9 RESPONDER OPTION

This chapter describes the Responder option for HiPAP systems.

Topics

Basic responder information

The responder option provides drive signals to responders from the HiPAP system. For this function a Responder Driver Unit (RDU) is used. The software is included in the APOS.

- The Responder Driver Unit is controlled from the operator station through the Ethernet connection, selecting the output to be activated. A sync signal from the transceiver controls the timing of the output drive signal.
- The Responder Driver Unit has:
  - **4 individual electrical outputs** - the electrical outputs can be connected directly to a Responder.
    and
  - **4 individual fibre optic outputs** - the fibre-optic outputs have to be converted to an electrical pulse before connected to a Responder. We have a special kit for this purpose. This gives a good insulation of the driver signal from other voltages in an umbilical.

→ *Kit: part no: 330965 – drawing on page 86*

The outputs can be used when you transmit the Responder drive signals as fibre-optic signals in an umbilical, and convert the signal to an electrical signal in front of the Responder. This gives a good insulation of the driver signal from other voltages in an umbilical.

Responder Driver Unit

The Responder Driver Unit is a stand-alone unit. The unit is protected against dust and water.

Figure 15 Responder Driver Unit

Inputs to the unit:

- Power
- Ethernet
- Sync signal

Outputs of the unit:

- Four electrical responder drive signals
- Four fibre optic responder drive signals

Technical specifications

Responder Driver Unit kit

Part no.:	317925

Includes:

- RDU unit
- Power cable
- Ethernet cable
- D-sub connectors
- Nut M4
- Spring washer
- Cover kit D-Sub
- Bolt M4x25

Responder Driver Unit

Weight:	2.8 kg
Degree of protection:	IP 44

→ *Outline dimensions - see drawing on page 82*

Power

Power:	230 Vac, 150 mA
Frequency:	40 - 440 Hz
Inrush max:	5 A Ac
Maximum current drawn:	0.4 A
Normal current drawn:	0.06 A
Nominal power consumption:	15 W

Environmental conditions

Operating temperature:	0 to 55°C
Storage temperature:	-30 to 70°C
Humidity:	15% - 95% (non condensing)

Vibration

Range:	5-100 Hz
Excitation level:	5-13.2 Hz ±1.5 mm, 13.2-100 Hz 1 g

Fibre to responder drive converter kit

Part No.:	330965

→ *Drawing on page 86*

Optic isolated responder kit

Part No.:	321630

Installation

Responder Driver Unit

The Responder Driver Unit is a stand-alone unit and can be mounted with 4 off screws horizontally or vertically.

Unit location

The unit should be located where it is most suitable for connecting the cables to the responders. This can be close to Remote Operating Vehicle (ROV) operation room.

There is normally one cable connected to the Responder Driver Unit for **each responder** to be operated. The unit must be installed so it is easy accessible for operators to check the working condition of the responder trig status diodes.

Logistics

Safety - Refer to the general safety procedures.

Special tools - None.

Drawings - Outline dimensions - see drawing on page 82

Mounting

1 Open the unit.
- Remove the four (4) screws which secure the lid (one in each corner).

2 Lift off the lid.
- There are four (4) through holes for the mounting screws inside the unit (one in each corner).

3 The mounting screws w/nuts are a part of the RDU kit (delivered with the unit).

→ *RDU kit on page 76*

4 Mount the RDU where suitable.

5 Fasten the four (4) mounting screws.

6 Close the unit.

Fibre to responder drive converter

The unit has a DIN rail mounting.

Cable layout and interconnections

→ *Cable plan and interconnections on page 71*

Maintenance

Note *Before you start, read the general maintenance information on page 54.*

Responder Driver Unit

Under normal conditions, maintenance is not required, apart from keeping the unit clean. If the unit is not functioning properly, the unit must be replaced.

The unit is interfaced to the HiPAP system via an Ethernet connection and hard wired to the HiPAP transceiver unit to get the sync pulse for correct timing. The APOS controls which drive is being active while the sync is received from the HiPAP Transceiver.

Figure 16 Responder Driver Unit

Connections

Caution *When not mounted/used - keep the protecting caps on the fibre-optic connectors.*

Four electrical outputs (**C**) and four fibre optical outputs (**B**) are available. Totally 8 outputs can be used. There is a green LED indicator for every responder drive output (**A**) showing the activity on the output. There is also a power on LED indicating power is on (**D**).

- The 4 electrical outputs can separately be connected directly to separately responders. Output drive signal to responders is a +24V electrical pulse of 4.5 ms or a fibre-optic pulse.
- The 4 optical outputs are normally connected with a fibre-optic cable to 4 separately converters with their own separate power. One converter for every responder. The fibre-optic output pulse is 4.5 ms as the electrical pulse.

→ *Fibre to responder drive converter on page 77*

- The converter power is normally the same power as the responder is powered from.
- The converter converts the optical signal back to an electrical signal before supplied to a responder.
  - Converter to be used: 326494 is a part of kit 330965
  - Fibre optic patch cable that can be used: 365716

→ *Responder Driver Unit replacement, see installation on page 77*

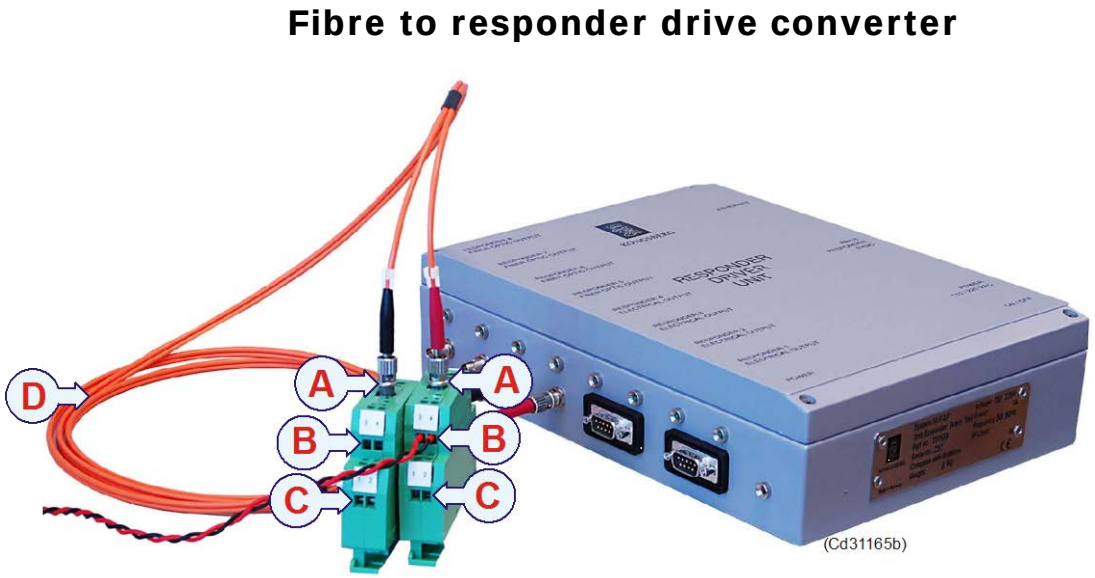


Figure 17 Illustrating a system using two optic responder converter kit - electrical connection to the responder is not shown

A: *Fibre-optic connector*
B: *Power supply cable (Local power cable is shown here)*
C: *Electrical connector*
D: *Fibre-optic patch cables*

→ *Kit see page 77*

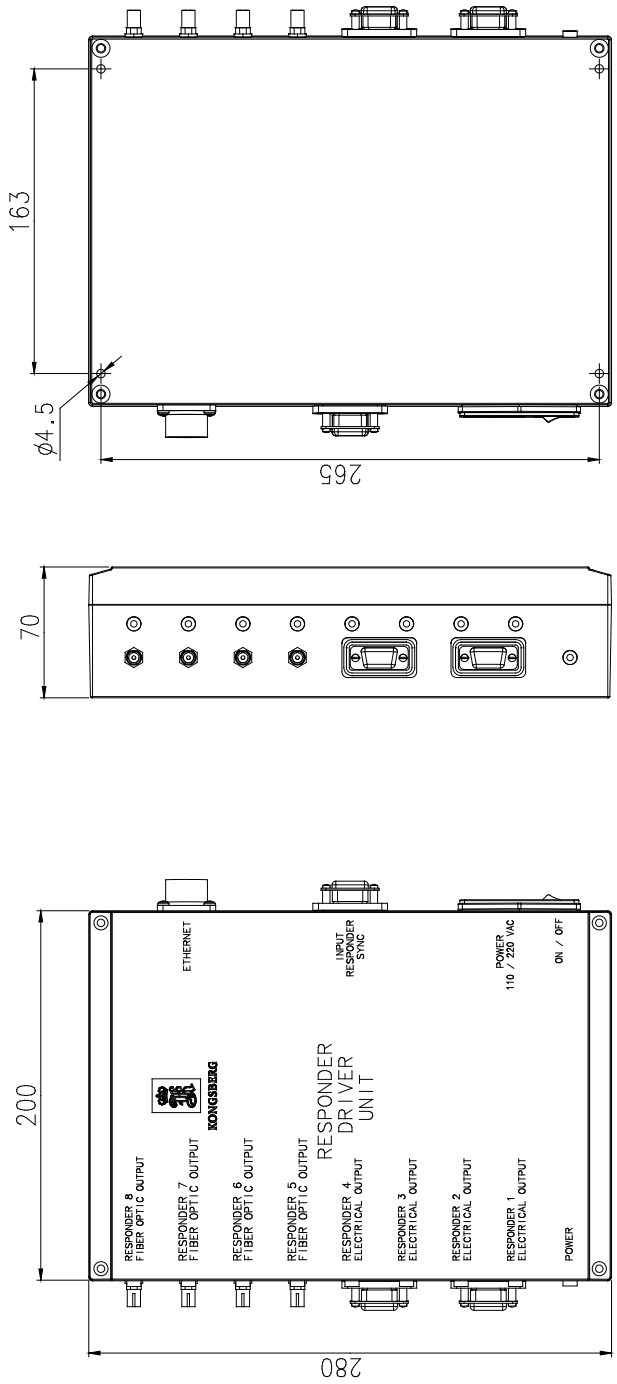
Spare parts

Part no.	Item name/Technical data
311509	Responder Driver Unit
317925	Responder Driver Unit, kit
330965	Fibre to responder drive converter, kit
321630	Optic isolated responder kit

Drawings

Part No.	Rev.	Description	Ref.
316067	A	Responder Driver Unit (option) - outline dimensions	on page 82
313697	E	Responder Driver Unit - wiring diagram	on page 85
W250A	N/A	Responder Driver Unit - Pinout responder sync.	on page 83
W251A	N/A	Responder Driver Unit - Electrical drive signal Responder 1-4 pinout	on page 83
330965	A	Fibre to responder drive converter - wiring diagram	on page 86

Responder Driver Unit - outline dimension



Note:
All measurements are in mm.
The drawing is not in scale.

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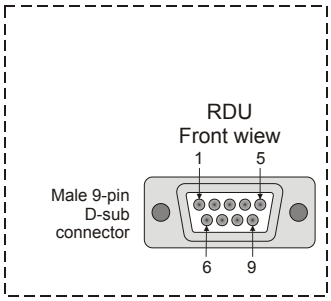
316067 Rev.A

Responder Driver Unit

→ *Refer to Responder Driver Unit - wiring diagram on page 85*

Pinout responder sync. input

Responder	9p D-sub
+Sync	1
-Sync	2



W250 Rev.A — Pinout Responder sync for Responder Drive Unit

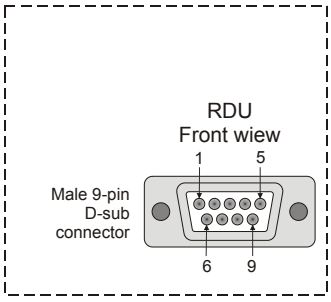
Electrical drive signal Responder 1-4 pinout

Responder 1	9p D-sub
Power 1 +24V	1
Drive signal 1	2
Ground	3

Responder 2	9p D-sub
Power 2 +24V	6
Drive signal 2	7
Ground	8

Responder 3	9p D-sub
Power 3 +24V	1
Drive signal 1	2
Ground	3

Responder 4	9p D-sub
Power 4 +24V	6
Drive signal 2	7
Ground	8



W251 Rev.A — Pinout Responder drive signal 1 to 4 for Responder Drive Unit

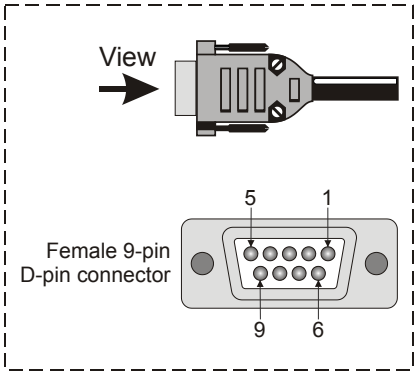
Optical drive signal responder 5-8:

Connector: Industry standard ST fibre connector 850 nm, optical drive signal pulse 5 ms.

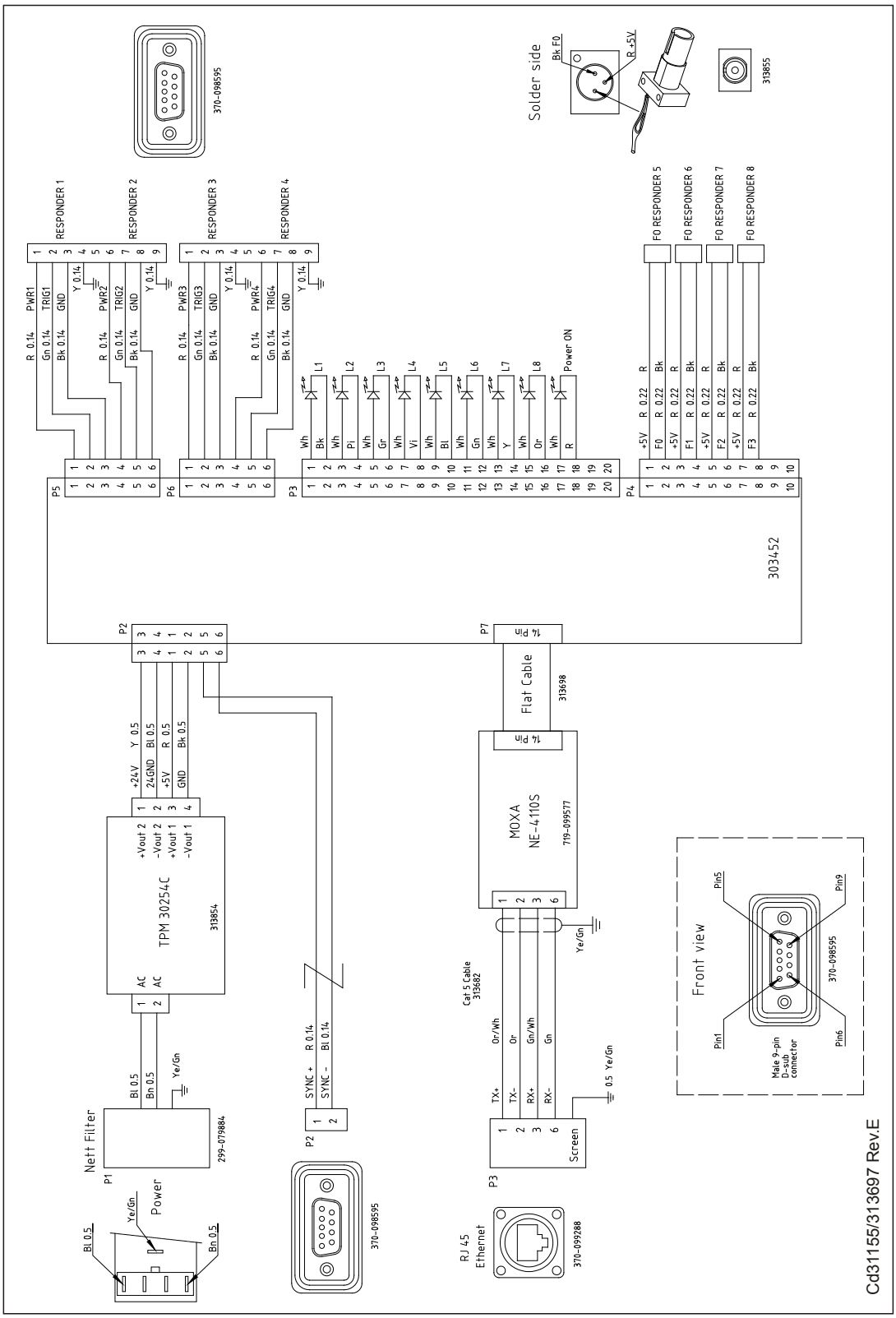
→ *Connector on page 27*

Responder sync cable, Transceiver unit x82

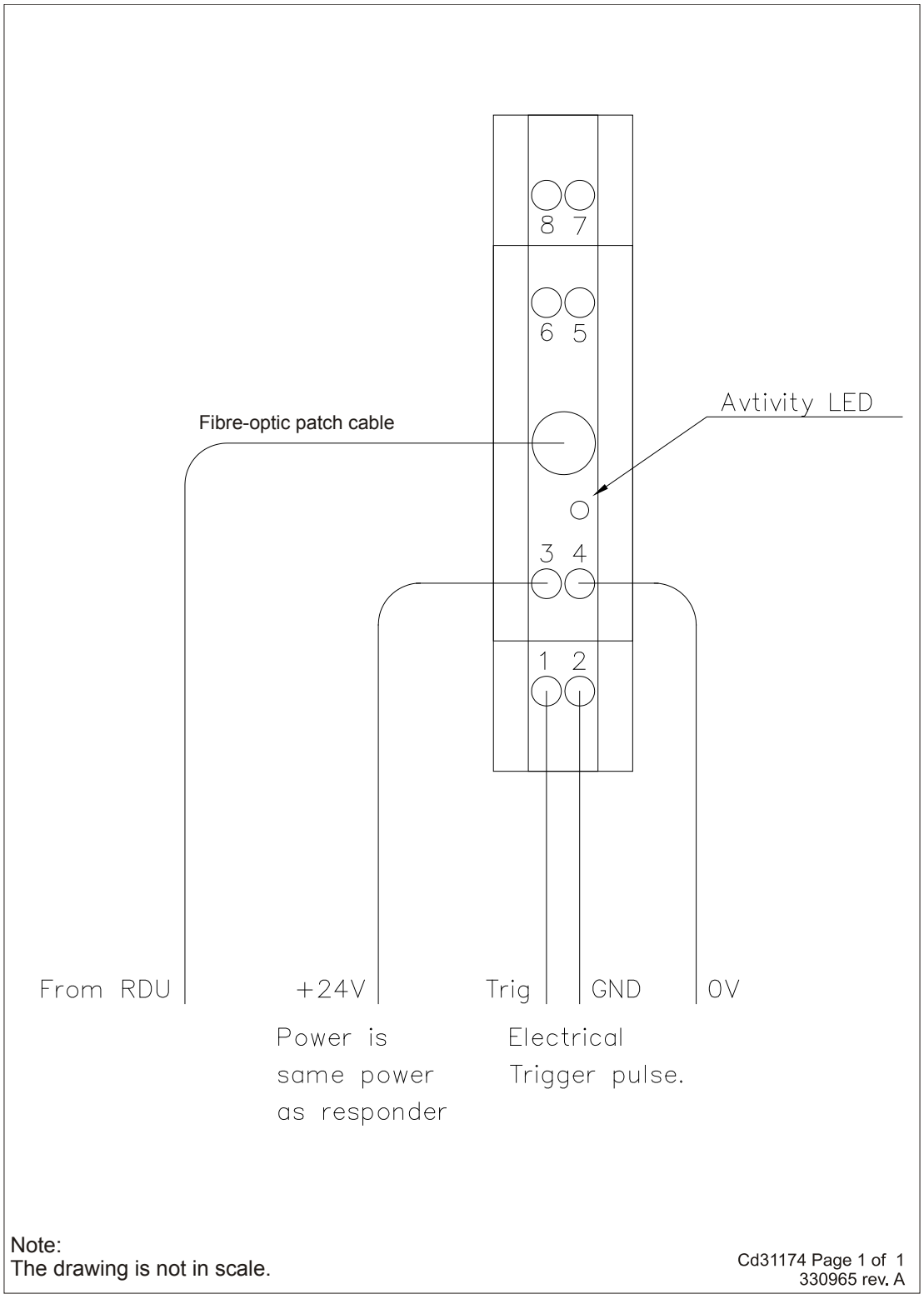
Responder	Terminal block	9p Dsub
+Sync out	12	1
-Sync out	13	2
Ground	14	



Responder Driver Unit - wiring diagram



Fibre to responder drive converter - wiring diagram



Note:
The drawing is not in scale.

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330965 rev. A