CERTIFICATE OF COMPLIANCE

Certificate Number	20171002-E28476
Report Reference	E28476-20120618
Issue Date	2017-OCTOBER-02
Issued to:	TYCO ELECTRONICS CORP 2901 FULLING MILL RD MIDDLETOWN PA 17057-3170
This is to certify that representative samples of	COMPONENT - CONNECTORS FOR USE IN DATA, SIGNAL, CONTROL AND POWER APPLICATIONS See Addendum
	Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	UL 1977, Component Connectors for Use in Data, Signal, Control and Power Applications CAN/CSA C22.2 No. 182.3-16, CAN/CSA C22.2 No. 182.3-16.
Additional Information:	See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

The UL Recognized Component Mark generally consists of the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory. As a supplementary means of identifying products that have been produced under UL's Component Recognition Program, UL's Recognized Component Mark: , may be used in conjunction with the required Recognized Marks. The Recognized Component Mark is required when specified in the UL Directory preceding the recognitions or under "Markings" for the individual recognitions.

Recognized components are incomplete in certain constructional features or restricted in performance capabilities and are intended for use as components of complete equipment submitted for investigation rather than for direct separate installation in the field. The final acceptance of the component is dependent upon its installation and use in complete equipment submitted to UL LLC.

Look for the UL Certification Mark on the product.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

CERTIFICATE OF COMPLIANCE

Certificate Number	20171002-E28476
Report Reference	E28476-20120618
Issue Date	2017-OCTOBER-02

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Motorman Hybrid Connector Cat. Nos. 0-2120319-2, 1-2120319-1, 0-2120320-1, 0-2120320-3, 0-2120325-1, 0-2120325-2, 0-2120325-3.

Motorman Hybrid Male Connector Cat. Nos. 2295893-1, -2, -3, 2295894-1, 1103426-1.

Motorman Hybrid Connector Cat. Nos. 2120320-1 and 2309877-1.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

DESCRIPTION

PRODUCT COVERED:

*USR, Motorman Hybrid Connector Cat. Nos. 0-2120319-2, 1-2120319-1, 0-2120320-1, 0-2120320-3, 0-2120325-1, 0-2120325-2, 0-2120325-3. Motorman Hybrid Male Connector Cat. Nos. 2295893-1, -2, -3, 2295894-1, 1103426-1.

USR, CNR - Motorman Hybrid Connector Cat. Nos. 2120320-1 and 2309877-1.

GENERAL:

These devices are male and female multi-pole hybrid with protective earth contact connectors intended for factory assembly on copper wire sizes as indicated in Ratings table below and soldered pin to PCB for the male connector. These devices may have metal or plastic housing. The devices are identified as follows:

USR indicates investigation to United States Standards, UL 1977.

CNR indicates investigation to Canadian National Standards, C22.2 No. 182.3.

RATINGS:

Motorman Hybrid Connector		Voltage Vac		Ampere A		Conductor Sizes, AWG Str
Power (2 or 3 pins)# Plastic and Metal housing		900		20		14
Control (2 pins)		50		20		14
Signal (1 to 5 pins)		50		2		21
Ethernet		50		0.5		27
2120320-1 employing Power contact: 1719840-3 (MCON 2.8mm), and mating connector Cat. No. 2309877-1 preloaded with (6) 2.8 mm Tab Contacts.		**900**		**15 (1)**		**14**

Note (1): 5 circuits energized (not PE/ground circuit)

Alternate Construction:

Motorman Hybrid Connector ##	Max. No. of contacts	Voltage Vac	Amperes A	Conductor Sizes, Cu Str
Power [contact: 1719840-3 (MCON 2.8mm)]	4	900	20	2.8 mm^2
Signal [contact: 1452653-2 (MCON 1.2mm)]	1	0	0	1.2mm^2

*

Signal [contact: 1658686-1 (HDP22)]	2	0	0	22 AWG

Note (#): Contact chamber "Pos.1" of *Female Housing* not used. 2 pins for connector with plastic housing and 3 pins for connector with metal housing.

Power circuit Type 5
Control circuit Type 2
Signal circuit Type 1A
Ethernet circuit Type 1A

Note (##): Signal contacts provided are not energized.

Disconnecting Use - see Sec Gen for required marking

Nomenclature.

0-2120319-2 Receptacle Housing (female connector) Code B
1-2120319-1 Receptacle Housing (female connector) Code A
0-2120320-1 Female Insert with PE Contact – Code A
0-2120320-3 Female Insert with PE Contact – Code C

0-2120325-1 Tab Housing (male connector) Code A
0-2120325-2 Tab Housing (male connector) Code B
0-2120325-3 Tab Housing (male connector) Code C

Code A, B and C are for commercial purposes (different customers) any other differences.

TECHNICAL CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

Use - For use only in or with complete equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.

Conditions of Acceptability - The following are among the considerations to be made when evaluating the device in the end-use product.

Interruption of Current

1. These devices are not suitable for interrupting the flow of current by connecting or disconnecting the mating connector.

Current-Carrying Capability and Current Ratings

2. These devices have been subjected to the Temperature test with the rated currents and maximum temperature rise values tabulated below.

Circuit	Current, (A) UR	Maximum UR Temp. recorded (°C)
Power	20	62.2
Control	20	62.2
Signal	2	62.2
Ethernet	0.5	62.2

*

Series Motorman Hybrid Male

Circuit	Current, (A) UR	Maximum UR Temp. recorded (°C)
Power	20	79.5
Signal	2	58.5
Ethernet	0.5	65.6

Alternate Construction:

Motorman Hybrid Connector	Max. No. of contacts	Amperes A	Conductor Sizes, Cu Str	Maximum Temperature, °C
Power [contact: 1719840-3 (MCON 2.8mm)]	4	20	2.8 mm^2	53.1

Motorman Hybrid Connector	**Max. No. of contacts**	**Amperes A**	**Conductor Sizes, Cu Str**	**°C**	
				Max Temp (1)	**Max Temp Rise**
2120320-1 employing Power contact: 1719840-3 (MCON 2.8mm), and mating connector Cat. No. 2309877-1 preloaded with (6) 2.8 mm Tab Contacts.	**5**	**15**	**14 AWG**	**43.8**	**18.8**

Note (1): recorded temperature adjusted to 25°C ambient
*

Spacings Greater than 600 V

3. Metal housing connector have been evaluated at potentials of 3800 Vac based on the minimum 9.5 mm through air and 12.7 mm over surface required by UL 508C, the Standard for Industrial Control Equipment, which covers the end-use products for which the devices were designed.

Insulating Materials

4. These devices employ insulating materials with properties as tabulated below at the minimum thickness employed in the connector housing, the suitability of the insulating materials based on the documented values shall be determined in the end-use application. Please note the values specified in the table when multiple materials are indicated represent the minimum values for the group of materials.

Cat. No.	Insulating Material (#)	Measured Minimum Thickness	Flame Class	HWI	HAI	RTI Elec		Max Operating Temp, ^{0}C
Power and control Insert (female)	A	0.90 mm	V-0	3	0	130		130
Tab Housing, Power (male)	A	0.90 mm	V-0	3	0	130		130
Signal Insert (female)	B	0.75 mm	V-0	4	1	120		120
Tab Housing, Signal (male)	B	0.75 mm	V-0	4	1	120		120
Ethernet Insert (female)	C	1.50 mm	V-0	2	0	130		130
Ethernet, Insert, Cover (Male)	C	1.50 mm	V-0	2	0	130		130
Tab Housing (male)	D	0.77 mm	V-0	4	0	220		130
Hood/ Cover	E	0.75 mm	V-0	0	0	130		130
Hood/ Cover	F	0.75 mm	V-0	3	0	130		130

(#) - Code for Insulating Body Material.

A. Tyco Electronics (TE) Raw Material PN 1573755. 1. Dielectric strength (kV/mm): 27
2. CTI: 3

B. TE Raw Material PN 26864
1. Dielectric strength (kV/mm): 22
2. CTI: 3

C. TE Raw Material PN 703292
1. Dielectric strength (kV/mm): 27
2. CTI: 2

D. TE Raw Material PN 704296 or 2136283
1. Dielectric strength (kV/mm): --
2. CTI: 3

E. TE Raw Material No. 16410
1. Dielectric strength (kV/mm): --
2. CTI: 2

F. TE Raw Material No. 704654
1. Dielectric strength (kV/mm): 30
2. CTI: 3

5. A Strain Relief Test was performed on the female connectors according to CSA/C22.2 No. 182.3- M1987 with a force of 133 N.

6. The quick connect terminals of the male connector types 1.2 x 0.6 mm (PN 2120323-X) and 2.8 x 0.6 mm (PN 2120322-X) have not been evaluated as quick connectors and their suitability shall be deemed at the end-use application.

Miscellaneous

7. The devices contained herein may be comprised of or provided with the following accessories the suitability of which shall be determined in the end-use:

Motorman Hybrid Connector
A. Metal Hood 2120197-X
B. Cover (Metal Hood) 2120200-X
C. Metal Hood Kit 2120330-1
D. Plastic Hood 2120342
E. Cover (Plastic Hood) 2120344-X
F. Plastic Hood Kit 2120340-1
G. Cable Seal 2120337-1
H. System Seal 2120332-X
I. Protection Cover 2120336-X
J. Gland Plate 2120338-X
K. Side Clip 1245276-X or 2120339-1
L. Ethernet Insert, Female 1103427-2
M. Ethernet Insert, Male 2120328-X
N. Ethernet Pin 2120329-X
O. Signal Housing 2120321-1
P. Tab Housing 2120324-X
Q. Dust Cap 1108847-1
R. Crimp Sleeve Kit 2120432-3

Motorman Hybrid Male Connector
A. Shroud (for plastic version) 2295892-1
B. Side Clip (for plastic version) 2295895-1
C. Locking Slider (for plastic version) 2297012-1
D. Flange Sealing (for metal & plastic versions) 2295897-1
E. Screen Clamp & Gland Plate (for metal & plastic versions) 2295891-1 Screen Clamp 2120338-1 Gland Plate
F. Shroud (for metal version) 2295889-1
G. Side Clip (for metal version) 2295896-1
H. Locking Slider (for metal version) 2295896-1

8. The following contacts are intended for assembly with their respective crimp tools (for information purposes only):

Contact	Crimp Tool
1452653-2 (MCON 1.2mm)	7-1528157-2
1658686-1 (HDP 22)	466423
1719840-3 (MCON 2.8mm)	1528633-1