



Appendix 1

Order Description

Delivery of the ROB testing holders

1. Introduction

The following specification covers the supply of ROB holders (Electro mechanical Test Equipment for interfacing the connectors) for the electrical inspection of wire harnesses produced on an automated line.



Figure 1 Left: ROB station; Right: ROB connector testing holder

2. Corporate Specification and Legal Requirements

Supplier agrees to comply with the latest revisions (unless otherwise specified) of the following Core Safety Specifications and International Safety Standards. Compliance with International Safety Standards is required, which apply to specific types of custom-built machinery. Any deviation by the supplier from these specifications must be approved in writing by the Global Occupational Health and Safety Officer.

Specification / legal requirements	summary
1. <u>Export Control Classification Number ECCN</u>	US requirement The ECCN is an alphanumeric code such as 3A001 that describes the product and indicates the export license requirements.



2. <u>Machinery Hazard Identification and Risk Assessment</u> Requires Machinery Risk Assessment Analysis (or equivalent)	The risk assessment of machinery must comply with the requirements set out in ISO standards.
3. Aptiv Electrical/Electronic Architecture ESD Engineering Specification C-9000	Not applicable
4. <u>Machinery EHS Checklist</u>	The requirements of the machine EHS checklist must be followed.
5. <u>Sound Level Specification for Equipment Suppliers</u> 6. <u>Sound Level Specification Test</u>	The 8-hour time-weighted average (TWA) of the A-sound level must not exceed 80 dBA at ANY of the designated measurement locations within the machine's measurement envelope and within the operator's hearing zone while the machine is operating.
7. <u>Design-In Ergonomics Guidelines and Design-In Ergonomics Checklist for Equipment or Workstation</u>	Machines must meet all country-specific ergonomic requirements, or failing that, comply with Aptiv's ergonomic guidelines.
8. <u>Equipment Energy efficiency guidelines</u>	Energy efficiency is one of the procurement evaluation criteria. The supplier should consider opportunities to improve energy efficiency and operational control when designing new equipment. The supplier will consider opportunities to improve energy efficiency and operational control when designing new equipment in accordance with the Aptiv Equipment Energy Efficiency Guidelines.
<i>The latest version of the following ISO standards applies:</i>	
9. ISO 4413 Standard for hydraulics	
10. ISO 4414 Standard for pneumatics	
11. ISO 10218-1 Robots and their accessories	
12. ISO 10218-2 Integration of robots and robotic devices	
13. ISO/TS 15066 Robots and robotic devices - Collaborative robots	
14. ISO 1161 Safety of machinery - Integrated manufacturing systems - Basic requirements	
15. ISO 12100 Safety of machinery - general design principles - risk assessment and risk reduction	
16. ISO 13849-1:2006 Safety of machinery - Safety-related components of control systems - Part 1: General design principles	
17. ISO 13850 Safety of machinery - Emergency stop - Design principles	
18. ISO 13854 Safety of machinery - Minimum clearances to avoid crushing parts of the human body	
19. ISO 13855 Safety of machinery - Arrangement of safeguards in relation to the approach speed of parts of the human body	
20. ISO 13856 (all parts) Safety of machinery.	



21.	ISO 13857 Safety of machinery - Safety distances to prevent upper and lower limbs from reaching danger zones	
22.	ISO 14118 Safety of machinery - Prevention of unexpected start-up	
23.	ISO 14119 Safety of machinery - Locking devices associated with guards - Principles of design and selection	
24.	ISO 14120 Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards	
25.	ISO 14122 (all parts) Safety of machinery - Permanent means of access to machinery	
26.	IEC 60204-1 Safety of machinery - Electrical equipment of machines - Part 1: General requirements	
27.	IEC 61496-1 Safety of machinery - Electrosensitive. Protective equipment - Part 1: General requirements and tests	
28.	IEC 61800-5-2 Adjustable speed electrical drive systems - Part 5-2: Safety requirements - Functional	
29.	IEC/TS 62046 Safety of machinery - Use of protective equipment to detect the presence of persons.	
30.	IEC 62061 Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems	
31.	ISO 3864-1 Graphical symbols - Safety colors and safety signs - Part 1: Design principles for safety signs and safety markings	
32.	ISO 11151-1 and ISO 11151-2 - Lasers and laser equipment - Standard optics	
33.	IEC 60825-SER Ed. 1.0 b - Safety of laser products	
34.	ISO 11553-1 - Safety of machinery - Laser processing machines	
35.	ISO 11929; ISO 7212 - Ionizing radiation	
36.	IEC 61340-5-1 - Electrostatics - Part 5-1: Protection of electronic devices against electrostatic phenomena - General requirements	
37.	IEC/TR 61340-5-2 - Electrostatics - Part 5-2: Protection of electronic devices against electrostatic phenomena - User's manual	

3. CONNECTOR HOLDER REQUIREMENTS

The holders must be able to be installed on the existing ROB frame at Aptiv, and should allow for the connection of connector test modules along with electrical test equipment.



4. CONNECTOR HOLDER SUMMARY

1		Module Type	Qty
1.1	Electrical Test Modules	PM- Standard pneumatic module	14
2		Test point (Pins=Probes)	
2.1		Threated test probes	10
		Step Probes	80
3		Detections	
3.1	Detection Requirements	Secondary Lock / Spacer (V)	1
3.2		Secondary Lock / Spacer (H)	26
3.3		Lever/ Slider (V)	1
3.4		Cover (H)	1
3.5		Clip (V)	1
3.6	Detection Options	Color detection	7
4		Additions	
4.1		Automatic expulsion of connector	14

5. CONNECTOR SPECIFICATION

GENERAL INFORMATION	Customer drawing number / change number	TAB_019_762 / TAB_019_763	TAB_019_762	TAB_019_762 / TAB_019_763	TAB_019_762 / TAB_019_763	TAB_019_762 / TAB_019_763	TAB_019_762 / TAB_019_763	TAB_019_762 / TAB_019_763
Component Information	ID DPN	10889272 + 35102110	13581332	13691237	13677977	13677977	35035017	33142718
	Cust ID (Manufacturer)	380_972_734 + 565_971_890_A	1K0_972_704_C	8K0_973_754_A	8K0_973_754	8K0_973_754	1J0_973_332	8W0_971_832
	Holder No.	3LSP	FHS	ZZG	AMB1 / AMB2	TIG	LTSPMT	ESTL
	Number of Cavities	8	4	4	4	4	2	2
	Gender/ Type of terminal (male/ female)	MALE	FEMALE	FEMALE	FEMALE	FEMALE	MALE	FEMALE
	Component Color	Black	Black	Brown	Black	Black	Black	Black
	Connector sealed [yes/no]	No	No	No	No	No	No	No
	Description (GSD)	CONN 8 M 1.5 BLK + MOUN CLIP CONN BLK	CONN 4 F 0.64 MQS BLK	CONN 4 F 0.64 MQS BRN	CONN 4 F 0.64 MQS BLK	CONN 4 F 0.64 MQS BLK	CONN 2 M DCS-2 1.5 BLK	CONN 2 F 0.64 MQS BLK
	Comment and/or specification (PLEASE FOLLOW OUT REQUIREMENTS)	Assure the presence and correct fit of the terminals Assure the presence and correct closure of the internal lock Assure the presence and correct fit of the mounted connector clip Assure correct plugging of terminals and detect unseated ones by using correct pins	Assure the presence and correct fit of the terminals Assure the presence and correct closure of the internal lock Differentiate from similar ones Assure correct plugging of terminals and detect unseated ones by using correct pins	Assure the presence and correct fit of the terminals Assure the presence and correct closure of the internal lock Differentiate from similar ones Assure correct plugging of terminals and detect unseated ones by using correct pins	Assure the presence and correct fit of the terminals Assure the presence and correct closure of the internal lock Differentiate from similar ones Assure correct plugging of terminals and detect unseated ones by using correct pins	Assure the presence and correct fit of the terminals Assure the presence and correct closure of the internal lock Differentiate from similar ones Assure correct plugging of terminals and detect unseated ones by using correct pins	Assure the presence and correct fit of the terminals Assure the presence and correct closure of the internal lock Assure correct plugging of terminals and detect unseated ones by using correct pins	Assure the presence and correct fit of the terminals Assure the presence and correct closure of the internal lock Assure correct plugging of terminals and detect unseated ones by using correct pins
	Block Occup. Compl. Or 1/2 Block	Small as possible	Small as possible	Small as possible	Small as possible	Small as possible	Small as possible	Small as possible
ELECTRICAL TEST MODULES	PM - Standard pneumatic module	1	1	1	1	1	1	1
PROBES	Threated Test Probes	8					2	
	Step Probes		4	4	4	4		2
DETECTION REQUIREMENTS	Secondary Lock / Spacer (V)							
	Secondary Lock / Spacer (H)	4	2	2	2	2	2	2
	Lever/Slider (V)							
	Cover (H)							
	Clip (V)	1						
DETECTION OPTIONS	Color detection		1	1	1	1		
ADDITIONAL	Automatic expulsion of connector	1	1	1	1	1	1	1
GENERAL INFORMATION	Customer drawing number / change number	TAB_019_762 / TAB_019_763	TAB_019_763	TAB_019_763	TAB_019_763	TAB_019_763	TAB_019_763	TAB_019_763
Component Information	ID DPN	13648928 + 13648918	13888659	13581332	13593711	13581333	33380431 + 33380381	15364070
	Cust ID (Manufacturer)	1J0_972_977_D	SC0_971_974	1K0_972_704_C	1K0_972_704_E	1K0_972_704_G	6C0_972_706_A	1J0_973_119
	Holder No.	TSGD_BF_2 / TSGD_F_2	FHST	TFEH	TFEH2	SLU	SVS	TBL
	Number of Cavities	32	10	4	4	4	6	2
	Gender/ Type of terminal (male/ female)	FEMALE	FEMALE	FEMALE	FEMALE	FEMALE	FEMALE	FEMALE
	Component Color	Natural + Blue	Black	Black	Brown	Blue	Brown	Black
	Connector sealed [yes/no]	No	No	No	No	No	No	No
	Description (GSD)	CONN 32 F 0.63 MQS NAT + ASM COV CONN MQS BLU	CONN 10 F 0.63 BLK	CONN 4 F 0.64 MQS BLK	CONN 4 F 0.64 MQS BRN	CONN 4 F 0.63 MQS BLU	CONN 6 F MQS 0.64 BRN + LOCK SECONDARY TPA 6 BRN	CONN 2 F 1.5 BLK
	Comment and/or specification (PLEASE FOLLOW OUT REQUIREMENTS)	Assure the presence and correct fit of the terminals Assure the presence and correct assembly of the cover Assure lever in pre-locked position Assure correct plugging of terminals and detect unseated ones by using correct pins	Assure the presence and correct fit of the terminals Assure the presence and correct closure of the internal lock Assure correct plugging of terminals and detect unseated ones by using correct pins	Assure the presence and correct fit of the terminals Assure the presence and correct closure of the internal lock Differentiate from similar ones Assure correct plugging of terminals and detect unseated ones by using correct pins	Assure the presence and correct fit of the terminals Assure the presence and correct closure of the internal lock Differentiate from similar ones Assure correct plugging of terminals and detect unseated ones by using correct pins	Assure the presence and correct fit of the terminals Assure the presence and correct closure of the internal lock Differentiate from similar ones Assure correct plugging of terminals and detect unseated ones by using correct pins	Assure the presence and correct fit of the terminals Assure the presence and correct closure of the internal lock Assure correct plugging of terminals and detect unseated ones by using correct pins	Assure the presence and correct fit of the terminals Assure the presence and correct closure of the internal lock Assure correct plugging of terminals and detect unseated ones by using correct pins
	Block Occup. Compl. Or 1/2 Block	Small as possible	Small as possible	Small as possible	Small as possible	Small as possible	Small as possible	Small as possible
ELECTRICAL TEST MODULES	PM - Standard pneumatic module	1	1	1	1	1	1	1
PROBES	Threated Test Probes							
	Step Probes	32	10	4	4	4	6	2
DETECTION REQUIREMENTS	Secondary Lock / Spacer (V)						1	
	Secondary Lock / Spacer (H)		1	2	2	2	1	2
	Lever/Slider (V)	1						
	Cover (H)	1						
	Clip (V)							
DETECTION OPTIONS	Color detection			1	1	1		
ADDITIONAL	Automatic expulsion of connector	1	1	1	1	1	1	1



6. DOCUMENTATION

It is important that prints for manufacturing machinery meet Aptiv Business Unit's standards for machinery drawings. Maintenance cannot effectively repair machinery without good documentation. EDR-01 specifies electrical documentation requirements. Sufficient mechanical drawings to allow technicians and engineering to make repairs or improvements including assemblies and tooling should be requested.

All drawings, diagrams generated in this project will be owned by Aptiv in its latest version and in an editable format.

A list of recommended spare parts with the Original Item Manufacturer (OIM) part name and part number cross referenced to the Original Equipment Manufacturer (OEM) part name and number should be requested. This applies to any chemical supplies as well as mechanical and electrical parts.

Maintenance manual:

- Installation instructions,
- Calibration procedures if applicable,
- Operational troubleshooting of common machine problems and solutions,
- Preventive maintenance schedules, procedures with lubricants to be used,
- Clear and precise definition of tools needed for each maintenance routine,
- Safety data sheets of the lubricants to be used,
- Maintenance troubleshooting,
- Machinery consumption of Air and Power,
- Detailed electrical scheme,
- Detailed pneumatic scheme,
- Troubleshooting,
- Clear definition of tools needed for each routine with detailed instruction with pictures.

Note: No flammable lubricants are allowed

Spare parts list:

- Machine assembly views that reference vendor part numbers
- Exploded views of all machine parts (arrangement views with parts called out)
- Bill of material
- Spare parts list divided in 3 categories:
 - Category 1: in plant stock of spare parts that the workstation depends on to operate properly. Parts one cannot predict when it will fail/break.
 - Category 2: regional stock of spare parts that are subject to wear and has a predicted lifespan. Parts that has a predicted lifecycle.
 - Category 3: in supplier's stock of spare parts that the workstation does not depend on to perform its operations.

Process / EHS documentation:

- CE
- EHS checklist

All deviations / exceptions must be agreed with ordering engineer from Aptiv.

7. SHIPPING INFORMATION /

The ROB holders must be delivered to Aptiv's production facility in Zywiec.



Fundusze Europejskie
dla Nowoczesnej Gospodarki



Rzeczpospolita
Polska

Dofinansowane przez
Unię Europejską



NCBR
Narodowe Centrum Badań i Rozwoju

64 Lesniana St., 34-300 Zywiec, Poland.

Packaging materials must be properly stored for future transfer activities.
Shipping must be included in the cost of the equipment.