

Base fault Code	Description	Sub fault code
Controller warning fault		
0	No error	-
1	N/A	-
2	Voltage getting low	1
		2
		3
		4
3	Inhibit drive / Battery-management-system Cut / External battery controller via can	1
		2
		3
		4
4	Voltage getting high	1
		2
		3
		4
5	Motor temperature high	-
6	Controller temperature high	-
		1
		2
		3
		4
		5
		6
		7

7	Adjustment out of range	8
		9
		10
		11
		12
		13
		14
		15
		16
		17
		18
		19
		< 999
999		
8	Default adjustments used	-
Drive error faults - Commence:		
9	Memory chip fault	> 0
10	Both forward and reverse inputs active	-
11	Ride-on: Seat switch not closed or timed out Walkie: Tiller switch not closed	-

12	Power up sequence fault	1
		2
		3
		4
		5
		6
		7
		8
		9
		10
		11
		12
		13
		14
		15
13	Accelerator more than 50% at power up	1
		2
		0
14	Inching sequence faults	1
		2
		3
		4
		5

		6
		7
		8
	Belly switch active	-
Soft error faults - Immedi		
15	Supply voltage fault	1
		2
		3
		4
16	Error in other controller	0
17	Battery voltage too low	1
		2
		3
		4
18	High sided mosfets short circuit	1
		2
		3
19	Motor stall protection	-
Hard error faults - Immediately		
20	Hardware over current detected	1
		2
		3
		4
		> 4
		1
		2
		3
		4

21	Contactor coil driver fault (e.g. short circuit)	5
		6
		7
		8
		9
		10
		11
		12
		13
22	Voltage is too high	1
		2
		3
		4
23	Low sided mosfets short circuit in neutral	1
		2
		3
24	Hardware fail safe fault	1
		2
		3
		4
		5
		6
		7
		8
25	main relay fault (e.g. short circuit)	1
		2

		3
26	Thermal shutdown fault (only for minimum pump speed fault)	1
		2
27	Low sided mosfets short circuit during power up and before main relay is closed	1
		2
		3
28	Wire off detected	1
		2
		3
		4
		5
		6
		7
		8
		9
		10
29	CAN node fault	1
		2
		3
		4
		5
		6
		7
		8
		9
		10
		11

29	CAN Node fault	12
		13
		14
		15
		16
		17
		18
		19
		20
		21
		22
30	Motor overspeeding	1
		2
31	Motor fault	> 0
32	Motor Module initialization error	> 0
33	Motor Module configuration inconsistency	> 0
34	Motor Module parameter inconsistency	> 0
35	Current sensor calibration fault	1
		2
36	Controller temperature over 100 degree	-
39	Generic time out	1
		2
		3
40	System Fault	> 0

Sub Code
0

1
2
3
4
5
6
7
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14
15
16
17
18

Description
ts - Reduces only performance - Fault will reset
-
Battery voltage below absolute minimum
Capacitor voltage below absolute minimum
Battery voltage below battery-management-system cut back adjustment (drive cut back active)
Capacitor voltage below battery-management-system cut off adjustment (drive cut back active)
battery-management-system Cut out (Battery below battery-management-system cut Level)
Pump inhibit input active (Only Pump Software)
External battery controller via CAN message time out
External battery controller via CAN message toggle security bit fail
Battery voltage above absolute minimum
Capacitor voltage above absolute minimum
Battery voltage above High Voltage cut back adjustment (brake cut back active)
Capacitor voltage above High Voltage cut back adjustment (brake cut back active)
Motor temperature higher than threshold level. Speed reducing
Controller temperature higher than threshold level. Speed reducing
Master does not share the main relay but any one of the slave does
Master shares the main relay but one of the requested slave doesn't
A slave node number larger than last sharing node also share the main relay
WigWag is enabled but walkie is not
inching and walkie are both enabled
dual motor with speed control mode
shared LC and Control Via CAN user interface both active

Inching and Control Via CAN user interface both active
Walkie and Control Via CAN user interface both active
Control Via CAN user interface enabled and CAN node number set as master
Hill hold Enabled and Torque control enabled

CAN control type options are active but Control Via CAN user interface is not enabled.
Can Node ID via digital input enabled but control but Control Via CAN user interface is not enabled.
means Shared main relay user interface option is activated ("ShareLC">=2) on but not control via CAN user interface active (CANMsgs>=4). Solution set CANMsgs < 4.
Shared main relay user interface "master node" ("CAN node") is higher/equal than last node ("LstNode"). This happens in the controller with the setting "ShareLC"=2 if "CAN node">="LstNode", that is a non-sense. Solution: check node assignment, and make sure "CAN node" < "LstNode"
Shared main relay user interface "slave node" ("CAN node") is lower/equal than Shared main relay user interface "master" node (defined in "LstNode"). This happens in the controller with the setting "ShareLC"=3 if "CAN node"<="LstNode", that is a non-sense. Solution: check node assignment, and make sure "CAN node" > "LstNode"
Safe Stop 1 and CAN node ID Via digital Inputs not compatible
PC interface request controller to stop pulsing
First digit: menu number
Last 2 digits: adjustment number within menu
Power PCB doesn't match firmware

s graceful neutral brake – Requires a neutral rec

Contact DMC
Both direction switches are active at the same time. Notice that this fault is detected with 1s delay.

Traction: FS1 switch active at power up
Traction: Forward switch active at power up
Traction: Reverse switch active at power up
Pump: speed 1 or pump pot active at power up
Pump: speed 2 active at power up
Pump: speed 3 active at power up
Pump: speed 4 active at power up
Pump: speed 5 active at power up
Inching: Forward switch active at power up
Inching: Reverse switch active at power up
Inhibit direction change fault
CAN user interface Safety Stop 1 switch inactive fault

Rear motor drives forward, while front motor drives forward
EM brake switch manual relased at rear motor
Normal accelerator type high at power up
Wig-wag high at power up
Mashine controller disable driving
Forward switch active when inching
Reverse switch active when inching
FS1 switch active when inching
Seat switch active when inching
Foot Brake switch active when inching

Hand Brake active when inching
Both inching buttons active when inching
Inching buttons active when normal drive

ately stops pulsing - Requires a neutral recycle

+5 V supply voltage too low
+5 V supply voltage too high
+14 V supply voltage too low
+14 V supply voltage too high
F15 or saftey line between controllers disconnected
Battery voltage below Low Voltage absolute minimum
Capacitor voltage below Low Voltage absolute minimum
Battery voltage below Low Voltage error adjustment
Capacitor voltage below Low Voltage error adjustment
M1 mosfets
M2 mosfets
M3 mosfets
Motor blocked for more than 10s, or encoder wire broken

stops pulsing and open main relay – Reset only

Positive overcurrent detected during initialization
Negative overcurrent detected during initialization
Positive overcurrent detected
Negative overcurrent detected
Contact DMC
Digital contactor output 1 short circuit during initialization
Digital contactor output 1 short circuit at closing
Digital contactor output 1 short circuit when closed
Digital contactor output 2 short circuit during initialization

Digital contactor output 2 short circuit at closing
Digital contactor output 2 short circuit when closed
Digital contactor output 3 short circuit during initialization
Digital contactor output 3 short circuit at closing
Digital contactor output 3 short circuit when closed
Digital output 4 short circuit during initialization
Digital output 4 short circuit at closing
Digital output 4 short circuit when closed
Unknow fault
Battery voltage above High Voltage absolute maximum
Capacitor voltage above High Voltage absolute maximum
Battery voltage above High Voltage error adjustment
Capacitor voltage above High Voltage error adjustment
M1 mosfets
M2 mosfets
M3 mosfets
Cannot finish checking the hardware fail safe
Hardware fail safe feedback is low at startup
Hardware fail safe feedback is high during toggling
Hardware fail safe feedback is low after toggling stops
Hardware fail safe encountered an unknown error
Hardware fail safe is not alive during normal run
Main loop is stuck
Software watchdog caused a reset. Recalculation is disabled now!
Could not discharge the capacitor bank
Capacitor bank dit not charge sufficiently to safely close the main relay

Main relay opened inadvertently
Pump thermal shutdown
Pump low voltage shutdown
M1 mosfets
M2 mosfets
M3 mosfets
Quadrature encoder sensor wire off or noise detected (AC only)
5 V supply wire off detected
0 V supply wire off detected
Wig-wag out of safety range
Motor Temperature Sensor wire off

EM brake wire off or short to battery minus detected
Accelerator potentiometer wire off detected or not matching with Fs1 digital signal
Steer potentiometer wire off (<0,2V or >4,5V) in rear controller
shared main relay slave time out fault
shared main relay Master fails to broadcast to slaves
shared main relay requested slave is not found by master
shared main relay master time out fault
Control Via CAN user interface timeout (not receive CAN Drive Command Message from machine controller)
Control Via CAN user interface security bit error (machine controller fails to toggle security bit)
Control Via CAN user interface enable switch/wire is not connected

Can Node ID via digital inputs is detected to 0, check input status

Control unit message counter error
Control unit check sum error
Control unit time out timer setting 13 in CAN setup menu
No message received by rear controller after time out timer setting 13 in CAN setup menu
Security bit is not toggling due to whatever CAN problems
No message received by front controller after time out timer setting 14 in CAN setup menu
Security bit is not toggling due to whatever CAN problems
Stand alone vehicle but front controller still receive message from rear controller
Motor speed is too high to commence safe pulsing (speed is > 80 % of maximum motor speed)
Motor speed is higher than absolute maximum speed (Check Absolute Maximum Speed)
See table "Motor sub error codes"
Could not initialize the calibration
Time out during calibration
Time out on configuration upload
Time out on getting stable inputs
Time out on motor ready
Internal system error Contact DMC

Motor failure

Description
No errors in the motor module.

The motor module could not be initialized. Internal init failure: load default and reparametrize. If persist refer to DMC.
The motor could not be fluxed in time or motor not connected, Check motor wiring.
A motor overcurrent is detected.
Internal unrecoverable Failure: Refer to DMC.
Wrong current: rated motor current is greater than maximum current : Increase Maximum Current in the Autotune menu and recycle the key.
internal error. Refer to DMC.
internal error. Refer to DMC.
Internal error: load default and reparametrize. If persist refer to DMC.
internal error: load default and reparametrize. If persist refer to DMC.
internal error: load default and reparametrize. If persist refer to DMC.
internal error: load default and reparametrize. If persist refer to DMC.
internal error: load default and reparametrize. If persist refer to DMC.
Wrong settings: min flux demand is greater than max flux demand. Check setting number #in the Motor Setup menu it must be greater or equal to setting #in Motor setup Menu.
internal error: load default and reparametrize. If persist refer to DMC.
Unable to calculate motor curves: → decrease motor nominal frequency (do autotuning again) → increase nominal current (do autotuning again) → decrease maximum current (do autotuning again).
Unable to recalculate motor parameters because unable to find the frequency base point for field weakening within the set max frequency: a.reduce maximum current in the autotuning menu (do auto-tuning again) b.increase max. frequency parameter in the autotuning menu (do auto-tuning again).
Unable to re calculate motor parameters because flux is out of table: → perform auto tuning again decreasing rated current.
An internal unknown error occurred: refer to DMC.

Abhilfemaßnahmen

itself (if possible)

at B400R not relevant
at B400R not relevant
Check battery G1, wiring and plug/screws (G1 - F3 - A4+A5 B+/1)
Change drive controller
Check battery G1, wiring and plug/screws (G1 - F3 - A4+A5 B+/1)
Check battery G1, wiring and plug/screws (G1 - F3 - A4+A5 B+/1)
at B400R not relevant
Change drive controller
High-impedance resistance in connection between drive controller and battery (G1 - F3 - A4+A5 B+/1)
Change drive controller
Let cool down, than reset by drive pedal through neutral position. If failure stays; check motor M1+M2 respectively temperature sensor (M1+M2)
Let cool down, than reset by drive pedal through neutral position. If failure stays; check controller A4+A5
Check wiring (A4PIN A15 - K2PIN N, respectively A4PIN A14 - K2PIN P)
Check configuration and wiring (A5PIN A15 - K2PIN N, respectively A5PIN A14 - K2PIN P)
at B400R not relevant
at B400R not relevant
at B400R not relevant

Misuse or check switch B3 and wiring (B3PIN3 - A4PIN A3)
Misuse or check signal from A2 (control panel) and check wiring (A2X109/3 - A4PIN A1)
Misuse or check signal from A2 (control panel) and check wiring (A2X109/4 - A4PIN A2)
at B400R not relevant
Misuse or check signal from A2 (control panel) and check wiring (A2X109/3 - A4PIN A1)
Misuse or check signal from A2 (control panel) and check wiring (A2X109/4 - A4PIN A2)

Misuse or check switch S2 and wiring (S2PIN1 - A5PIN A6)
Check potentiometer B3 and wiring (B3PIN5 - A4PIN A9)
Check potentiometer B3 and wiring (B3PIN5 - A4PIN A9)
Check sub failure
at B400R not relevant
at B400R not relevant
Misuse or check switch B3 + signal from A2(control panel) and wiring (B3PIN3 - A4PIN A3, respectively A2X109/3+4 - A4PIN A1+A2)
Misuse or check switch S5 + signal from A2(control panel) and wiring (S5 - A1(work master) - A4(drive front) or A5(drive rear), respectively A2X109/3 - A4PIN A1)
Misuse or check switch S2 + signal from A2 (control panel) and wiring (S2PIN1 - A5PIN A6, respectively A2X109/3+4 - A4PIN A1+A2)

Misuse or check switch S15 + signal from A2(control panel) and wiring (S15PIN1 - A4PIN A7, respectively A2X109/3+4 - A4PIN A1+A2)
at B400R not relevant
at B400R not relevant

action to reset fault

Check wiring (A4PIN A17 - A5PIN A11+A30)
Check battery G1, wiring and plug/screws (G1 - F3 - A4+A5 B+/1)
Change drive controller
Check battery G1, wiring and plug/screws (G1 - F3 - A4+A5 B+/1)
Change drive controller
Check motor M1+M2, encoder (M1+M2) and wiring (M1+M2 X1PIN2+3 - A4+A5 PIN A28+A29)

γ by a key switch recycle

Change drive controller
Check drive contactor K2+K3, wiring and plugs (A4+ A5 PIN A15 - K2+K3 PIN N)
Check drive contactor K2+K3, wiring and plugs (A4+ A5 PIN A15 - K2+K3 PIN N)
Check drive contactor K2+K3, wiring and plugs (A4+ A5 PIN A15 - K2+K3 PIN N)
Check brake switch S21, wiring and plugs(A4PIN A16 - S21PIN NC2 - M1 X3PIN2, respectively A5PIN A16 - M2 X3PIN2)

Check brake switch S21, wiring and plugs(A4PIN A16 - S21PIN NC2 - M1 X3PIN2, respectivly A5PIN A16 - M2 X3PIN2)
Check brake switch S21, wiring and plugs(A4PIN A16 - S21PIN NC2 - M1 X3PIN2, respectivly A5PIN A16 - M2 X3PIN2)
Check wiring and plugs (A4PIN A17 - X11PIN4 - A5PIN A11+A30)
Check wiring and plugs (A4PIN A17 - X11PIN4 - A5PIN A11+A30)
Check wiring and plugs (A4PIN A17 - X11PIN4 - A5PIN A11+A30)
at B400R not relevant
at B400R not relevant
at B400R not relevant
Change drive controller

Change drive controller

Change drive controller
Reset and than key OFF and ON. If failure stay change drive controller
Reset and than key OFF and ON. If failure stay change drive controller
Reset and than key OFF and ON. If failure stay change drive controller
Reset and than key OFF and ON. If failure stay change drive controller
Reset and than key OFF and ON. If failure stay change drive controller
Reset and than key OFF and ON. If failure stay change drive controller
Reset and than key OFF and ON. If failure stay change drive controller
Reset and than key OFF and ON. If failure stay change drive controller
Reset and than key OFF and ON. If failure stay change drive controller
Reset and than key OFF and ON. If failure stay change drive controller
Reset and than key OFF and ON. If failure stay change drive controller
Change drive controller
Change drive controller

Check drive contactor K2+K3 and wiring (K2+K3 PIN N - A4+A5 B+/1)
at B400R not relevant
at B400R not relevant
Change drive controller
Change drive controller
Change drive controller
Check encoder (M1+M2) and wiring (M1+M2 X1PIN2+3 - A4+A5 PIN A28+A29)
Check encoder (M1+M2) and wiring (M1 + M2 X1PIN1 - A4+A5 PIN A17)
Check encoder (M1+M2) and wiring (M1+M2 X1PIN4 - A4+A5 PIN A31)
Check potentiometer B3 and wiring (B3PIN5 - A4PIN A9, respectively B3PIN4 - A4PIN A8 or B3PIN6 - XS6 - X43)
Check sensor (M1+M2) and wiring (M1+M2 X2PIN1+3 - A4+A5 PIN A34+A35)

Bremse (M1+M2)und check wiring (M1 X3PIN1 - A4PIN A14, respectively M1 X3PIN2 - S21 PIN NO1+NC1 (- NO2 - XS6 - X43 oder - NC2 - A4PIN A16); oder M2 X3PIN1+2 - A4PIN A14+A16)
at B400R not relevant
at B400R not relevant
Check CAN-Bus
Check wiring (A4PIN A17 - A5PIN A11+A30)

Check CAN-Bus

Check CAN-Bus
Check configuration
Check encoder (M1+M2)
Check encoder (M1+M2)
see Motor failure list (down)
Reset and than key OFF and ON. If failure stay change drive controller
Reset and than key OFF and ON. If failure stay change drive controller
at B400R not relevant
Reset and than key OFF and ON. If failure stay change drive controller
Reset and than key OFF and ON. If failure stay change drive controller
Reset and than key OFF and ON. If failure stay change drive controller
Change drive controller

list
Abhilfemaßnahmen

Change drive controller
Check wiring (M1+M2 U - A4+A5 M1PIN1, respectively M1+M2 V - A4+A5 M2PIN1, respectively M1+M2 W - A4+A5 M3PIN1)

Change drive controller

Change drive controller

Change drive controller

Change drive controller