



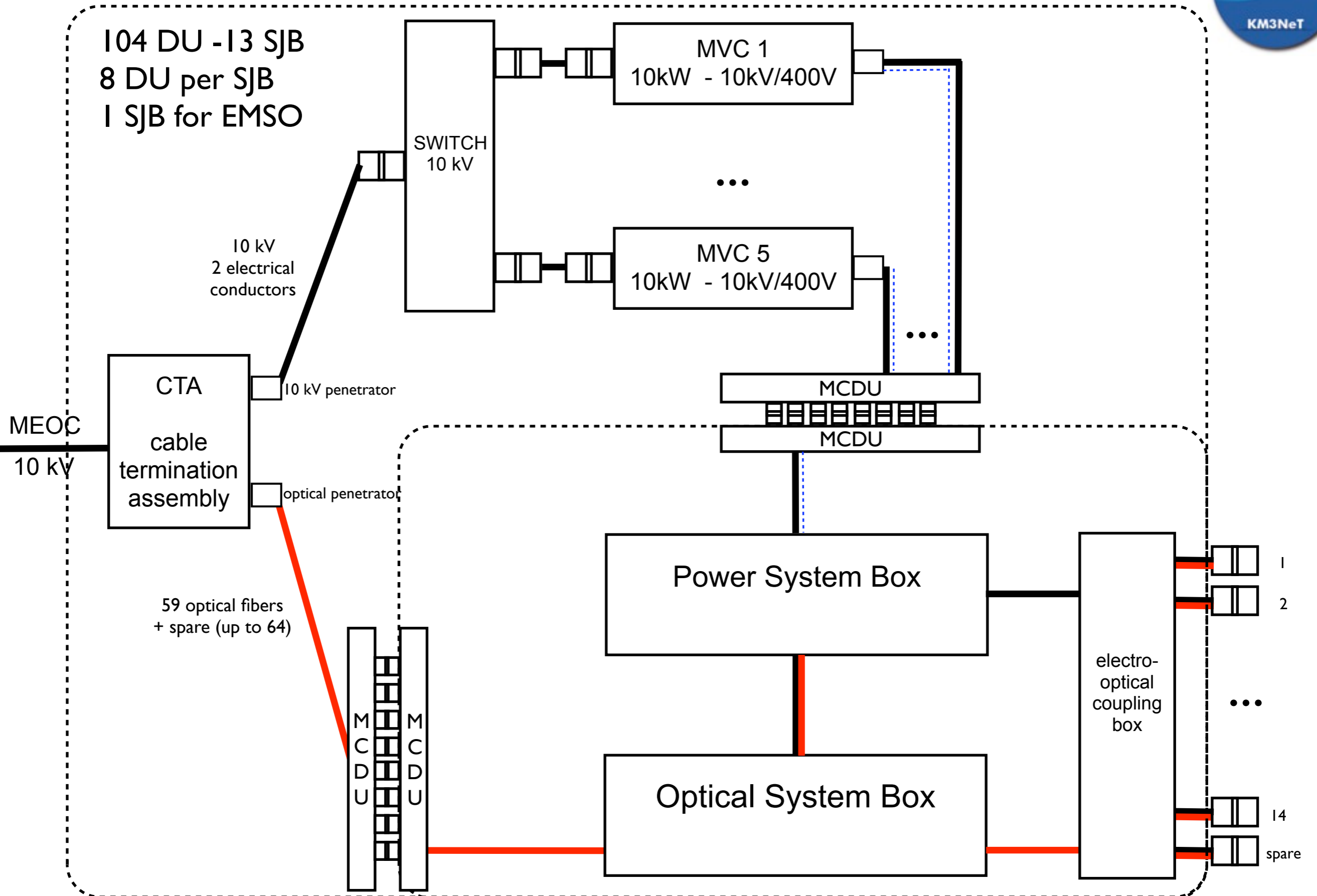
Junction Box elements and block diagrams

R. Cocimano, A. D'Amico, A.Orlando, G. Cacopardo INFN-LNS for WPH , Rome 15-3-2011

Primary Junction Box



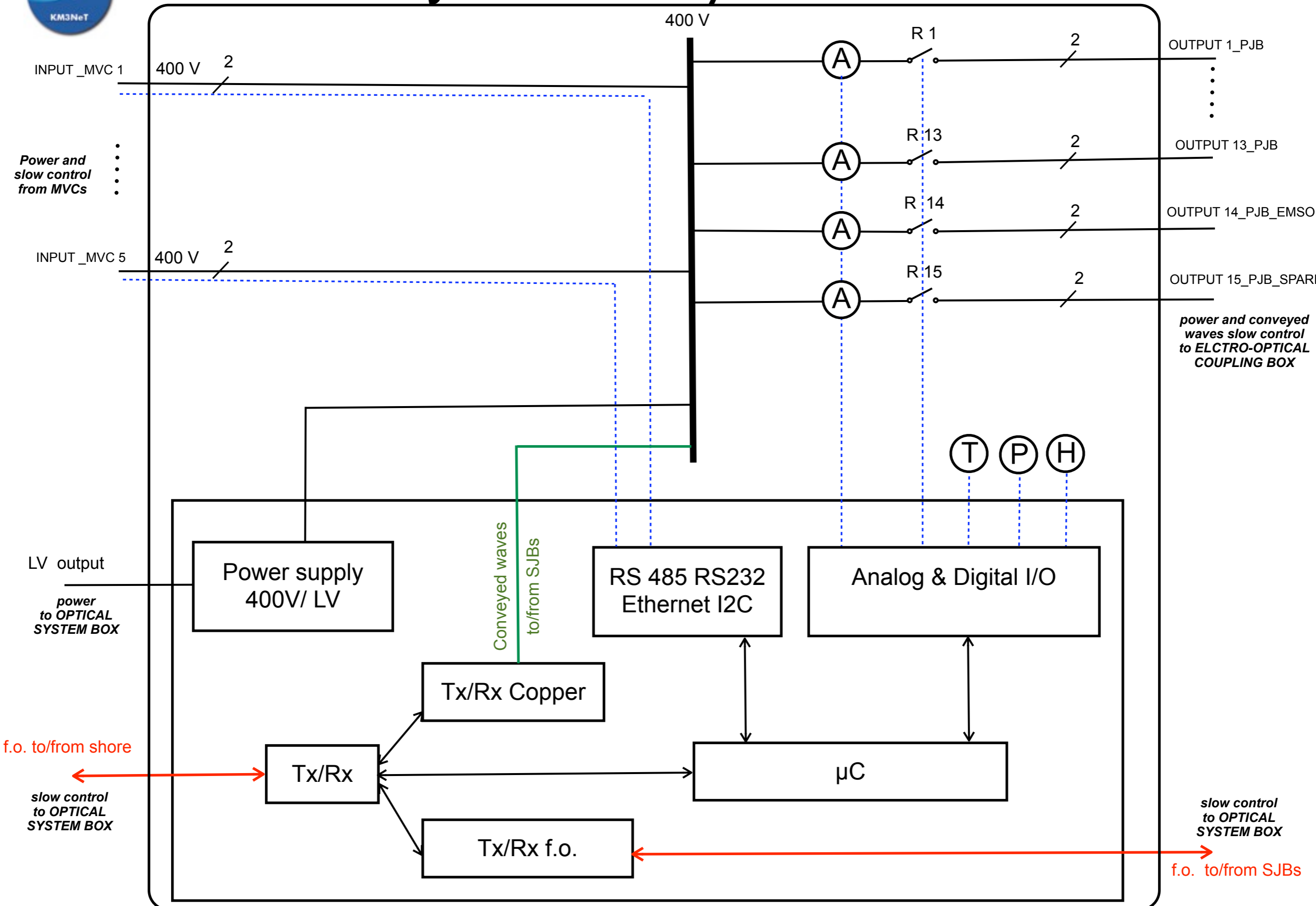
104 DU -13 SJB
8 DU per SJB
1 SJB for EMSO



R. Cocimano, A. D'Amico, A.Orlando, G. Cacopardo INFN-LNS for WPH , Rome 15-3-2011



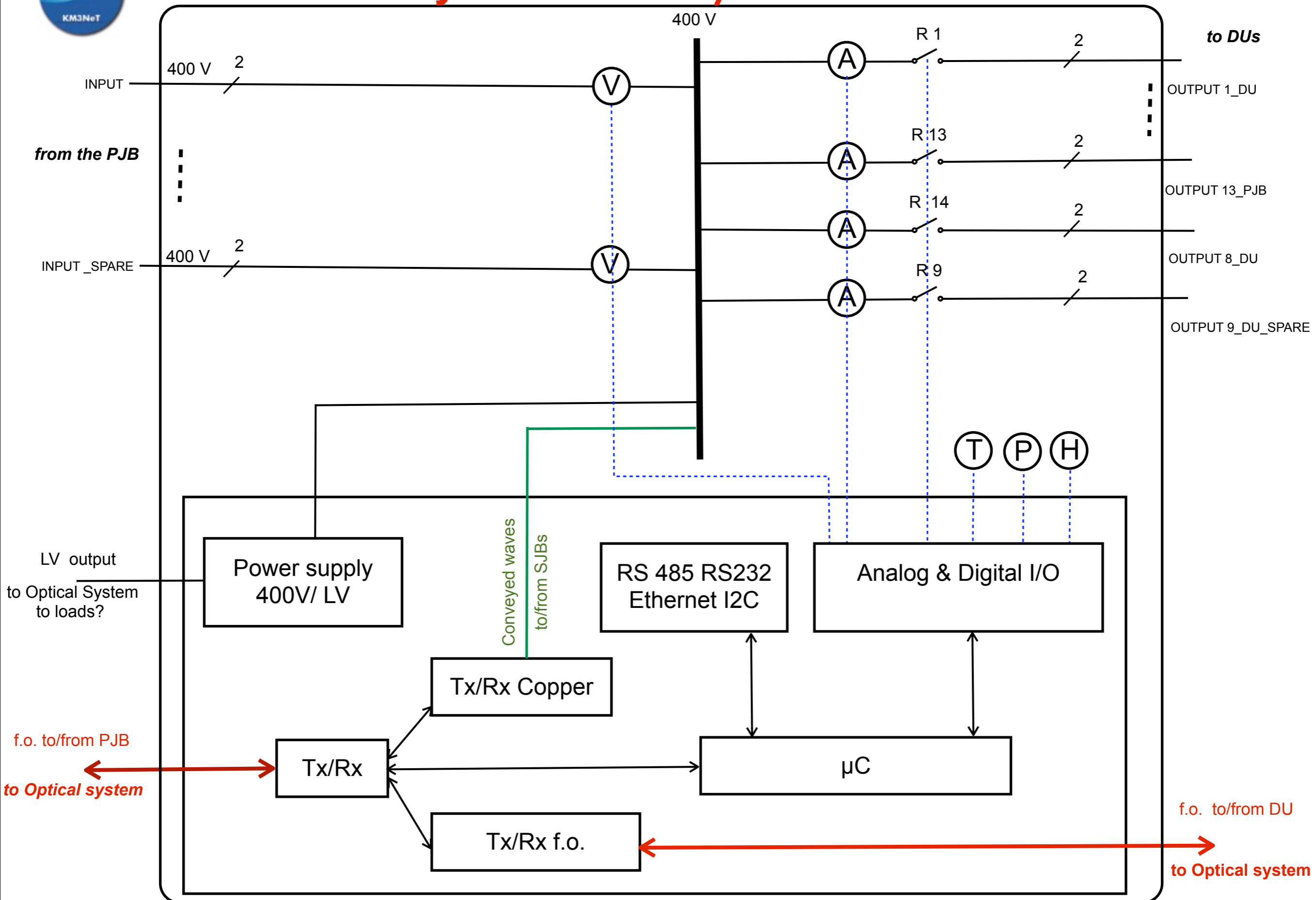
PJB - Power System Box



R. Cocimano, A. D'Amico, A.Orlando, G. Cacopardo INFN-LNS for WPH , Rome 15-3-2011



SJB - Power System Box

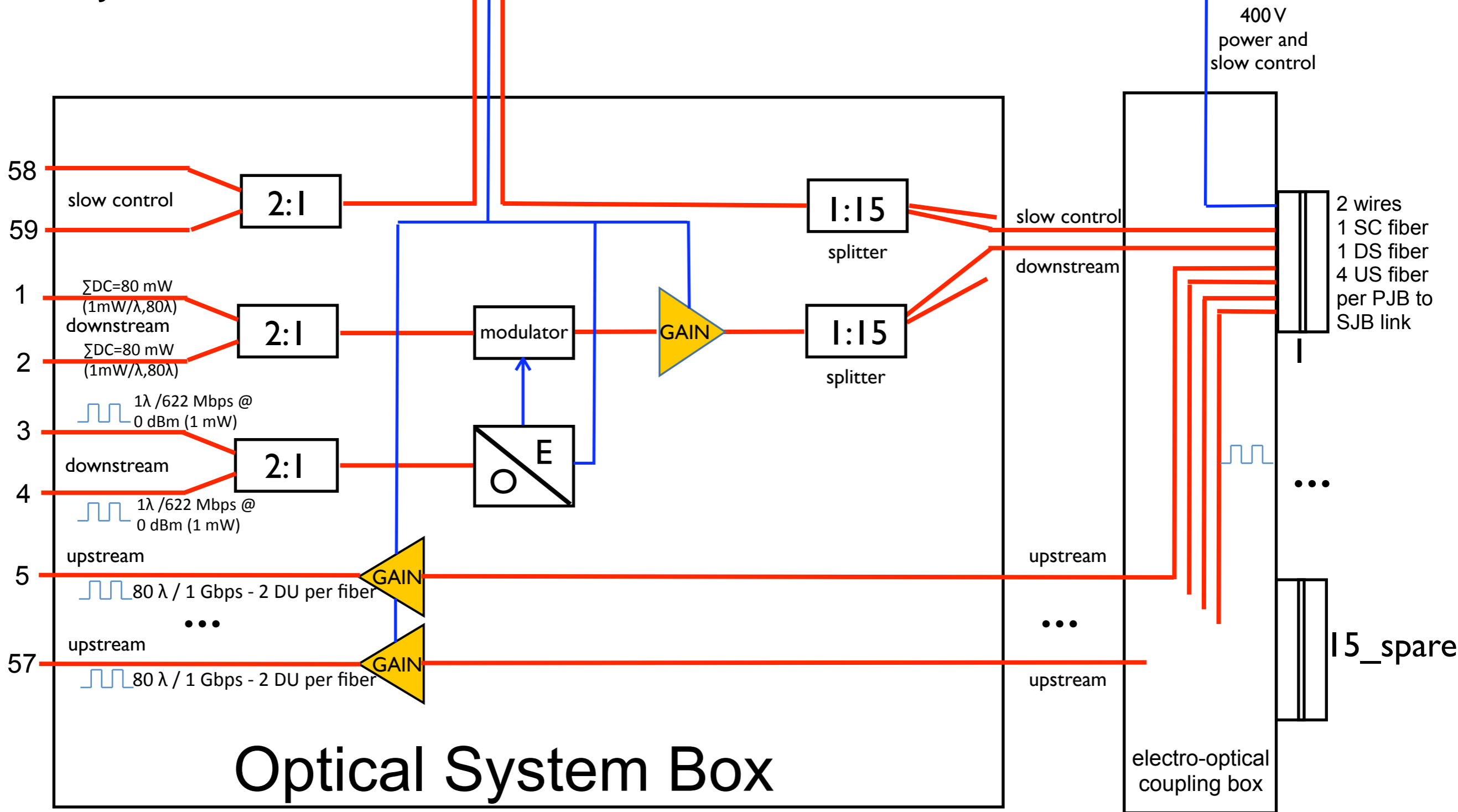


R. Cocimano, A. D'Amico, A.Orlando, G. Cacopardo INFN-LNS for WPH , Rome 15-3-2011



104 DU -13 SJB
 8 DU per SJB
 1 SJB for EMSO

Power System Box



R. Cocimano, A. D'Amico, A.Orlando, G. Cacopardo INFN-LNS for WPH , Rome 15-3-2011



PJB - MCDU

TELEDYNE-ODI

Modular Connectorized Distribution Unit

It can provide input connectivity through a variety of sources, such as cable, hose, penetrator

- standardized configurations ranging from 2 up to 8 connector positions.
- 6.5 inch connector spacing
- Stainless Steel or Titanium
- 25 Years design life
- The retrievable MCDU option can be recovered back to the surface for system re-configurations.





PJB - OPTICAL PENETRATOR

TELEDYNE ODI

Optical penetrator

Provides a differential pressure barrier

- Fluid isolation
- reliable optical feed-through
- Typically installed on customer's atmospheric pressure vessels
- its adaptable design allows it to be integrated into:
 - Teledyne ODI Field Assembled Cable Terminations (FACT)
 - and Modular Connectorized Distribution Units (MCDU)
- standard 4, 8, and 12-fiber configurations available
- working pressure certification of 9,100 psi (627 bar)
- 25 years design life
- Optical fiber type: SMF-28E (ITU-T 652.D compliant optical fiber)
- Insertion Loss: <0.2 dB per channel
- Return Loss <-50 dB per channel



R. Cocimano, A. D'Amico, A.Orlando, G. Cacopardo INFN-LNS for WPH , Rome 15-3-2011



PJB - APC hybrid wet mateable connector

TELEDYNE ODI

APC Rolling Seal Connector

wet-mate

- multichannel
- optical/electrical hybrid connector
- Angled-Physical- Contact (APC)
- The APC Rolling Seal's design reduces signal interference due to reflections at the connector face
- Max Operational Pressure:
 - 10,000 psi ambient
 - 5,000 psi differential (bulkhead)
- Mating Force: <120 lbs
- Demating Force: <100 lbs
- Configurations: ROV, Stab & Manual-Mate
- Material: Titanium is preferred shell material
- Design Life: 25 Years
- Number of Circuits: 8 max, optical or electrical
- Insertion Loss: <0.5 dB @ 1310/1550 nm
- Return Loss: <-45 dB @ 1310/1550 nm
- Max Operational Current: 7 amps per circuit
- Max Operational Voltage: 700 VAC/1,000 VDC



R. Cocimano, A. D'Amico, A.Orlando, G. Cacopardo INFN-LNS for WPH , Rome 15-3-2011



PJB- HV connector

Teledyne ODI Nautilus High-Power G2

- 3-Circuit, 10 kV_{DC},
- 150 amps DC / 170 amps AC (subsea)
- Max Operational Pressure: 5,000 psi (3,500 meters)
- Mating Force: < 150 lbs
- Demating Force: < 100 lbs
- Material: Titanium
- Design Life: > 25 Years
- designed using Advanced Materials Science & Materials Certification processes
- is being qualified under the guidelines of IEC 60502-2 for medium voltage connectors
- to validate the 25-year performance life
- has demonstrated a reliability level of greater than 99.9% based on accelerated life testing.



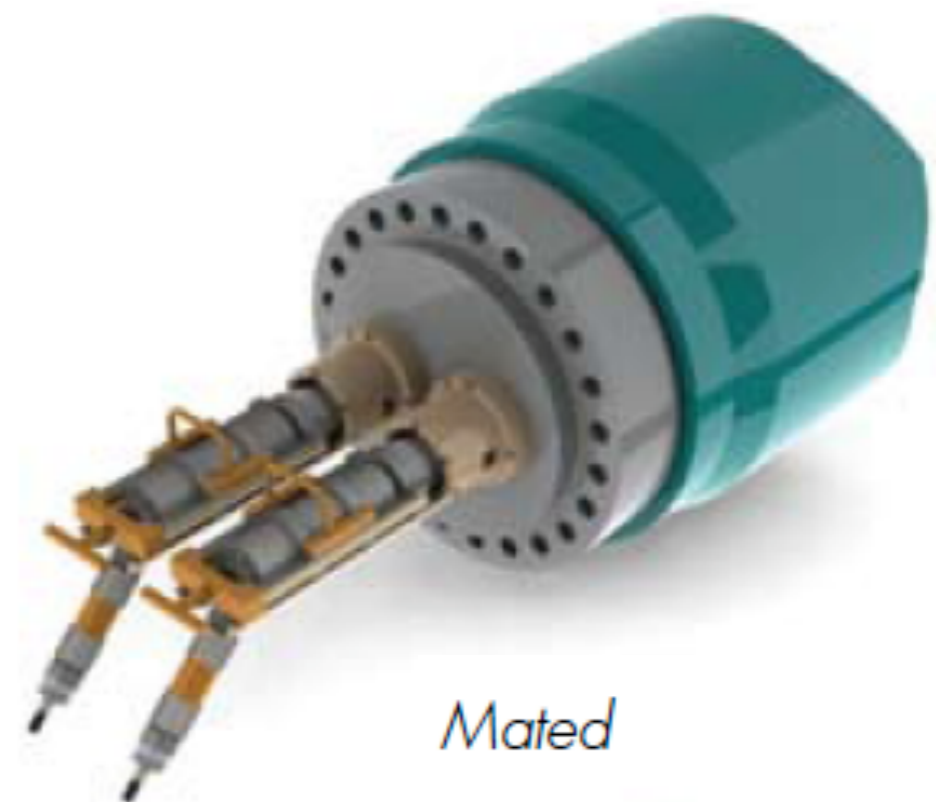
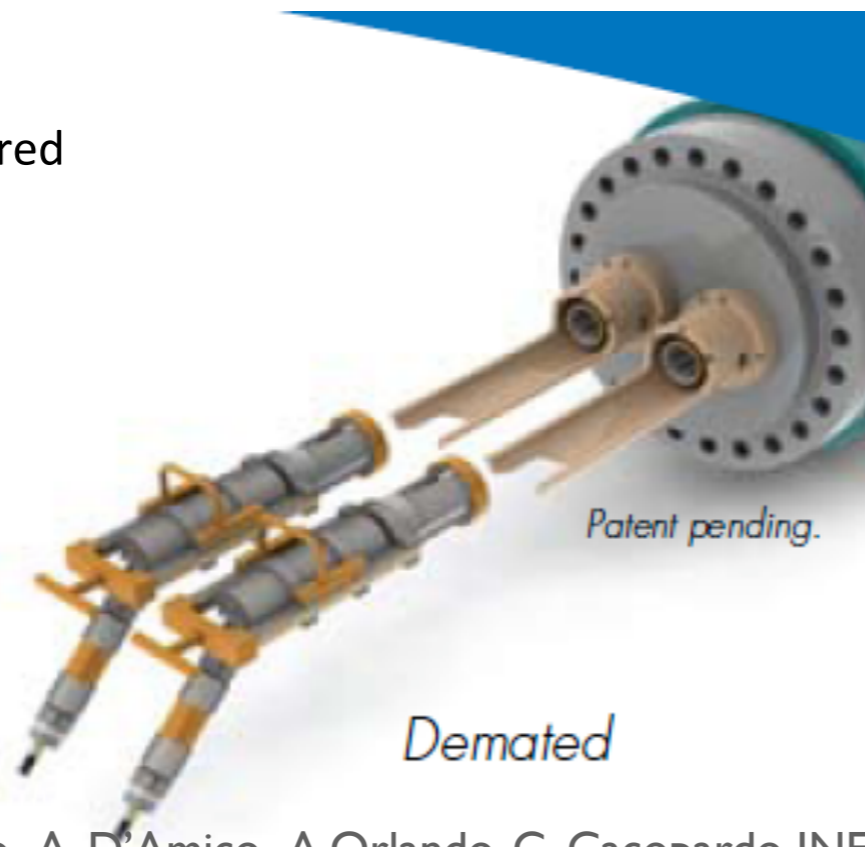
R. Cocimano, A. D'Amico, A.Orlando, G. Cacopardo INFN-LNS for WPH , Rome 15-3-2011



PJB- HV connector

Teledyne ODI HV connector

- Category A/B – $U_o/U/U_m$:
6.6/11.4/13.2 kV
- Category C – $U_o/U/U_m$:
6.6/6.6/7.9 kV
- 300 amps per Circuit
- Mating Force (WMC): <200 lbs
- Demating Force (WMC): <200 lbs
- External Pressure: 0 – 300 bar
(4,350 psi)
- Up to 3 pin
- Design life is not declared



R. Cocimano, A. D'Amico, A.Orlando, G. Cacopardo INFN-LNS for WPH , Rome 15-3-2011



PJB- SEA EARTH & CTA

MEOC



SEA EARTH

MEOC

10 kV
2 electrical
conductors



CTA

59 optical fibers
+ spare (up to 64)

R. Cocimano, A. D'Amico, A.Orlando, G. Cacopardo INFN-LNS for WPH , Rome 15-3-2011



PJB- ODI 10 kV CONNECTOR

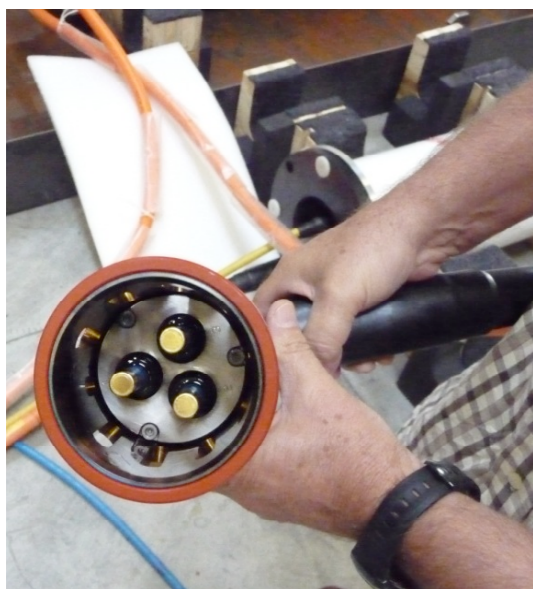
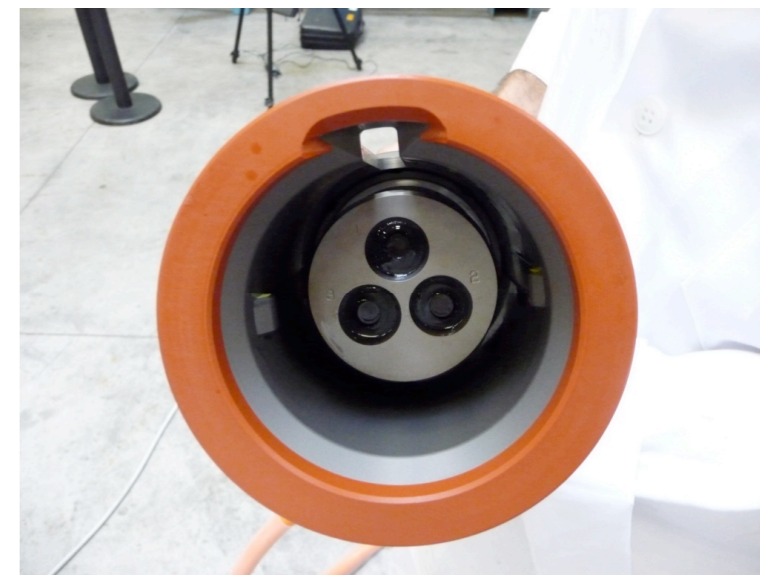
ODIs 10kV 25 years survival probability based on test results is 0,9998

Several tests have been carried out by ODI in cooperation with Alcatel.

Tests on connector pin did not satisfy Alcatel specification so Alcatel remains cautious about the long term suitability of this connector wet mated.

On the bases of these results, for Alcatel, the connector is qualified for the use in a dry mate configuration

TESTS FOR WET MATE CONFIGURATION ARE IN PROGRESS



R. Cocimano, A. D'Amico, A.Orlando, G. Cacopardo INFN-LNS for WPH , Rome 15-3-2011



MVC news

- Gen. 2011 first contacts with OceanWorks (Canada) for a new MVC
- OceanWorks worked for NEPTUNE and VENUS (Node)
- They produced a MVC for VENUS -10 kW - 1,8 kV/375V (4 kV design)
- We have asked for the ability to work with multiple MVC on the same input line connected in parallel with an input nominal voltage of -10kVDC driven from 100km cable with a seawater return
- Ocean Works answered last week:

'our existing design can be scaled up to this voltage with minimal engineering development and risk we are confident in providing a 10kV solution in a single stage with firm fixed price and performance guarantees. The engineering group is still putting together the expected performance characteristics but we wanted to check with you regarding your schedule and requirements for this device'



MVC news

- results and info from last week conference call:
- Input range from -7kVDC to -10kVDC
- Output voltage of 375VDC at 10kW
- 10 kW module made of two 5 kW units
- telemetry system of output power and parameters
- fluorinert cooling
- no switching system at the input (soft start system)
- MVCs able to work in parallel
- dimensions (assumption): 20 inches x 36 inches
- 8 months for the prototype unit

The engineering group will provide the expected performance characteristics