

1 Current flow diagram - general information

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1.1 Signal names

- ◆ ⇒ [“1.1.1 Signal names, from 2017”, page 1](#)
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1.1.1 Signal names, from 2017



Note



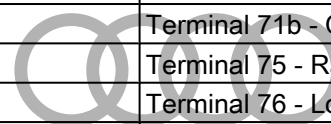
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These signal names will be used from 2017. You will find the old terminal designations in the chapters
 ⇒ [“1.1.2 Signal names - DIN standard 72552”, page 5](#) and ⇒ [“1.1.3 Signal names - supplement”, page 9](#)

Signal names	Explanation
(S)	Shield for aerial or video wires
A~	Alternating current phase A
AIR	Air wire
ANT	Aerial wire
ANT-	Aerial wire, negative
ANT+	Aerial wire, positive
B~	Alternating current phase B
C~	Alternating current phase C
CAN-H	CAN bus, high
CAN-L	CAN bus, low
CRASH	Crash signal
CTRL	Activation for actuators
CTRL-	Activation, negative (for actuators)
CTRL+	Activation, positive (for actuators)
CTRL1-	Engine/motor activation 1, negative

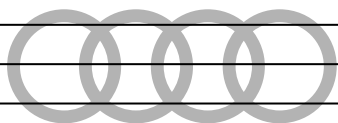
Signal names	Explanation
CTRL1+	Engine/motor activation 1, positive
CTRL2-	Engine/motor activation 2, negative
CTRL2+	Engine/motor activation 2, positive
DATA	Data wire
DATA-	Data wire, negative
DATA+	Data wire, positive
DIAG	Diagnosis wire
ETH-	Ethernet data wire, negative
ETH+	Ethernet data wire, positive
FxR-H	FlexRay bus, high
FxR-L	FlexRay bus, low
GETH-	Ethernet data wire, negative (gigabit)
GETH+	Ethernet data wire, positive (gigabit)
GND	Earth or negative (also virtual earth)
H2O	Water
HV-	High voltage, negative
HV+	High voltage, positive
HV-U~	High voltage, U-phase
HV-V~	High voltage, V-phase
HV-W~	High voltage, W-phase
K-Diag	Bidirectional K-wire (diagnosis)
KL1	Terminal 1 - Ignition coil, ignition contact breaker or starter unit
KL15	Terminal 15 - Output terminal of ignition switch or ignition/glow enable
KL15a	Terminal 15a - Ignition, protected
KL30	Terminal 30 - Terminal directly from battery
KL30a	Terminal 30a - Battery positive, protected
KL32	Terminal 32 - Electric motors, terminal for return wire
KL33	Terminal 33 - Electric motors, terminal for main connection
KL33L	Terminal 33L - Electric motors, anticlockwise rotation
KL33R	Terminal 33R - Electric motors, clockwise rotation
KL4	Terminal 4 - Terminal on ignition coil and on ignition distributor (high voltage)
KL40	Terminal 40 - Input terminal directly from 48V battery
KL49	Terminal 49 - Input terminal indicator relay (pulse generators)

Signal names	Explanation
KL49a	Terminal 49a - Output terminal on indicator relay, input terminal on turn signal switch for flashing pulses
KL50	Terminal 50 - Starter control
KL50a	Terminal 50a - Battery switch-over relay, output for starter control
KL50b	Terminal 50b - Starter control for parallel operation
KL50e	Terminal 50e - Starter inhibitor relay, input
KL50f	Terminal 50f - Start inhibitor relay, output
KL53	Terminal 53 - Wiper motor, input
KL53a	Terminal 53a - Wipers, end position
KL53b	Terminal 53b - Wipers, shunt winding
KL53c	Terminal 53c - Windscreen washer pump
KL53e	Terminal 53e - Wipers, brake winding
KL54	Terminal 54 - Brake lights on trailer connection equipment
KL55	Terminal 55 - Front fog lights
KL56	Terminal 56 - Headlights
KL56a	Terminal 56a - Main beam and main beam control
KL56b	Terminal 56b - Dipped beam
KL58	Terminal 58 - Side lights, tail lights, number plate lights and instrument lighting
KL58d	Terminal 58d - Terminal for variable instrument lighting
KL58L	Terminal 58L - Side lights, tail lights, number plate lights and instrument lighting, left
KL58R	Terminal 58R - Side lights, tail lights, number plate lights and instrument lighting, right
KL59	Terminal 59 - Terminal for alternating voltage (alternator, light switch or rectifier)
KL71	Terminal 71 - Input for multi-tone horn switching device (horn)
KL71a	Terminal 71a - Output (bass)
KL71b	Terminal 71b - Output (treble)
KL75	Terminal 75 - Radio, cigarette lighter
KL76	Terminal 76 - Loudspeakers
KL77	Terminal 77 - Terminal for door valve control
KL85	Terminal 85 - Switching relay, drive (output; winding end)
KL86	Terminal 86 - Switching relay, drive (output; winding start)
KL87	Terminal 87 - Switching relay, input terminal for break contact/changeover contact
KL87a	Terminal 87a - Switching relay, first output terminal or terminal 87, protected
KL87b	Terminal 87b - Switching relay, second output terminal



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Signal names	Explanation
L1~	Mains phase L1
L2~	Mains phase L2
L3~	Mains phase L3
L-Diag	Unidirectional L-wire (diagnosis)
LIN	LIN bus
LIN1...x	LIN bus numbered 1, 2, 3....etc.
MOST	MOST bus (fibre optic cable)
N	Neutral wire N
PE	Protective earth
PILOT	Pilot line
SIG	Signal
SIG-	Negative signal
SIG+	Positive signal
SIG+C	Positive signal, cosine
SIG+S	Positive signal, sine
SIG15	Signal terminal 15 (status signal)
SIG50	Signal terminal 50 (status signal)
SIG54	Signal terminal 54 (status signal)
SIG-C	Negative signal, cosine
SIG-H	Signal, high
SIG-L	Signal, low
SIG-n	Rotational speed signal
SIG-Rx	Receiver wire
SIG-S	Positive signal, sine
SIG-Tx	Transceiver wire (transmitter/receiver)
SIG-v	Speed signal
U~	Three-phase alternating current, phase U
V~	Three-phase alternating current, phase V
VS	Supply voltage, general (without special voltage level)
VS3V	3-volt supply voltage
VS5V	5-volt supply voltage
W~	Three-phase alternating current, phase W



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1.1.2 Signal names - DIN standard 72552

- ◆ Terminal 1 - Ignition coil, ignition distributor – low voltage
- ◆ Terminal 1a - To ignition contact breaker I (ignition distributor with two separate circuits)
- ◆ Terminal 1b - To ignition contact breaker II (ignition distributor with two separate circuits)
- ◆ Terminal 4 - Ignition coil, ignition distributor – high voltage
- ◆ Terminal 4a - From ignition coil I (ignition distributor with two separate circuits)
- ◆ Terminal 4b - From ignition coil II (ignition distributor with two separate circuits)
- ◆ Terminal 15 - Switched positive to battery (output of ignition/driving switch)
- ◆ Terminal 15a - Output on ballast resistor to ignition coil and starter
- ◆ Terminal 17 - Glow plug and starter switch – start
- ◆ Terminal 19 - Glow plug and starter switch – preglow
- ◆ Terminal 30 - Input from positive terminal (+) on battery, series/parallel switch-over relay 12/24 V, direct
- ◆ Terminal 30a - Input from positive terminal (+) on battery II
- ◆ Terminal 31 - Negative battery terminal or earth, direct
- ◆ Terminal 31a - Return wire to negative terminal on battery II (series/parallel switch-over relay 12/24 V)
- ◆ Terminal 31b - Return wire to negative terminal on battery or earth via switch or relay (switched negative)
- ◆ Terminal 31c - Return wire to negative terminal on battery I (series/parallel switch-over relay 12/24 V)
- ◆ Terminal 50 - Starter control (direct)

Electric motors

- ◆ Terminal 32 - Return wire
- ◆ Terminal 33 - Main connection
- ◆ Terminal 33a - Limit switch-off
- ◆ Terminal 33b - Shunt field
- ◆ Terminal 33f - For second, lower speed range

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- ◆ Terminal 33g - For third, lower speed range
- ◆ Terminal 33h - For fourth, lower speed range
- ◆ Terminal 33L - Anticlockwise rotation
- ◆ Terminal 33R - Clockwise rotation

Starter

- ◆ Terminal 45 - Separate starting relay, output; starter, input (primary current); two starters – parallel operation C – starting relay for engagement current
- ◆ Terminal 45a - Output, starter I, input, starter I and II
- ◆ Terminal 45b - Output, starter II
- ◆ Terminal 48 - Terminal on starter and start repeating relay for monitoring starting procedure

Turn signal (indicator relay)

- ◆ Terminal 49 - Input
- ◆ Terminal 49a - Output
- ◆ Terminal 49b - Output, second circuit
- ◆ Terminal 49c - Output, third circuit



Starter control

- ◆ Terminal 50 - Starter control (direct)
- ◆ Terminal 50a - Switch-over relay – output for starter control
- ◆ Terminal 50b - Starting relay for sequential control of the engagement current during parallel operation of two starters
- ◆ Terminal 50c - Input on starting relay for starter I
- ◆ Terminal 50d - Input on starting relay for starter II
- ◆ Terminal 50e - Input starter inhibitor relay
- ◆ Terminal 50f - Output starter inhibitor relay
- ◆ Terminal 50g - Input start repeating relay
- ◆ Terminal 50h - Output start repeating relay

Wiper motors

- ◆ Terminal 53 - Wiper motor, input (+)

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- ◆ Terminal 53a - Wipers (+), limit switch-off
- ◆ Terminal 53b - Wipers (shunt winding)
- ◆ Terminal 53c - Electric pump for windscreen washer
- ◆ Terminal 53e - Wipers (brake winding)
- ◆ Terminal 53l - Wiper motor with permanent magnet and third brush (high speed)

Lighting

- ◆ Terminal 55 - Fog lights
- ◆ Terminal 56 - Headlights
- ◆ Terminal 56a - Main beam and main beam warning lamp
- ◆ Terminal 56b - Dipped beam
- ◆ Terminal 56d - Headlight flasher
- ◆ Terminal 57a - Parking light
- ◆ Terminal 57L - Left parking light
- ◆ Terminal 57R - Right parking light
- ◆ Terminal 58 - Side lights, number plate lights, instrument lighting, tail lights
- ◆ Terminal 58b - Brightness control
- ◆ Terminal 58d - Brightness control
- ◆ Terminal 58L - Left number plate light
- ◆ Terminal 58R - Right number plate light

Alternators and voltage regulators

- ◆ Terminal 61 - Alternator charging light
- ◆ Terminal B+ - Battery positive
- ◆ Terminal B- - Battery negative
- ◆ Terminal D+ - Dynamo positive
- ◆ Terminal D- - Dynamo negative
- ◆ Terminal DF - Dynamo field winding, terminal DF1 dynamo field winding 1



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- ◆ Terminal DF2 - Dynamo field winding 2
- ◆ Terminal U, terminal V, terminal W - Three-phase terminals
- ◆ Terminal 75 - Radio, cigarette lighter
- ◆ Terminal 76 - Loudspeakers



Switches

Break contacts (NC) and changeover contacts

- ◆ Terminal 81 - Input
- ◆ Terminal 81a - Output 1, break contact side
- ◆ Terminal 81b - Output 2, break contact side

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Multiple position switch

- ◆ Terminal 83 - Input
- ◆ Terminal 83a - Output, position 1
- ◆ Terminal 83b - Output, position 2
- ◆ Terminal 83L - Output, position left
- ◆ Terminal 83R - Output, position right

Relays/current relays

- ◆ Terminal 84 - Input, drive and relay contact
- ◆ Terminal 84a - Output, drive
- ◆ Terminal 84b - Output, relay contact

Alternators and voltage regulators

- ◆ Terminal 85 - Output, drive (end of winding, negative or earth)
- ◆ Terminal 86 - Input, drive (start of winding)
- ◆ Terminal 86a - Start of winding or first winding
- ◆ Terminal 86b - Winding tap or second winding

Relay contact for break contact (NC) and changeover contact

- ◆ Terminal 87 - Input Also used for engine/motor current supply
- ◆ Terminal 87a - Output 1 (break contact side)

- ◆ Terminal 87b - Output 2, 87c Output 3
- ◆ Terminal 87z - Input 1
- ◆ Terminal 87y - Input 2
- ◆ Terminal 87x - Input 3

Relay contact for make contact and changeover contact

- ◆ Terminal 88 - Input
- ◆ Terminal 88a - Output 1
- ◆ Terminal 88b - Output 2
- ◆ Terminal 88c - Output 3
- ◆ Terminal 88z - Input 1
- ◆ Terminal 88y - Input 2
- ◆ Terminal 88x - Input 3

Turn signal (indicator relay)

- ◆ Terminal C - Indicator lamp 1
- ◆ Terminal C2 - Indicator lamp 2
- ◆ Terminal C0 - Main connection for check circuits made by turn signal switch and broken by turn signal
- ◆ Terminal C3 - Indicator lamp 3 (e.g. for second trailer)
- ◆ Terminal L - Left turn signals
- ◆ Terminal R - Right turn signals

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1.1.3 Signal names - supplement

If no suitable DIN standard code is available, terminal designations will be written in English, for example:

- ◆ CAN_H/CAN_L - Wires for CAN bus High and Low
- ◆ FlexRay +/FlexRay - - FlexRay data bus
- ◆ +V - Output supply voltage from electronic control unit
- ◆ 0V - Reference voltage from electronic control unit (not connected to body earth, terminal 31)

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- ◆ Signal - data wire

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1.2 Wires

- ◆ ⇒ [“1.2.1 Wire cross-section”, page 10](#)

- ◆ ⇒ [“1.2.2 Wire colour”, page 11](#)

- ◆ ⇒ [“1.2.3 Coaxial cable”, page 11](#)

1.2.1 Wire cross-section



Note

Only for markets where AWG (American Wire Gauge) measurements are used.

Wire cross-section in mm ²	AWG
0.35	22
0.50	20
0.75	18
1.0	17
1.5	15
2.5	13
4.0	11
6.0	9
16.0	5
25.0	3
35.0	2

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1.2.2 Wire colour



Note



For current flow diagrams where the English colour code is used.

German abbreviation	English abbreviation	Explanation
bl	U	blue
br	N	brown
ge	Y	yellow
gn	G	green
ro	R	red
sw	B	black
li	P	purple
ws	W	white
gr	S	grey
or	O	orange
rs	K	pink

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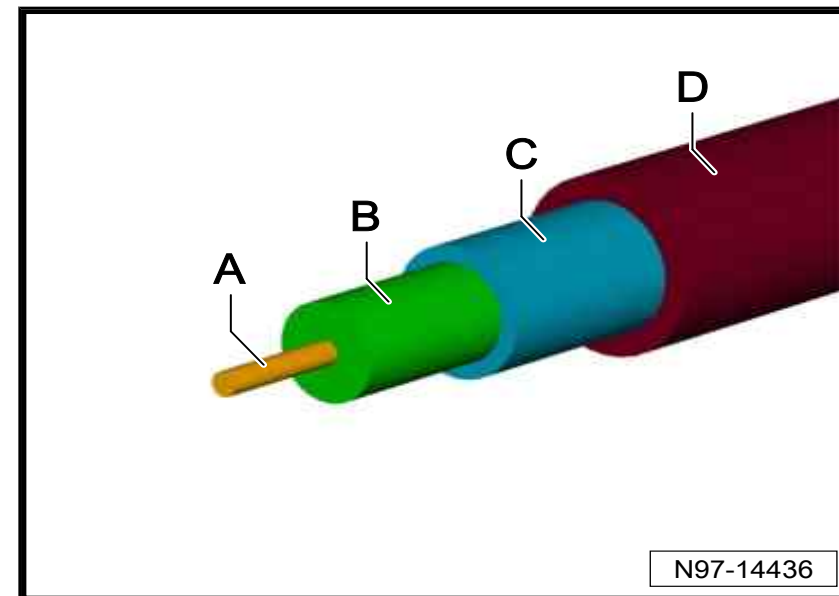
1.2.3 Coaxial cable

A - Inner conductor (solid wire or stranded type)

B - Dielectric/insulation layer

C - Shield (braided or foil type)

D - Jacket



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1.3 Fuse colours

◆ ⇒ ["1.3.1 Fuse colours for mini type", page 13](#)

◆ ⇒ ["1.3.2 Fuse colours for ATO type", page 13](#)

◆ ⇒ ["1.3.3 Fuse colours for MAXI type", page 14](#)

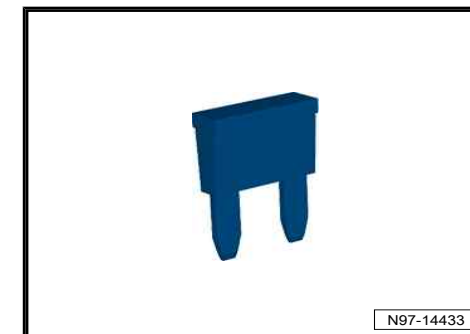
◆ ⇒ ["1.3.4 Fuse colours for JCase type", page 15](#)

◆ ⇒ ["1.3.5 Fuse colours for LP JCase type", page 15](#)

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1.3.1 Fuse colours for mini type

Mini type fuse



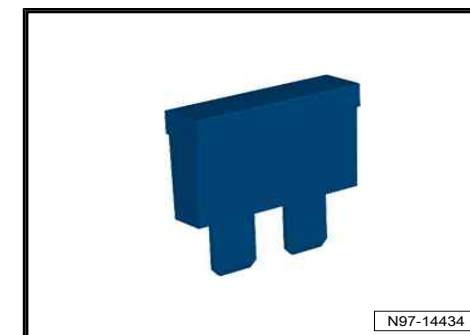
Nominal value	Fuse colour
1 A	black
2 A	grey
3 A	violet
4 A	pink
5 A	light brown
7.5 A	brown
10 A	red
15 A	light blue
20 A	yellow

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1.3.2 Fuse colours for ATO type

ATO type fuse

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Nominal value	Fuse colour
1 A	black

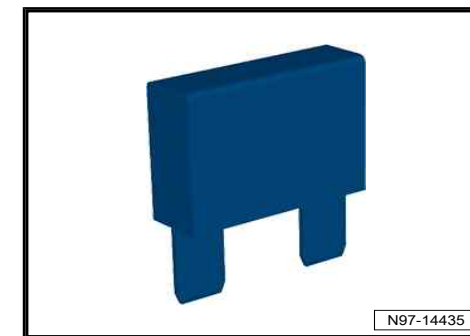
Nominal value	Fuse colour
2 A	grey
3 A	violet
4 A	pink
5 A	light brown
7.5 A	brown
10 A	red
15 A	light blue
20 A	yellow
25 A	white
30 A	light green
35 A	blue-green
40 A	orange

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1.3.3 Fuse colours for MAXI type

Maxi type fuse



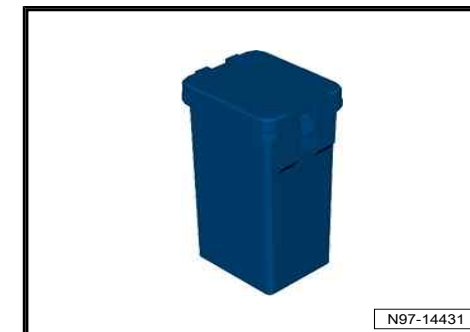
Nominal value	Fuse colour
20 A	yellow
30 A	light green
40 A	orange
50 A	red
60 A	light blue
80 A	white

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1.3.4 Fuse colours for JCase type

JCase type fuse

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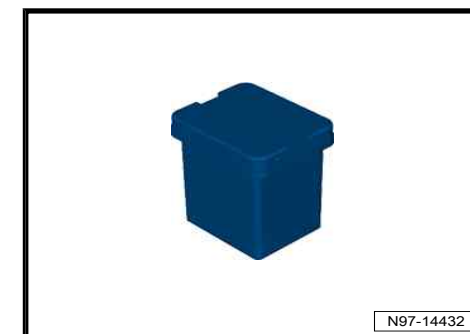


Nominal value	Fuse colour
20 A	blue
25 A	white
30 A	pink
40 A	green
50 A	red
60 A	yellow

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1.3.5 Fuse colours for LP JCase type

LP JCase type fuse



Nominal value	Fuse colour
20 A	blue
25 A	white
30 A	pink

Nominal value	Fuse colour
40 A	green
50 A	red
60 A	yellow

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