



Certificate Number: 20210127X3-A6026

Date: 2023-07-14

UL CONDITIONS OF ACCEPTABILITY

Company Name: TRACO ELECTRONIC AG

File-CCN: E188913 - QQJQ2, QQJQ8

Product Description: DC-DC Converter

Models: TEN 10-11010WIRHaaaaaa, TEN 10-11011WIRHaaaaaa, TEN 10-11012WIRHaaaaaa, TEN 10-11013WIRHaaaaaa, TEN 10-11015WIRHaaaaaa, TEN 10-11021WIRHaaaaaa, TEN 10-11022WIRHaaaaaa, TEN 10-11023WIRHaaaaaa, TEN 3-11010WIRHaaaaaa, TEN 3-11011WIRHaaaaaa, TEN 3-11012WIRHaaaaaa, TEN 3-11013WIRHaaaaaa, TEN 3-11015WIRHaaaaaa, TEN 3-11021WIRHaaaaaa, TEN 3-11022WIRHaaaaaa, TEN 3-11023WIRHaaaaaa, TEN 6-11010WIRHaaaaaa, TEN 6-11011WIRHaaaaaa, TEN 6-11012WIRHaaaaaa, TEN 6-11013WIRHaaaaaa, TEN 6-11015WIRHaaaaaa, TEN 6-11021WIRHaaaaaa, TEN 6-11022WIRHaaaaaa, TEN 6-11023WIRHaaaaaa

Conditions Of Acceptability:

For use only in or with complete equipment where the acceptability of the combination is determined by UL LLC. When installed in an end-product, consideration must be given to the following:

- The following output circuits are at ES1 energy levels : Outputs for all models
- The following output circuits are at PS2 energy levels : Outputs for all models
- The investigated Pollution Degree is : 2
- The following end-product enclosures are required : Electrical, Fire, Mechanical
- The following magnetic devices (e.g. transformers or inductor) are provided with an OBJY2 insulation system with the indicated rating greater than Class A (105°C) : TX1 (Class F)
- The Class of equipment and AC Power Distribution Systems to which the end-use equipment is connected are to be evaluated when it's employed in the end-use equipment.
- The Current rating of protective device is to be determined when it's employed in the end-use equipment.
- The outputs of this component DC to DC Converter has been evaluated for PS2 and ES1. The ES classification of circuits and parts that are accessible to ordinary persons should be reconsidered when it's employed in the end-use equipment
- The terminals of this component DC to DC Converter are only suitable for factory wiring only.
- Upon request, an Electric Strength test voltage of 3000Vac has been applied between input and output/plastic enclosure and 2000Vac has been applied between output and plastic enclosure according to manufacturer's specification.



- The equipment has been evaluated for reinforced insulation and intended to be supplied by an isolated or non-isolated DC source. The transient voltage through the DC source is assuming up to 2500 Vpk maximum.
- All tests were tested in series with an external time delay fuse, having a current rating of 1.0 A.
- Tests for Abnormal operating and Single Fault conditions were carried out with an external, time-delay fuse having a current rating of 1.0 A. Tests should be repeated when it's employed in the end-use equipment with a differently rated overcurrent protective device.
- The need for suitable Electrical enclosure (for ES safeguard), fire enclosure (for PS safeguard), mechanical enclosure (for MS safeguard), and safeguard for thermal burn injury (for TS safeguard) are to be evaluated and provided (if necessary) when it's employed in the end-use equipment.

Ratings:

Models are similar to each other, except for output ratings, windings of transformer (TX1), circuit, PCB layout and model designation. See enclosures 7-01 for detail information.

| Model | Input rating | Output voltage | Output current | TX1 | PCB |
|------------------|--------------|----------------|----------------|-------|-----|
| TEN 10-11010WIRH | 36-160 Vdc | 3.3 Vdc | 2.500 A | X'FM1 | A |
| TEN 10-11011WIRH | | 5.1 Vdc | 2.000 A | X'FM2 | A |
| TEN 10-11012WIRH | | 12 Vdc | 0.830 A | X'FM4 | B |
| TEN 10-11013WIRH | | 15 Vdc | 0.670 A | X'FM5 | B |
| TEN 10-11015WIRH | | 24 Vdc | 0.416 A | X'FM4 | C |
| TEN 10-11021WIRH | | ±5 Vdc | ±1.000 A | X'FM3 | D |
| TEN 10-11022WIRH | | ±12 Vdc | ±0.416 A | X'FM4 | D |
| TEN 10-11023WIRH | | ±15 Vdc | ±0.333 A | X'FM5 | D |
| TEN 6-11010WIRH | | 3.3 Vdc | 1.800 A | X'FM1 | A |
| TEN 6-11011WIRH | | 5 Vdc | 1.200 A | X'FM2 | A |
| TEN 6-11012WIRH | | 12 Vdc | 0.500 A | X'FM4 | B |
| TEN 6-11013WIRH | | 15 Vdc | 0.400 A | X'FM5 | B |
| TEN 6-11015WIRH | | 24 Vdc | 0.250 A | X'FM4 | C |
| TEN 6-11021WIRH | | ±5 Vdc | ±0.600 A | X'FM3 | D |
| TEN 6-11022WIRH | | ±12 Vdc | ±0.250 A | X'FM4 | D |
| TEN 6-11023WIRH | | ±15 Vdc | ±0.200 A | X'FM5 | D |
| TEN 3-11010WIRH | | 3.3 Vdc | 1.000 A | X'FM6 | B |
| TEN 3-11011WIRH | | 5 Vdc | 0.600 A | X'FM7 | B |
| TEN 3-11012WIRH | | 12 Vdc | 0.250 A | X'FM8 | B |
| TEN 3-11013WIRH | | 15 Vdc | 0.200 A | X'FM9 | B |
| TEN 3-11015WIRH | 24 Vdc | 0.125 A | X'FM8 | C | |
| TEN 3-11021WIRH | ±5 Vdc | ±0.300 A | X'FM7 | D | |



| Model | Input rating | Output voltage | Output current | TX1 | PCB |
|-----------------|--------------|----------------|----------------|-------|-----|
| TEN 3-11022WIRH | 36-160 Vdc | ±12 Vdc | ±0.125 A | X'FM8 | D |
| TEN 3-11023WIRH | | ±15 Vdc | ±0.100 A | X'FM9 | D |

The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification in the following:

| Model | 36 -160 Vin | 72, 110 Vin |
|---------------|-------------|-------------|
| TEN 03 Series | 90 °C | 95 °C |
| TEN 06 Series | 85 °C | 90 °C |
| TEN 10 Series | 70 °C | 85 °C |

Nomenclature: a = alphanumeric, "-", "/" or blank for marketing purposes.