



Separator Control with the E40/D10

We automate – you separate



Separator and Control Unit from GEA Westfalia Separator

Separator and control unit – GEA Westfalia Separator provides these indispensable elements for solving process technology tasks from a single source. All the parameters for economic process management are specifically matched to suit one another perfectly, with interfaces avoided and confidence generated by the high standard of quality to ISO 9001:2008 (worldwide).

The difference

In terms of function, the E40 and D10 control units are identical. They differ in shape and display structure. The E40 control unit consists of a 6-inch touch panel with a color display and decentralized modular control components with upgrade option. It is available both in a separate on-site housing with separate motor control and in a compact control cabinet with integrated motor control. Special designs are possible.

The D10 control unit is supplied as a compact design with a text display. An image is accordingly built up from static text and/or current status displays from the separator system. As standard, the control cabinet is supplied with an integrated starter motor for the separator and the feed pump. Special customer-specific designs are possible.

Always on the safe side

In each control unit, GEA Westfalia Separator realizes all the safety functions on the basis of a large number of relevant directives and standards. In compliance with IEC 60204-1 and implemented in accordance with the requirements of the Machinery Directive, they specifically meet all the specifications of CE requirements. This also enables the safety requirements on the centrifuge as per EN 12547 and the safety requirements of the professional association to be reliably met.

If the customer requests it, this high standard of safety is also confirmed by an EC declaration of conformity.

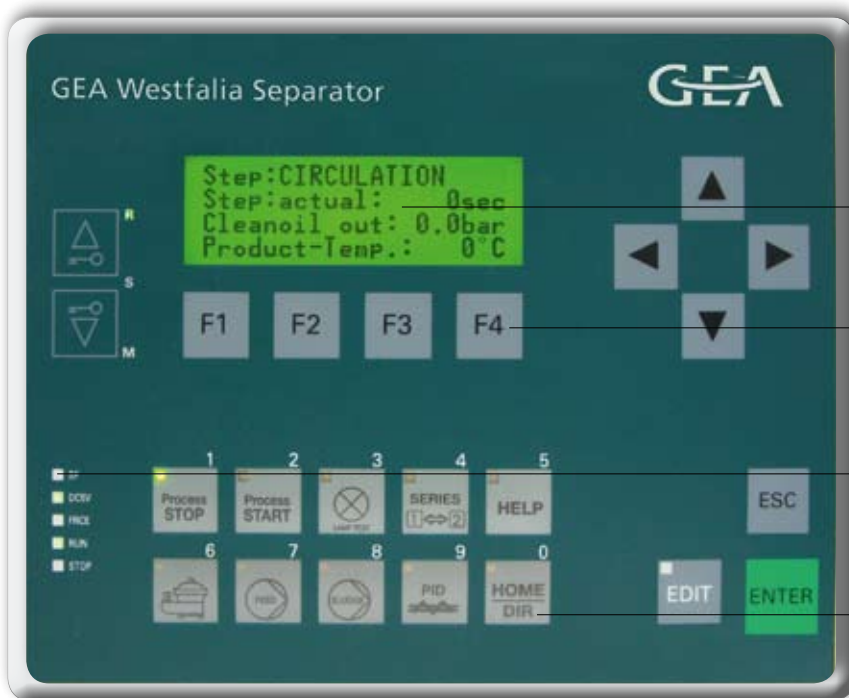
6-inch color touch display

Display keys with variable functions

ACK key for acknowledging alarms



Westfalia Separator® **unitrol**plus
E40 control unit



4-line backlit display

Display keys F1–F4

Status LEDs

Function keys 1–0 assigned
fixed functions

Westfalia Separator® **unitrol**plus
D10 control unit

New: E40 Control Unit with Sm@rt Client Server Function

The E40 control unit is specifically designed for the Westfalia Separator® **eagleclass**. Even the most complex separator and system applications, such as Westfalia Separator® **ViscoBooster** Unit or treatment of bilgewater and slurry are controlled with precision.

The E40 control unit performs process and control functions over and above those of the D10. To facilitate understanding, operating states, current process values, faults and changes in system status are shown by a change in color in the color display. Machine or system-specific display screens with assigned touch keys reduce the possibility of operating faults even further. MMC cards function as program memory; the lifetime data of the systems can be read out by technical staff for interval or preventive maintenance purposes.

As an option, the control unit can be patched into the worldwide web using the Sm@rt Client server function of the panel and the integrated Ethernet port. Sm@rt Client allows remote servicing to be effected quickly and simply. The machine can be operated and observed from any workstation within the customer's network.

Program control

The control unit controls the program automatically as well as monitoring the separator completely. In addition to all the electrical components on the separator itself, it is also possible to incorporate in the control and monitoring system the peripherals required for a customer's specific application.



- Controlled partial/total ejection steps possible at periodic intervals
- Oil displaced by water prior to ejection
- Flush ejection
- Modes 01,91,01-36,01-96 can be preselected
- Serial mode can be effected using two control units
- Emptying by Westfalia Separator® **unitrolplus** slurry chamber monitoring system
- Feed pump control with integrated PID controller
- Display of throughput
- Electric heater, feed pump and slurry pump programmed as a function of process

Separator control/monitoring function

Menu-controlled user guidance monitors the following systems:

- Separator motor current
- Separator bowl speed (by speed initiator)
- Drainage of water from separator (by pressure transmitter)
- Temperature of contaminated oil fed in (using Pt100)
- Bowl ejection (using current/speed)
- Slurry chamber capacity (by pressure transmitter)
- Proportion of water in feed (by water sensor)

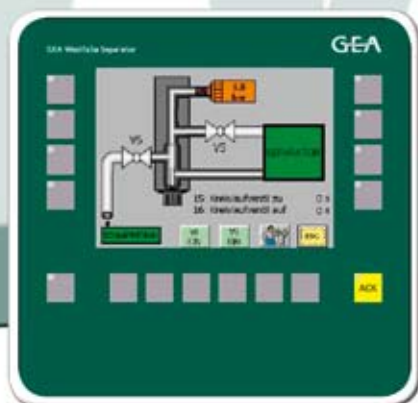
- Cyclical monitoring of sensor system (by test programs)
- Automatic calculation of filling and displacement times
- Start/stop of separator
- Limit values, alarm counter etc.

The control unit is configured on a customer-specific basis. All separator parameters, specified time values and limit values are preset on a machine-specific basis.

If the separator malfunctions, alarm messages are activated and the fault is shown in the display. The information is archived on the MMC card and is available to service staff for optimum maintenance.

Features of the E40 control unit

- System of stored-programmable control and operator panel
- Fully-graphical 6-inch color display
- Operated by touch display
- Central functions actuated by separate keys
- Profibus interface DP (optional)
- Software updates via Micro Memory Card (MMC) and flash card
- Modular concept makes it simple to upgrade



Compact Device D10 – Operate and Observe

The D10 control unit is a compact unit consisting of a CPU, input and output assembly and a text display for controlling and monitoring separators and their system components. The control cabinet is supplied as standard with an integrated starter motor for separators and feed pump, but special customer-specific designs are possible.

The control unit executes design-dependent functional system checks and ejection programs, monitors for correct operating functions and controls the peripheral electrical components of the separator as a function of process. Operating states, current process values and faults are shown in the 4-line text display. The keypad is used to enter details for process/machine optimization directly or via a password function.

Details about machine diagnosis can be called up and optimized operator software makes the control unit simple to handle. Program and operating data are recorded on the Micro Memory Card to assist with servicing.

Operate and observe

The basic functions consist of displays of machine and process states and the relevant keystrokes for program start/stop, time/counter entries, reset functions, language switches etc.

The user guide is specified by the software loaded.

The following display and operating functions are programmed as standard:

- Operating messages
- Fault messages with troubleshooting hints
- Machine selection and process sequence
- Information text –
temperature, pressure, current, speed etc.
- List of inputs/outputs with status displays
- Time/counter lists
- Multilingual user guide

The control unit is a linear display device, with an image accordingly being built up from static text and/or current status displays for the separator system.



Compact device D10

Technical data

Designation	E40	D10
Order number	6AU6642-5DC10-1AC1	6ES7613-1SB00-0AC0
Part number	0005-4050-700	0005-4050-380
Dimensions (H x W x D)	228 x 195 x 45 mm	215 x 165 x 88 mm
Dimensions when fitted/of opening	240 x 208,5 mm (tolerance + 1 mm)	202 x 152 mm (tolerance + 1 mm)
Weight	1450 g	1350 g
Display backlighting	STN Liquid Crystal Display (LCD) 5.7"/ 320 x 240 px / 256 colors	LC display, LED backlit / 4 lines of 20 characters each, 5 mm
Keypad	Film keypad – touch panel, 16 keys, screen 116 x 87 mm (5.7")	Film keypad, 23 keys with 11 integrated LEDs
Interfaces	Standard MPI interface for programmer and networking Standard Ethernet interface on OP	Standard MPI interface for programmer and networking P-Bus for S7 expansion modules
Power supply Reverse pole protection	DC 24 V, range DC 20.4 – DC 28.8 V Yes	DC 24 V, range DC 20.4 – DC 28.8 V Yes
Power cut-out	> 20 ms	> 20 ms
Current consumption (In)	2.4 A	2.4 A
Integrated RAM	64 kB	48 kB
Memory	Plug-in Micro Memory Card (MMC) 128 KB	Plug-in Micro Memory Card (MMC) 512 kB
Buffering	Guaranteed by MMC, no battery OP part on CompactFlash Card	Guaranteed by MMC, no battery
Project management software	Step 7 from Version 5.1; service pack 4	Step 7 from Version 5.1; service pack 4
HMI software	Win CC Flexible 2008	Integrated in Step 7
Inputs	24 digital, DC 24 V 4 analog, 4 – 20 mA / 0 –10 V 1 Pt 100	24 digital, DC 24 V 4 analog, 4 – 20 mA / 0 –10 V 1 Pt 100
Outputs	16 digital, each 0.5 A, total current 4 A 2 analog, 4 – 20 mA	16 digital, each 0.5 A, total current 4 A 2 analog, 4 – 20 mA
Safety standard	DIN EN 61131-2 / IEC 61131-2	DIN EN 61131-2 / IEC 61131-2
Type of protection	Front of device: IP 65 to IEC 60529, NEMA 4X Housing of device: IP 20 to IEC 60529	Front of device: IP 65 to IEC 60529, NEMA 4X Housing of device: IP 20 to IEC 60529
Electromagnetic compatibility	A to EN 55011	A to EN 55011
Climatic conditions	Tested to IEC 60068-2-1, IEC 60068-2-2	Tested to IEC 60068-2-1, IEC 60068-2-2
Operation	0 °C to 50 °C if fitted upright	0 °C to 55 °C if fitted upright
Storage	–20 °C to +60 °C	–20 °C to +70 °C
Humidity	5 % to 95 % at 25 °C	5 % to 95 % at 25 °C
Ambient mechanical conditions	Tested to IEC 60068-2-6	Tested to IEC 60068-2-6
Vibration – operation	10 to 58 Hz, amplitude 0.075	10 to 58 Hz, amplitude 0.075
Vibration – storage / transport	5 to 9 Hz	5 to 9 Hz
Shocks – operation	Half-sine: 150 m/s ² (15 g), 11 ms, 18 shocks	Half-sine: 150 m/s ² (15 g), 11 ms, 18 shocks
Shocks – storage / transport	250 m/s ² (25 g), 6 ms, 1000 shocks	250 m/s ² (25 g), 6 ms, 1000 shocks
Fire resistance	Plug connectors FV2 to IEC 60707 Earth connectors FV0 to IEC 60707	Plug connectors FV2 to IEC 60707 Earth connectors FV0 to IEC 60707
Approvals	CE/EC EMC directive 89/336/EEC UL/Underwriters Laboratories to UL 508 CSA/Canadian Standard Association to C22.2 No. 142	CE/EC EMC directive 89/336/EEC UL/Underwriters Laboratories to UL 508 CSA/Canadian Standard Association to C22.2 No. 142
Type testing / classification societies	GL/Germanischer Lloyd LRS/Lloyd's Register of Shipping DNV/Det Norske Veritas BV/Bureau Veritas ABS/American Bureau of Shipping RINA/Registro Italiano Navale	GL/Germanischer Lloyd LRS/Lloyd's Register of Shipping DNV/Det Norske Veritas BV/Bureau Veritas ABS/American Bureau of Shipping RINA/Registro Italiano Navale
Accessories: Mounting frame, substitute for C7 Service pack Micro Memory Card CompactFlash Card for OP	– – – –	0005-4278-040 0005-4050-420 0005-3668-010 On request

Directives and Standards

Examples of relevant regulations

EU Directives

Directive	Title
98/37/EC	Machinery Directive (follow-up version to 89/292/EEC)
89/106/EEC	If appropriate: Construction Products Directive
89/336/EEC	Electromagnetic Compatibility (EMC) Directive
72/23/EEC	Electrical equipment designed for use within certain voltage limits (Low Voltage Directive)
94/9/EC	Explosion protection directive (ATEX 100, ATEX 100a, ATEX 95) (for manufacturers)
1999/92/EC	If appropriate: explosion protection directive (ATEX 118, ATEX 118a, ATEX 137) (for operators)
97/23/EC	Pressure Equipment Directive
89/655/EC	If appropriate: Work Equipment Directive

EU Standards (harmonized standards)

Standard	Title	Relevant
EN 60204-1	Electrical equipment of machines – Part 1	Always
EN 60439-1	Low-voltage switchgear and controlgear assemblies – Part 1	For control units/display panels
EN 954-1	Safety-related control systems – Part 1	Always
EN ISO 12100-1.../-2	Safety of machinery, basic concepts, general principles for design	Always
EN ISO 13849-1 (from 01/12/09)	Safety of machinery, safety-related parts of control systems – Part 1	Always
EN 1050	Safety of machinery, principles of risk assessment	Always
EN ISO 9001:2008	Quality management systems – requirements	Always
EN 12547	Centrifuges – common safety requirements	Always
EN 60079-14	Electrical apparatus for explosive gas atmospheres – Part 14 – Electrical installations in hazardous areas (other than mines)	For EX
EN 1227-1	Explosive atmospheres – explosion protection: principles and methodology	If appropriate in EX areas
EN 13463-1...-5	Non-electrical equipment for use in potentially explosive atmospheres	If appropriate in EX areas

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