# MEAN-WELL DDR-120 Series 120W DIN Rail Type DC DC Converter Owner's Manual



**DDR-120 series**
**120W DIN Rail Type DC-DC Converter**

Contents



## DDR-120 Series 120W DIN Rail Type DC DC Converter


User's Manual

https://www.meanwell.com/Upload/PDF/DDR-120,240,480_EN.pdf

IEC62368-1 UL62368-1 AS/NZS 62368.1 TPTC004

Railway Household Industrial Security Network Telecom

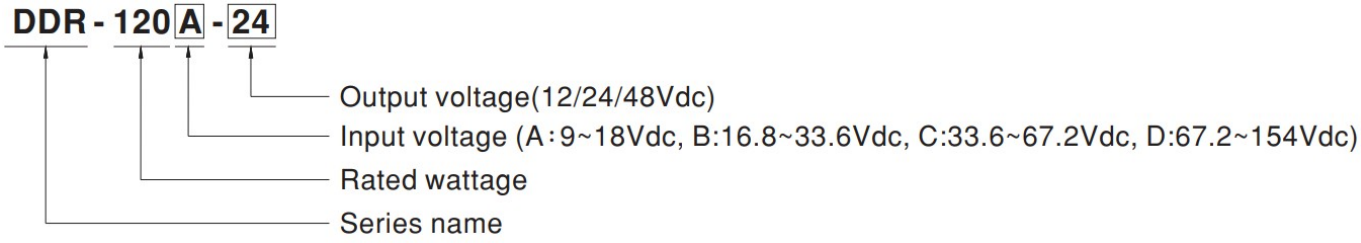
## Features

- Compliance to BS EN/EN50155 and BS EN/EN45545-2 railway standard
- Width only 32mm
- 2:1 wide input range
- -40~+70°C wide working temperature
- 150% peak load capability
- DC output adjustable
- Cooling by free air convection
- Can be installed on DIN rail TS-35/7.5 or 15
- Protections: Short circuit / Overload / Over voltage / Input reverse polarity / Input under voltage protection
- 4KVdc I/0 isolation(Reinforced isolation)
- 3 years warranty

## Description

DDR-120 series is a 120W DIN Rail type DC-DC converter with main features including DIN rail-type easy installation, ultra slim width (32mm), 2:1 wide input voltage, fanless design, -40~+70°C wide operating temperature, 4KVdc I/Oisolation, 150% peak load, adjustable output voltage and full protective functions.
This series of models has various input options: 9~18V /16.8~33.6V /33.6~67.2V/67.2~154V and various output options: 12V /24V / 48V and can be used for industrial & railway control, security control, communication system and other fields. Suitable applications include DC buck/boost regulator, increasing system insulation level and voltage drop compensation along cable…etc.

## Model Encoding




## Applications

- Bus,tram,metro or railway system
- Industrial control system
- Semi-conductor fabrication equipment
- Factory automation
- Electro-mechanical
- Wireless network
- Telecom or datacom system

**GTIN CODE**
MW Search: **httos://www.meanwell.com/serviceGTIN.aspx**

## SPECIFICATION

| MODEL | | DDR-120A-12 | DDR-120A-24 | DDR-120A-48 | DDR-120B-12 | DD R-1201 3-24 | DDR-12013-48 |
|---|---|---|---|---|---|---|---|
| OUTP | DC VOLTAGE | 12V | 24V | 48V | 12V | 24V | 48V |
| | RATED CURREN T | 8.3A | 4.2A | 2.1A | 10A | 5A | 2.5A |
| | CURRENT RANG E | 0~8.3A | 0 ~ 4.2A | 0 ~ 2.1A | 0~10A | 0 ~ 5A | 0~2.5A |
| | RATED POWER | 99.6W | 100.8W | 100.8W | 120W | 120W | 120W |
| | PEAK CURRENT | 12.45A | 6.3A | 3.15A | 15A | 7.5A | 3.75A |
| | PEAK POWER N oteS | 150W (3sec.) | | | 180W (3sec.) | | |
| | RIPPLE & NOISE (mat) Note.2 | 50mVps | 50mVp-p | 50mVp-p | 50mVp-p | 50mVp-p | 50mVps |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| UT | VOLTAGE ADJ. RANGE | 9 – 14V | 24 – 28V | 48 – 56V | 9 – 14V | 24 – 28V | 48 – 56V |
| | VOLTAGE TOLERANCE Note-3 | ±1.0% | ±1.0% | ±1.0% | ±1.0% | ±1.0% | ±1.0% |
| | LINE REGULATION | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% |
| | LOAD REGULATION | ±1.0% | ±1.0% | ±1.0% | ±1.0% | ±1.0% | ±1.0% |
| | SETUP, RISE TIME | 500ms, 60ms @12Vdc | | | 500ms, 6Orrts @24Vdc | | |
| | HOLD UP TIME ( Typ.) | Please refer to page 7 Hold up Time( Load de-rating curve ) | | | | | |
| INPUT | VOLTAGE RANGE NoteA | 9 ～18Vdc | 9 ～ 18Vdc | 9～18Vac | 16.8 ～ 33.6Vdc | 16.8～ 33.6 Vdc | 16.8～33.6 Vdc |
| | EFFICIENCY (Typ.) | 89.% | 89.% | 89.% | 89% | 90.% | 91% |
| | DC CURRENT (Typ.) | 11.2A ©12Vdc | | | 5.6A@24Vdc | | |
| | INRUSH CURRENT (Typ.) | 5A 012Vdc | | | 5A fit 24Vdc | | |
| | INTE FRIPTI ON OF VOLTAGE S L P PLY | EN50155:2007-comply with 3m s@ Wo ad | | | Ett55155:2007-contryeithS1 teed (Cens)@lin!ort,S2!eiel(10.nei@DVoz | | |
| | | EN50155:2017-comply withS1 level | | | EN50155:2017-comply withS 1 level | | |
| PROTECTION | OVERLOAD | Normally works widen 150% rated output power for more than 3 seconds and the n oonstant current protection 105-135% rated output power with auto-recovery | | | | | |
| | OVER VOLTAGE | 14.4～ 16.8 V 1 | 28.8 ～ 33.01 | 157.6～ 67.2V | 1 14.4 ～ 1 6.8V | l 28.8 ～33.6V | 157.6 ～67.2V |
| | | Protection type : Shut down o/p voltage, re-power on to recover | | | | | |
| | REVERSE POLARITY | By internal MOSF ET, no damage, recovers automatically after fault condi tbn re moved | | | | | |
| | UNDER VOLTAGE LOCKOUT | 12Vin (A-type) Power ON≥9V , OFF≤8.5V | | | 24Vin (B- type) :Power ON ≥16.8V , OFF ≤16.5V | | |
| FINEGILIENT | WORKING TEMP. | -40～+4.70’12 (Refer to “Derating Curve’) | | | | | |
| | WORKING HUMIDITY | 5 ～95% RH non-condensing | | | | | |
| | STORAGE TEMP., HUMIDITY | -40 – 4.85t , 5 – 95% RH non-condensirg | | | | | |
| | TEMP. COEFFICIENT | ±0.03%/t (0- 55°C ) | | | | | |
| | VIBRATION | Corrponent:10 – 500Hz, 5G 10minticycle,60rnn. each along X, Y, Z axes; Mounting: Compliance to IEC61373 | | | | | |

| | | | | |
|---|---|---|---|---|
| | OPERATING ALTI TUDE | 5000 meters | | |
| SAFE TY & EMC (Note 6) | SAFETY STANDA RDS | IEC 62368-1, UL 62368-1, EAC TP TC 004, AS/N ZS 62368.1 approved; Desir ref er to UL508 | | |
| | WITHSTAND VOL TAGE | I/P-01P:4KVdc I/P-FG:2.5KVdc OIP-FG:2.5KVdc | | |
| | ISOLATION RESI STANCE | I/P-0/P, I/P-FG, 0/P-FG:>100M Ohms / 500Vdc / 25'C/ 70% RH | | |
| | EMC EMISSION | Parameter | Standard | Test Level / Note |
| | | Conducted | BS EN!EN55032 | Class 8 |
| | | Radiated | BS EN/EN55032 | Class B |
| | | Voltage flicker | BS EN/EN61000-3-3 | — |
| | | Harmonic Current | — | — — |
| | EMC IMMUNITY | BS EN/EN55035 , BS EN/EN610004i-2(BS EN/EN50082-2) | | |
| | | Parameter | Standard | Test Level! Note |
| | | ESD | BS EN/EN61000-4-2 | Level 3, 8KV air ; Level 3, 6KV c ontact; aitetiaA |
| | | Radiated | BS E N/EN 61000 -4-3 | Level 3, 10V/m ; criteria A |
| | | EFT /Burst | BS EN/EN61000-4-4 | Level 3, 2KV ; cited a A |
| | | Surge | BS E N/EN 61000 -4-5 | Levet 3, 1KVA.iie-lioe Level 3, 2 KV/Lite-line-FG :crteriaA |
| | | Conducted | BS EN/EN61000-4-6 | Level 3, 10V ; criteriaA |
| | | Magnetic Field | BS EN/EN61000-4-8 | Level 4, 30A/m ; criteria A |
| | RAILWAY STAND ARD | Compliance to BS EN/EN45545.2 for fie protection ; Meet BS EN/EN50155 / IEC 60571 itktling IEC61373 fa shock & venation, BS EN/EN50121-3-2 fa EMC (exce pt for 9-181/.1) | | |
| OTHE RS | MTBF | 1769.5K hrs min. Telcordia SR-332 (Bellcore); 214.5K hrs mit M IL-HD BK-217F ( 25t) | | |
| | DIMENSION | 32'125.2'102mm (WH'D) | | |
| | PACKING | 510g. 28pcs/15.3K9/1.22CUFT | | |

**Note**

1. All parameters NOT specially mentioned are measured at normal input (A:12Vdc , B:24Vdc) , rated load and 25°C of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12″ twisted pair-wire terminated with a 0.1 sf &

47 «f parallel capacitor.

3. Tolerance : includes set up tolerance, line regulation and load reguiation.
4. Derating may be needed under low input voltage. Please check the derating curve for more details.
5. 3 seconds max, please refer to peak loading curves.
6. The power supply is considered as an independent unit, but the final equipment still need to re-confirm that the whole system complies with the EMC directives. For guidance on how to perform these EMC tests, please refer to “EMI testing of component power supplies.” (as available on **http://www.meanwell.com**)
7. The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating atiitude higher than 2000m(8500ft).

   # Product Liability Disclaimer : For detailed information, please refer to **htips://www.meanwel.com/serviceDisclaimer.aspx**

| MODEL | | DDR-120C-12 | DDR-120C-24 | DDR-120C-48 | DD R-120 D4 2 | DDR-120D-24 | DD R-1200. 48 |
|---|---|---|---|---|---|---|---|
| OUTPUT | DC VOLTAGE | 12V | 24V | 48V | 12V | 24V | 48V |
| | RATED CURRENT | 10A | 5A | 2.5A | 10A | 5A | 2.5A |
| | CURRENT RANGE | 0~10A | 0 ~5A | 0~ 2.5A | 0 ~WA | 0~5A | 0~2.5A |
| | RATED POWER | 120W | 120W | 120W | 120W | 120W | 120W |
| | PEAK CURRENT | 15A | 7.5A | 3.75A | 15A | 7.5A | 3.75A |
| | PEAK POWER Note.S | 103W (3sec.) | | | | | |
| | RPPLE 8 NOISE ( max.) Note.2 | 50mVp-p | 50mVp-p | 50mVp-p | 50mVp-p | 50mVp-p | 50mVp-p |
| | VOLTAGE ADJ. RANGE | 9 ~14V | 24~28V | 48~56V | 9 ~14V | 24 ~ 28V | 48 ~ 56V |
| | VOLTAGE TOLERANCE Note.3 | ±1.0% | ±1.0% | ±1.0% | ±1.0% | ±1.0% | ±1.0% |
| | LINE REGULATION | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% |
| | LOAD REGULATION | ±1.0% | ±1.0% | ±1.0% | ±1.0% | ±1.0% | ±1.0% |
| | SETUP, RISE TIME | 500ms, 60ms ©48Vdc | | | 500ms, 60ms ©110Vdc | | |
| | HOLD UP TIME ( Typ.) | Please refer to page 7 Hold up Tine( Load de-rating curve ) | | | | | |
| | VOLTAGE RANGE Note.4 | 33.6 – 67.2 Vdc | 33.6 -67.2V dc | 33.6 -67.2V dc | 67.2 – 154 Vdc | 67.2 – 154 Vdc | 67.2 -154V dc |
| | EFFICIENCY (Typ .) | 90.% | 91% | 92% | 90.% | 91% | 92.% |

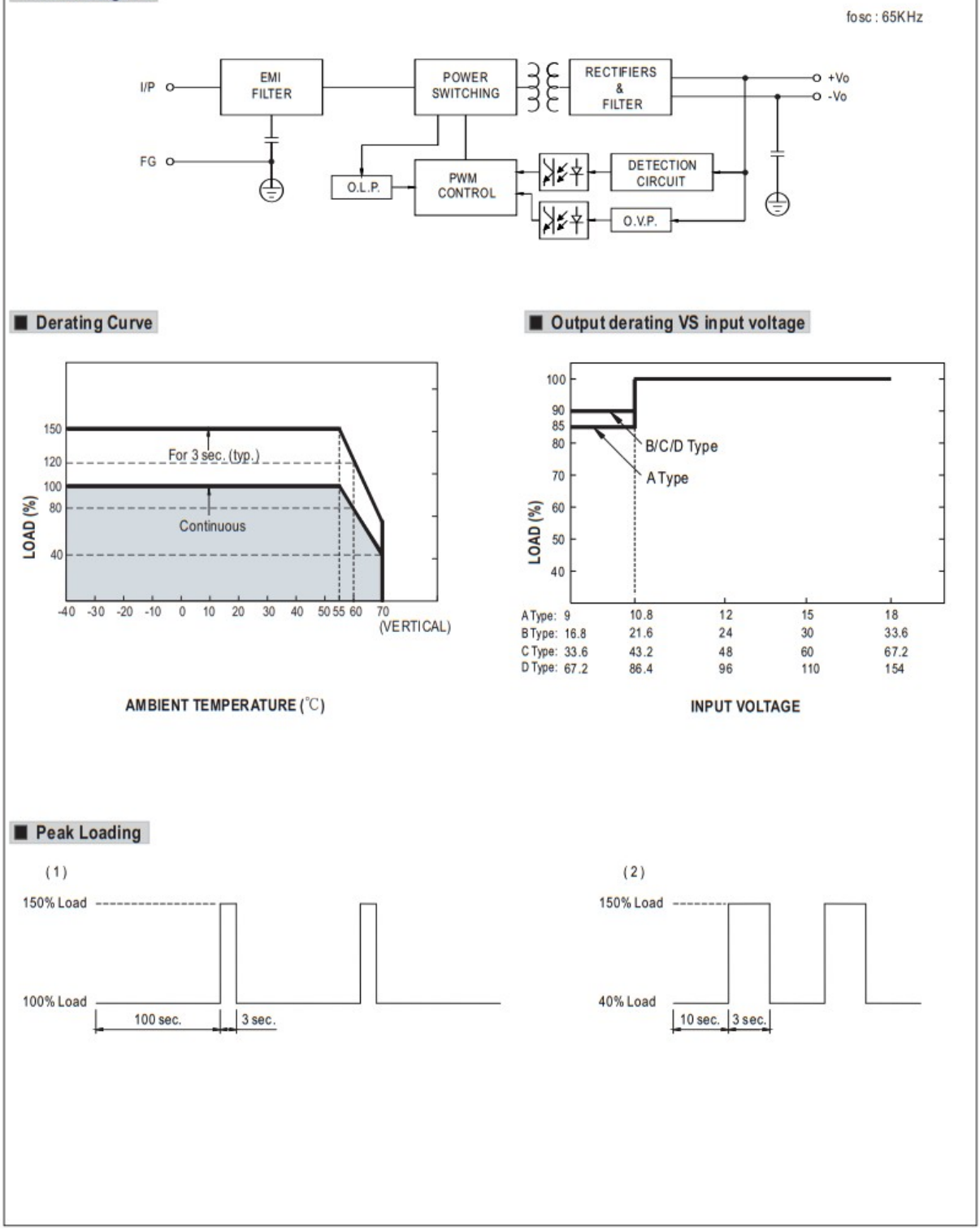
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| INPUT | DC CURRENT (Typ.) | 2.8A ©48Vdc | | | 1.3A©110Vdc | | |
| | INRUSH CURRENT (Typ.) | SAE:048Vdc | | | SA ©110Vdc | | |
| | IWERRUPTION OF VOLTAGE SUPPLY | EN50155.2037-conplywith SI level (Gna)@ kill loudS21ml (lems)@60% load | | | EN 50155:2007-compl y with S2level ( 10m s) © foe load | | |
| | | EN50155:2017-comply with Si level | | | EN50155:2017-cam ply with Si level | | |
| PROTECTION | OVERLOAD | Normally workswithin 150% rated output power fa more than 3 seconds and then oonstant current protection 105-135% rated output power with auto-recovery | | | | | |
| | OVER VOLTAGE | 14.4~16.8 V | l 28.8 ~33. 6V 1 | 57.6~672V | 1 14.4~16. 8V j | 28.8 ~33.6 V | 157.6~ 67. 2V |
| | | Protection type :Shutdown o/p voltage, re-power on to recover | | | | | |
| | REVERSE POLARITY | By intemal MOSFET, no damage, recovers automaticaly after fault Donation removed | | | | | |
| | UNDER VOLTAGE LOCKOUT | 481/in (C . type) Power ON ?…33.6V , OFF iC33V | | | 1110Vn (0 – type):Power ON.%•67.2V , OFFLC.65V | | |
| ENVIRONMENT | WORKING TEMP. | -40 ~ +70 ii (Refer to “Derating Cum’) | | | | | |
| | WORKING HUMIDITY | 5 ~ 95% RH non-condensing | | | | | |
| | STORAGE TEMP. , HUMIDITY | -40 – +85 ii , 5 – 95% RH non-condensing | | | | | |
| | TEMP. COEFFICIENT | ±0.03%/C (0~ 55`C ) | | | | | |
| | VIBRATION | Component:10 ~ 500Hz, 5G 10minilcycle, 60m in. each along X, Y. Z axes; Mounting: Compliance to 1EC61373 | | | | | |
| | OPERATING ALTITUD E | 5000 meters | | | | | |
| SAFE | SAFETY STANDARDS | IEC 62368-1, UL 6236&1, EAC TP TC 004, AS/NZS 62368.1 wproved; Design refer to U L508 | | | | | |
| | WITHSTAND VOLTAGE | I/P-0/P:4KVdc I/P-FG:2.5KVdc 0/P-FG:2.5KVdc | | | | | |
| | ISOLATION RESISTANCE | I/P-0/P, I/P-FG, 0/P-FG:>100M Ohms/ 500Vdc/ 25’C/70% RH | | | | | |
| | EMC EMISSION | Parameter | | Standard | | Test Level! Note | |
| | | Conducted | | BS EN/EN55032 | | Class B | |
| | | Radiated | | BS E N/E N55032 | | Class B | |
| | | Voltage Flicker | | BS EN/EN61030-3-3 | | — | |
| | | Harmonic Current | | — | | — | |

| | | | | |
|---|---|---|---|---|
| TY & EMC (Note 6) | EMC IMMUNITY | BS EN/EN55035 , BS EN/EN61003-6-2(BS EN/EN50082-2) | | |
| | | Parameter | Standard | Test Level! Note |
| | | ESD | BS EN/EN61000-4-2 | Level 3, 8KV air ; Level 3, 6KV c ontact; aiteriaA |
| | | Radiated | BS E WEN61030-4-3 | Level 3, 10V/m ; aderia A |
| | | EFT/ Bust | BS EN/EN610004-4 | Levee 3, XV ; criteria A |
| | | Surge | BS E N/E N61030 -4-5 | Level 3. IKV/Line-Une :Level 3. 2KWLine-Line-FG .,c mane A |
| | | Conducted | BS ENFEN61000-4.6 | Level 3, 10V; aitedaA |
| | | Magnetic Field | BS E N/E N61030 -4-8 | Level 4. 30A/m ; aiteria A |
| | RAILWAY STANDARD | Canpliance to BS EN1EN45545-2 for ire protecticn ; Meet BS EN/EN50155 / 1EC 60571 including IEC61373 fa shock & vibration, BS EN/EN50121-3-2 for EMC | | |
| OTHERS | MT BF | 1769.5K hrs min. Telcordia SR-3M (Belcore); 214.5K hrs min. MIL-HDBK-217F (25ti ) | | |
| | DIMENSION | 32’125.2’102mm (APH•D) | | |
| | PACKING | 510g; 28pc s/15.3Kg/1.22CU FT | | |

**Note**

1. All parameters NOT specially mentioned are measured at normal input (C:48Vdc , D:110Vdc) , rated load and 25°C of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12″ twisted pair-wire terminated with a 0.1 x f & 47 u parallel capacitor.
3. Tolerance : indudes set up tolerance, line regulation and load regulation.
4. Derating may be needed under low input voltage. Please check the derating curve for more details.
5. 3 seconds max., please refer to peak loading curves.
6. The power supply is considered as an independent unit, but the final equipment stil need to re-confimn that the whole system complies with the EMC directives. For guidance on how to perform these EMC tests, please refer to “EMI testing of component power supplies.” (as available on **http://www.meanwell.com** )
7. The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating atiitude higher than
   2000m(8500ft).
   # Product Liability Disclaimer : For detailed information, please refer to
   **htips://www.meanwel.com/serviceDisclaimer.aspx**

## ■ Block Diagram




**InputFuse**

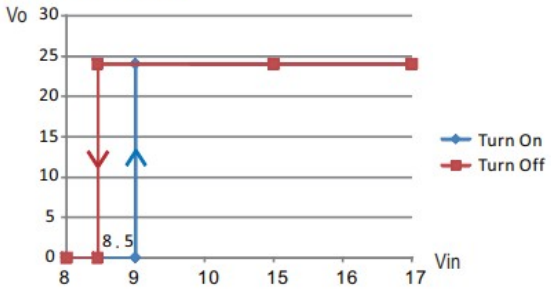
There is a fuse connected in series to the positive input line, which is used to protect against abnormal surge. Fuse specifications of each model are shown as below.

| Type | Fuse Type | Reference and Rating |
|---|---|---|
| A | Time-Lag | Conquer MST, 10A, 250V *2 |
| B | Time-Lag | Conquer MST, 8A, 250V *2 |
| c | Time-Lag | Conguer MST, 8A, 250V *1 |
| D | Time-Lag | Conquer MST, 4A, 250V *1 |

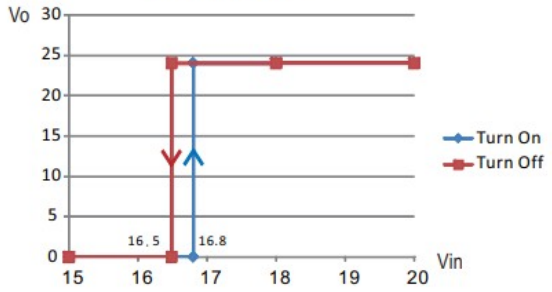
**Input Under-Voltage Protection**

If input voltage drops below Vimin, the internal control IC shuts down and there is no output voltage. It recovers automatically when input voltage reaches above Vimin,please refer to the cruve below.

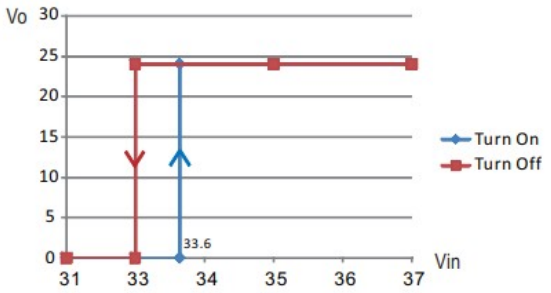
DDR-120A-24



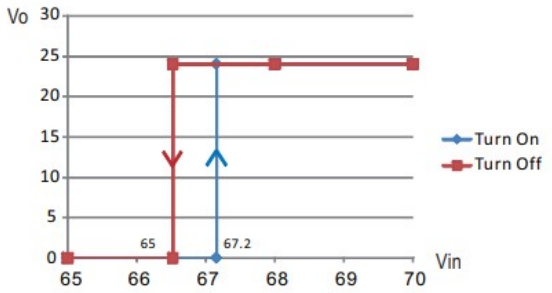

DDR-120B-24




DDR-120C-24




DDR-120D-24




**Input Reverse Polarity Protection**

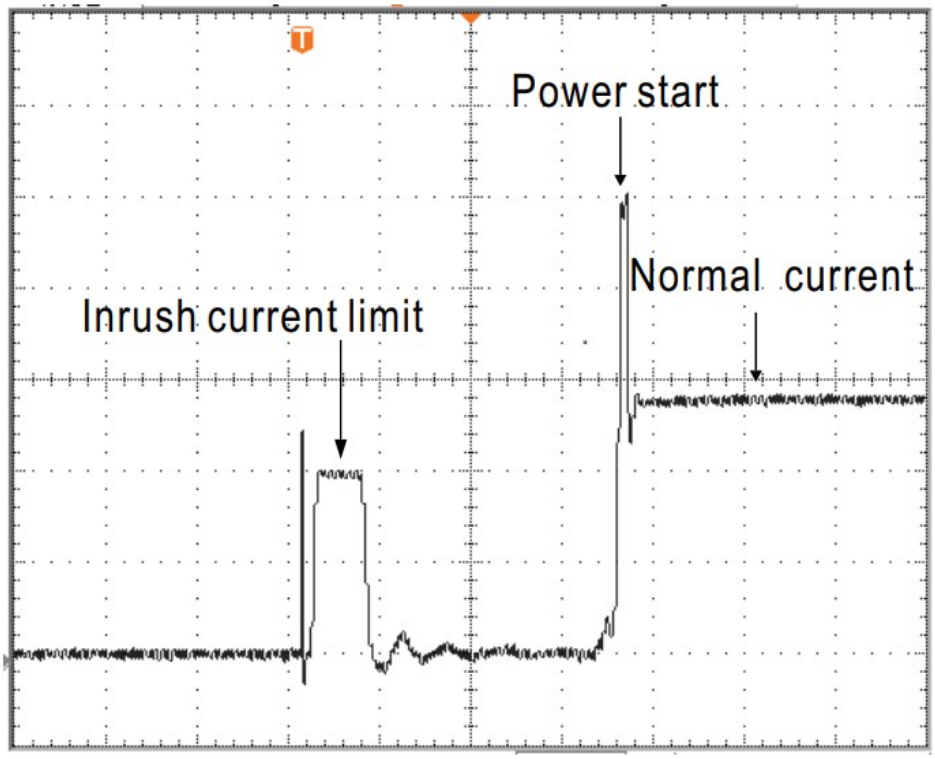
Thereis aMOSFET connected in series to the negative inputline. If the input polarity is connected reversely, the MOSFET opens and there will be no output to protect the unit.

**InputRange and Transient Ability**

The series has a wide range input capability. With -30% / +40% of rated input voltage(except A Type), it can withstand that for 1 second.

**Inrush Current**

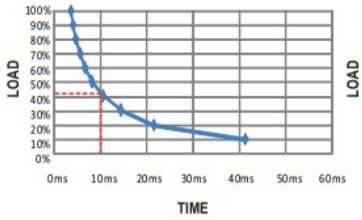
Inrush current is suppressed by a current limit circuit during the initial start-up, and then the circuit is bypassed by a MOSFET to reduce power consumption after accomplishing the start-up.



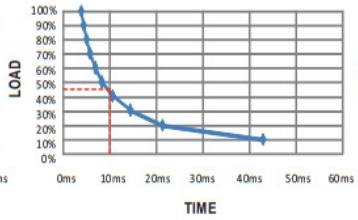

**Hold-up Time**

EN50155: 2007 version -D type is in compliance with S2 level (10ms), while Atypes are in compliance with S1 level (3ms) at full load output condition. To fulfil the requirements of S2 level (10ms), B types require de-rating theiroutput load to 70%, C types
require de-rating their output load to 60%, please refer to the curve diagrams below.

DDR-120A-12




DDR-120A-24

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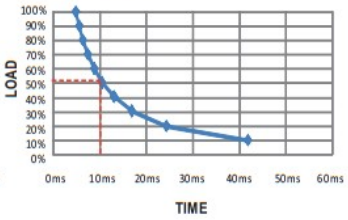


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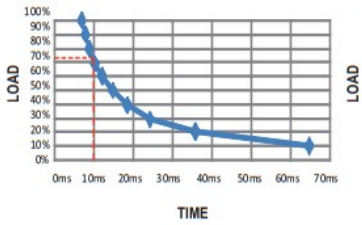


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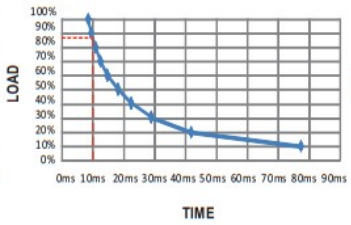
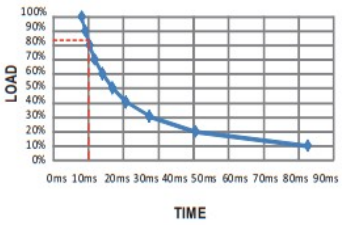
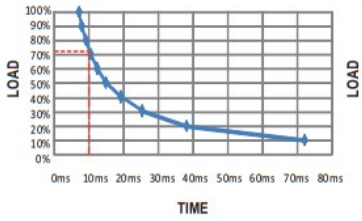


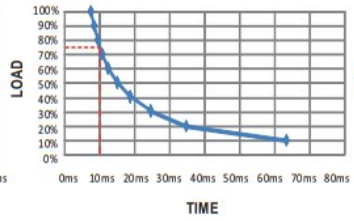

DDR-120B-48




DDR-120C-12




DDR-120C-24

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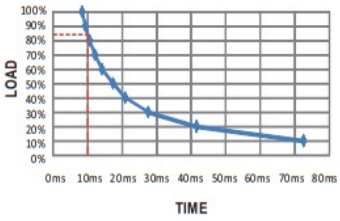
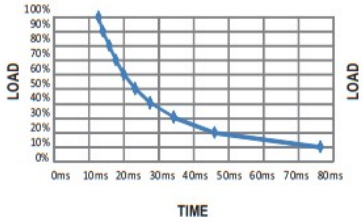
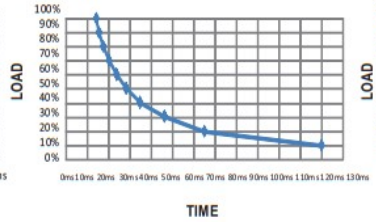



DDR-120D-12




DDR-120D-24

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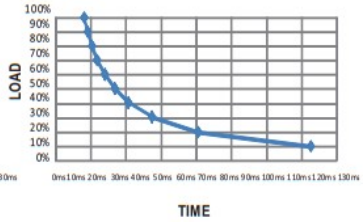
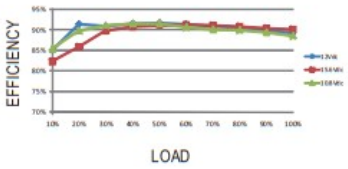



**Efficiency vs Load & Vin Curve**

The efficiency vs load & Vin curves of each model are shown as below.

DDR-120A-12

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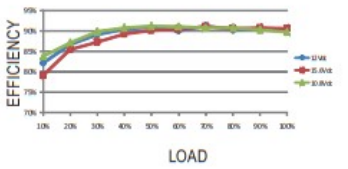


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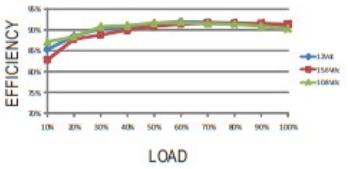


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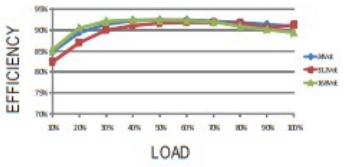


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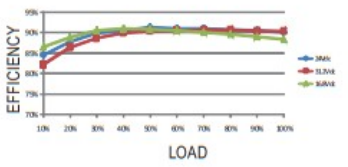


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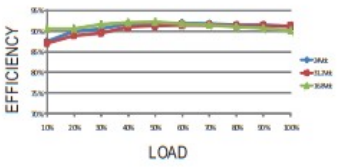


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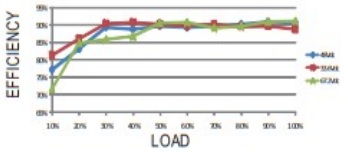


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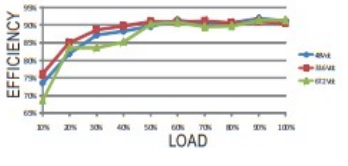


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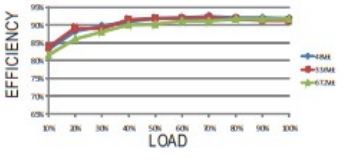


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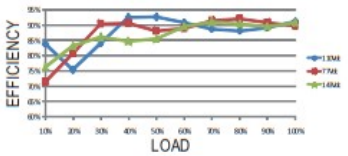


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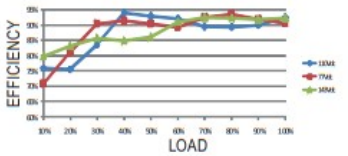


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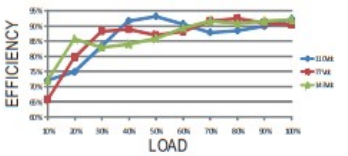


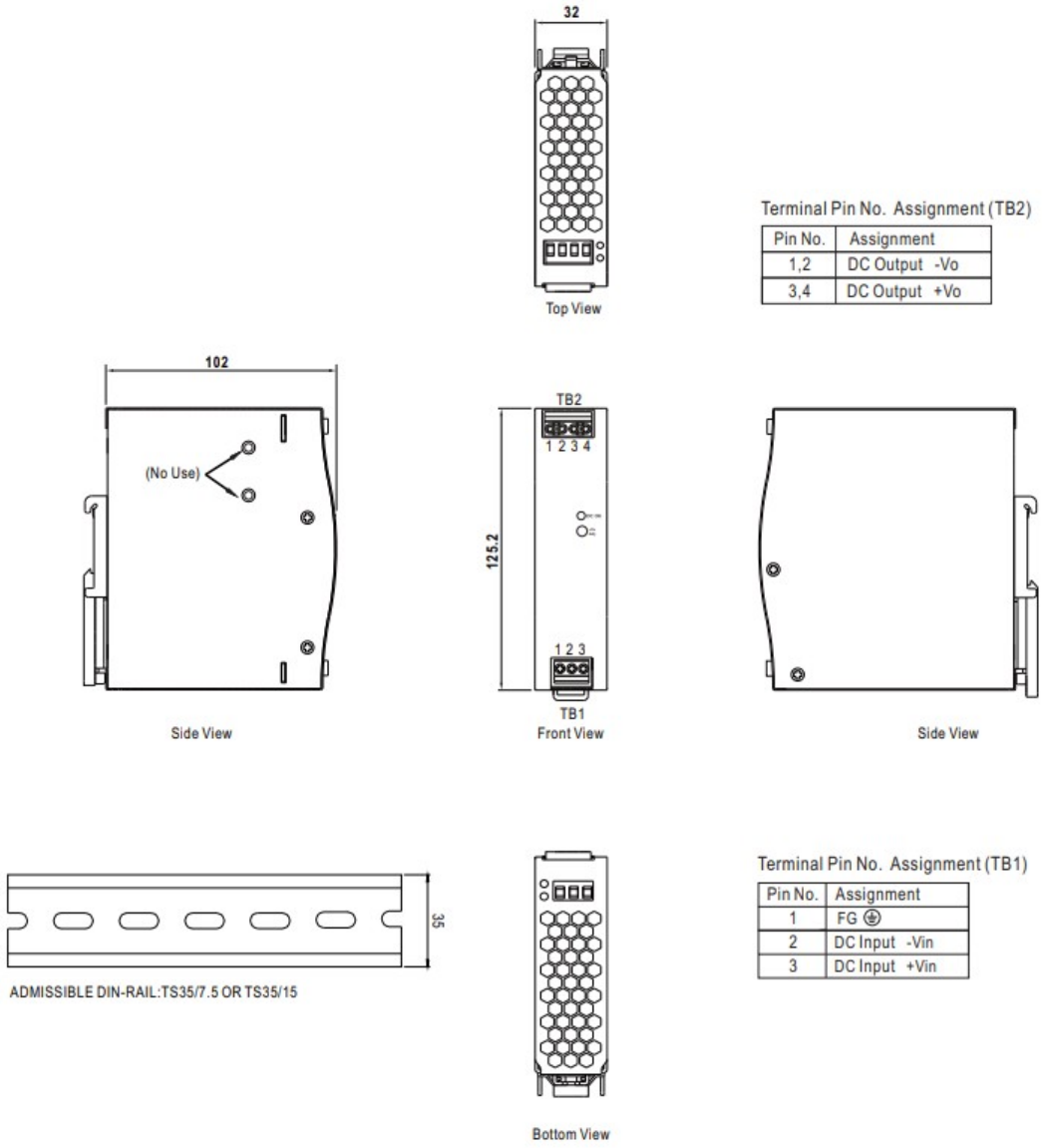

**Immunity to Environmental Conditions**

| Test method | Standard | Test conditions | Status |
|---|---|---|---|
| Cooling Test | EN 50155 section 12.2.3 (Column 2, Class TX) E N 60068-2-1 | Temperature: -40°C Dwell Time: 2 hrs/cy cle | No dama ge |
| Dry Heat Test | EN 50155 section 12.2.4 (Column 2, Class TX) EN 50155 section 12.2.4 (Column 3, Class TX & C olumn 4, Class TX) EN 60068-2-2 | Temperature: 70°C 1 85°C Duration: 6 hrs / 10min | PASS |
| Damp Heat Test, Cyclic | EN 50155 section 12.2.5 EN 60068-2-30 | Temperature: 25°C-5 5°C Humidity: 90%-1 00% RH Duration: 4 8 hrs | PASS |
| Vibration Test | EN 50155 section 12.2.11 EN 61373 | Temperature: 19°C Humidity: 65% Duration: 10 mins PASS | PASS |
| Increased Vibration Tes t | EN 50155 section 12.2.11 EN 61373 | Temperature: 19°C Humidity: 65% Duration: 5 hrs | PASS |
| Shock Test | EN 50155 section 12.2.11 EN 61373 | Temperature: 21 ± 3° C Humidity: 65 ± 5% Duration: 30ms*18 | PASS |
| Low Temperature Stora ge Test | EN 50155 section 12.2.3 (Column 2, Class TX) E N 60068-2-1 | Temperature: -40°C Dwell Time: 16 hrs | PASS |
| Salt Mist Test | EN 50155 section 12.2.10 (Class ST4) | Temperature: 35°C ± 2°C Duration: 96 hrs | PASS |

**EN45545-2 Fire Test Conditions**

| Test Items Hazard Level | | | | | |
|---|---|---|---|---|---|
| | Items | Standard | HL1 | HL2 | HL3 |
| R22 | Oxygen index t est | EN 45545-2:2013 EN ISO 4589-2:1996 | PASS | PASS | PASS |
| | Smoke density test | EN 45545-2:2013 EN ISO 5659-2:2006 | PASS | PASS | PASS |
| | Smoke toxicity test | EN 45545-2:2013<br>NF X70-100:2006 | PASS | PASS | PASS |
| R24 | Oxygen index t est | EN 45545-2:2013 EN ISO 4589-2:1996 | PASS | PASS | PASS |
| R25 | Glow-wire test | EN 45545-2:2013 EN 60695-2-11:2000 | PASS | PASS | PASS |
| R26 | Vertical flame t est | EN 45545-2:2013 EN 60695-11:2003 | PASS | PASS | PASS |

## Mechanical Specification




Installation Manual

Please refer to : http://www.meanwell.com/manual.html



## Documents / Resources

| | |
|---|---|
|  | MEAN-WELL DDR-120 Series 120W DIN Rail Type DC DC Converter [pdf] Owner's Manual<br>DDR-120 Series 120W DIN Rail Type DC DC Converter, DDR-120 Series, 120W DIN Rail Type DC DC Converter, Type DC DC Converter, DC Converter, Converter |

## References

- User Manual