

MANUFACTURER'S DECLARATION

E213337-Vol1-Sec2

Scope

This manufacturer's declaration confirms that the products listed below, manufactured by **HUMMEL AG**, have been assessed in accordance with the specified **standards, regulations and/or legal requirements** and comply with the applicable requirements, unless product-specific deviations are explicitly documented.

Products

PRODUCT COVERED:

USR Component Connector, Series M16, M23 (5+3+PE) (Power/Signal),
M23 (ethernet/signal/power) size 1, M40 (ethernet/signal/power) size 1.5 and
M40 Size 1.5

*USR Component Connector,
M16 4+3+PE (**Power/Signal**), Insert M16 6+PE male and female, Insert M40
4+3+PE male and female, Insert M40 2+3+PE male and female, insert M23
(4+4+3+PE) male and female,
insert M40 (2+6+4+PE) male and female, insert M40 (6+6+4+PE) male and female.

USR/CNR Component Connector, M23(5+PE) (Power), M23(4+3+PE) (Power/Signal)
Size 1, M16 (**4+4**) (**power/signal**, M16 (**8 poles**) (**Power/Signal**)

GENERAL:

These devices are multi-pole connectors intended for factory assembly where
the acceptability of combinations is determined by Underwriters Laboratories
Inc.. The devices are identified as follows:

Electrical Ratings:

Series	No. of Poles	Wire Size (AWG) Power/signal	Current (A)		Voltage (V) AC/DC Power/signal
			USR Power/signal	CNR Power/signal	
M16	10	18	8	-	160
M16	10	26	8	-	160
M16	3	18	8	-	400
M16	3	26	8	-	400
M23 (Power)	6 (5+PE)	12	28	-	600
M23 (Power)	6 (5+PE)	18	14	-	600
M16 (8 poles) (Power/Signal)	8	16 / 22	16 / 5	11 / 4	320 / 160
M23 (Power)	6 (5+PE)	18	14	-	600Vac/(800 Vdc)
		12	28	-	600Vac/(800 Vdc)
		12	30	20	600Vac/(800 Vdc)
M23 (Power/Signal)	8 (4+3+PE)	12 / 18	30 / 8	20 / 5	600Vac(800 Vdc) / 300 Vdc/ac
		12 / 18	28 / 8	-	600Vac (800 Vdc) / 300 Vdc/ac
		18 / 24	10 / 3	-	600Vac (800 Vdc) / 300 Vdc/ac
		18 / 24	8 / 3	-	600Vac (800 Vdc) / 300 Vdc/ac
M23 (Power/Signal)	9 (5+3+PE)	18 / 24	8 / 3	-	600Vac (800 Vdc) / 250 Vdc/ac
		12 / 18	30 / 8	-	600Vac(800 Vdc) / 300 Vdc/ac
M16	3	14/20	20/5	-	630
M16 (Power/Signal)	3/12	16/28	10/0.5	-	160/60
M16 (Power/Signal)	3/12	18/26	8/1	-	160/60
M16 (Power/Signal)	3/12	20/24	5/2	-	160/60
M16 (Power/Signal)	3/12	20/22	5/3.5	-	160/60
M16	18	28	0.5	-	60
M16	18	26	1	-	60
M16	18	24	2	-	60
M16	18	22	3.5	-	60
M16 4+3+PE (power/signal)	3+PE/4	16/22	16/5	-	600/300
M16 (4+4) (power/signal)	4+4	14/22	25/5	13/4	60/160
		- (2)			
M16 6+PE	6+PE	16/22	16	-	600
M40 4+3+PE (Power/Signal)	8	6 / 12	55 / 28	-	600 / 300
M40 4+3+PE (Power/Signal)	8	16 / 20	14 / 10	-	600 / 300
M40 2+3+PE (Power/Signal)	6	6 / 12	55 / 28	-	600 / 300
M40 2+3+PE (Power/Signal)	6	16 / 20	14 / 10	-	600 / 300

Note:

2 - for female respectively employed with wires: 14AWG for power and 22AWG for signal poles and only for male mating part employed with soldering pins mounted on Printed Wiring Board - Any R/C (ZPMV2).

coun't Electrical Ratings:

Series	No. of Poles	Wire Size (AWG)	Current (A)	Voltage (V) AC/DC
M23 (4+4+3+PE) (ethernet+signal+power+PE)	ethernet 4	28-24	0.5	60
		22	3.5	
	signal 4	26-18	1	300
		16	16	
	power 3+PE	18	8	600
		16	16	
		14	20	
		12	28	
M40 (2+6+4+PE) M40 (6+6+4+PE) (ethernet+signal+power+PE)	ethernet 2	26-24	0.5	30
		22	3.5	
	ethernet 6	30-26	0.2	
		24	2	
	signal 6	22	3.5	150/300 (1)
		26-18	1	
	power 4+PE	16	16	600
		16	16	
		14	20	
		12	28	
		10	35	
		8	42	
		6	55	

Note:

1 - connected all 6 pins: U=150V for 4 pins (1,2,+,-) and U=300V for 2 pins (A,B) or connected 4 of 6 pins

Assessment Basis / Standard

Regulation / Standard	Test Description
UL File E213337	Specific conditions

ENGINEERING CONSIDERATIONS (NOT FOR UL REPRESENTATIVE 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 - In order to be judged acceptable as a component of electrical equipment, the following conditions should be met.

Interruption of Current

1. These devices have not been tested for interrupting the flow of current by connecting or disconnecting the mating connector. These devices should be used only where they will not interrupt the flow of current.

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. Devices with number of poles that differ from that shown in this table, have not been evaluated. The conductors terminated by the device and other associated components are to be reviewed in the end-use to determine whether the temperature rise from the connector exceeds their maximum operating temperature ratings.

Series	No. of Poles	Wire Size (AWG) Power/signal	Current (A)		Max. Temp, °C	
			USR Power/signal	CNR Power/signal	USR Recorded Power/signal	CNR Rise Power/signal
M16	10	18	8	-	77	
M16	10	26	8	-	105.2	
M16	3	18	8	-	49	
M16	3	26	8	-	104	
M23 (power)	6 (5+PE)	12	28	-	119.8	
M23 (power)	6 (5+PE)	18	14	-	112.2	
M23 (power)	6 (5+PE)	12	30	20	89.0	29.1
M16 (8 poles) (Power/Signal)	8	16 / 22	16 / 5	11 / 4	82.4/78.8	28.8/27.7
M23 (Power/Signal)	8 (4+3+PE)	12 / 18	28 / 8	-	91.1/83.4	
M23 (Power/Signal)	8 (4+3+PE)	18 / 24	10 / 3	-	118.9/117.9	
M23 (Power/Signal)	8 (4+3+PE)	12 / 18	30 / 8	20 / 5	76.5/68.3	23.6/20.0
M23 (Power/Signal)	9 (5+3+PE)	18 / 24	8 / 3	-	43.6	
M16	3	14	20	-	66.3	
M16	3	16	10	-	38.6	
M16	3	18	7	-	38.6	
M16	3	20	5	-	33.4	
M16 (4+4) (power/signal)	4+4	14/22	25/5	13/4	110.1/102.4	27.9/29.2
M16 (4+4) (power/signal)	4+4	(1)	25/5	13/4	93.3/102.1	23.7/25.8

Note:

1 - for female respectively employed with wires: 14AWG for power and 22AWG for signal poles and only for male mating part employed with soldering pins mounted on Printed Wiring Board - Any R/C (ZPMV2).

Series	No. of Poles	Wire Size (AWG)	Current (A)	Max. Temp, °C
M16 (Power/Signal)	3/12	16/28	10/0.5	47.5/44.0
M16 (Power/Signal)	3/12	18/26	8/1	48.5/44.0
M16 (Power/Signal)	3/12	20/24	5/2	44.6/43.0
M16 (Power/Signal)	3/12	20/22	5/3.5	57.3/55.5
M16	18	28	0.5	32.3
M16	18	26	1	32.5
M16	18	24	2	37.3
M16	18	22	3.5	69.6
M16 4+3+PE (Power/Signal)	3+PE/4	16/22	16/5	79.4/76
M16 6+PE	6+PE	16/20	16	104.2
M40 4+3+PE (Power/Signal)	8	6 / 12	55 / 28	80.9 / 85.8
M40 4+3+PE (Power/Signal)	8	16 / 20	14 / 10	120 / 118.9
M40 2+3+PE (Power/Signal)	6	6 / 12	55 / 28	80.9 / 85.8
M40 2+3+PE (Power/Signal)	6	16 / 20	14 / 10	120 / 118.9
M23 (4+4+3+PE) (ethernet/signal/power)	12 (4+4+3+PE)	22/16/12	3.5/16/28	107.3/107.7/104.6
		22/16/16	3.5/16/16	107.2/111.6/105.1
		24/16/16	2/16/16	113.6/121.5/110.3
M40 (6+6+4+PE) (ethernet/signal/power)	17 (6+6+4+PE)	22/16/ 6	3.5/16/55	108.2/112.4/106.2
		24/16/12	2/16/28	112.7/113.8/118.3
M23 (Power/Signal)	9 (5+3+PE)	12 / 18	30 / 8	52.4 / 41.4

		18 / 24	8 / 3	-	600Vac (800 Vdc) / 250 Vdc/ac
				-	600Vac(800 Vdc) / 300 Vdc/ac

Spacings and Voltage Ratings

3. Dielectric-Voltage-Withstand testing has been conducted between adjacent poles at the following potentials.

Series	No. of Poles	Voltage rating (V)	Test Voltage (V)
M16	10	160	1320
M16	3	400	1800
M23 (power)	6 (5+PE)	600 Vac and 800 Vdc	2200 Vac and 3640 Vdc
M16 (8 poles) (Power/Signal)	8	320 / 160	1640
M23 (Power/Signal)	8	600 / 300	2200 / 1600
M23 (Power/Signal)	8 (4+3+PE)	600 Vac and 800 Vdc / 300 Vdc/ac	2200 Vac and 3640 Vdc / 1600 Vdc/ac
M23 (Power/Signal)	9 (5+3+PE)	600 Vac and 800 Vdc / 250 Vdc/ac	2200 Vac and 3640 Vdc / 1500 Vdc/ac
M16	3	630	2260
M16 (Power/Signal)	3/12	160/60	1320 / 1120
M16	18	60	1120
M16 4+3+PE (Power/Signal)	3+PE/4	600 / 300	2200 / 1600
M16 6+PE	6+PE	600	2200
M40 4+3+PE (Power/Signal)	8	600 / 300	2200 / 1600
M40 2+3+PE (Power/Signal)	6	600 / 300	2200 / 1600
M23 (4+4+3+PE) (ethernet/signal/power)	12 (4+4+3+PE)	60 / 300 / 600	1120/1600/2200
M40 (6+6+4+PE) (ethernet/signal/power)	17 (6+6+4+PE)	30/(150/300)/600	-* /(1300/1600)/2200
M40 (2+6+4+PE) (ethernet/signal/power)	12 (2+6+4+PE)	30/(150/300)/600	-* /(1300/1600)/2200
M16 (4+4) (power/signal)	4+4	60/160	1120/1320
M16 (4+4) (power/signal)	4+4	60/160	1120/1320 (1)
M23 (Power/Signal)	9 (5+3+PE)	600Vac(800 Vdc) / 300 Vdc/ac	2200 Vac / 1600 Vac

Note: * - type 0 - Dielectric test is not required.

1 - The measurement of spacings and Dielectric Voltage-Withstand test were performed at unsoldered and unmounted connectors on PCB. The Dielectric Voltage-Withstand test were performed at 1120/1320 Vac. The Dielectric Voltage-Withstand test must be performed after soldering connectors on PCB in end use application. Measurement of spacings must be performed after soldering connectors on PCB in end use application. Accordance of measured values of spacings after soldering connectors on PCB should be considered with requirements of end use application.

Basis of Assessment

This declaration is based on:

- // Information and declarations provided by our suppliers
- // Internal material, product and risk assessments
- // Reasonable and appropriate verification and control measures

This declaration does not constitute a certification or official approval unless such certification is explicitly required by applicable legislation.

Validity

This manufacturer's declaration is valid from the date of issue and remains valid for a period of **5 years**, provided that no changes occur to the products, materials, supply chains or applicable legal requirements. In the event of significant changes, this declaration will be reviewed and updated accordingly.

Liability

All information provided in this declaration has been prepared to the best of our knowledge and belief. Any liability for the completeness and accuracy of supplier-provided information is excluded to the extent permitted by law. This declaration does not constitute a warranty or guarantee of specific product characteristics.

HUMMEL AG



Bernd Hotze
CSO / CTO



On behalf of: Christian Latte
Head of TEC