 |
| 254 | 1 | Dog, mid-section for VH 100, VH130 and VH180. | 040V300417 |
| 255 | 2 | Locking washer | 040V400301 |
| 256 | 1 | Attachment plate for MBK 6V2. | 040V300157 |
| 256 | 1 | Attachment plate for MBK 600, 6V3, 6V4, VH 06 and VH 08. | 040V300170 |
| 256 | 1 | Attachment plate for MBK 800, 1300 and 1400. | 040V300152 |
| 256 | 1 | Attachment plate for MBK V 1002. | 040V300162 |
| 256 | 1 | Attachment plate for VH 100, VH 130 and VH 180. | 040V300418 |
| 257 | 2 | Guide ring | 040V400302 |
| 258 | 2 | Pillar | 040V400304 |
| 259 | 2 | Slide bearing, 25x28x30 | 419B200028 |
| 260 | 2 | Wiper, 25x33x4/7 | 418A230128 |
| 261 | 4 | Screw, M6S 8x22 FZB | 411A112009 |
| 262 | 4 | Screw, MC6S 8x25 FZB | 411A121152 |
| 263 | 4 | Screw, MC6S 6x25 FZB for MBK 600, 6V3, 6V4, VH 06 and VH 08. | 411A122004 |
| 263 | 4 | Screw, MC6S 8x25 FZB for MBK 800, 1300 and 1400. | 411A121152 |
| 263 | 4 | Screw, MC6S 8x16 FZB for MBK V 1002. | 411A122027 |
| 263 | 4 | Screw, MC6S 8x35 FZB for VH 100, VH 130 and VH 180. | 411A121154 |
| 264 | 1 | Screw, MC6S 4x16 FZB | 411A122016 |
| 264 | 1 | Screw, MC6S 4x30 för VH 100, VH 130 and VH 180. | 411A122018 |
| 265 | 1 | Spacer ring | 414A112025 |
| 266 | 2 | Protection plug | 420A000012 |
| 267 | 2 | Protection plug | 420A000011 |
| 268 | 2 | Pull spring (Only for adaptor with spring return.) | 416A111041 |
| 269 | 2 | Plug (Only for adaptor with spring return.) | 040V400303 |
| 270 | 2 | Plug (Only for adaptor with spring return.) | 040V400305 |
| 271 | 4 | Grooved pin, RPC 4x20 (Only for adaptor with spring return.) | 415A111020 |

| Pos. | Qty | Description | Part no. |
|---|---|---|---|
| 280 | 1 | Rotary Union | 040J100000 |
| 281 | 1 | Hydraulic hose, incl. G 3/8 couplings, length = 400 mm (1.31 Ft) | 040U000500 |
| 282 | 1 | Protection plate | 040V300459 |
| 283 | 1 | Mid-section plate | 040V400726 |
| 284 | 2 | Torque bar | 040V400727 |
| 285 | 1 | Slide plate | 040V400728 |
| 286 | 1 | Bear coupling | 040V400729 |
| 287 | 1 | Coolant tube | 040V400730 |
| 288 | 2 | Screw, DIN 7984 5x10 FZB | 411A121018 |
| 289 | 3 | Screw, SK6S 4x4 black | 411A151199 |
| 290 | 1 | O-ring, 6,0x1,0 Nitril | 418A210045 |
| 291 | 2 | Ball bearing | 419A100012 |
| 292 | 4 | Bushing | 419B000016 |
| 293 | 4 | Screw, MC6S M5x75 FZB | 411A121181 |
| 294 | 1 | Collet chuck ER 32 / MT2, special version. | 040J000108 |
| | | | |
| | | Complete kits: | |
| | 1 | Spindle, with B12 taper. | 040R000014 |
| | 1 | Pilot valve kit, complete. | 040R000025 |
| | 1 | Pressure regulating valve, complete. | 040R000030 |
| | 1 | Regulating valve, complete. | 040R000031 |
| | 1 | Pressure regulating valve for working feed, complete. | 040R000032 |
| | 1 | Pressure filter, complete. | 040R000033 |

## Spare parts drawing and Spare parts list

**Feed housing:**



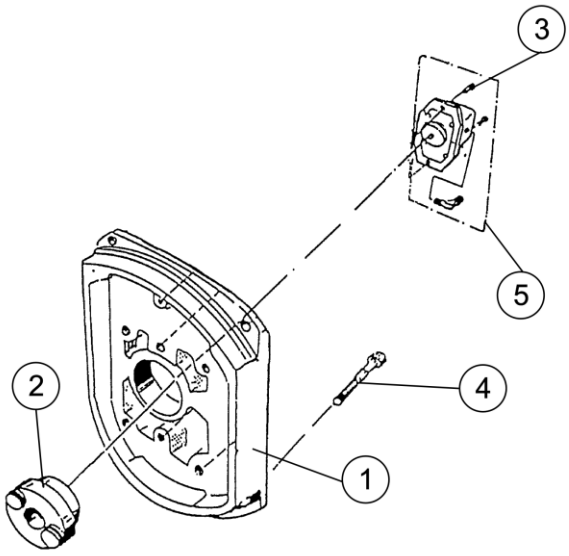

| Pos. | Qty | Description | Part no. |
|---|---|---|---|
| 1 | 1 | Feed housing | 040A000021 |
| 2 | 1 | Front plate, front end | 040U000173 |
| | 1 | Bushing, front end | 040U000174 |
| 3 | 1 | Rear plate, rear end | 040U000175 |
| | 1 | Bushing, rear end | 040U000176 |
| 4 | 6 | Screw, MC6S 5x16 FZB | 411A121114 |
| 5 | 4 | Screw, M6S 10x210 FZB | 411A111001 |
| 6 | 1 | End position nut | 040U000114 |
| 7 | 1 | Knob | 040A000061 |
| 8 | 1 | Screw, SK6SS 5x5 black | 411A151209 |
| 9 | 1 | Protection plate | 040U000112 |

| Pos. | Qty | Description | Part no. |
|---|---|---|---|
| 10 | 1 | Clips sensor , complete. | 040U000162 |
| 11 | 1 | Clip ruler | 040U000150 |
| 12 | | Clips | 040U000149 |
| 13 | 1 | Screw, MF6S 3x6 FZB | 411A121036 |
| 14 | 1 | Screw, MFS 3x8 FZB | 411A132007 |
| 15 | 1 | Front end position sensor, complete. | 040U000161 |
| 16 | 1 | Screw, MC6S 4x10 FZB | 411A121101 |
| 17 | 1 | Slave valve, complete. | Se pos. 50 |
| | 1 | O-ring, Ø11,3x2,4 Nitril | |
| | 1 | O-ring, Ø4,1x1,6 Nitril | |
| 18 | 1 | Throttle-check valve, for approach feed, complete. | Se pos. 51 |
| | 1 | O-ring, Ø11,3x2,4 Nitril | |
| 19 | 1 | Throttle-check valve, for retract feed, complete. | Se pos. 52 |
| | 1 | O-ring, Ø11,3x2,4 Nitril | |
| 20 | 2 | Washer, BRB4,3X10X0,8 FZB | 414A122004 |
| 21 | 2 | Screw, MFS 4x8 FZB | 411A132015 |
| 22 | 1 | Coupling B9 6/4-1/8", T-coupling | 057B096400 |
| 23 | 3 | Coupling B5 6/4-1/8", angled | 057B050618 |
| 24 | 1 | Coupling B1 6/4-1/8", staright | 057B010618 |
| 25 | 1 | Seal kit, for front end, complete. | Se pos. 53 |
| 26 | 1 | Seal kit, for rear end, complete. | Se pos. 54 |
| 27 | 1 | Tank piston, complete. | Se pos. 55 |
| 28 | 1 | Pressure spring | 416A111019 |
| 29 | 1 | Isolation sleeve | 418A230094 |
| 30 | 1 | Plug kit, complete. | Se pos. 56 |
| 31 | 1 | Feed spindle, complete. | 040U000180 |
| | 1 | Piston ring | |
| | 1 | O-ring, Ø54,6x2,4 Nitril | |
| 32 | 1 | Retract feed sleeve, complete. | Se pos. 57 |
| | 2 | O-ring, Ø14,1x1,6 Nitril | |
| | 1 | O-ring, Ø11,1x1,6 Nitril | |
| | 1 | X-ring, 10,82x1,78 | |
| 33 | 1 | End position shaft | 040U000115 |
| 34 | 1 | Cylindric pin, Ø3x12 m6 | 415A111013 |
| 35 | 1 | End position stop | 040U000125 |
| 36 | 1 | End position spindle, complete. | Se pos. 58 |
| 37 | 1 | Pressure spring | 416A111018 |
| 38 | 1 | Dog, complete. | Se pos. 59 |
| 39 | 1 | Bearing seat | 040U000113 |
| 40 | 1 | Ball bearing | 419A100018 |
| 41 | 1 | Bearing retainer | 040U000117 |
| 42 | 3 | Screw, MC6S 5x35 FZB | 411A121117 |
| 43 | 1 | Spindle kit, for JT2 taper, complete. | Se pos. 60 |
| 44 | 1 | Spindle kit, for MT2 taper, complete. | Se pos. 61 |
| 45 | 1 | O-ring, Ø31,4x1,6 Nitril | 418A210066 |
| 46 | 1 | Coupling B1 6/4-1/8", straight | 057B010618 |

| Pos. | Qty | Description | Part no. |
|---|---|---|---|
| | | Complete kits: | |
| 50 | 1 | Slave valve, complete. | 040R000027 |
| 51 | 1 | Throttle-check valve, for approach feed, complete. | 040R000028 |
| 52 | 1 | Throttle-check valve, for retract feed, complete. | 040R000028 |
| 53 | 1 | Seal kit, for front end, complete. | 040R000012 |
| 54 | 1 | Seal kit, for rear end, complete. | 040R000013 |
| 55 | 1 | Tank piston, complete. | 040R000034 |
| 56 | 1 | Plug kit, complete. | 040R000035 |
| 57 | 1 | Retract feed sleeve, complete. | 040R000036 |
| 58 | 1 | End position spindle, complete. | 040R000039 |
| 59 | 1 | Dog, complete. | 040R000037 |
| 60 | 1 | Spindle kit, for JT2 taper, complete. | 040R000016 |
| 61 | 1 | Spindle kit, for MT2 taper, complete. | 040R000015 |
| 62 | 1 | Seal kit, for feed housing, complete. | 040R000001 |

# Spare parts drawing and Spare parts list

**Hydraul lid, pump and coupling:**




| Pos. | Qty | Description | Part no. |
|---|---|---|---|
| 1 | 1 | Hydraul lid | 040A000033 |
| 2 | 2 | Screw, MC6S 6 x 25 black | 411A121137 |
| 3 | 4 | Screw, MC6S 8 x 20 black | 411A121004 |
| | | | |
| 4 | 1 | Hydraulic pump, for 2-pole el. motor with 2800 rpm, complete. *) | 040R000044 |
| 4 | 1 | Hydraulic pump, for 4-pole el. motor with 1400 rpm, complete. *) | 040R000045 |
| 4 | 1 | Hydraulic pump, for 6-pole el. motor with 900 rpm, complete. *) | 040R000046 |
| 4 | 1 | Hydraulic pump, for 8-pole el. motor with 700 rpm., complete. *) | 040R000047 |
| | | | |
| | | Complete kits: | |
| 5 | 1 | Pump coupling, complete | 040R000042 |

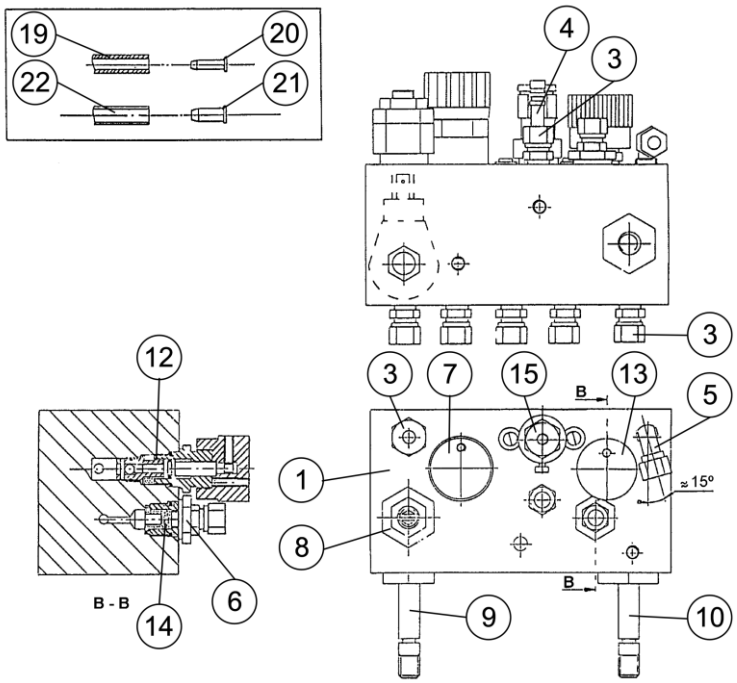
*) Reversible hydraulic pump that is suitable for all types of electric motors.

Connections to connect the drainage outlet to the pump with the hose to the tank pistion is included.

- Cut off the hose to the tank piston and connect the T-coupling.

# Spare parts drawing and Spare parts list

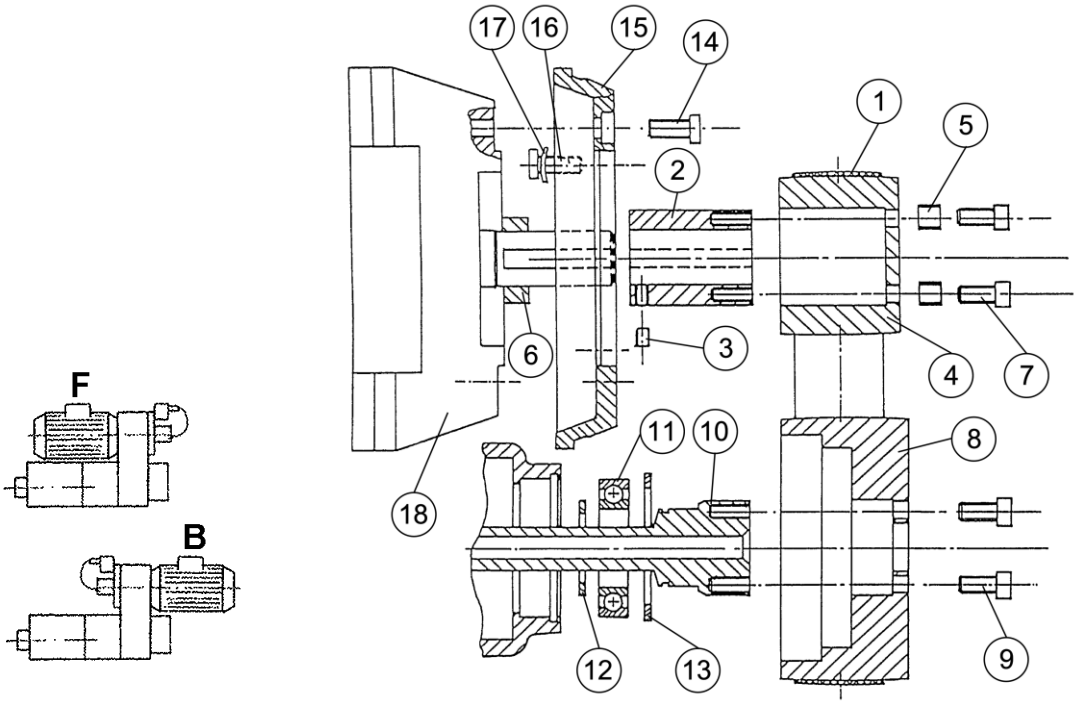
**Valve block:**




| Pos. | Qty | Description | Part no. |
|---|---|---|---|
| 1 | 1 | Valve block assembly excl. valves | Se pos. 25 |
| 3 | 8 | Coupling B1 6/4-1/8", rak | 057B010618 |
| 4 | 1 | Plugg | 057E090600 |
| 5 | 1 | Coupling B5 6/4-1/8", vinklad | 057B050618 |
| 6 | 1 | Filter nipple | 040V400095 |
| 7 | 1 | Pressure regulating valve | 040A000072 |
| 8 | 1 | Pressure regulating valve | 040A000071 |
| 9 | 1 | Directional control valve, 4/2 | 040A000074 |
| 10 | 1 | Directional control valve, 3/2 | 040A000073 |
| 11 | 2 | Magnetic coil, 220 VAC 50 Hz | 040A000075 |
| 11 | 2 | Magnetic coil, 110 VAC 60 Hz | 040A000076 |
| 12 | 1 | Return filter | 040U000082 |
| 13 | 1 | Flow control valve, complete. | Se pos. 26 |
| 14 | 1 | Pressure filter | 040U000083 |
| 15 | 1 | Oil refilling valve, complete. | Se pos. 27 |
| 19 | 1 | Plastic hose PA12, Ø6/3,2 mm black | 057G000026 |
| 20 | 10 | Support sleeve, Ø6/3,2 | 040U000109 |
| 21 | 4 | Support sleeve, Ø6/4 mm | 057B126400 |
| 22 | 1 | Plastic hose PA12, Ø6/4 mm natur | 057G000023 |
| | | | |
| | | Complete kits: | |
| 25 | 1 | Valve block assembly excl. valves | 040R000061 |
| 26 | 1 | Flow control valve, complete. | 040R000062 |
| 27 | 1 | Oil refilling valve, complete. | 040R000063 |
| 26 | 1 | Valve block assembly for 220 VAC, complete. | 040S100002 |
| 27 | 1 | Valve block assembly for 110 VAC, complete. | 040S100003 |
| 28 | 1 | Seal kit for valve block, complete. | 040R000060 |
| | 1 | Solenoid valve kit for 220 VAC 50 Hz, complete | 040R000040 |
| | 1 | Solenoid valve kit for 110 VAC 60 Hz, complete | 040R000041 |

# Spare parts drawing and Spare parts list

**Transmission for F- and B-mounted electric motor IEC 80 and IEC 90 with flat drive belt:**
**Transmission for F- and B-mounted electric motor IEC 80 and IEC 90 with toothed drive belt.**




**Flat drive belt for BE 552, BE 555 and BE 558.**

| Type of motor: | Ratio: | Pos. 1<br>Drive belt | Pos. 2<br>Hub | Pos. 3<br>Screw | Pos. 4<br>Pulley |
|---|---|---|---|---|---|
| IEC 80<br>"F" | 2,76:1 | 040U000006 | 040U000033 | 411A151266 | - |
| | 2,17:1 | 040U000006 | 040U000036 | 411A151266 | - |
| | 1,67:1 | 040U000006 | 040U000033 | 411A151266 | 040U000026 |
| | 1,3:1 | 040U000005 | 040U000034 | 411A151266 | 040U000029 |
| | 1:1 | 040U000003 | 040U000032 | 411A151266 | 040U000029 |
| | 0,77:1 | 040U000005 | 040U000032 | 411A151266 | 040U000030 |
| | 0,6:1 | 040U000004 | 040U000032 | 411A151266 | 040U000030 |
| | 0,46:1 | 040U000002 | 040U000032 | 411A151266 | 040U000030 |
| | 0,36:1 | 040U000001 | 040U000032 | 411A151266 | 040U000030 |
| | **Ratio:** | **Pos. 5<br>Spacer** | **Pos. 7<br>Screw** | **Pos. 8<br>Pulley** | **Transmission kit, complete.** |
| | 2,76:1 | 040U000131 | 411A121088 | 040U000022 | 040A000136 |
| | 2,17:1 | 040U000131 | 411A121088 | 040U000022 | 040A000135 |
| | 1,67:1 | 040U000130 | 411A121088 | 040U000022 | 040A000134 |
| | 1,3:1 | 040U000132 | 411A121011 | 040U000021 | 040A000133 |
| | 1:1 | - | 411A121087 | 040U000029 | 040A000132 |
| | 0,77:1 | - | 411A121087 | 040U000029 | 040A000131 |
| | 0,6:1 | - | 411A121087 | 040U000028 | 040A000130 |
| | 0,46:1 | - | 411A121087 | 040U000027 | 040A000129 |
| | 0,36:1 | - | 411A121087 | - | 040A000128 |

| Type of motor: | Ratio: | Pos. 1<br>Drive belt | Pos. 2<br>Hub | Pos. 3<br>Screw | Pos. 4<br>Pulley |
|---|---|---|---|---|---|
| IEC 80<br>"B" | 2,76:1 | 040U000006 | 040U000033 | 411A151266 | - |
| | 2,17:1 | 040U000007 | 040U000036 | 411A151266 | - |
| | 1,67:1 | 040U000008 | 040U000033 | 411A151266 | 040U000026 |
| | 1,3:1 | 040U000005 | 040U000034 | 411A151266 | 040U000029 |
| | 1:1 | 040U000003 | 040U000034 | 411A151266 | 040U000029 |
| | 0,77:1 | 040U000009 | 040U000034 | 411A151266 | 040U000030 |
| | 0,6:1 | 040U000004 | 040U000034 | 411A151266 | 040U000030 |
| | 0,46:1 | 040U000002 | 040U000034 | 411A151266 | 040U000030 |
| | 0,36:1 | 040U000001 | 040U000034 | 411A151266 | 040U000030 |
| | **Ratio:** | **Pos. 5<br>Spacer** | **Pos. 7<br>Screw** | **Pos. 8<br>Pulley** | **Transmission kit, complete.** |
| | 2,76:1 | 040U000131 | 411A121088 | 040U000022 | 040A000127 |
| | 2,17:1 | 040U000131 | 411A121088 | 040U000022 | 040A000126 |
| | 1,67:1 | 040U000130 | 411A121088 | 040U000022 | 040A000125 |
| | 1,3:1 | 040U000132 | 411A121011 | 040U000021 | 040A000124 |
| | 1:1 | 040U000132 | 411A121087 | 040U000029 | 040A000123 |
| | 0,77:1 | 040U000132 | 411A121087 | 040U000029 | 040A000122 |
| | 0,6:1 | 040U000132 | 411A121087 | 040U000028 | 040A000121 |
| | 0,46:1 | 040U000132 | 411A121088 | 040U000027 | 040A000120 |
| | 0,36:1 | 040U000132 | 411A121087 | - | 040A000119 |

| Type of motor: | Ratio: | Pos. 1<br>Drive belt | Pos. 2<br>Hub | Pos. 3<br>Screw | Pos. 4<br>Pulley |
|---|---|---|---|---|---|
| IEC 90<br>"F/B" | 2,76:1 | 040U000012 | 040U000020 | 411A151266 | - |
| | 2,17:1 | 040U000013 | 040U000035 | 411A151266 | - |
| | 1,67:1 | 040U000011 | 040U000031 | 411A151266 | 040U000026 |
| | 1,3:1 | 040U000009 | 040U000031 | 411A151266 | 040U000025 |
| | 1:1 | 040U000010 | 040U000031 | 411A151266 | 040U000024 |
| | **Ratio:** | **Pos. 5<br>Spacer** | **Pos. 7<br>Screw** | **Pos. 8<br>Pulley** | **Transmission kit, complete.** |
| | 2,76:1 | - | 411A121087 | 040U000023 | 040A000141 |
| | 2,17:1 | - | 411A121087 | 040U000023 | 040A000140 |
| | 1,67:1 | 4x 414A112031 | 411A121087 | 040U000023 | 040A000139 |
| | 1,3:1 | 4x 414A112031 | 411A121087 | 040U000023 | 040A000138 |
| | 1:1 | 4x 414A112031 | 411A121087 | 040U000023 | 040A000137 |

**Toothed drive belt for BE 552, BE 555 and BE 558.**

| Type of motor: | Ratio: | Pos. 1<br>Drive belt | Pos. 2<br>Hub | Pos. 3<br>Screw | Pos. 4<br>Pulley |
|---|---|---|---|---|---|
| IEC 80 "F" | 2,05:1 | 422A000002 | 040U000032 | 411A151266 | 040V400154 |
| | 1,72:1 | 422A000001 | 040U000032 | 411A151266 | 040V400286 |
| | 1,38:1 | 422A000003 | 040U000032 | 411A151266 | 040V300112 |
| | 1:1 | 422A000004 | 040U000032 | 411A151266 | 040V300080 |
| | 0,72:1 | 422A000005 | 040U000032 | 411A151266 | 040V300050 |
| | 0,58:1 | 422A000006 | 040U000032 | 411A151266 | 040V300058 |
| | **Ratio:** | **Pos. 5<br>Spacer** | **Pos. 6<br>Spacer** | **Pos. 7<br>Screw** | **Pos. 8<br>Pulley** |
| | 2,05:1 | - | - | 2x 411A121087 | 040V300065 |
| | 1,72:1 | - | - | 2x 411A121087 | 040V300058 |
| | 1,38:1 | - | - | 2x 411A121087 | 040V300065 |
| | 1:1 | - | - | 2x 411A121087 | 040V300065 |
| | 0,72:1 | - | - | 2x 411A121087 | 040V300049 |
| | 0,58:1 | - | - | 2x 411A121087 | 040V300057 |

| Type of motor: | Ratio: | Pos. 1<br>Drive belt | Pos. 2<br>Hub | Pos. 3<br>Screw | Pos. 4<br>Pulley |
|---|---|---|---|---|---|
| IEC 80 "B" | 2,05:1 | 422A000002 | 040U000034 | 411A151266 | 040V400154 |
| | 1,72:1 | 422A000001 | 040U000034 | 411A151266 | 040V400286 |
| | 1,38:1 | 422A000003 | 040U000034 | 411A151266 | 040V300112 |
| | 1:1 | 422A000004 | 040U000034 | 411A151266 | 040V300080 |
| | **Ratio:** | **Pos. 5<br>Spacer** | **Pos. 6<br>Spacer** | **Pos. 7<br>Screw** | **Pos. 8<br>Pulley** |
| | 2,05:1 | 040V400292 | 040V400288 | 2x 411A121140 | 040V300065 |
| | 1,72:1 | 040V400292 | 040V400288 | 2x 411A121140 | 040V300058 |
| | 1,38:1 | 040V400292 | 040V400288 | 2x 411A121140 | 040V300065 |
| | 1:1 | 040V400292 | 040V400288 | 2x 411A121140 | 040V300065 |

**Toothed drive belt for BE 552, BE 555 and BE 558.**

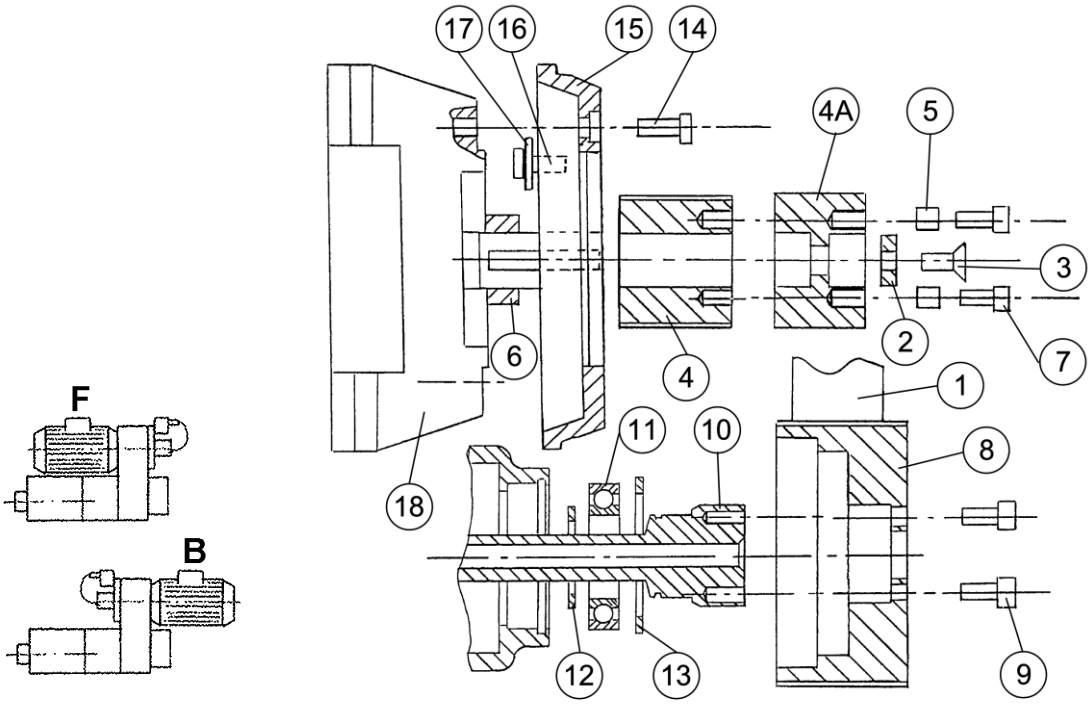
| Type of motor: | Ratio: | Pos. 1<br>Drive belt | Pos. 2<br>Hub | Pos. 3<br>Screw | Pos. 4<br>Pulley |
|---|---|---|---|---|---|
| IEC 90<br>"F" | 2,05:1 | 422A000002 | 040U000031 | 411A151266 | 040V400154 |
| | 1,72:1 | 422A000001 | 040U000031 | 411A151266 | 040V400286 |
| | 1,38:1 | 422A000003 | 040U000031 | 411A151266 | 040V300112 |
| | 1:1 | 422A000004 | 040U000031 | 411A151266 | 040V300080 |
| | 0,72:1 | 422A000005 | 040U000031 | 411A151266 | 040V300050 |
| | 0,58:1 | 422A000006 | 040U000031 | 411A151266 | 040V300058 |
| | **Ratio:** | **Pos. 5<br>Spacer** | **Pos. 6<br>Spacer** | **Pos. 7<br>Screw** | **Pos. 8<br>Pulley** |
| | 2,05:1 | 4x…414A112031 | - | 2x 411A121087 | 040V300065 |
| | 1,72:1 | 4x…414A112031 | - | 2x 411A121087 | 040V300058 |
| | 1,38:1 | 4x…414A112031 | - | 2x 411A121087 | 040V300065 |
| | 1:1 | 4x…414A112031 | - | 2x 411A121087 | 040V300065 |
| | 0,72:1 | 4x…414A112031 | - | 2x 411A121087 | 040V300049 |
| | 0,58:1 | 4x…414A112031 | - | 2x 411A121087 | 040V300057 |

| Type of motor: | Ratio: | Pos. 1<br>Drive belt | Pos. 2<br>Hub | Pos. 3<br>Screw | Pos. 4<br>Pulley |
|---|---|---|---|---|---|
| IEC 90<br>"B" | 2,05:1 | 422A000002 | 040U000034 | 411A151266 | 040V400154 |
| | 1,72:1 | 422A000001 | 040U000034 | 411A151266 | 040V400286 |
| | 1,38 | 422A000003 | 040U000034 | 411A151266 | 040V300112 |
| | 1:1 | 422A000004 | 040U000034 | 411A151266 | 040V300080 |
| | **Ratio:** | **Pos. 5<br>Spacer** | **Pos. 6<br>Spacer** | **Pos. 7<br>Screw** | **Pos. 8<br>Pulley** |
| | 2,05:1 | 4x…414A112031 | - | 2x 411A121087 | 040V300065 |
| | 1,72:1 | 040V400292 | - | 2x 411A121087 | 040V300058 |
| | 1,38 | 4x…414A112031 | - | 2x 411A121087 | 040V300065 |
| | 1:1 | 4x…414A112031 | - | 2x 411A121087 | 040V300065 |

| Pos. | Qty | Description | Part no. |
|---|---|---|---|
| 9 | | Screw, MC6S 6x20 | 411A121087 |
| 10 | 1 | Drive shaft | 040U000122 |
| 11 | 1 | Ball beraing | 419A100015 |
| 12 | 1 | Circlip, SGA 35 | 415A151003 |
| 13 | 1 | Circlip, SGH 62 | 415A151019 |
| 14 | | Screw, DIN 7984 6x16 black | 411A121024 |
| 15 | 1 | Motor lid, IEC 80 | 040A000029 |
| 15 | 1 | Motor lid, IEC 90 | 040A000031 |
| 16 | | Screw, DIN 7984 8x25 FZB | 411A121028 |
| 17 | | Tension washer, DIN 6796 8,4x18x2 | 414A121030 |

# Spare parts drawing and Spare parts list

**Transmission for F-/B-mounted electric motor IEC 80 and IEC 90 with toothed drive belt.**




**Toothed drive belt for BE 552, BE 555 and BE 558.**

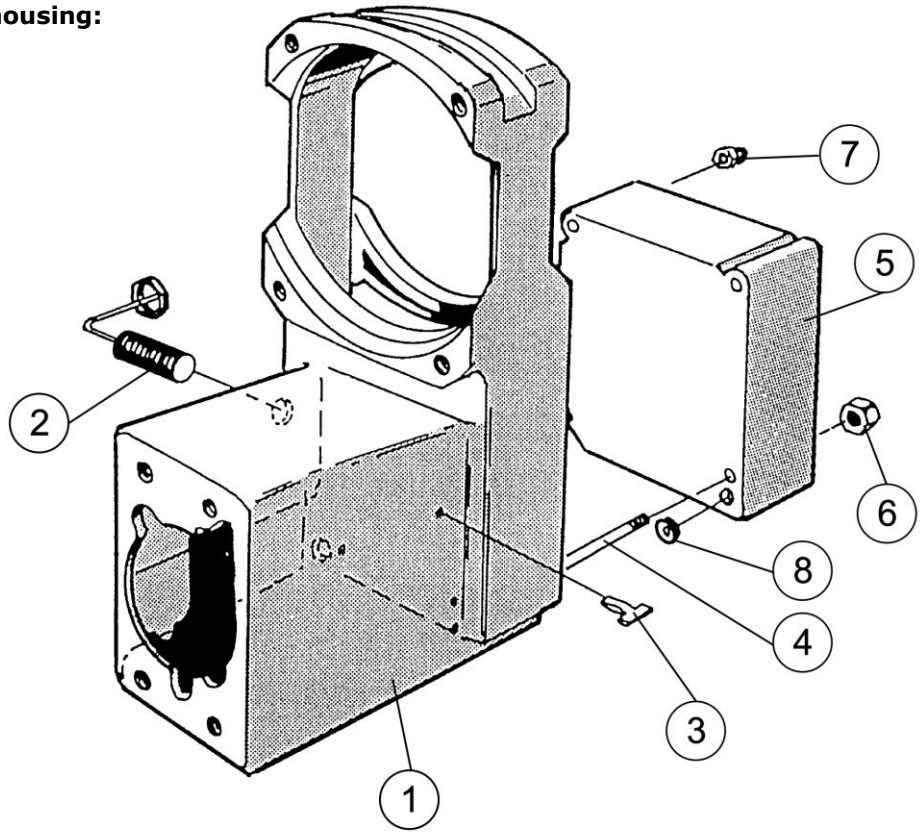
| Type of motor: | Ratio: | Pos. 1 Drive belt | Pos. 2 Washer | Pos. 3 Screw | Pos. 4 Pulley |
|---|---|---|---|---|---|
| IEC 80 "F/B" | 2,71:1 | 422A000001 | 040V400157 | 411A121062 | 040V400289 |
| | Ratio: | Pos. 5 Spacer | Pos. 6 Spacer | Pos. 7 Screw | Pos. 8 Pulley |
| | 2,71:1 | 040U000131 | - | 2x 411A122005 | 040V300065 |

| Type of motor: | Ratio: | Pos. 1 Drive belt | Pos. 2 Washer | Pos. 3 Screw | Pos. 4 Pulley | Pos. 4A Clutch |
|---|---|---|---|---|---|---|
| IEC 90 "F/B" | 2,71:1 | 422A000001 | 040V400157 | 411A121062 | 040V400289 | 040V400159 |
| | Ratio: | Pos. 5 Spacer | Pos. 6 Spacer | Pos. 7 Screw | Pos. 8 Pulley | |
| | 2,71:1 | - | 040V400156 | 2x 411A122024 | 040V300065 | |

| Pos. | Qty | Description | Part no. |
|---|---|---|---|
| 9 | | Screw, MC6S 6x20 | 411A121087 |
| 10 | 1 | Drive shaft | 040U000122 |
| 11 | 1 | Ball beraing | 419A100015 |
| 12 | 1 | Circlip, SGA 35 | 415A151003 |
| 13 | 1 | Circlip, SGH 62 | 415A151019 |
| 14 | | Screw, DIN 7984 6x16 black | 411A121024 |
| 15 | 1 | Motor lid, IEC 90 | 040A000031 |
| 16 | | Screw, DIN 7984 8x25 FZB | 411A121028 |
| 17 | | Tension washer, DIN 6796 8,4x18x2 | 414A121030 |

# Spare parts drawing and Spare parts list

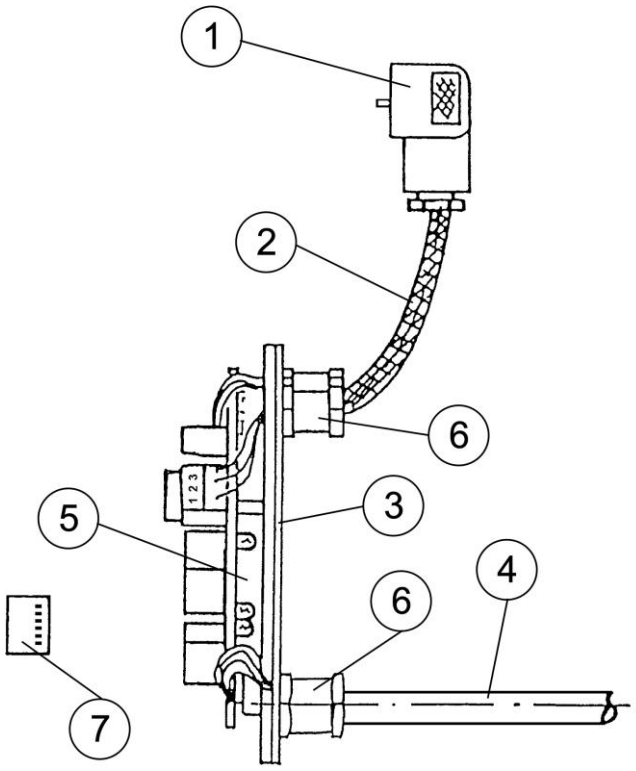
**Transmission housing:**




| Pos. | Qty | Description | Part no. |
|---|---|---|---|
| 1 | 1 | Transmission housing | 040A000025 |
| 2 | 1 | Rear end position sensor, complete. | 040U000191 |
| 3 | 5 | Cable clamp | 420A000120 |
| 4 | 4 | Pin screw, M5x73 2X10 | 040U000144 |
| 5 | 1 | Electronic box, complete. | 040U000105 |
| 6 | 2 | Nut, M6M M5 FZB | 413A112014 |
| 7 | 4 | Dome nut, MhM M5 FZB | 413A112031 |
| | | | |
| | | Complete kits: | |
| | 1 | Cable gland kit, complete. | 040R000024 |

# Spare parts drawing and Spare parts list

**Control card C1:A.**




| Pos. | Qty | Description | Part no. |
|---|---|---|---|
| 1 | 2 | Plug, PG9 | 028J000101 |
| 2 | 2 | Cable, 3x0,75, L = 0,5 meter (1.64 Ft) | 514A000002 |
| 3 | 1 | Lable, for control card. | 417S900013 |
| 4 | 1 | Cable, CY 10x0,34, L = 1,5 meter (4.92 Ft) | 514A000005 |
| | | | |
| | | Complete Kits: | |
| 5 | 1 | Control card C1:A, complete. | 040U000235 |
| 6 | 1 | Cable gland kit, complete. | 040R000024 |
| 7 | 1 | Connector, incl. crimp contacts, complete. | 040R000055 |

## Warranty conditions

The warranty period for the product is 4 000 000 cycles or 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

Unit, Type BE 552 , BE 555, BE 558 or BEG 552, BEG 555, BEG 558.

| | | |
|---|---|---|
| Housing | : | Aluminium |
| Pinole | : | Brass |
| Electric motor | : | Aluminium, steel and copper. |
| Other parts | : | Aluminium, brass and steel. |
| Seals, Drive belt | : | Rubber, Rubber/steel |
| Hydraulic oil | : | Oil. The unit contains a small amount of hydraulic oil. |

| | | |
|---|---|---|
| Housing, pinole and other metallic parts | : | Dispose as metal waste; Aluminium, brass and steel. |
| Electric motor | : | Dispose as electric waste. |
| Seals, Drive belt | : | Dispose as combustable waste. |
| Hydraulic oil | : | Dispose as hazardous waste. |

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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.