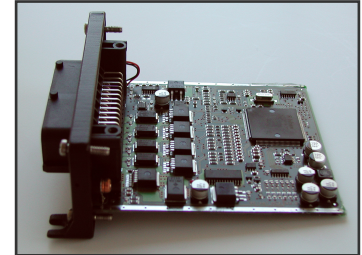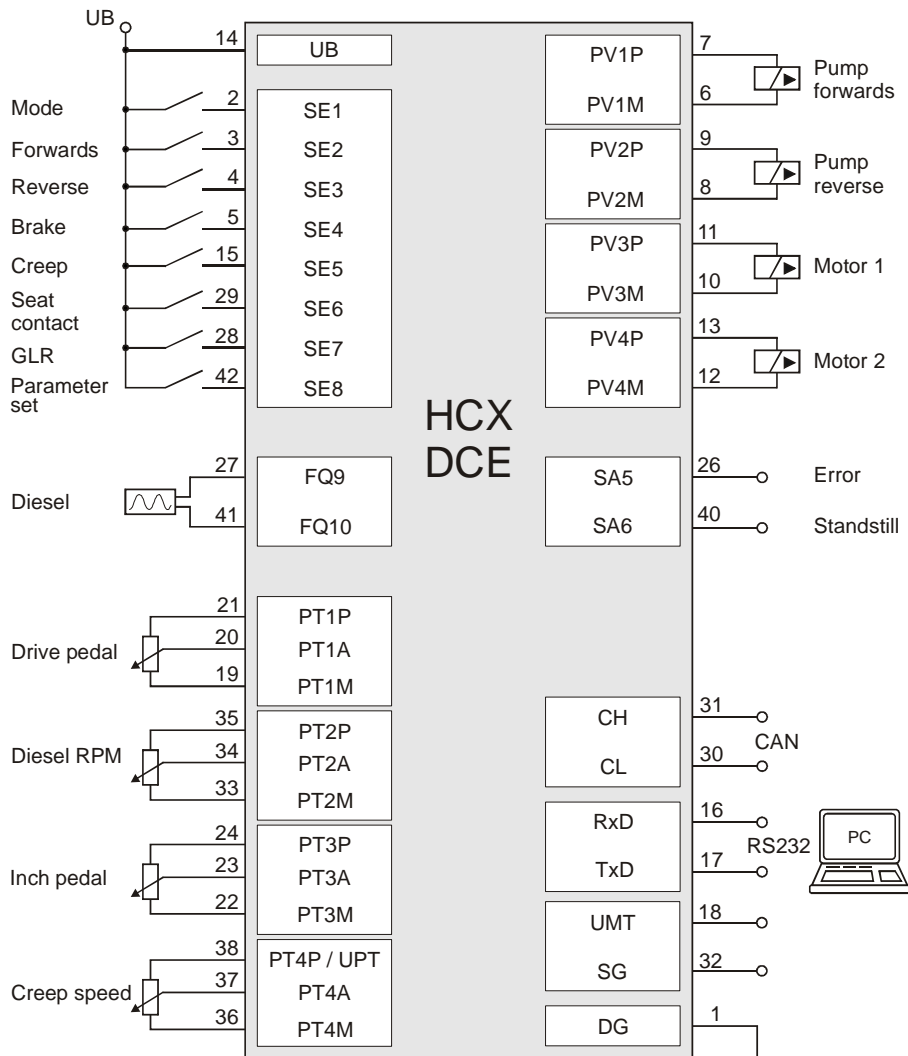# DriveControl DCE

The DCE is a universal control system for hydrostatic drives with electrical adjustment of the pump and the motor. It is equipped with extensive functions and can therefore be used for a wide range of machinery. Both driving at a constant rotary frequency and with rotary frequency dependent actuation of the pump and the hydraulic engine are possible.

DCE is based on the hardware platform HCX. The hand terminal MT and the PC program ConDoc - Control& Document® serve to adapt and input the machine-specific data.
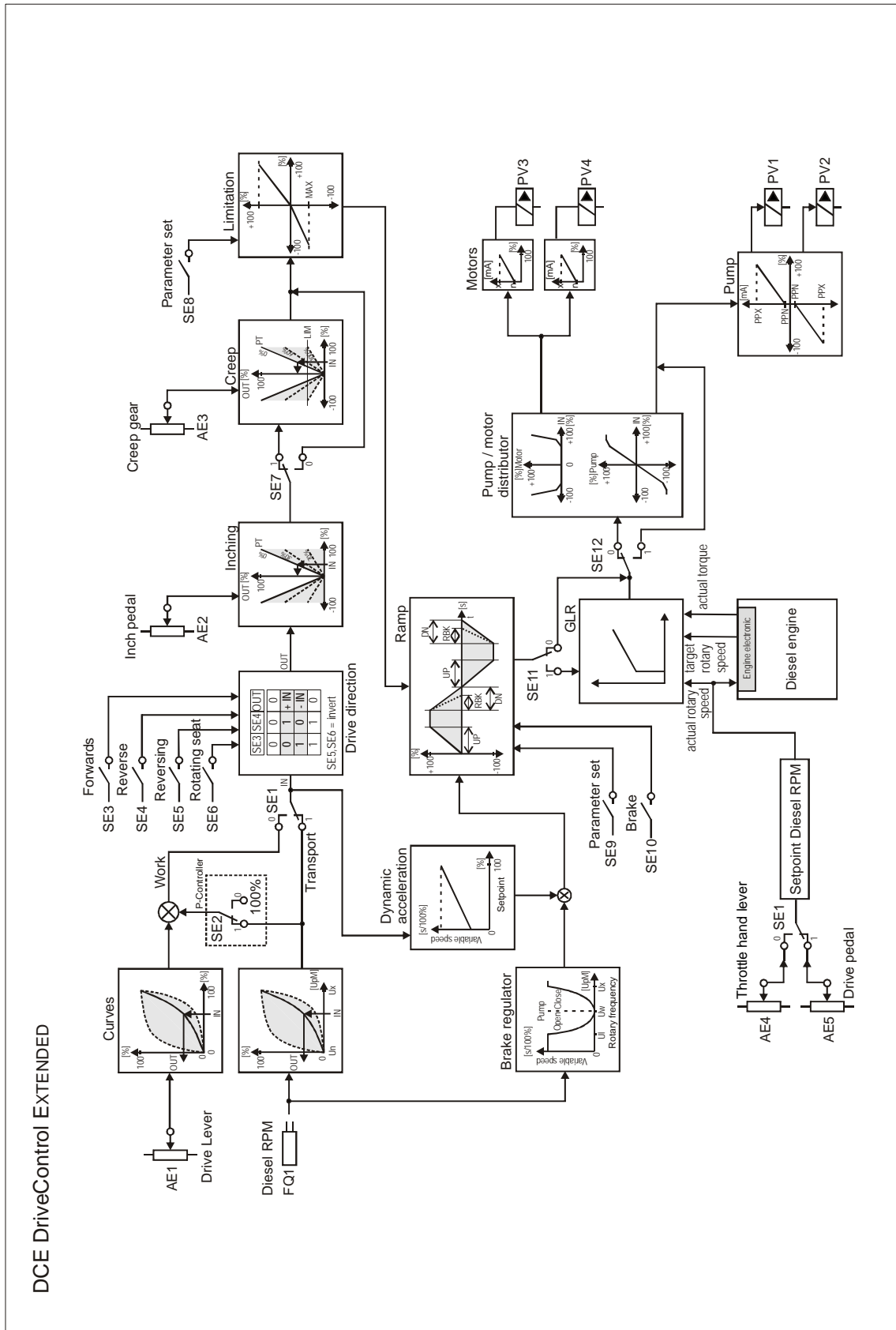
DCE Connection Diagram

VÖLKEL
M I K R O E L E K T R O N I K

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DCE Block Diagram

DCE DriveControl EXTENDED

DCE Funktional Description

Operating mode work/transport
- Operating mode selection by switches

Working mode
- Driving at a fixed diesel rotary frequency
- Selection of diesel rotary frequency using a separate potentiometer
- Actuation of the hydrostat using a control lever or a pedal

Transport mode
- Adjustment of diesel rotary frequency using the throttle pedal
- Driving the hydrostat dependent on the diesel rotary frequency

Characteristic curves
- The desired value generation for the hydrostat can be made linear or by the hyperbolic function and can be set separately for each operation mode, leads to sensitive starting
- Transport mode: Start and stop function to trigger the hydrostat can be set separately, dependent on the diesel rotary frequency. Enables driving at the lowest diesel rotary frequency necessary (minimum noise development and consumption)
- Diesel rotary frequency range separately adjustable for each operating mode

Selection of drive direction
- Selection of drive direction with two switches
- If there is a rotating seat in the vehicle: reversal of drive direction for each seat position
- Change-over of drive direction in working mode using a reversing switch

Inching
- Reduction of the driving speed using the inch pedal

Creep speed
- Limitation of the maximum speed using a creep speed potentiometer or a fixed value improves sensitive driving at the lower speed range
- Function can be activated via a switch
- Maintenance of the full pedal range

Speed control
- Speed limitation per operating mode and direction

Diesel overspeed controller
- Protects the diesel against overspeed during hydrostatic deceleration
- Reduction of the noise development during hydrostatic deceleration

Ramps
- Damping the hydrostat adjustment
- Separate acceleration, reduction and braking ramp times according to the operating mode

Dynamic acceleration
- Acceleration dependent on the pedal position

Load limit sensing control
- Control of power withdrawal by diesel engine
- Protection against stalling the diesel engine

Speed recall
- Recall of stored setting values for the diesel engine and the hydrostat
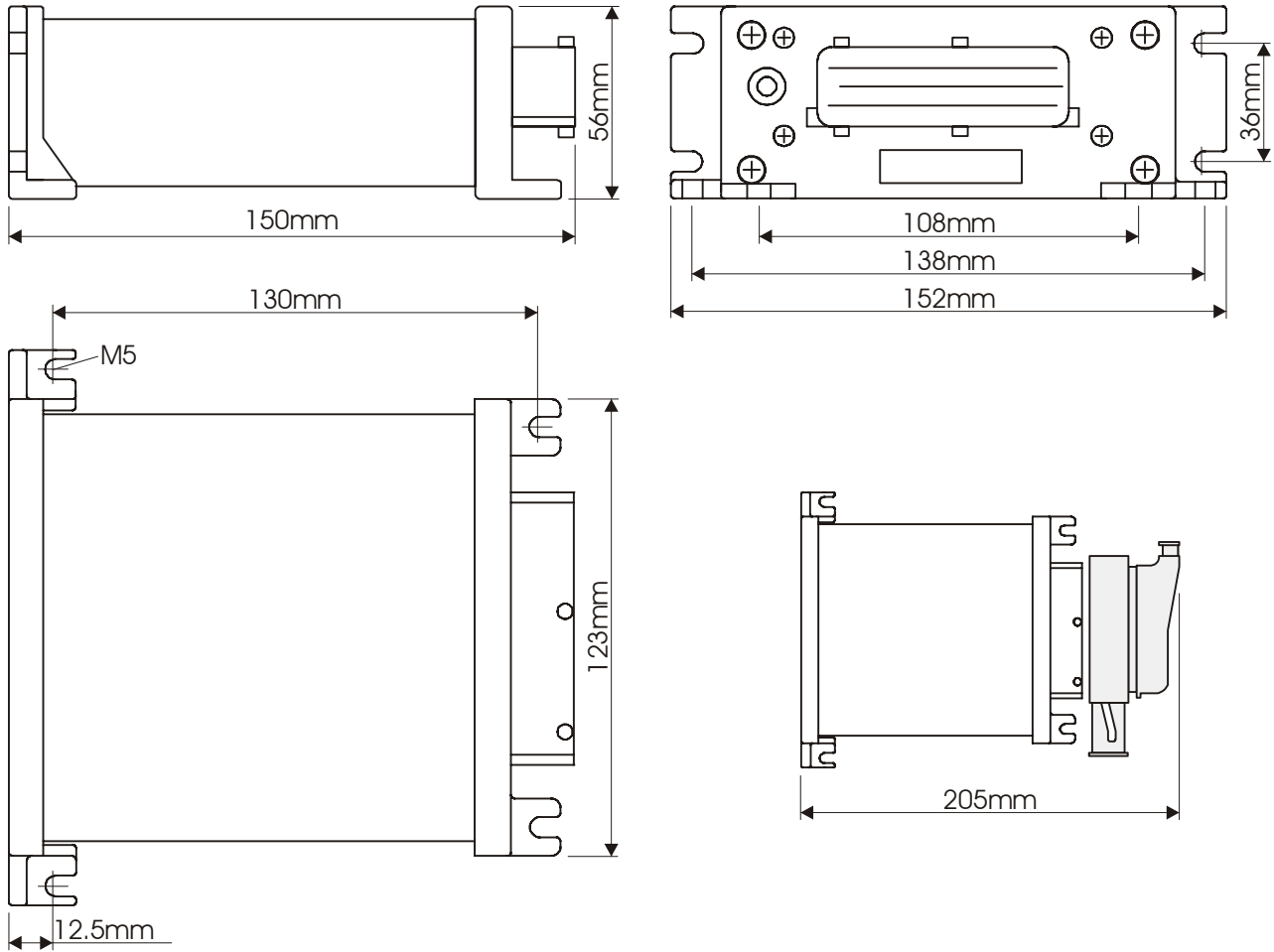
Safety functions
- Protection against undesired changes in direction
- Protection against undesired change of the operating mode
- Starting lock after braking manoeuvre until still, dependent on the setting value source
- Starting lock for setting value errors during switch-on time

Functionality when sensors are defective
- Limited functionality when the diesel rotary frequency sensor is defective

HCX Housing Dimensions
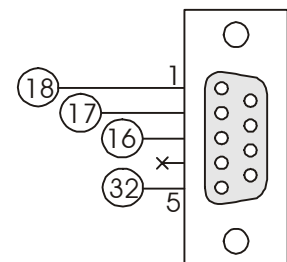
56mm

150mm

108mm

138mm

152mm

36mm

130mm

M5

123mm

205mm

12.5mm

HCX Connector

Diagnosis

1 2 3 4 5 6 7 8 9 10 11 12 13 14
15 16 17 18 19 20 21 22 23 24 25 26 27 28
29 30 31 32 33 34 35 36 37 38 39 40 41 42

18 17 16 32   1 16 5
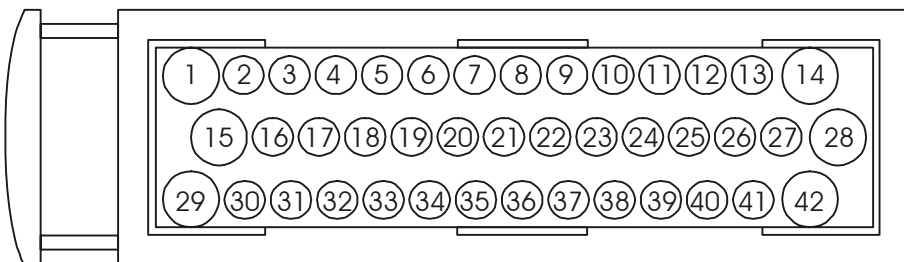
DCE Pin Assignment

1	DG	Supply, minus (earth)
14	UB	Supply, plus
2	SE1	Switch input 1
3	SE2	Switch input 2
4	SE3	Switch input 3
5	SE4	Switch input 4
15	SE5	Switch input 5
29	SE6	Switch input 6
28	SE7	Switch input 7
42	SE8	Switch input 8
27	FQ9	Switch input 9 / Pickup H / Clamp W
41	FQ10	Switch input 10 / Magnetic pickup L
21	PT1P	Potentiometer 1, plus
20	PT1A / AE1	Potentiometer 1, pickup / Analogue input 1
19	PT1M	Potentiometer 1, minus
35	PT2P	Potentiometer 2, plus
34	PT2A / AE2	Potentiometer 2, pickup / Analogue input 2
33	PT2M	Potentiometer 2, minus
24	PT3P	Potentiometer 3, plus
23	PT3A / AE3	Potentiometer 3, pickup / Analogue input 3
22	PT3M	Potentiometer 3, minus
38	PT4P	Potentiometer 4, plus
37	PT4A / AE4	Potentiometer 4, pickup / Analogue input 4
36	PT4M	Potentiometer 4, minus
25	CE1 / AE5	4 to 20mA current input 1 / Analogue input
39	CE2 / AE6	4 to 20mA current input 2 / Analogue input
7	PV1P	Proportional output 1, plus
6	PV1M	Proportional output 1, minus
9	PV2P	Proportional output 2, plus
8	PV2M	Proportional output 2, minus
11	PV3P	Proportional output 3, plus
10	PV3M	Proportional output 3, minus
13	PV4P	Proportional output 4, plus
12	PV4M	Proportional output 4, minus
26	HP	Actuator output, plus
40	HM	Actuator output, minus
31	CH	CAN line H
30	CL	CAN line L
16	RXD	RS232 Receive cable for the hand terminal or PC
17	TXD	RS232 Send cable for the hand terminal or PC
18	UMT	Supply output (12V) for hand terminal
32	SG	Signal earth

DCE Technical data

Dimensions:	152mm x 150mm x 56mm
Weight:	650g
Connections:	AMP 1-0967280-1, 42 pins
Supply:	UB = 8 ... 32V
Current consumption:	Approx. 60mA at 24V
Parameter setting:	Using hand terminal MT or PC (RS232)
Microcontroller:	C167CR, 20MHz
Program memory:	1MByte flash EPROM
Data memory:	128kByte RAM
Parameter memory:	64kBit EEPROM
Interfaces:	RS232, CAN

Inputs:

8	Digital switch inputs with pull-down $4.7k\Omega$ resistors, switching threshold Uon approx. 5.8V, Uoff approx. 3.7V
1	As Rotary frequency sensor input, pickup, differential input, up to 10kHz, Uss sensitivity approx. 400mV at 1kHz, sensitivity reduction at higher frequencies or Frequency input clamp W, up to 2kHz, switching thresholds at Uon 75% of UB, Uoff 25% of UB
6	Analogue inputs, 10Bit, 0 ... 10V, of which 4 are usable for $1k\Omega$ ... $10k\Omega$ potentiometers with error recognition 2 inputs for 4 ... 20mA electricity measurements, 220Ω resistance to earth

Outputs:

1	12V power supply, for UB>15V, max. 50mA for hand terminal MT
4	Proportional solenoid outputs, max. 3A
1	Actuator output, max. 2A

Safety:	Microcontroller watchdog No terminals with sockets used Ventilation membrane Protection categories IP65, IP69K
Temperature range:	-40 …+85°C
EMV:	Industrial application: EN 50081-2 and EN 50082-2; Road vehicles: DIN 40839 and Directive 72/245/EC, version 95/54/EC Agricultural and forestry vehicles: Directive 75/322/EC, version 2001/3/EC

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