

Ergonic® Systems

The technical advancement for more efficiency
and a maximum utilisation



1



Ergonic® – the best conditions for getting ahead

Greater efficiency, lower costs, increased flexibility – these are the results that Putzmeister concrete pumps with Ergonic® systems can achieve in practice.

Being ready for use more quickly, achieving increased concrete placement performance and working economically with little wear are important economic factors, and not only for machine and pump operators. Construction site managers have also been convinced by the potential of Ergonic®: the construction site is

run more efficiently and Putzmeister pumps with Ergonic® are simply ready for concreting more quickly.

Ergonic® has set new standards. And will continue to do so in the future, because Putzmeister will continue to develop innovative solutions that benefit you.



2

Just when it's getting tight and tricky – for concreting indoors or narrow formworks, for example – the Ergonic® Boom Control (EBC) functions are invaluable to the machine operators.



3

Ergonic® control optimises the pumping process. A PUMI® with Ergonic® Pump System (EPS) works more quietly thanks to the silence function.



4

Ergonic® systems are microprocessor-supported control systems for controlling and regulating concrete pumps and placing booms.

EBC – Ergonic® Boom Control

controls and regulates concrete placing booms. EBC enables a higher concrete placement performance, reinforces safety on the construction site and makes it easier to control the boom.

EPS – Ergonic® Pump System

undertakes the control of the concrete pump and ensures an optimised pumping process.

EOC – Ergonic® Output Control

ensures economic operation of the concrete pump. It automatically regulates to the ideal engine speed with the lowest consumption, wear and noise.

EBC – Ergonic® Boom Control – for increased concrete placement performance

The innovative EBC control system for truck-mounted concrete pumps (Ergonic® Boom Control) was the first of the Ergonic® systems and revolutionised boom control. Aided by a computer, the placing boom can be easily and precisely controlled. Moreover, the concrete placement performance of the concrete pump can be increased.

The concrete pump operator is unburdened and can concentrate better on his surroundings and the movement of the end hose. The boom is precisely moved horizontally and vertically by simple movements of the joystick with One Touch Control.

A real advantage: no need to change your grip, no additional switchovers of individual arms.

The pumping process is optimised by the damping of boom vibrations and an intelligent working range restriction. The boom and end hose are very smooth, allowing the concrete pump operator to work the construction site more precisely. The boom is also prevented from colliding with itself in critical positions with EBC (Ergonic® Boom Control).

Your customers will soon accept nothing less on the construction site.

The advantages of EBC at a glance:

- Precise concrete placement with high output
- Blocking critical areas reinforces safe working
- Simple boom control unburdens the operator
- Smoother end hose thanks to vibration damping
- Improved ergonomics with One Touch Control
- Precise vertical control of the end hose with a simple turn of the joystick
- Increased operational safety due to semi-automatic folding in/out
- Computer-aided arm control optimises concreting
- High machine availability thanks to high-quality components and rapid diagnostics

Precise concrete placement with high output

When the joystick is turned, the end hose moves precisely up or down proportionally. A great advantage when concreting formwork or abutments. When large foundations are being concreted in layers, the end hose must be precisely threaded into various places in the reinforcement in succession. A concrete pump with EBC is considerably quicker and its concrete placement performance is significantly greater.

Important note: Ergonic® Boom Control makes work easier and optimises processes, but has no safety function. The operator remains responsible for his work.



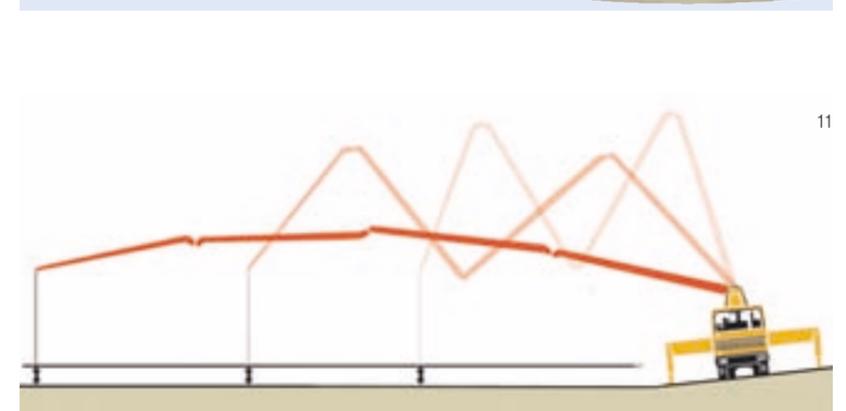
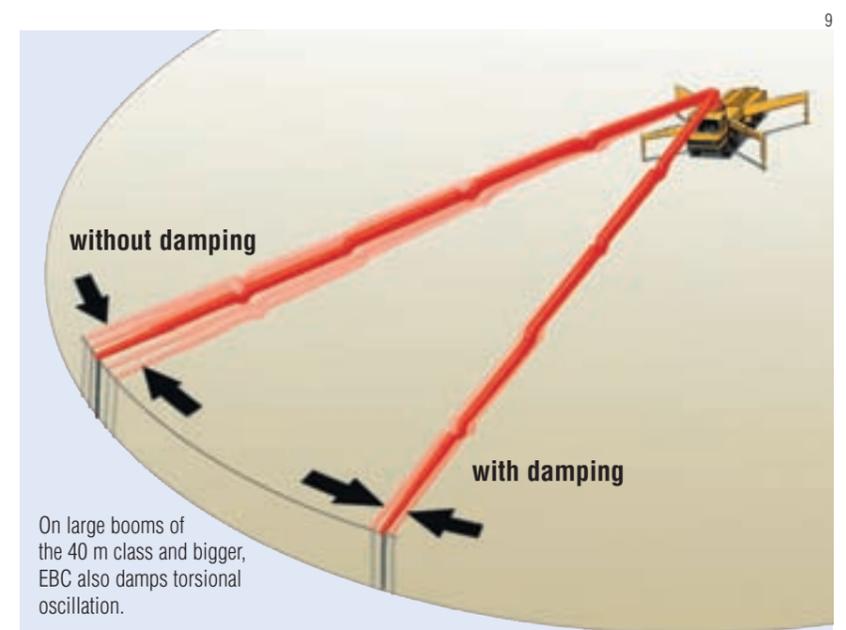
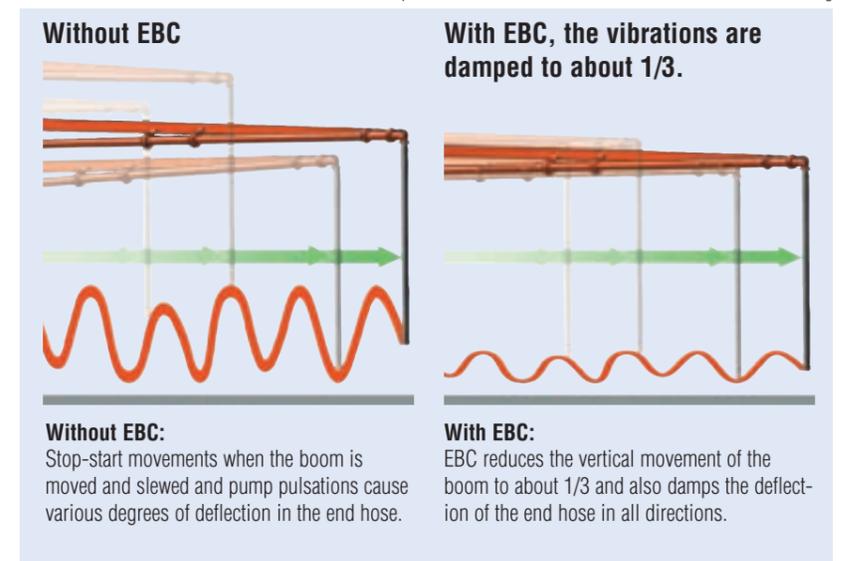
EBC – still boom at full power

Better work with vibration damping

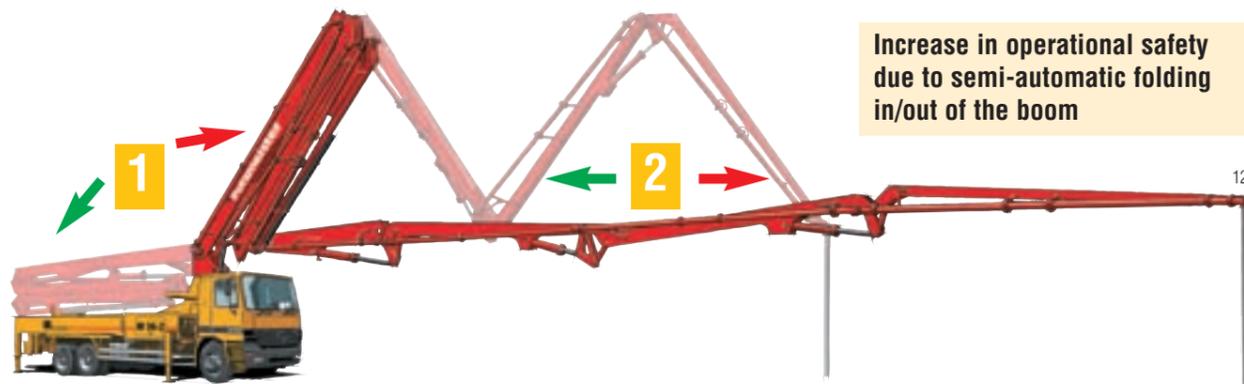
If EBC operation is preselected, damping is automatically activated when the boom is moved. During pumping operations (without movement of the boom), damping must be activated on the left-hand joystick. EBC then balances out vibrations in the placing boom regardless of the delivery rate. The still end hose can be moved more easily and the concrete is cleanly inserted – making life much easier for the operator at the end hose.

Constant height when moving the end hose

If the end hose is moved in a horizontal direction only, its height remains constant during the concreting – regardless of the angle of the truck ($\pm 3^\circ$). EBC even compensates for a changing concrete weight in the delivery line.



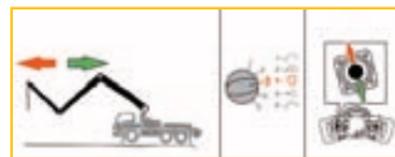
EBC – the boom does exactly what you want it to do



Increase in operational safety due to semi-automatic folding in/out of the boom

1 Raise and slew the arm assembly manually with the right-hand joystick (M 36) (left-hand joystick for large booms with overhead roll-and-fold)

2 Folding in and out: The boom can be automatically folded in and out by moving the left-hand joystick up or down.



Locking arm positions and setting preferred positions make concreting operations easier

The positions of arm 1 and arm 2 can be locked. Once the position has been saved, the arms remain in their position, regardless of how the other arms are moved.

A preferred position can be set for the last arm. This position is maintained during concreting.



EBC – additional safety provided by working range restriction



Additional safety provided by locking critical areas

A working and movement range can be specified for the boom. This range will not be exceeded during subsequent concreting. This represents an additional safety factor for indoor concreting operations and is one less thing for the machine operator to worry about.

Setting the lower limit:

The boom tip is moved to the desired lower limit. Confirmation of the lower limit with the remote control.



Setting the upper limit:

The boom tip is also moved to the upper limit and confirmed with the remote control.



Moving in the defined working range:

Once the upper and lower limits are defined, the boom always moves within the set limits. This reduces risks and prevents damage.



Ergonic® remote control: Within your grip.



23

Better design for more functionality

Radio remote control with display:
For wireless boom control and for monitoring and setting various machine parameters



23/1

Optimum and flexible operation of the machine with Putzmeister radio remote control

- Ergonomic boom control with two joysticks
- The EBC functions (see pages 4 – 7) can be directly operated using the radio remote control. When EBC operation is activated, it is possible to control the boom with only one joystick.
- The pump operator receives up-to-date feedback and system displays for the machine directly on the clear display via an additional signal transmission. The strength of the radio signal and the battery charge state are shown by bars.



24

Cable remote control:
For reliable use when a radio remote control cannot be used.

24/1



25

Simple operation of the entire display menu via rotary pushbutton

Relevant machine data, such as speed of rotation, fluid temperature, concrete pressure, delivery rate and pressure and volume limit, can be quickly called up. As well as EBC parameters, such as the upper and lower limits of the working range and the slewing gear limit, the vibrator and end hose squeeze valve can also be switched on and off. The slewing gear and boom arms are locked or released here and the boom speed is set.



26



- 1 Individual axis operation (computer-aided) with sensors
- 2 EBC operation
- 3 Semi-automatic folding in/out of the boom
- 4 Programming operation: working range restriction with EBC
- 5 Individual axis operation without sensors

EPS – Ergonic® Pump System – ensuring perfect operation

The computer-aided Ergonic® control constantly monitors and regulates the operation of the concrete pump and the truck engine. This means maximum productivity and performance with minimum intervention from the operator.

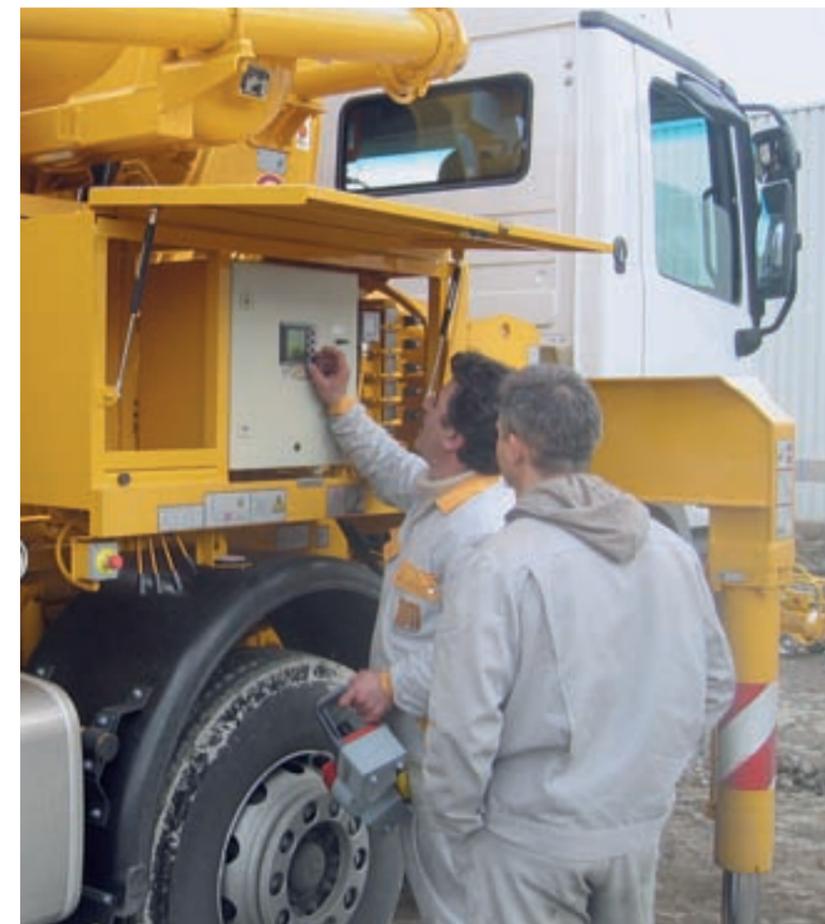
The switchover of the transfer tubes, for example, is adjusted to suit the consistency of concrete (PUMI®). This means that the concrete does not “strike through” the transfer tube, even if it is of a very soft consistency.

EPS (Ergonic® Pump System) has considerable advantages over conventional hydraulic controls: it regulates the concrete pump fully electronically and ensures that the pumping process runs perfectly.

Pump data, such as delivery pressure, delivery rate of the hydraulic pump, hydraulic pressure and many other signals, is actively and perfectly co-ordinated. This is not really possible with conventional hydraulic control systems.

The advantages of EPS at a glance:

- Smooth pumping process
- Less noise emission thanks to the silence function (PUMI®)
- Low wear
- Low fuel consumption
- Vibrations in the machine and boom are reduced
- Fully electronic control of the concrete pump
- Fewer hydraulic components
- Doubly protected control
- EOC (Ergonic® Output Control) is included in EPS



32

Better efficiency due to fewer hydraulic components

In purely hydraulic control systems, there are valves, throttles, regulators, etc. that control all the functions. With EPS, all this is taken on by a computer. Few hydraulic components are required, i.e. there is less energy loss in the system and therefore less wear and a lower fuel consumption.



33

Less noise thanks to the silence function (PUMI®)

The silence function integrated in the EPS control system in PUMI®s minimises pressure peaks and reduces switchover impacts.

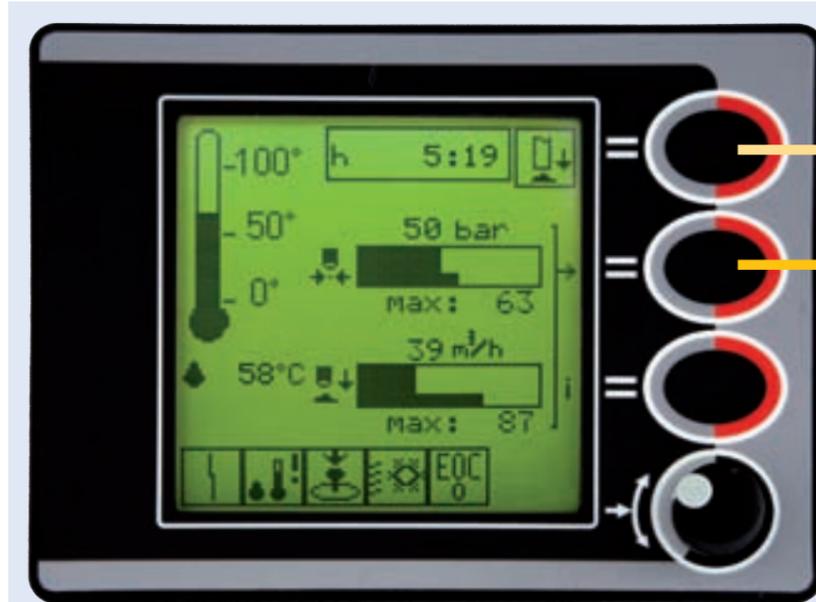
The softer pumping process and the gentler run up reduce vibrations in the machine and boom and increase the fill level of the concrete pump. The result is fewer strokes with the same output, which conserves the concrete pump and truck and makes the pumping process significantly smoother.



35

34

EGD – Ergonic® Graphic Display – the window to EPS



36

EGD (Ergonic® Graphic Display) provides a full overview

Main menu

The main menu is shown when the equipment is switched on. It provides information about:

- Hydraulic fluid temperature
- Operating hours
- Delivery pressure/delivery pressure limit
- Delivery rate/delivery rate limit

Limit values can be entered in the "Pump settings" menu (see right).



37

Simple control and increased operational safety

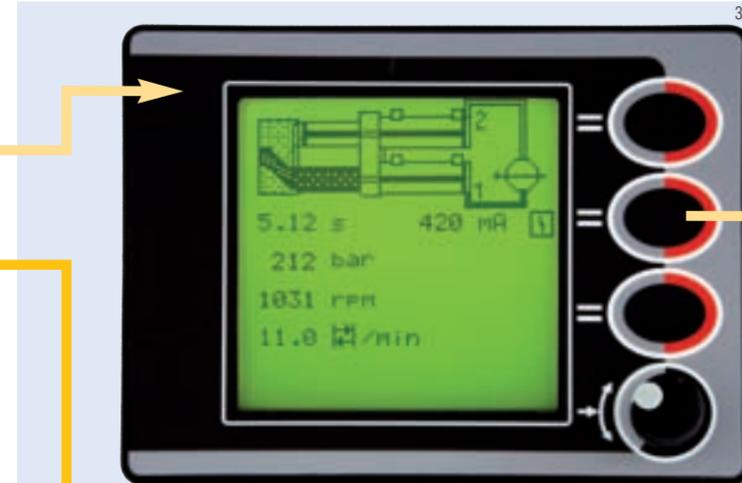
The pump operator can display important information about the machine centrally on the EGD (Ergonic® Graphic Display). The individual parameters for the machine can be set here.

The doubly-protected electronic and hydraulic control system means that the machine can continue to be operated in emergency operation in most cases if a malfunction occurs.

The EGD contains further functions that can be accessed by the service and maintenance personnel.

The display is easy to operate using three keys and a rotary selection knob:

- The keys take you from the main menu to the individual submenus (see right-hand side).
- By turning the rotary selection knob, you can mark the individual symbols in the "Machine status" menu and then press to select. In the "Pump settings" menu, the limit and maximum values are set by turning the knob and confirmed by pressing it.



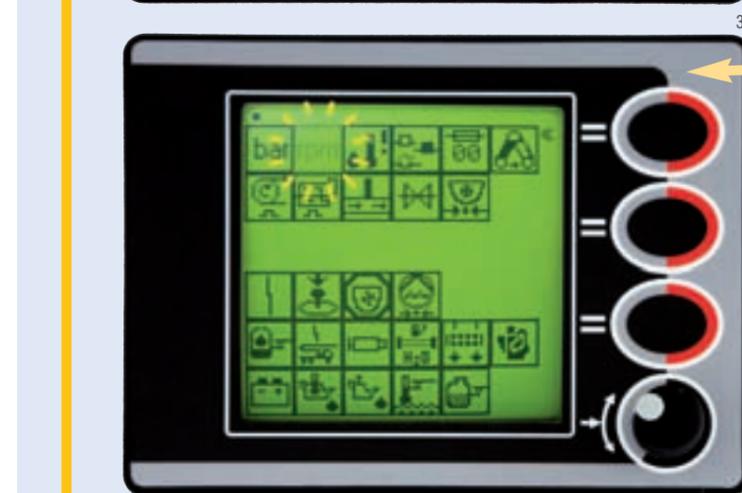
38

Pump status

The "Pump status" menu appears when you press the upper key in the main menu:

- Pumping animation in real time
- Pumping data: e.g. hydraulic pressure, stroke time, speed of rotation

Pressing the second pushbutton takes you from the "Pump status" menu on to the "Machine status".

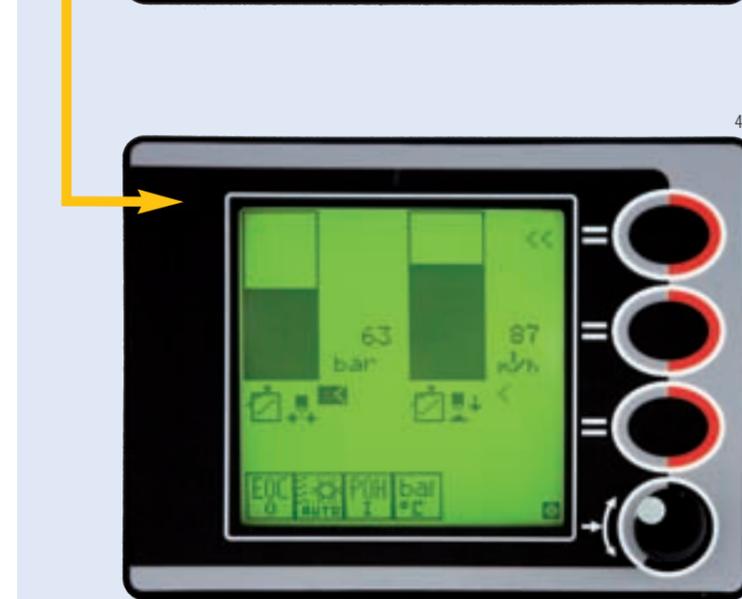


39

Machine status

The appropriate symbol flashes in the event of a fault. Sensors not relevant for safety can be deselected – you can then continue to work in emergency operation. The faulty component can be located later and replaced in the workshop.

- Monitoring of the sensors: e.g. speed of rotation, transfer tube, magnetic switch, agitator, etc.



40

Pump settings

The middle pushbutton takes you from the main menu to the "Pump settings".

This is where the machine operator can adjust the pump to suit his requirements:

- Switching EOC on and off
- Limiting the delivery pressure and rate
- Adjusting the fan and POH (Push Over), etc.

EOC – Ergonic® Output Control reduces consumption, wear and noise



41

EOC – lower fuel consumption, less wear

You can set the delivery rate of your pump directly with just one rotary knob on the remote control. The electronics of the EOC (Ergonic® Output Control) automatically regulate to the optimum engine speed with the lowest consumption, wear and noise.

The EOC function is integrated in the EPS (Ergonic® Pump System).

EOC – from zero to a hundred in one turn

You can set the desired delivery rate with the “Output regulation” rotary knob on the remote control. You can control the hydraulic pump performance linearly from zero to the maximum delivery rate.

The electronics regulate the speed up to 75 % of the maximum delivery rate (e.g.: 120 m³/h) to a value that is optimum for the specific engine (e.g.: 1300 rpm), at which the fuel consumption is particularly low (see diagram).

If a delivery rate above 75 % is selected with the rotary knob, the EOC automatically increases the speed. However, it never reaches the unfavourable area which cannot be controlled without EOC. It is not possible to set the full throttle engine speed and minimum delivery rate with EOC at the same time. (See the diagram.)

If the boom is not moved and the pump is off, the speed drops back down to 850 rpm after 10 seconds.



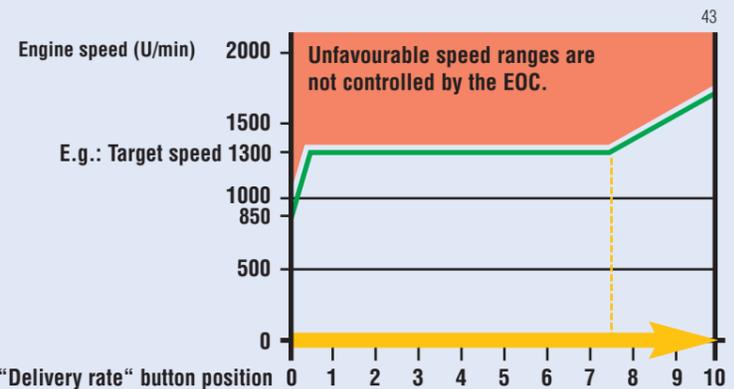
42

In particular cases, you can demand more engine output via the “Speed of rotation plus” button

If you still require more power...

If you want to accelerate particular processes (e.g. folding out the boom), you can simply increase the engine speed on the remote control using the “Speed of rotation plus” button. As soon as you subsequently start to operate the “Output regulation” rotary knob again, EOC takes over and regulates down to your optimum speed.

If in extreme situations, e.g. if the concrete is particularly heavy, it becomes necessary to pump small amounts of concrete with full pressure, the EOC can be switched off at the control cabinet or on the remote control.



43

E.g.: 16 H (160 m³/h max. delivery rate)

— Engine speed, controlled by EOC
— Output

ETS – Ergonic® Tele Service – your advantage in the event of a service

Higher machine availability and lower costs

The ETS (Ergonic® Tele Service) enables the remote diagnosis and parameterisation of status data for the concrete pump. All Ergonic® functions can therefore be displayed, e.g. boom positions and boom operating states, limits entered by the machine operator and limiting angle or engine data such as speed of rotation and temperature.

This is displayed on a PC, to which the machine data is transferred via mobile data communication. In the case of a fault, the machine operator can receive rapid and specific assistance remotely. A Putzmeister service technician does not have to be on site with the machine.

With this same user interface, the relevant data can be accessed:

- directly on the machine via a Service laptop
- remotely via a modem and PC in the concrete pumping service workshop or at the Putzmeister After Sales Service

Future function enhancements – e.g. business data or working data storage – can be implemented with simple software updates.

All measures in the area of ETS create transparency for the user and support the workshop and service. In all, this is a benefit for the increased availability and efficiency of the machine.



44

On site, the Ergonic® status data can be read out using a laptop



45

At the concrete pumping service or at a Putzmeister service partner, the machine data is transferred via mobile data communication to a PC and displayed in real time

Prepared for the future with the Ergonic® service and training systems

ECT – Ergonic® Control Tools are software tools for the parameterisation and checking of Ergonic® components during setting up and service performed by Putzmeister technicians



46



47

Ergonic® Job Site Training is a 3-D simulation on the PC, where situations on a construction site with a M 36 can be run through with realistic graphics. The Putzmeister Academy uses this modern software for training.



48



49

ETC – Ergonic® Training Clips are actual video films demonstrating the complete process of operation of a truck-mounted concrete pump (M 36). These are used by trainers at the Putzmeister Academy and the After Sales Service.



50



51

Putzmeister Products and Services

Concrete Pumps · Industrial Technology PIT · Telebelt · Mörtelmaschinen GmbH · Dynajet High Pressure Cleaners · Services · Concrete Project Division CPD · Consulting and Data Technology · Academy



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