

# LD 200N

## LOAD DUMP GENERATOR WITH CLIPPING-MODULE



### FOR TESTS ACCORDING TO ...

- › BMW - (Airbag ECU)
- › BMW 600 13.0 (Part 1)
- › BMW 600 13.0 (Part 2)
- › BMW GS 95002 (1999)
- › BMW GS 95003-2
- › Case New Holland ENS0310
- › Chrysler CS-11979
- › Chrysler PF-9326
- › Claas CN 05 0215
- › Cummins 14269 (982022-026)
- › DaimlerChrysler DC-10842
- › DaimlerChrysler PF-10540
- › EN 300329
- › EN 300340
- › EN 300342-1
- › EN 301489-1
- › EN 301489-17
- › FAW Diesel ECU MY06.0 (Rev.7)
- › Fiat 9.90110
- › Ford EMC-CS-2009.1
- › Ford ES-XW7T-1A278-AB
- › ...

### LD 200N - COMPACT HIGH-ENERGY LOAD DUMP GENERATOR

Load Dump pulses simulate a sudden battery disconnection (e.g. by corrosion) from the alternator. Cause the lost of the battery load the alternator generates an overvoltage impulse. Such Load Dump pulses are high energy pulses with a high potential of destruction. The LD 200N simulates these high energy pulses having a duration time in the range of hundreds of milliseconds. The LD 200N generates the Load Dump pulses as per ISO 7637, ISO 16750-2, SAE J1113, SAE J1455, JASO and many more manufacturer specification, e.g. Ford, Chrysler, Renault, PSA, NISSAN etc. By means of a built-in clipping circuit the LD 200N also generates clipped load dump pulses as per international standards as well as manufacturer requirements.

### HIGHLIGHTS

- › Load Dump generator according to ISO 7637, ISO 16750-2, SAE J1113, SAE J1455, JASO, Nissan and most car manufacturer requirements
- › Generates Clipped Load Dump pulses
- › Built-in 0.5 - 38 Ohm source impedance, selectable in 0.1 Ohm steps
- › Pulse duration up to 1,200ms

### APPLICATION AREAS

-  AUTOMOTIVE
-  TELECOM

## TECHNICAL DETAILS

## LOAD DUMP GENERATOR

## PULSE SPECIFICATION

|                |                  |
|----------------|------------------|
| Voltage (o.c.) | 20V - 200V ± 10% |
|----------------|------------------|

## ISO PULSE 5 AND 7

|                 |  |
|-----------------|--|
| Rise time       | 5ms - 10ms (10 - 90%)                            |
| Pulse duration  | 40 - 400ms (10 - 10%)                            |
| Int. resistor   | 0.5ohm - 38ohm,<br>selectable in steps of 0.1ohm |
| Repetition rate | Min. 30s   |

## ISO 16750-2, 12V SYSTEM

|                |                             |
|----------------|-----------------------------|
| Voltage (o.c.) | +79V to 101V ± 10%          |
| Rise time      | 10ms (+0/-5ms)              |
| Pulse duration | 40 - 400ms ± 10% (10 - 10%) |
| Int. resistor  | 0.5ohm - 4ohm               |

## ISO 16750-2, 24V SYSTEM

|                |                              |
|----------------|------------------------------|
| Voltage (o.c.) | +151 V to 202 V ± 10 %       |
| Rise time      | 10ms (+0/-5ms)               |
| Pulse duration | 100 - 350ms ± 10% (10 - 10%) |
| Int. resistor  | 1ohm - 8ohm                  |

## ISO 7637-2:2004, 12V SYSTEM

|                |                             |
|----------------|-----------------------------|
| Voltage (o.c.) | +65V to 87V ± 10%           |
| Rise time      | 10ms (+0/-5ms)              |
| Pulse duration | 40 - 400ms ± 10% (10 - 10%) |
| Int. resistor  | 0.5ohm - 4ohm               |

## ISO 7637-2:2004, 24V SYSTEM

|                |                              |
|----------------|------------------------------|
| Voltage (o.c.) | +123V to 174V ± 10%          |
| Rise time      | 10ms (+0/-5ms)               |
| Pulse duration | 100 - 350ms ± 10% (10 - 10%) |
| Int. resistor  | 1ohm - 8ohm                  |

## LOAD DUMP GENERATOR

## SAE J1455 FOR 12V BATTERY SUPPLY

|                |                        |
|----------------|------------------------|
| Voltage (o.c.) | +86V ± 10%             |
| Rise time      | 100us (10% - 90%)      |
| Pulse duration | 400ms ± 10% (10 - 10%) |
| Int. resistor  | 0.4ohm                 |

## SAE J1455 FOR 24V BATTERY SUPPLY

|                |                        |
|----------------|------------------------|
| Voltage (o.c.) | +122V ± 10%            |
| Rise time      | 100us                  |
| Pulse duration | 400ms ± 10% (10 - 10%) |
| Int. resistor  | 0.8ohm                 |

## JASO PULSE A1

|                |                               |
|----------------|-------------------------------|
| Voltage (o.c.) | +70V ± 10%                    |
| Rise time      | 1us (10% - 90%)               |
| Pulse duration | 200ms ± 10% (measured at tau) |
| Int. resistor  | 0.8ohm                        |
| Capacitor      | 110mF                         |

## JASO PULSE B1 (FIELD DECAY)

|                |                        |
|----------------|------------------------|
| Voltage (o.c.) | -80V ± 10%             |
| Rise time      | 1us (10% - 90%)        |
| Pulse duration | 60ms (measured at tau) |
| Int. resistor  | 8ohm                   |
| Capacitor      | 3mF                    |

## JASO PULSE D1

|                |                         |
|----------------|-------------------------|
| Voltage (o.c.) | +110V ± 10%             |
| Rise time      | 1us (10% - 90%)         |
| Pulse duration | 400ms (measured at tau) |
| Int. resistor  | 1.5ohm                  |
| Capacitor      | 73mF                    |

## TECHNICAL DETAILS

## LOAD DUMP GENERATOR

## CHRYSLER PF 9326 PULSE 5

|                 |                                  |
|-----------------|----------------------------------|
| Voltage (o.c.)  | +91.5V ± 10%                     |
| Rise time       | 5 - 10ms (10% - 90%)             |
| Pulse duration  | 300ms td (10 - 10%)              |
| Loaded pulse    | +45.75V ± 10% into a 0.5ohm load |
| Pulse duration  | > 95ms (10 - 10%)                |
| Int. resistor   | 0.5ohm                           |
| Repetition rate | 120s                             |

## FORD ES-XW7T CI 240 (AB-VERSION)

|                  |                              |
|------------------|------------------------------|
| Voltage (o.c.)   | 60V ± 10%                    |
| Rise time        | 1 - 10ms (10% - 90%)         |
| Pulse duration   | 300ms (10% - 10%)            |
| Voltage (loaded) | 30V ± 10% into a 0.7ohm load |
| Pulse duration   | 150ms ± 10% (10 - 10%)       |
| Int. resistor    | 0.5ohm                       |
| Repetition rate  | 3 pulses every 30s           |

## FORD ES-XW7T CI 220G (AC-VERSION)

|                  |                              |
|------------------|------------------------------|
| Voltage (o.c.)   | 60V ± 10%                    |
| Rise time        | 1 - 10ms (10% - 90%)         |
| Pulse duration   | 300ms (10% - 10%)            |
| Voltage (loaded) | 30V ± 10% into a 0.5ohm load |
| Pulse duration   | 150ms ± 10% (10 - 10%)       |
| Int. resistor    | 0.5ohm                       |
| Repetition rate  | 3 pulses every 30s           |

## LOAD DUMP GENERATOR

## FORD EMC-CS-2009.1, PULSE G1

|                  |                              |
|------------------|------------------------------|
| Voltage (o.c.)   | 60V ± 10%                    |
| Rise time        | 10ms (-5/+0ms)               |
| Pulse duration   | 300ms ± 20%                  |
| Voltage (loaded) | 30V ± 10% into a 0.5ohm load |
| Pulse duration   | 150ms ± 20%                  |
| Int. resistor    | 0.5ohm                       |

## FORD EMC-CS-2009.1, PULSE G2

|                      |                              |
|----------------------|------------------------------|
| Voltage (loaded)     | 30V ± 10% into a 0.5ohm load |
| Voltage (suppressed) | 21.5V (-1/+0V)               |
| Rise time            | 10ms (-5/+0ms)               |
| Pulse duration       | 150ms ± 20%                  |
| Int. resistor        | 0.5ohm                       |

## FORD FMC1278, CI222 PULSE 5A

|                  |                               |
|------------------|-------------------------------|
| Voltage (o.c.)   | 60V ± 10%                     |
| Rise time        | 10ms (-5/+0ms)                |
| Pulse duration   | 300ms ± 20%                   |
| Voltage (loaded) | 30V ± 10% into a 0.5ohm loadv |
| Pulse duration   | 150ms ± 20%                   |
| Int. resistor    | 0.5ohm                        |

## FORD FMC1278, CI222 PULSE 5B

|                      |                              |
|----------------------|------------------------------|
| Voltage (loaded)     | 30V ± 10% into a 0.5ohm load |
| Voltage (suppressed) | 21.5V (-1/+0V)               |
| Rise time            | 10ms (-5/+0ms)               |
| Pulse duration       | 150ms ± 20%                  |
| Int. resistor        | 0.5ohm                       |

## TECHNICAL DETAILS

## LOAD DUMP GENERATOR

## MERCEDES BENZ MBN 10 284 PART 2

|                 |                               |
|-----------------|-------------------------------|
| Voltage (o.c.)  | 100V ± 10% (Pulse 5a for 12V) |
| Rise time       | < 0.1ms (10% - 90%)           |
| Pulse duration  | 400ms (10 - 10%)              |
| Int. resistor   | 2ohm                          |
| Voltage (o.c.)  | 200V ± 10% (Pulse 5a for 24V) |
| Rise time       | < 0.1ms (10% - 90%)           |
| Pulse duration  | 500ms (10 - 10%)              |
| Int. resistor   | 2ohm                          |
| Voltage (o.c.)  | 100V ± 10% (Pulse 5a for 42V) |
| Rise time       | < 0.1ms (10% - 90%)           |
| Pulse duration  | 400ms (10 - 10%)              |
| Int. resistor   | 2ohm                          |
| Repetition rate | 120s                          |

## SCANIA TB1400

|                |                       |
|----------------|-----------------------|
| Voltage (o.c.) | +90V ± 10% for trucks |
| Rise time      | 1 - 10ms (10% - 90%)  |
| Pulse duration | 300ms (10 - 10%)      |
| Voltage (o.c.) | +125V ± 10% for buses |
| Rise time      | 1 - 10ms (10% - 90%)  |
| Pulse duration | 480ms (10 - 10%)      |
| Int. resistor  | 1.5ohm                |

## SCANIA TB1700

|                |                      |
|----------------|----------------------|
| Voltage (o.c.) | +125V ± 10%          |
| Rise time      | 1 - 10ms (10% - 90%) |
| Pulse duration | 480ms (10 - 10%)     |
| Int. resistor  | 1.5ohm               |

## LOAD DUMP GENERATOR

## NISSAN PULSE A1

|                  |                       |
|------------------|-----------------------|
| Voltage (o.c.)   | +60V ± 10%            |
| Rise time        | 1ms ± 50% (10% - 90%) |
| Int. resistor R1 | 18ohm                 |
| Int. resistor R2 | 0.66ohm               |
| Capacitor        | 15mF                  |

## NISSAN PULSE A2

|                  |                       |
|------------------|-----------------------|
| Voltage (o.c.)   | +60V ± 10%            |
| Rise time        | 1ms ± 50% (10% - 90%) |
| Int. resistor R1 | 11ohm                 |
| Int. resistor R2 | 0.8ohm                |
| Capacitor        | 1mF                   |

## NISSAN PULSE B1

|                  |                       |
|------------------|-----------------------|
| Voltage (o.c.)   | +80V ± 10%            |
| Rise time        | 1ms ± 50% (10% - 90%) |
| Int. resistor R1 | 20ohm                 |
| Int. resistor R2 | 20ohm                 |
| Capacitor        | 1mF                   |

## TEST ROUTINES

|            |  |
|------------|--|
| ISO 7637-2 | Load Dump & Field Decay                    |
| PF-9326    | Pulse 5a and 5b                            |
| Ford       | ES-XW7T, AB & AC versions<br>EMC-CS-2009.1 |
| MBN 10284  | Pulse 5a, 5b and 5c                        |
| SCANIA     | Pulse 5 & 5b (TB1400 and TB1700)           |
| JASO       | Pulse A1, B1, D1                           |
| NISSAN     | Pulse A1, A2, B1                           |
| Service    | Service, setup, self test                  |

## TECHNICAL DETAILS

## FREESTYLE MODE LOAD DUMP

## PULSE PROGRAMMING MODE

|                |  |
|----------------|--|
| Rise time      | <1us<br>10us - 90us with 10us steps<br>100us - 900us with 100us steps<br>1ms - 10ms with 1ms steps |
| Pulse duration | 10ms - 1,200ms   |
| Int. resistor  | 0.5ohm - 38ohm, in steps of 0.1ohm   |

## MODULE CLIPPED LOAD DUMP

## TEST ROUTINES

|                        |   |
|------------------------|---|
| Standard Test routines | pre-programmed and controlled via iso.control |
| ISO 7637-2             | Pulse 5b for 12V and 24V                      |
| ISO/WD 16750           | Pulse 5b                                      |
| SAE J1113-11           | Pulse 5b                                      |
| EMC-CS-2009.1          | (Ford) Pulse G2                               |
| FIAT 9.90110           | Pulse 5a                                      |
| PSA B21 7110           | Pulse 5b for 12V                              |
| Volvo                  | Pulse 5a and 5c                               |
| GS 95003-2             | Pulse 5b                                      |
| Porsche EMV            | Pulse 5                                       |
| GMW 3097               | Pulse 5b                                      |
| 36.00.808              | Pulse 5b                                      |
| TSC 7034G              | Pulse 5b                                      |
| Iveco                  | Pulse 5b                                      |
| Scania TB1400          | Pulse 5b                                      |
| Scania TB1700          | Pulse 5b                                      |
| ES 96100-02            | Pulse 5b                                      |

## PULSE PROGRAMMING MODE

|                 |                                    |
|-----------------|------------------------------------|
| Clipped Voltage | 15V - 99.5V, in steps of 0.5V      |
| Rise time       | 100us - 10ms                       |
| Pulse duration  | 10ms - 1,200ms                     |
| Int. resistor   | 0.5ohm - 38ohm, in steps of 0.1ohm |

## GENERAL DATA

## DIMENSIONS AND WEIGHT

|                |                                  |
|----------------|----------------------------------|
| Dimensions     | 19"/6HU, 500mm x 450mm x 290mm   |
| Weight         | approx. 25kg                     |
| Supply voltage | 115V/230V +10%/-15%              |
| Fuses          | 2x T2AT (230V) or 2x T4AT (115V) |

## OUTPUT

|            |                              |
|------------|------------------------------|
| +/- output | Safety laboratory connectors |
| Coupling   | To the battery +line         |
| Decoupling | Via diode                    |
| DUT supply | Max. 80V/30A                 |

## INTERFACE

|                    |                                   |
|--------------------|-----------------------------------|
| Serial interface   | USB                               |
| Parallel interface | IEEE 488, addresses 1 - 30        |
| CN interface       | To control external CN - UCS 200N |

## ENVIRONMENT

|                      |   |
|----------------------|---|
| Temperature          | 10 °C to 35 °C                            |
| Humidity             | 30 % to 75 %, non condensing              |
| Atmospheric pressure | 86 kPa (860 mbar) to 106 kPa (1,060 mbar) |

## OPTIONS

## OPTIONS

|             |  |
|-------------|--|
| iso.control | Software to control the test, including standard library, test report facility and data conversion generator |
| CA ISO      | Pulse verification set for micropulse and load dump pulse verification                                       |

# COMPETENCE WHEREVER YOU ARE



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Information about scope of delivery, visual design and technical data correspond with the state of development at time of release. Subject to change without further notice.