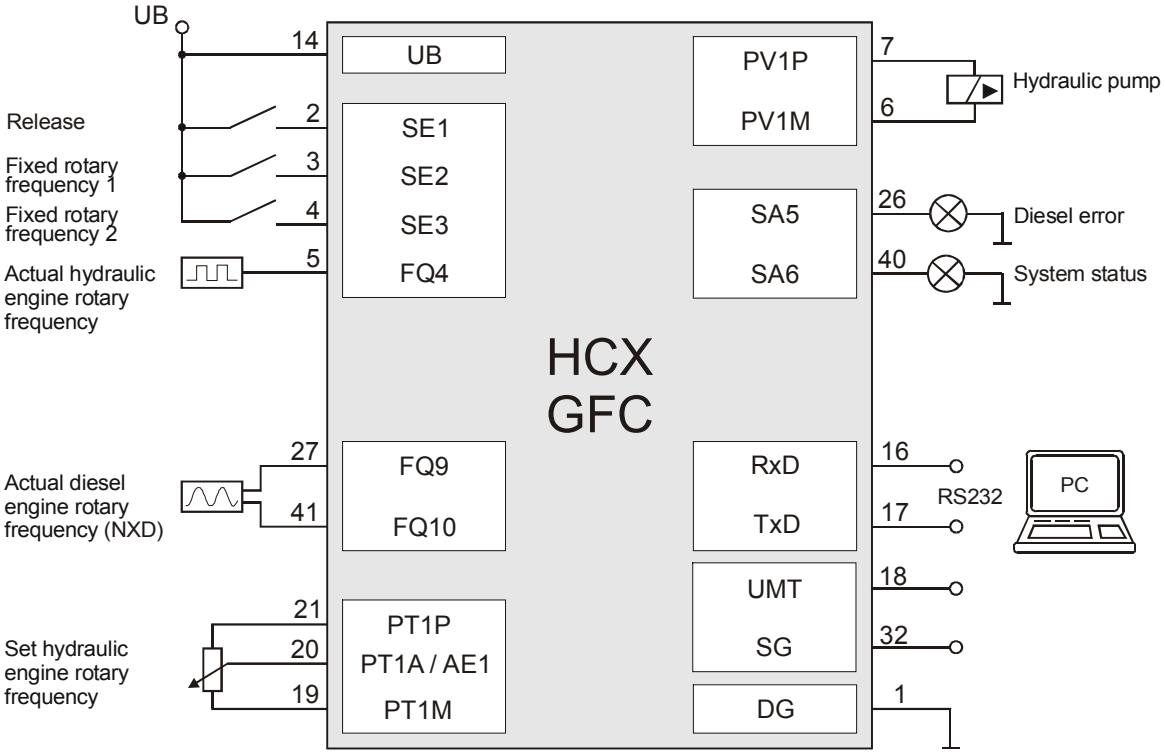
GFC GeneratorControl

GeneratorControl is a universal rotary frequency controller that is well-suited for use with hydrostatically driven generators. By altering the hydrostatic transmission ratio, GFC constantly regulates the rotary current generator's frequency to a set value. For this purpose, the generator's rotary frequency and diesel frequency are measured constantly and a plan/actual comparison carried out. The rotary frequency set values for the generator can be preset as analogue or as digital figures (calling up two freely determinable numbers via a switch).

GFC is constructed based on the HCX hardware platform. The hand terminal MT and the PC program ConDoc – Control&Document® are used to adapt and enter the machine-specific data.

GFC is protected by robust casing.

GFC Connection



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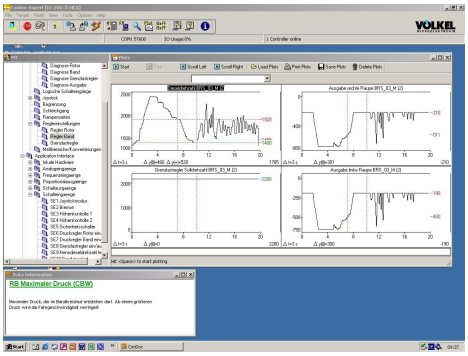
GFC Functions

- **Constant rotary frequency regulation**
  Preset guideline for the hydraulic engine rotary frequency via the analogue input or, as an alternative: two rotary frequency values which can be pre-determined and can be called up using a switch.

- **Rotary frequency measurement**
  The rotary frequency measurements are made using clamp W, a frequency sensor or via magnetic pickup, dependent on the parameterisation.

- **Compensation**
  Fluctuations in the diesel engine's rotary frequency are compensated directly, using an adjustable degree of compensation.



All parameters can be set online by PC using ConDoc®

Adjustability of the rotary frequency control

- **Regulator parameters**
  All settings can be adjusted individually.

- **Rotary frequency limitation**
  - It is possible to parameterise a rotary frequency limit to switch off the diesel engine if overloaded.
  - The permissible run-up time for the diesel engine when it reaches the rotary frequency limit (operation mode "wait") can also be parameterised.
  - An adjustable tolerance period exists for undercutting the limit figure that is not intended to cause shutdown of the generator.

- **Minimum rotary frequency**
  The lowest rotary frequency needed by the diesel engine to connect the hydraulic engine can be parameterised.

- **Ramps**
  It is possible to set a delayed set value target for current operations using a ramp.
  Soft start and soft stop can be programmed by ramp for the pump output.

Safety functions

- Checking the inputs and outputs for errors. If errors are found, e.g. if there are cable breakages / short-circuits at the set value input or a rotary frequency sensor is faulty, the generator is switched off
- The generator is switched on again according to its parameterisation
- The status output registers switching off the generator due to undercutting the rotary frequency
- An error output indicates when defects occur on the hydraulic motor's rotary frequency sensor or the analogue set value input or at the proportional output.

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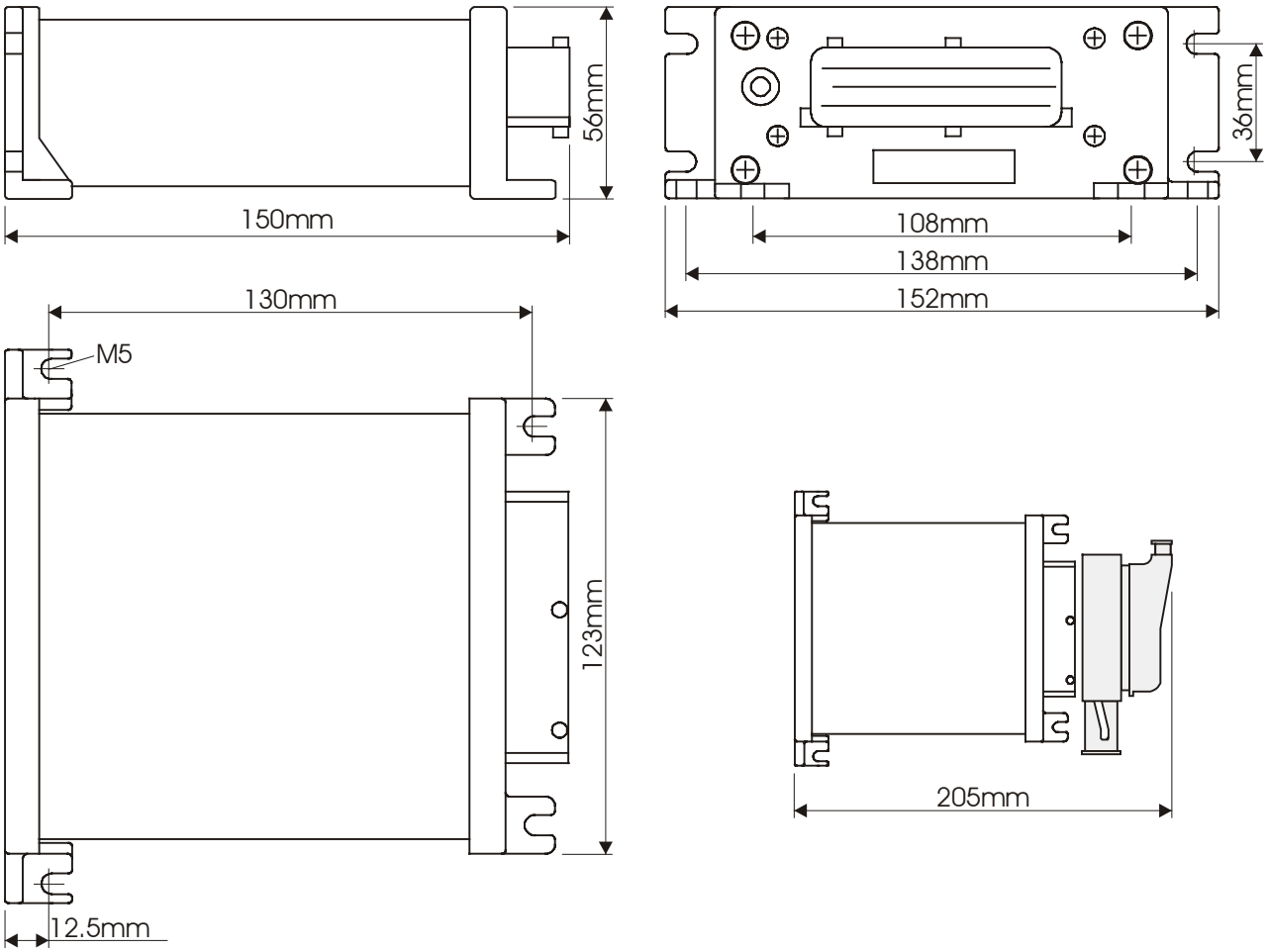
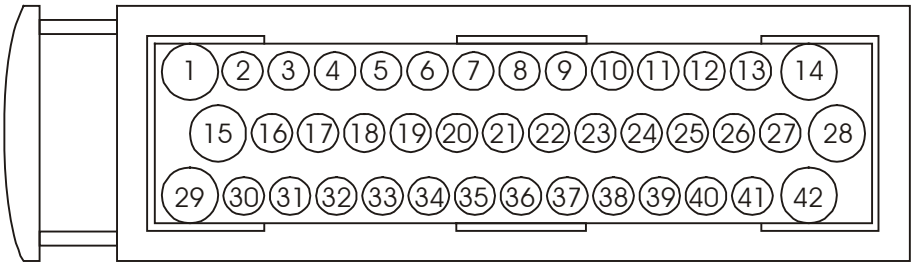
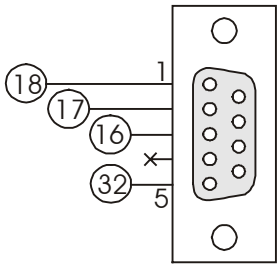
HCX Housing dimensions



HCX Connector



Diagnosis



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GFC Pin assignment

1	DG	Supply, minus (earth)
14	UB	Supply, plus (12V/ 24V)
2	SE1 / FQ1	Switch input 1 (5V/ 2.5V)
3	SE2 / FQ2	Switch input 2 (5V/ 2.5V)
4	SE3 / FQ3	Switch input 3 (5V/ 2.5V)
5	SE4 / FQ4	Switch input 4 (5V/ 2.5V)
15	SE5 / FQ5	Switch input 5 (5V)
29	SE6 / FQ6	Switch input 6 (5V)
28	SE7 / FQ7	Switch input 7 (5V)
42	SE8 / FQ8	Switch input 8 (5V)
27	SE9 / FQ9	Switch input 9 (5V / 2.5V) / magnetic pickup H, clamp W
41	SE10 / FQ10	Switch input 10 (5V / 2.5V) / magnetic pickup L
21	PT1P	Potentiometer 1, plus
20	PT1A / AE1	Potentiometer 1, pick-up / analogue input 1 (10V)
19	PT1M	Potentiometer 1, minus
35	PT2P	Potentiometer 2, plus
34	PT2A / AE2	Potentiometer 2, pick-up / analogue input 2 (10V)
33	PT2M	Potentiometer 2, minus
24	PT3P	Potentiometer 3, plus
23	PT3A / AE3	Potentiometer 3, pick-up / analogue input 3 (10V)
22	PT3M	Potentiometer 3, minus
38	PT4P / UPT	Potentiometer 4, plus / output 5V/ 8V
37	PT4A / AE4	Potentiometer 4, pick-up / analogue input 4 (10V)
36	PT4M	Potentiometer 4, minus
25	CE1 / AE5	4 – 20 mA current input 1 / analogue input 5 (10V)
39	CE2 / AE6	4 – 20 mA current input 2 / analogue input 6 (10V)
7	PV1P / SA1	Proportional output 1, plus / switch output 1
6	PV1M	Proportional output 1, minus
9	PV2P / SA2	Proportional output 2, plus / switch output 2
8	PV2M	Proportional output 2, minus
11	PV3P / SA3	Proportional output 3, plus / switch output 3
10	PV3M	Proportional output 3, minus
13	PV4P / SA4	Proportional output 4, plus / switch output 4
12	PV4M	Proportional output 4, minus
26	HP/ SA5	Actuator output, plus / switch output 5
40	HM/ SA6	Actuator output, minus / switch output 6
31	CH	CAN line H
30	CL	CAN line L
16	RXD	RS232 Receive cable for hand terminal or PC
17	TXD	RS232 Send cable for hand terminal or PC
18	UMT	Supply output (12V) for hand terminal
32	SG	Signal earth

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GFC Technical Data

Dimensions:	152mm x 150mm x 56mm
Weight:	650g
Plug connections:	AMP 1-0967280-1, 42 contacts
Power supply:	UB = 8 ... 32V
Current consumption:	approx. 60mA at 24V
Parameter settings:	Using the hand terminal MT or a PC (RS232)
Microcontroller:	C167CR, 20MHz
Program memory:	1MByte flash EPROM
Data memory:	128kByte RAM
Parameter memory:	64kBit EEPROM
Interfaces:	RS232, CAN
Inputs:	10 Digital switch inputs, pull down 4.7kΩ resistors, Uon switching thresholds approx. 5.8V, Uoff approx. 3.7V with possible alternative uses: 8 Frequency inputs up to 4KHz 6 Uon switching thresholds approx. 3,4V, Uoff ca. 2.7V 1 Rotary frequency sensor input, pickup, differential input up to 10 kHz, Uss sensitivity approx. 400 mV at 1 kHz, Sensitivity reduction at higher frequencies 1 Frequency input clamp W, up to 2 kHz, Switching thresholds with Uon 75 % von UB, Uoff 25 % of UB 6 Analogue inputs, 10bit, 0 ... 10V, of which useable: 4 Inputs for 1kΩ ... 10kΩ potentiometer with error recognition 2 Inputs for 4 ... 20mA current measurements, measurement resistance 220Ω to ground
Outputs:	1 Power supply output engaging and disengaging at 5V or 8V for sensor supply, maximum 50mA 1 12 V Power supply for UB >15V, maximum 50mA 4 Proportional solenoid outputs, maximum 3A, alternative: switch outputs 1 Actuator output, maximal 2A, alternative: 2 switch outputs
Safety:	Microcontroller watchdog No terminals with sockets used Ventilation membrane Protection category IP65/IP69K
Temperature range:	-25 ... 70°C, newer version: -40 ... 85°C
EMV:	Industrial application: EN 50081-2 and EN 50082-2 Road vehicles: DIN 40839 and Directive 72/245/EEC, version 95/54/EC Agricultural and forestry tractors: Directive 75/322/EEC, version 2001/3/EC

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