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Process Instrumentation Consultancy & Design

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INTER TERMINALS

IMMINGHAM EAST TERMINAL

4 EAST RAIL LOADING

GAS OIL MARKER CONCENTRATE – BATCHING SYSTEM

DESIGN MANUAL

Rev	Date	By	Checked	Approved	Description	Client Ref.
A	16.01.17	M. Morgan	D. Faulkner	M.Morgan	Original Issue	
B	24.01.17	D. Smith	M. Morgan	M. Morgan	As Built	
						Document No. 16062MNL001

IF NOT SIGNED THIS DOCUMENT IS UNCONTROLLED

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7. **Pump Starter Drawings**
8. **Operating Instructions**
9. **Installation Scope of Work**
10. **Testing & Handover**



Register Control System

<u>Register No</u>	<u>Description</u>	<u>Issue</u>
16062REG001	Report Register	B
16062REG002	Specification Register	A
16062REG003	Drawing Register	B



P & I Design Ltd. – Report Register

CLIENT: Inter Terminals Immingham East Terminal	ISSUE A	DATE 16.01.17	BY MM	CHKD DBF	APPD MM	CLIENT REF. 4 East GOMC Batching P & I REF. 16062REG001 SHT 1 OF 1
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<u>DOCUMENT NO.</u>	<u>REVISION</u>	<u>DESCRIPTION</u>
16062RPT001	C	User Requirement Specification
16062RPT004	A	Microload Operating Instructions
16062RPT006	A	Meter Adjustment Instructions
16062INS001	B	Installation Scope of Work

P & I Design Ltd

Specification Register

CLIENT:
Inter Terminals
Immingham East Terminal

ISSUE **DATE** **BY** **CHKD** **APPD**
A 16.01.17 MM DBF MM

CLIENT REF
4 East GOMC Batching
P & I REF.
16062REG002
SHT 1 OF 2

DOCUMENT NO.	REVISION	MANUFACTURER	TAG No.	ITEM
16062SPC001	A	Endress & Hauser	LSL4-66	Pump Dry Run Level Switch
16062SPC001	A	Endress & Hauser	LSL4-67	Pump Dry Run Level Switch
16062SPC002	A	Pyropress	TSH4-66	Pump Temperature Switch
16062SPC002	A	Pyropress	TSH4-67	Pump Temperature Switch
16062SPC003	B	Endress & Hauser	FT1	Mass Flowmeter (GOMC)
16062SPC003	B	Endress & Hauser	FT2	Mass Flowmeter (GOMC)
16062SPC003	B	Endress & Hauser	FT3	Mass Flowmeter (GOMC)
16062SPC003	B	Endress & Hauser	FT4	Mass Flowmeter (GOMC)
16062SPC003	B	Endress & Hauser	FT5	Mass Flowmeter (GOMC)
16062SPC003	B	Endress & Hauser	FT6	Mass Flowmeter (GOMC)
16062SPC004	A	Endress & Hauser	FQ1	Batcher (GOMC)
16062SPC004	A	Endress & Hauser	FQ2	Batcher (GOMC)
16062SPC004	A	Endress & Hauser	FQ3	Batcher (GOMC)
16062SPC004	A	Endress & Hauser	FQ4	Batcher (GOMC)
16062SPC004	A	Endress & Hauser	FQ5	Batcher (GOMC)
16062SPC004	A	Endress & Hauser	FQ6	Batcher (GOMC)
16062SPC005	A	Dafram	XV1	Batching Valve (GOMC)
16062SPC005	A	Dafram	XV2	Batching Valve (GOMC)
16062SPC005	A	Dafram	XV3	Batching Valve (GOMC)
16062SPC005	A	Dafram	XV4	Batching Valve (GOMC)
16062SPC005	A	Dafram	XV5	Batching Valve (GOMC)
16062SPC005	A	Dafram	XV6	Batching Valve (GOMC)
16062SPC006	A	ASCO	XSV1	Batching Solenoid Valve (GOMC)
16062SPC006	A	ASCO	XSV2	Batching Solenoid Valve (GOMC)
16062SPC006	A	ASCO	XSV3	Batching Solenoid Valve (GOMC)
16062SPC006	A	ASCO	XSV4	Batching Solenoid Valve (GOMC)
16062SPC006	A	ASCO	XSV5	Batching Solenoid Valve (GOMC)
16062SPC006	A	ASCO	XSV6	Batching Solenoid Valve (GOMC)

P & I Design Ltd

CLIENT:

Inter Terminals
Immingham East Terminal

Specification Register

ISSUE	DATE	BY	CHKD	APPD
A	16.01.17	MM	DBF	MM

CLIENT REF

4 East GOMC Batching

P & I REF.

16062REG002

SHT 2 OF 2

DOCUMENT NO.	REVISION	MANUFACTURER	TAG No.	ITEM
16062SPC007	C	Weidmuller	JB4/210	Pump Control Junction Box
16062SPC007	C	Weidmuller	JB4/211	Pump Control Junction Box
16062SPC008	B	Weidmuller	JB4/212	Loading Point 1 AC Junction Box
16062SPC008	B	Weidmuller	JB4/213	Loading Point 2 AC Junction Box
16062SPC008	B	Weidmuller	JB4/214	Loading Point 3 AC Junction Box
16062SPC008	B	Weidmuller	JB4/215	Loading Point 4 AC Junction Box
16062SPC008	B	Weidmuller	JB4/216	Loading Point 5 AC Junction Box
16062SPC008	B	Weidmuller	JB4/217	Loading Point 6 AC Junction Box
16062SPC009	B	Weidmuller	JB4/218	Comms Junction Box 1
16062SPC009	B	Weidmuller	JB4/219	Comms Junction Box 2
16062SPC010	A	CEAG	-	Batcher AC Isolator

P & I Design Ltd. – Drawing Register

CLIENT: Inter Terminals Immingham East Terminal	ISSUE A	DATE 16.01.17	BY MM	CHKD DBF	APPD MM	CLIENT REF. 4 East GOMC Batching P & I REF. 16062REG003 SHT 1 OF 1
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<u>DOCUMENT NO.</u>	<u>REVISION</u>	<u>DESCRIPTION</u>
16062DWG001	E	Cable Overview
16062DWG003	E	GOMC General Arrangement
16062DWG005	B	GOMC DC Junction Box Connection Details
16062DWG006	B	GOMC Loading Point FQ01 Connection Details
16062DWG007	B	GOMC Loading Point FQ02 Connection Details
16062DWG008	B	GOMC Loading Point FQ03 Connection Details
16062DWG009	B	GOMC Loading Point FQ04 Connection Details
16062DWG010	B	GOMC Loading Point FQ05 Connection Details
16062DWG011	B	GOMC Loading Point FQ06 Connection Details
16062DWG016	A	P4-66 Pump Starter Drawing
16062DWG017	A	P4-67 Pump Starter Drawing
16062DWG018	A	Printer Enclosure Wiring Drawing
16062SCH002	D	Cable Schedule
16062SCH003	B	JB4/210 Connection Schedule
16062SCH004	B	JB4/211 Connection Schedule

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
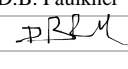

INTER TERMINALS IMMINGHAM LTD.

EAST TERMINAL

4 EAST RAIL LOADING

GAS OIL MARKER SYSTEM

USER REQUIREMENT SPECIFICATION

Rev	Date	By	Checked	Approved	Description	Client Ref.
A	06.07.16	M. Morgan	D.B. Faulkner	M. Morgan	Original Issue – For Review	Document No. 16062RPT001
B	19.07.16	M. Morgan	D.B. Faulkner	M. Morgan	Incorporating comments	
C	20.07.16	M. Morgan	D.B. Faulkner	M. Morgan	Approved	
						

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Appendices

- I Inter Terminals sketch of proposed system
IME-K-0073 Rev.3 (red lined) – P2-25 #4 Rail Loading System P&I Diagram

References

IME-K-0073 Rev.3 – P2-25 #4 Rail Loading System P&I Diagram

IME-K-0020 Rev.1 – Arcton Hosepit P&I Diagram

GSP-7601 – Marking of Hydrocarbon Oil and Control of Marking Operations

SI039001_MNL - P&I Design - 4 East rail loading design manual

SI1760 - P&I Design project – 4 East rail loading modifications – Mabanraft contract

HMRC Excise Notice 179: motor and heating fuels – general information and accounting for excise duty and VAT



1 REVISION HISTORY

Rev	Description
A	Original Issue
B	Incorporating comments
C	Approved with final comments: <ul style="list-style-type: none">• Section 2.2 clarified with regard to hose connections• Drg. IME-K-0073 (red lined) added to appendices



2 INTRODUCTION

An existing facility at 4 East rail gantry allows for the loading of ULSD from the Arcton facility (T615/616/617/618/619) and the 600 series tanks (T601/602/603). It is required to modify this facility to provide the ability to add Gas Oil Marker Concentrate (GOMC) to all twelve rail car loading points, to enable the provision of Gas Oil at the rail gantry. The system will continue to provide the ability to load unmarked ULSD.

This User Requirement Specification (URS) has been produced by P&I Design Ltd on behalf of Inter Terminals.

The URS has been produced retrospectively to record the preferred solution determined by the terminal in order to ensure that operational and fiscal requirements of the system will be achievable

On agreement of the proposed solution, the system will be subject to a HAZOP study and the project can be progressed to select equipment, vendors and produce a detailed design package to enable installation, testing and commissioning. The URS is written from a high level perspective and intentionally avoids technical detail.

2.1 Existing System Overview

Refer to P&I Diagrams IME-K-0073 Rev.3 and IME-K-0020 Rev.1

The rail gantry at 4 East is predominantly manually operated. Six double sided loading points are provided, thus making provision for twelve rail cars in total. Remote product pumps are started and stopped from control stations at the rail gantry. Actuated valves are provided on the product loading points, twelve in total. Rail car overfill level switches are provided, acting on the product actuated valves. The product valves are manually operated via local pneumatic handswitches, there is no route interlocking and thus more than one valve may be open simultaneously.

Rail cars are loaded to ‘dip’ i.e. there is no auto batch cut off. Rail car quantity loaded is established from storage tank pre and aft dips. A product flowmeter may be considered to supplement / replace tank dips.

2.2 Proposed Marker Dye System Overview

The preferred solution is as shown on Sketch 1 in the appendices.

It is intended to use Gas Oil Marker Concentrate (GOMC) in 1000 litre IBC’s. GOMC is a composite solution which when added to ULSD in the prescribed quantity meets the Gas Oil marking requirements of HMRC (see excise Notice 179 paragraph 8.3 and paragraph 8.6). A range of commercially available GOMC is available with variable dosing rates, typically either 1:1000 (vol/vol) or 1:5000 (vol/vol). It is intended to use 1:5000 concentration. For a nominal rail car product batch size of 90m³, this determines a GOMC volume of 18 litres per Gas Oil rail car. In practice it is usual to slightly overdose GOMC



to 105% i.e. approx. 19 litres. Actual marker dye volume will be calculated against rail car calibration tables and normal fill levels.

It is proposed to provide a commercially available double IBC containment bund, also known as spill pallet, in order that a continuous supply of GOMC can be made available.

A Duty/Standby pump delivery system will be installed to provide security of supply.

Referring to the sketch and drawing IME-K-0073 in the appendices, a single electronic preset batch controller is proposed at each double sided loading point mounted at ground level i.e. six controllers in total. Hosed connections via dry break couplings will be provided for the final connection to the corresponding product import line to the rail car.

Normal operation will be to pre-load the GOMC prior to loading the main product.

Ticket printing of quantity of GOMC loaded per rail car is a requirement.



3 CONSTRAINTS

3.1 Availability

Trains will be loaded in a batch wise manner with periods of inactivity between trains. No particular frequency of trains has been stipulated. For the purpose of establishing a basis of design, it has been assumed that up to one train per day will be loaded and all twelve rail cars will be marked Gas Oil. Whilst the rail cars are on the siding requiring Gas Oil, the marker dye system will be required as a high availability system i.e. delays due to equipment failure shall be considered, redundancy built in as necessary and manual fallback procedures considered. With regard to availability the following points are to be considered

- Marker dye storage shall be capable of providing sufficient on site storage to load 12 rail cars without significant manual intervention other than, for example, change of an IBC. At the expected dosing rate of 1:5000, this would be achieved with the availability of a single IBC approx. one third full.
- Duty/Standby GOMC delivery pumps will be installed. The key purpose of this is to prevent the need for a pump installation changeover in the event of a single pump failure.
- Consideration shall be given to any other common mode failure issues in the control system components that would prevent the loading of marker dye e.g. electronic presets (should that be the selected mode of operation)
- The availability and functionality of the product delivery system is not within the scope of this URS. It is not anticipated that the existing product controls will be utilised for this marker dye system, however should the proposed solution consider the use of the existing facilities, the obsolescence issues noted later should be considered.

3.2 Simultaneous Loading

It will be procedural to ensure a single rail car marking operation takes place at any time, interlocking will not be provided to prevent this happening. Physical disconnection of hose will take place on completion.

It will be procedural to ensure a rail car is pre-loaded with marker dye prior to loading the main product. No interlocking will be provided to ensure this or to prevent simultaneous loading of GOMC with product.

3.3 Manual Operation

The system will be designed to be an automated facility requiring batch metering of GOMC and printing of tickets. No manual override facility has currently been included.

3.4 GOMC Metering

It is essential for accurate metering that air is not introduced into the system. The GOMC pipework system will need to remain fully flooded at all times. It is the intention to swap IBCs with 10% volume remaining.



OTAMS GSP-7601 states that the GOMC should be loaded to $\geq 105\%$ of manufacturer's specified ratio and also specifies that loading in excess of 150% of manufacturer's ratio breaches HMRC requirements. GOMC meter accuracy of $\pm 0.15\%$ is required together with the facility to prove the meters.

4 FUNCTIONAL REQUIREMENTS

4.1 Pumped Delivery System

- Duty/Standby pumps will be installed. Duty pump will start on demand from the preset batch controllers
- Dry run and discharge over temperature protection will be provided to site standard
- Local start/stop will be provided

Note : It would be preferential to use the same specification of pump as currently used on the Kerosene marker dye system.

4.2 Batch Control

Batch loading of GOMC will be performed by a single batch controller per double sided loading point. Connection of the GOMC delivery header to the correct rail car will be via a hosed connection and it will be operator procedure to ensure the correct rail car is connected. There are no automated route checks performed. One preset controller will be mounted adjacent to each double sided loading point at ground level.

The preset desired batch size of GOMC will default to zero after each batch thus requiring manual input of desired volume at the start of each batch.

4.2.1 Procedural Controls

The preset batch controller will provide automated loading of a preset volume of GOMC. The batch controller has no knowledge of downstream connections or routing. It will be procedural to ensure the following.

- Correct downstream hosed connection to the desired rail car
- No double batching to the same rail car (and conversely as a result of this, no unmarked rail cars)



4.3 Ticket Printing

It is a requirement to print a ticket for each rail car loaded. At the moment it has been specified that the ticket shall contain

- Date
- Rail Car No.
- Volume of GOMC loaded

In order to facilitate ticket printing, the operator will be required to manually enter the rail car identification No. at the batch controller as part of the loading process.

The ticket printing shall be in a safe area at 4 East office or the vicinity of. It will also be necessary to print the tickets for each rail car post loading of the whole train i.e. it will not be acceptable to have to return to the safe area to print a ticket each and every time a rail car is loaded with GOMC. Many similar batch loading ticket printing systems have been implemented across Inter Terminals UK facilities and for this reason it is anticipated that the ticket printing requirement will be fulfilled via Inter Terminals Computer Services.

4.4 Interlocks

None required between marker dye system and Site ESD or Rail car overfill prevention system.

Dry run protection (liquid sensor) and high discharge temperature protection will be required on the GOMC delivery pumps to the site standard.

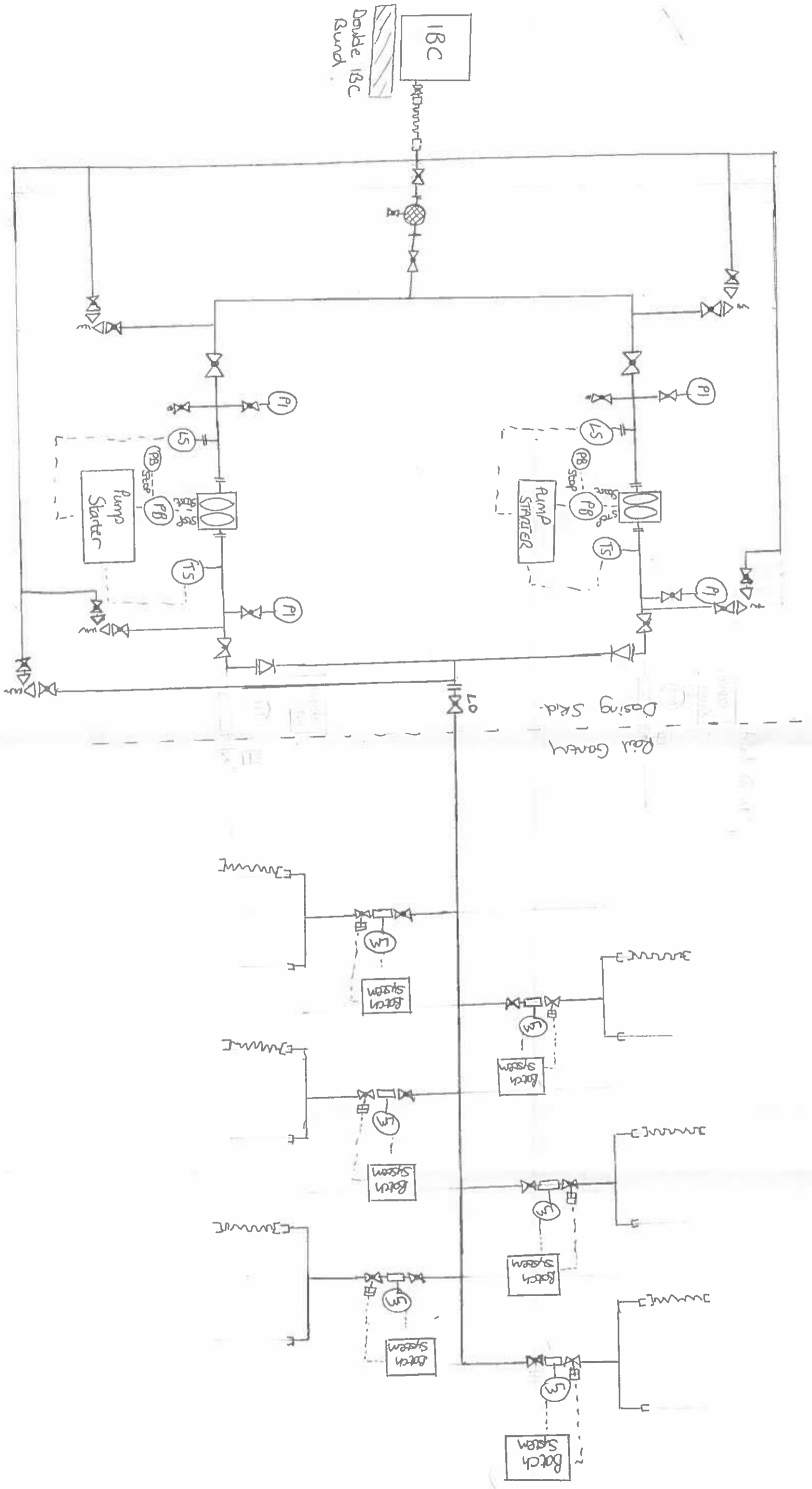


Appendix I

Inter Terminals sketch of proposed system

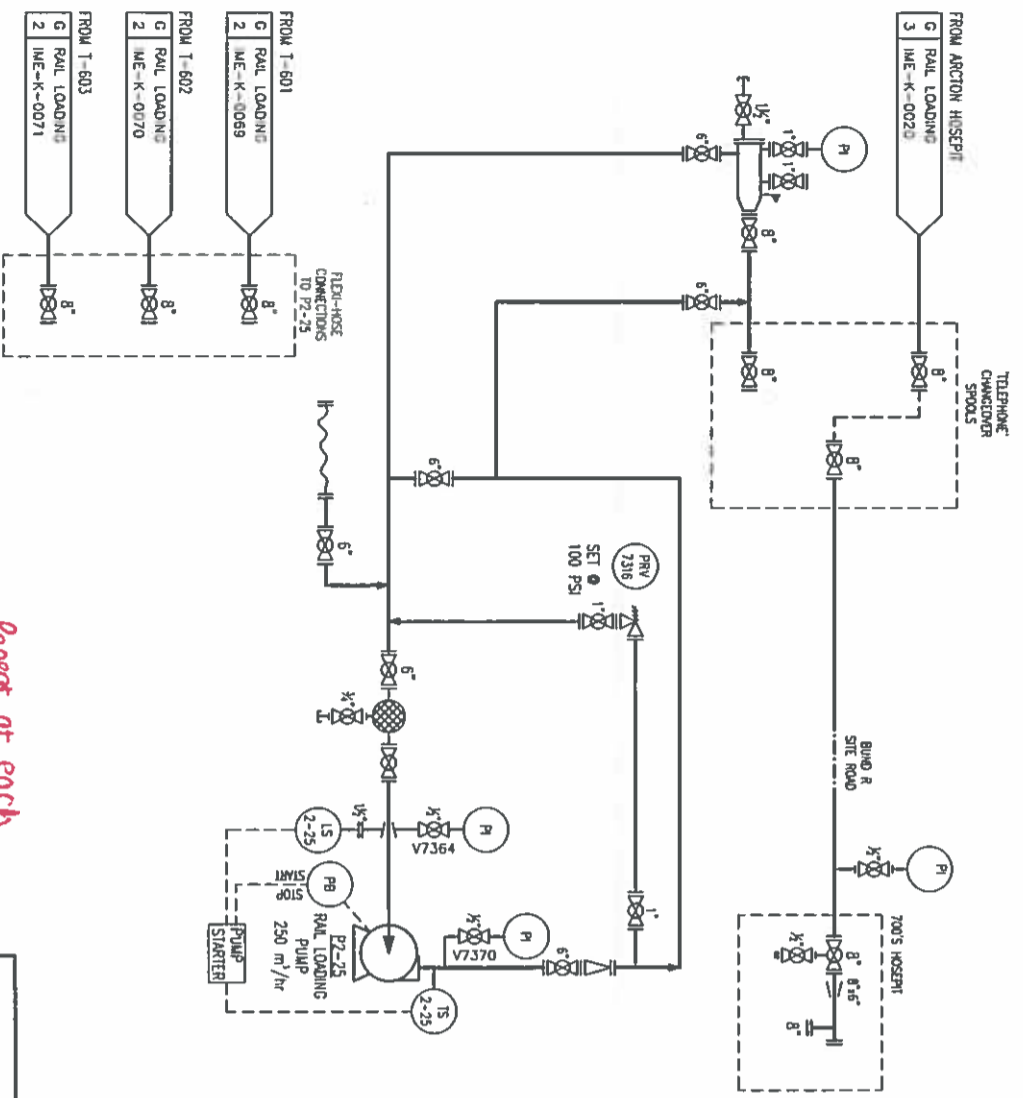
IME-K-0073 Rev.3 (red lined) – P2-25 #4 Rail Loading System P&I Diagram



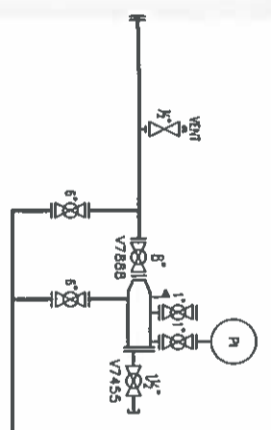
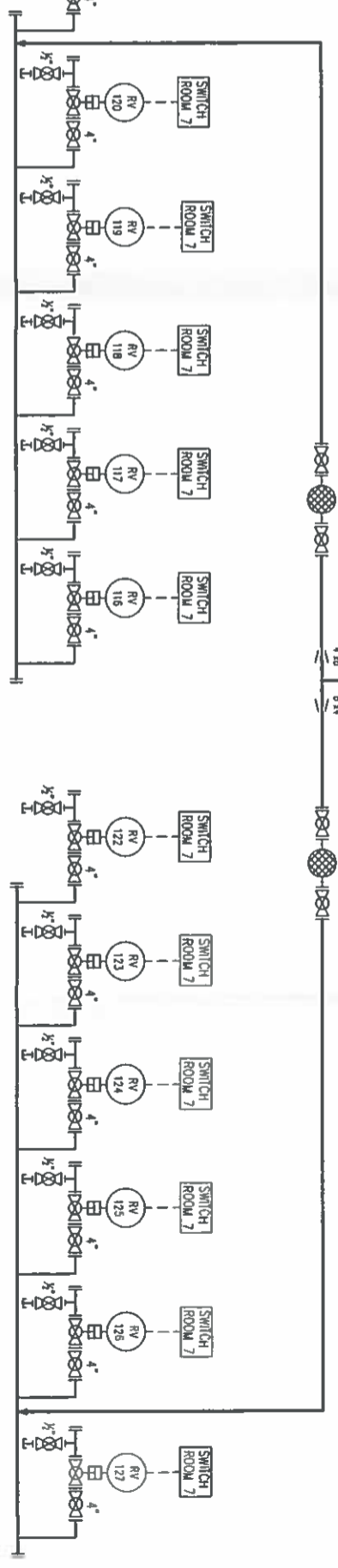


Ideally pump match existing pump in Arcon
 Johnson Pumps TG L095-02V
 PO 3374
 SFX contract S122879

DO NOT ASSUME. IF IN DOUBT, ASK.



Repeat at each station.



NOTES:
NOTE 1: RAIL EQUIPMENT WAYS ARE LOADED GREEN

FOR DETAILS OF STANDARD PUMP SYMBOLS REFER TO DRAWING TIR-662A.

DOCUMENT REVIEW

A SIGNATURE INDICATES THAT AN APPROVED PERSON FROM THE SECTION LISTED HAS REVIEWED THIS DRAWING.

SECTION	REV.	DATE	REV	REVISIONS	BY	DATE	CHK	CHECKED	APPROVED	PU	DATE	SCALE	NTS
	3			ADDS TO PROVIDE DEDICATED LINE TO T-603	SGH	20-04-18		SGH					
	2			FR-009 SET PRESSURE CHANGED FROM 100 PSI	SGH	18-09-14		SGH					
	1			FR-009 ADDED	SGH	15-07-14		SGH					



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PROJECT: MASTER P&ID

TITLE: P2-25 #4 RAIL LOADING SYSTEM P&ID

SPEC. No.	IME-K-0073	REV.	2
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Signature Certificate



Document Reference: IWRSWZIPZ4UA5JV8MJJPT9

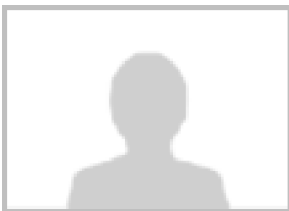


Martin Morgan
Party ID: 8UPSB9JSZ3SM5C48KSWSDL
IP Address: 109.148.191.119
VERIFIED EMAIL: mm@pidesign.co.uk

Electronic Signature:

Multi-Factor
Digital Fingerprint Checksum

6d51a29369328c912b401aa7301b9c3e50f9d503



Dave Faulkner
Party ID: IT6ESNISP283BA62LBACL3
IP Address: 81.134.150.98
VERIFIED EMAIL: df@pidesign.co.uk

Electronic Signature:

Multi-Factor
Digital Fingerprint Checksum

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Martin Morgan
Party ID: KZBJSWIZA2NFNWV9G55ULP
IP Address: 109.148.191.119
VERIFIED EMAIL: mm@pidesign.co.uk

Electronic Signature:

Multi-Factor
Digital Fingerprint Checksum

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Timestamp

2016-07-21 00:42:11 -0700
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2016-07-21 00:41:17 -0700
2016-07-20 23:44:41 -0700
2016-07-20 23:39:40 -0700
2016-07-20 09:37:41 -0700
2016-07-20 09:37:07 -0700
2016-07-20 09:33:57 -0700

Audit

All parties have signed document. Signed copies sent to: P I Design Ltd, Martin Morgan, Dave Faulkner, and Martin Morgan.
Document signed by Martin Morgan (mm@pidesign.co.uk) with drawn signature. - 109.148.191.119
Document viewed by Martin Morgan (mm@pidesign.co.uk). - 109.148.191.119
Document signed by Dave Faulkner (df@pidesign.co.uk) with drawn signature. - 81.134.150.98
Document viewed by Dave Faulkner (df@pidesign.co.uk). - 81.134.150.98
Document signed by Martin Morgan (mm@pidesign.co.uk) with drawn signature. - 109.148.191.119
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CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	13.09.16	MM	PJP	MM

CLIENT REF.
P & I REF.
16062SPC001
SHT 1 OF 2

ITEM: Level Switch
(Tuning Fork)

GENERAL Tag Number See Sheet 2
Service Pump Dry Run Protection
Area Classification Zone 1 IIB T4

DETECTOR ELEMENT Type Vibrating Fork
Location Classification Zone 0 for wetted parts
Material: Wetted Parts 316L Stainless Steel
 Seals n/a
Connections: Size 2"
 Type Flanged
 Rating ANSI 150
Mounting: Position Vertical
 Probe Length 200mm

HOUSING Material Aluminium housing with separate connection compartment
Enclosure Class IP 66
Electrical Classification ATEX II 1/2 G EEx de IIC T6
Certificate Reference KEMA 00ATEX2035
Electrical Connection M20

TRANSMISSION Type Relay output
Supply 19-253V ac, 19-55 Vdc
Output 2 x Relay, SP Changeover
Load I max 6 Amps
Action De-energise on alarm (uncovered) & power failure
Electrical Connection Terminals
Insert FEL 54

OPTIONS

PROCESS DATA Fluid Gas Oil Marker Concentrate (Dyeguard GOMC5)
Temperature Max./Min. Within probe operating conditions 150°C / -50°C
Temperature Normal. Within probe operating conditions
Pressure Max./Min. Within probe operating conditions 64BarG / -1BarG
Pressure Normal. Within probe operating conditions
Specific Gravity Within Probe operating conditions (>0.7 to <1.2)

MANUFACTURERS DATA Supplier Endress & Hauser
Model Number FTL51-IAE2BB(200mm)4G7A

DOCUMENTATION See Attached Documentation Specification

Note : This specification based on site standard template SI003107_SPC

P & I Design Ltd.

Instrument Specification

CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	13.09.16	MM	PJP	MM

CLIENT REF.
P & I REF.
16062SPC001
SHT 2 OF 2

REVISION HISTORY	
Rev	Description
A	Original Issue
B	

TAG No.	SERVICE	COMMENTS
LSL4-66	Gas Oil marker Concentrate Pump P4-66	
LSL4-67	Gas Oil marker Concentrate Pump P4-67	

CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	13.09.16	MM	PJP	MM

CLIENT REF.

P & I REF.
16062SPC002
SHT 1 OF 4

ITEM: Temperature Switch

GENERAL	Tag Number	See Sheet 3
	Service	Pump High Discharge Temperature
	Area Classification	Zone 1 IIB T4
DETECTOR ELEMENT	Type	Filled System
	Material :	Diaphragm Wetted Parts
		Manufacturers Standard 316 Stainless Steel
	Process Connection	Manufacturers Standard into thermowell
	Mounting	Vertical
SWITCH	Type	Microswitch
	Form	1 x SPDT
	Rating	3A @ 30V dc, 5A @ 250V ac
	Action	Contacts Open on Rising Temperature
	Set Point	40°C
	Adjustable Range	25°C to 75°C
	Switching Differential	4°C with Pocket
HOUSING	Material	Anodised Aluminium
	Enclosure Class	IP66
	Electrical Classification	ATEX II 2GD EExd IIB + H ₂ T6
	Certificate Reference	ITS 09 ATEX 16146X
	Electrical Connection	M20 x 1.5
OPTIONS		
PROCESS DATA	Fluid	Gas Oil Marker Dye
	Temperature Maximum	25°C
	Temperature Minimum	5°C
	Pressure Maximum	4 barg
	Pressure Minimum	Atmospheric
MANUFACTURERS DATA	Supplier	Pyropress
	Model Number	TF171A1B/075MT/P00XA (Note Process connection to be ½" BSPT)
DOCUMENTATION	See Attached Documentation Specification	

REVISION HISTORY	
Rev	Description
A	Original Issue

CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	13.09.16	MM	PJP	MM

CLIENT REF.
P & I REF.
16062SPC002
SHT 2 OF 4

ITEM: Thermowell

GENERAL	Tag Number	N/A
	Service	N/A

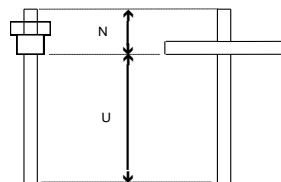
WELL CONSTRUCTION	Type	Fabricated
	Process Conn.Size/Type	½” BSPT
	Internal Conn.Size/Type	½” BSPP
	Material	316 Stainless Steel
	Insertion Length - U	To suit switch
	Extension Length - N	N/A
	Stem Diameter	15mm
	Tip Diameter	15mm
	Tip Length	n/a
	Internal Bore	11.5mm (to suit switch)
	Element	Refer to sheet 1
	Test Pressure	n/a

OPTIONS

PROCESS DATA	Fluid	Refer to sheet 1
	Max. Temperature	Refer to sheet 1
	Max Pressure	Refer to sheet 1

MANUFACTURERS DATA	Supplier	Pyropress
	Model Number	Refer to sheet 1

DOCUMENTATION See attached Documentation Specification



CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	13.09.16	MM	PJP	MM

CLIENT REF.

P & I REF.
16062SPC002
SHT 3 OF 4

REVISION HISTORY	
Rev	Description
A	Original Issue
B	

TAG No.	SERVICE	COMMENTS
TSH4-66	Gas Oil Marker Concentrate Pump P4-66	
TSH4-67	Gas Oil Marker Concentrate Pump P4-67	

CLIENT:
Inter Terminals
Immingham East Terminal

REV DATE BY CHKD APPD
A 13.09.16 MM PJP MM

CLIENT REF.
P & I REF.
16062SPC002
SHT 4 OF 4

Documentation Requirement

Item	Quantity	Description
1.	n/a	APPROVAL DOCUMENTATION To be supplied before manufacture commences
2.	n/a	GENERAL ARRANGEMENT DRAWING Cross-sectioned to show all details necessary for repair and maintenance purposes.
3.	n/a n/a	MATERIALS TEST CERTIFICATES a. Mechanical. b. Chemical analysis.
4.	n/a	ITEMISED PARTS LIST Cross-referenced with G.A. drawing(s) and illustrating manufacturers references for all proprietary items such as bearings, oilseals, mechanical seals, etc.
5.	n/a n/a	RECOMMEND SPARES QUOTATION a. Two years service. b. Commissioning only.
6.	1 1	INSTALLATION, OPERATING AND MAINTENANCE MANUALS To include calibration instructions where applicable. a. Paper Copy b. Electronic copy (Preferably Adobe Acrobat)
7.	n/a n/a	SOFTWARE a. Programming manual. b. Operating manual.
8.	n/a	PRESSURE VESSELS Calculation sheets, spark test certificates (for lined vessels),hydraulic test certificates.
9.	n/a n/a n/a	ELECTRICAL a. Schematic and circuit diagrams. b. Certificates of conformity (to include EMC Directive 89/336/EEC). c. Hazardous area certification.
10.	1 1 1	INSTRUMENTATION a. Certificates of conformity (to include EMC Directive 89/336/EEC). b. Calibration certificates. c. Hazardous area certification.
11.	n/a	SPECIAL REQUIREMENTS

IMPORTANT NOTICE:

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P & I Design reserve the right to cancel any order where the documentation does not comply with P & I requirements. No item will be paid in full until documentation specified has been received.

CLIENT:	REV	DATE	BY	CHKD	APPD	CLIENT REF.
Inter Terminals	A	13.09.16	MM	PJP	MM	
Immingham East Terminal	B	21.09.16	MM	PJP	MM	P & I REF. 16062SPC003 SHT 1 OF 2

ITEM: Coriolis
Mass Flowmeter

GENERAL

Tag Number	See Sheet 2
Service	Gas Oil Marker Dye (4 East Rail Siding)
Area Classification	Zone 1 IIB T4
Line Size / Rating / Material	½" /ANSI 150 / Carbon Steel

MEASURING ELEMENT

Material:	Body Housing	Stainless Steel 1.4301/304 and 1.4308/304L
	Body Wetted Parts	Flanges - Stainless Steel 1.4404/316L
	Seals	N/A
	Tubes	Stainless Steel 1.4539/904L
Connections:	Size	1/2"
	Rating	ANSI 150
	Type	RF Flanged
Meter:	Casing Material	Powder Coated Die-Cast Aluminium
	Cable Entry	3 off M20 x 1.5
	Enclosure Class	IP67
	Power Supply	230V AC
	Electrical Class	See Transmission
	Certificate Reference	See Transmission
	Indicator	LCD backlit four lines with 16 characters per line
Measuring Range:	Maximum	6.5 m³/h
	Minimum	0 m³/h

TRANSMISSION

Output:	Current 1	4-20 mA HART
	Pulse/ Frequency	Dual Pulse phase shifted, 1 pulse = 0.1 litre
Power Supply		24V DC
Calibrated Range		See Outputs
Electrical Classification		ATEX II 2GD Ex db eb [ia] IIC T6
Certificate Reference		SIRA16ATEX2177X

OPTIONS

PROCESS DATA

Fluid	Gas Oil Marker Concentrate (Dyeguard GOMC5)
Flowrate Maximum	3 m³/hr
Flowrate Minimum	1.5 m³/hr
Inlet Pressure Maximum	4 barg
Inlet Pressure Minimum	2 barg
Meter Pressure Drop	0.5 bar at 3 m³/hr
Temperature Maximum	25°C
Temperature Operating	15°C
Specific Gravity Operating	1.00 (0.95 – 1.01)
Viscosity Maximum (cps)	< 20cps @ 20°C
Viscosity Operating (cps)	9cps @ 20°C

MANUFACTURERS DATA

Supplier	Endress + Hauser
Model Number	8F3B15-BBEBAFFGAASAAASAA1+Z1

DOCUMENTATION See Attached Documentation Specification

FT#-MSA5.SPC

REVISION HISTORY	
Rev	Description
A	Original Issue
B	Model changed to latest generation

P & I Design Ltd.

Instrument Specification

CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	13.09.16	MM	PJP	MM
B	21.09.16	MM	PJP	MM

CLIENT REF.
P & I REF.
16062SPC003
SHT 2 OF 2

TAG No.	SERVICE	COMMENTS
FT1	Arm 1 (North Siding) / Arm 7 (South Siding)	
FT2	Arm 2 (North Siding) / Arm 8 (South Siding)	
FT3	Arm 3 (North Siding) / Arm 9 (South Siding)	
FT4	Arm 4 (North Siding) / Arm 10 (South Siding)	
FT5	Arm 5 (North Siding) / Arm 11 (South Siding)	
FT6	Arm 6 (North Siding) / Arm 12 (South Siding)	

CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD	CLIENT REF.
A	13.09.16	MM	PJP	MM	

P & I REF.
16062SPC004
SHT 1 OF 4

ITEM: Batch
Controller
(Electronic)

GENERAL Tag Number See Sheet 2
Service Gas Oil Marker Dye (4 East Rail Siding)
Area Classification Zone 1 IIB T4

CONTROLLER Type Pre-Set Delivery System

INPUTS

Pulse / Frequency:	No.	One (Meter Pulse)
	Type	Single Pulse from Mass Flowmeter
Analogue:	No.	One (Temperature)
	Type	Spare
Digital :	No.	Three (DC)
	Type	Input 1 – Spare
		Input 2 – Spare
		Input 3 - Spare

OUTPUTS

Pulse / Frequency:	No.	One Pulse Repeat
	Type	Spare
Digital :	No.	Six (2 Off DC & 4 Off AC)
	Type	Output 1 (DC) – Spare
		Output 2 (DC) – Spare
		Output 3 (AC) – Batching Valve
		Output 4 (AC) – Pump Request
		Output 5 (AC) – Spare
		Output 6 (AC) – Spare

FUNCTIONS

Communications	No.	Four Ports
	Type	Three serial channels EIA-232 or EIA-485
		One Ethernet Port
Power Supply		230Vac 50 Hz
Case		Cast Enclosure
Enclosure Class		IP 65
Connections		Terminals
Mounting		Surface
Electrical Class		ATEX II 2G EExd ib IIB T6
Certificate Reference		DEMKO 04ATEX 0403315X

Continued on Sheet 2

FQC-##A4.SPC

P & I Design Ltd.

Instrument Specification

CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	13.09.16	MM	PJP	MM

CLIENT REF.

P & I REF.
16062SPC004
SHT 2 OF 4

ITEM: Batch
Controller
(Electronic)

Continued from sheet 1

CONFIGURATION Front Panel
Remote Programmer
PC software

Keypad
No
Standard

DISPLAY Type

Liquid Crystal Display

OPTIONS

Engineering Notes

**MANUFACTURERS
DATA**

Supplier
Model Number

Artisan Measurement & Control Ltd
Batcher - Microload ML-XP-STD-2

DOCUMENTATION See Attached Documentation Specification

REVISION HISTORY	
Rev	Description
A	Original Issue
B	

P & I Design Ltd.

Instrument Specification

CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	13.09.16	MM	PJP	MM

CLIENT REF.

P & I REF.
16062SPC004
SHT 3 OF 4

TAG No.	SERVICE	COMMENTS
FQ1	Arm 1 (North Siding) / Arm 7 (South Siding)	
FQ2	Arm 2 (North Siding) / Arm 8 (South Siding)	
FQ3	Arm 3 (North Siding) / Arm 9 (South Siding)	
FQ4	Arm 4 (North Siding) / Arm 10 (South Siding)	
FQ5	Arm 5 (North Siding) / Arm 11 (South Siding)	
FQ6	Arm 6 (North Siding) / Arm 12 (South Siding)	

CLIENT:
Inter Terminals
Immingham East Terminal

REV DATE BY CHKD APPD
A 13.09.16 MM PJP MM

CLIENT REF.
P & I REF.
16062SPC004
SHT 4 OF 4

Documentation Requirement

<u>Item</u>	<u>Quantity</u>	<u>Description</u>
1.	n/a	APPROVAL DOCUMENTATION To be supplied before manufacture commences
2.	n/a	GENERAL ARRANGEMENT DRAWING Cross-sectioned to show all details necessary for repair and maintenance purposes.
3.	n/a	MATERIALS TEST CERTIFICATES a. Mechanical. n/a b. Chemical analysis.
4.	n/a	ITEMISED PARTS LIST Cross-referenced with G.A. drawing(s) and illustrating manufacturers references for all proprietary items such as bearings, oilseals, mechanical seals, etc.
5.	n/a	RECOMMEND SPARES QUOTATION a. Two years service. n/a b. Commissioning only.
6.		INSTALLATION, OPERATING AND MAINTENANCE MANUALS To include calibration instructions where applicable. 1 a. Paper Copy 1 b. Electronic copy (Preferably Adobe Acrobat)
7.	1	SOFTWARE a. Programming manual. 1 b. Operating manual.
8.	n/a	PRESSURE VESSELS Calculation sheets, spark test certificates (for lined vessels),hydraulic test certificates.
9.	n/a	ELECTRICAL a. Schematic and circuit diagrams. n/a b. Certificates of conformity (to include EMC Directive 89/336/EEC). n/a c. Hazardous area certification.
10.	1	INSTRUMENTATION a. Certificates of conformity (to include EMC Directive 89/336/EEC). n/a b. Calibration certificates. 1 c. Hazardous area certification.
11.	n/a	SPECIAL REQUIREMENTS

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###FMB6.SPC

P & I Design Ltd.

Valve Specification

CLIENT:
Inter Terminals
Immingham East Terminal

REV DATE BY CHKD APPD
A 21.09.16 MM PJP MM

CLIENT REF.
P & I REF.
16062SPC005
SHT 1 OF 4

ITEM Ball Valve

GENERAL Valve Tag Number See Sheet 3
Service Gas Oil Marker Dye (4 East Rail Siding)
Area Classification Zone 1 IIB T4
Line Size /Rating/Material ½"/ANSI150/Carbon Steel

BODY Type Floating Ball, anti static & fire safe
Bore Full
Connections
Size ½"
Type Flanged
Rating ANSI B16.5 150Rf
Materials
Body A350 LF2 Carbon Steel
Ball 316 Stainless Steel
Stem 316 Stainless Steel
Seats PTFE
Seals PTFE / Graphoil
Gland Packing Graphoil

ACTUATION Type See Sheet 2

OPTIONS

PROCESS DATA Fluid Gas Oil Marker Concentrate (Dyeguard GOMC5)
Type Liquid
Flowrate Maximum 3 m³/hr
Valve Pressure Drop
Inlet Pressure Max. / Min. 4 Barg
Temperature Max. / Min. 25°C / 5°C
Viscosity Max. / Min. 20cps / 9cps
Calculated Cv Max.
Valve Rated Cv Max.

MANUFACTURERS DATA Supplier John Clark Valves
Model Number : Dafram 150TM

DOCUMENTATION See Attached Documentation Specification

BV#-##A2.SPC

P & I Design Ltd.

Valve Specification

CLIENT:
Inter Terminals
Immingham East Terminal

REV DATE BY CHKD APPD
A 21.09.16 MM PJP MM

CLIENT REF.
P & I REF.
16062SPC005
SHT 2 OF 4

ITEM	Valve Actuator		
GENERAL	Valve Tag Number	See Sheet 3	
	Service	See Sheet 3	
BODY	Type		
	Size Range		
	Action	Air to Open	
	Failure Action	Air Fail Closed	
	Mounting	Direct	
	Movement	90°	
	Operating Media Connections :		
	Size	¼" BSPP	
	Type	Female	
	Material :		
	Body	Aluminium Hard Anodized	
	Pinion	Mfr's std.	
	Pistons	Mfr's std.	
	Springs	Mfr's std.	
	Seals	Mfr's std.	
	Hazardous Area Classification	Ex II 2 GD	
	ATEX Certification		
SWITCH BOX	Type	None	
	Mounting		
	Switches :		
	Quantity		
	Type		
	Rating		
	Connections		
	Cable Entry		
	Enclosure Material		
	Enclosure Class		
	Visual Indication		
	Hazardous Area Classification		
	ATEX Certification		
OPERATING MEDIA	Media	Instrument Air	
	Operating Pressure	80Psig	
OPTIONS			
MANUFACTURERS DATA	Supplier		
	Model Number :	Actuator	Actreg
		Switch Box	n/a
DOCUMENTATION	See Attached Documentation Specification		

ACT-##A3.SPC

P & I Design Ltd.

Valve Specification

CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	21.09.16	MM	PJP	MM

CLIENT REF.

P & I REF.
16062SPC005
SHT 3 OF 4

TAG No.	SERVICE	COMMENTS
XV1	Arm 1 (North Siding) / Arm 7 (South Siding)	
XV2	Arm 2 (North Siding) / Arm 8 (South Siding)	
XV3	Arm 3 (North Siding) / Arm 9 (South Siding)	
XV4	Arm 4 (North Siding) / Arm 10 (South Siding)	
XV5	Arm 5 (North Siding) / Arm 11 (South Siding)	
XV6	Arm 6 (North Siding) / Arm 12 (South Siding)	

CLIENT:
Inter Terminals
Immingham East Terminal

REV DATE BY CHKD APPD
A 21.09.16 MM PJP MM

CLIENT REF.
P & I REF.
16062SPC005
SHT 4 OF 4

Documentation Requirement

<u>Item</u>	<u>Quantity</u>	<u>Description</u>
1.	n/a	APPROVAL DOCUMENTATION To be supplied before manufacture commences
2.	1	GENERAL ARRANGEMENT DRAWING Cross-sectioned to show all details necessary for repair and maintenance purposes.
3.	n/a	MATERIALS TEST CERTIFICATES a. Mechanical.
	n/a	b. Chemical analysis.
4.	n/a	ITEMISED PARTS LIST Cross-referenced with G.A. drawing(s) and illustrating manufacturers references for all proprietary items such as bearings, oilseals, mechanical seals, etc.
5.	n/a	RECOMMEND SPARES QUOTATION a. Two years service.
	n/a	b. Commissioning only.
6.	n/a	INSTALLATION, OPERATING AND MAINTENANCE MANUALS To include calibration instructions where applicable.
	n/a	a. Paper Copy
	1	b. Electronic copy (Preferably Adobe Acrobat)
7.	n/a	SOFTWARE a. Programming manual.
	n/a	b. Operating manual.
8.	n/a	PRESSURE VESSELS Calculation sheets, spark test certificates (for lined vessels),hydraulic test certificates.
9.	n/a	ELECTRICAL a. Schematic and circuit diagrams.
	n/a	b. Certificates of conformity (to include EMC Directive 89/336/EEC).
	n/a	c. Hazardous area certification.
10.	n/a	INSTRUMENTATION a. Certificates of conformity (to include EMC Directive 89/336/EEC).
	n/a	b. Calibration certificates.
	1	c. Hazardous area certification.
11.	n/a	SPECIAL REQUIREMENTS

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###-FMB6.SPC

P & I Design Ltd.

Instrument Specification

CLIENT:
Inter Terminals
Immingham East Terminal

REV DATE BY CHKD APPD
A 27.09.16 MM PJP MM

CLIENT REF.
P & I REF.
16062SPC006
SHT 1 OF 3

ITEM: Solenoid Valve
Direct

GENERAL Tag Number See Sheet 2
Service Gas Oil Marker Dye (4 East Rail Siding)
Area Classification Zone 1 IIB T4

BODY Type Direct Acting
Number of Ways 3/2
Action Spring Return
Construction Brass
Connections:Size/Type 1/4" NPT
Mounting Surface Mount Remote from Valve Actuator

SOLENOID Type Exd
Voltage 240V ac
Power 16.7W
Enclosure Class IP67
Electrical Classification ATEX II 2 GD EEx d IIC T6
ATEX Certificate LCIE00ATEX6008X
Electrical Connection M20 x 1.5 Cable Entry

OPTIONS

PROCESS DATA Fluid Instrument Air
Pressure Max. 6 barg
Oper. Diff. Max./Min. 6 bar / 0 bar
Temperature Oper. Ambient ($\leq 40^{\circ}\text{C}$)

MANUFACTURERS DATA Supplier PCE Ltd
Model Number ASCO NFETFBXG320A186

DOCUMENTATION See Attached Documentation Specification

Note : This specification based on site standard template SI002109_SPC

REVISION HISTORY	
Rev	Description
A	Original Issue
B	

P & I Design Ltd.

Instrument Specification

CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	27.09.16	MM	PJP	MM

CLIENT REF.

P & I REF.
16062SPC006
SHT 2 OF 3

TAG No.	SERVICE
XSV1	Arm 1 (North Siding) / Arm 7 (South Siding)
XSV2	Arm 2 (North Siding) / Arm 8 (South Siding)
XSV3	Arm 3 (North Siding) / Arm 9 (South Siding)
XSV4	Arm 4 (North Siding) / Arm 10 (South Siding)
XSV5	Arm 5 (North Siding) / Arm 11 (South Siding)
XSV6	Arm 6 (North Siding) / Arm 12 (South Siding)

###-FMA1.SPC

CLIENT:
Inter Terminals
Immingham East Terminal

REV DATE BY CHKD APPD
A 27.09.16 MM PJP MM

CLIENT REF.
P & I REF.
16062SPC006
SHT 3 OF 3

Documentation Requirement

Item	Quantity	Description
1.	n/a	APPROVAL DOCUMENTATION To be supplied before manufacture commences
2.	n/a	GENERAL ARRANGEMENT DRAWING Cross-sectioned to show all details necessary for repair and maintenance purposes.
3.	n/a n/a	MATERIALS TEST CERTIFICATES a. Mechanical. b. Chemical analysis.
4.	n/a	ITEMISED PARTS LIST Cross-referenced with G.A. drawing(s) and illustrating manufacturers references for all proprietary items such as bearings, oilseals, mechanical seals, etc.
5.	1 n/a	RECOMMEND SPARES QUOTATION a. Two years service. b. Commissioning only.
6.	1 1	INSTALLATION, OPERATING AND MAINTENANCE MANUALS To include calibration instructions where applicable. a. Paper Copy b. Electronic copy (Preferably Adobe Acrobat)
7.	n/a n/a	SOFTWARE a. Programming manual. b. Operating manual.
8.	n/a	PRESSURE VESSELS Calculation sheets, spark test certificates (for lined vessels),hydraulic test certificates.
9.	n/a n/a n/a	ELECTRICAL a. Schematic and circuit diagrams. b. Certificates of conformity (to include EMC Directive 89/336/EEC). c. Hazardous area certification.
10.	1 n/a 1	INSTRUMENTATION a. Certificates of conformity (to include EMC Directive 89/336/EEC). b. Calibration certificates. c. Hazardous area certification.
11.	1	SPECIAL REQUIREMENTS IEC 61508 PFD Certified Certificate of Conformity

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CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	10/10/16	PP	MM	MM
B	17/10/16	MM	PP	MM
C	01/11/16	MM	PP	MM

CLIENT REF.
P & I REF.
16062SPC007
Page 1 of 3

ITEM: Electrical Component

GENERAL Tag Number See Sheet 2
Service Pump Control Junction Box
Area Classification Zone 1 IIB T4

UNIT Type Stainless Steel Enclosure (1 bottom gland plate)
Dimensions 260 x 260 x 150mm
Supply 240Vac
Case Stainless Steel
Connections See OPTIONS
Mounting Surface
Enclosure Class IP66
Electrical Classification ATEX Ex II 2G Exeb IIC T6
Certificate Reference IBExU14ATEX1050

OPTIONS Enclosure to be fitted with the following:-

1. Terminals
 - 1-off Vertical row of 15-off WDU2.5 EEx'e' terminals. Terminal identification & linking shown on sheet 2.
2. Cable Entries : Enclosure to be drilled for the following entries:-
 - 4 x 20mm Bottom entry

Note : All Holes to be Clearance & Plugged
3. Labels
 - White/Black/White traffolyte label with Tag Number and Service Details – See Sheet 2.
 - ATEX Certification Label.

MANUFACTURERS DATA Supplier R&M Electrical Group Ltd
Model Number Weidmuller TB MH

DOCUMENTATION See attached Documentation Specification

REVISION HISTORY	
Rev	Description
A	Issued for Tender
B	Issued for Purchase
C	Linking Changed (Links 5 to 7 to 9 removed)

CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	10/10/16	PP	MM	MM
B	17/10/16	MM	PP	MM
C	01/11/16	MM	PP	MM

CLIENT REF.

P & I REF.
16062SPC007
Page 2 of 3

TERMINAL NUMBERING/LINKING DETAILS

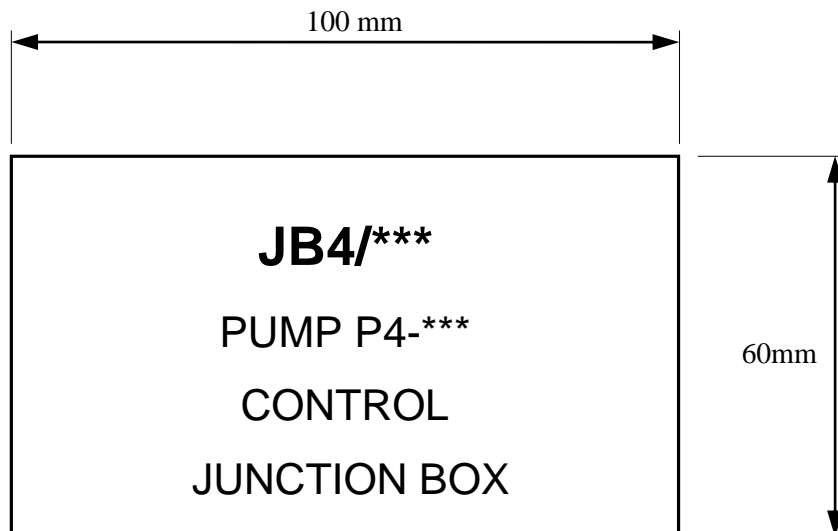
TB-1

1
2
3
4
5
6
7
8
9
10
11
12
13 ●
14 ●
15 ●

TAG No.	SERVICE
JB4/210	Pump P4-66 Control Junction Box
JB4/211	Pump P4-67 Control Junction Box

LABEL DETAILS

- 1) Label to be manufactured from White/Black/White traffolyte.
- 2) Engraved text to be best fit.
- 3) Text to be centered.



CLIENT: Inter Terminals Immingham East Terminal	REV A B C	DATE 10/10/16 17/10/16 01/11/16	BY PP MM MM	CHKD MM PP PP	APPD MM MM MM	CLIENT REF. P & I REF. 16062SPC007 Page 3 of 3
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Documentation Requirement

Item	Quantity	Description
1.	n/a	APPROVAL DOCUMENTATION To be supplied before manufacture commences
2.	n/a	GENERAL ARRANGEMENT DRAWING Cross-sectioned to show all details necessary for repair and maintenance purposes.
3.	n/a n/a	MATERIALS TEST CERTIFICATES a. Mechanical. b. Chemical analysis.
4.	n/a	ITEMISED PARTS LIST Cross-referenced with G.A. drawing(s) and illustrating manufacturers references for all proprietary items such as bearings, oilseals, mechanical seals, etc.
5.	n/a n/a	RECOMMEND SPARES QUOTATION a. Two years service. b. Commissioning only.
6.	n/a n/a	INSTALLATION, OPERATING AND MAINTENANCE MANUALS To include calibration instructions where applicable. a. Paper Copy b. Electronic copy (Preferably Adobe Acrobat)
7.	n/a n/a	SOFTWARE a. Programming manual. b. Operating manual.
8.	n/a	PRESSURE VESSELS Calculation sheets, spark test certificates (for lined vessels),hydraulic test certificates.
9.	n/a 1 1	ELECTRICAL a. Schematic and circuit diagrams. b. Certificates of conformity (to include EMC Directive 89/336/EEC). c. Hazardous area certification.
10.	n/a n/a n/a	INSTRUMENTATION a. Certificates of conformity (to include EMC Directive 89/336/EEC). b. Calibration certificates. c. Hazardous area certification.
11.	n/a	SPECIAL REQUIREMENTS

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###-FMB6.SPC

CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	10/10/16	PP	MM	MM
B	17/10/16	MM	PP	MM

CLIENT REF.
P & I REF.
16062SPC008
Page 1 of 4

ITEM: Electrical Component

GENERAL Tag Number See Sheet 2
Service Loading Point AC Junction Box
Area Classification Zone 1 IIB T4

UNIT Type Stainless Steel Enclosure (1 bottom gland plate)
Dimensions 260 x 260 x 150mm
Supply 240Vac
Case Stainless Steel
Connections See OPTIONS
Mounting Surface
Enclosure Class IP66
Electrical Classification ATEX Ex II 2G Exeb IIC T6
Certificate Reference IBExU14ATEX1050

OPTIONS Enclosure to be fitted with the following:-

- Terminals
 - 1-off Vertical row of 15-off WDU2.5 EEx'e' terminals. Terminal identification & linking shown on sheet 2.
- Cable Entries : Enclosure to be drilled for the following entries:-
 - 4 x 20mm Bottom Entry

Note : All Holes to be Clearance & Plugged
- Labels
 - White/Black/White traffolyte label with Tag Number and Service Details – See Sheet 3.
 - ATEX Certification Label.

MANUFACTURERS DATA Supplier R&M Electrical Group Ltd
Model Number Weidmuller TB MH

DOCUMENTATION See attached Documentation Specification

REVISION HISTORY	
Rev	Description
A	Issued for Tender
B	Issued for Purchase

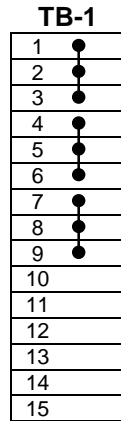
CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	10/10/16	PP	MM	MM
B	17/10/16	MM	PP	MM

CLIENT REF.

P & I REF.
16062SPC008
Page 2 of 4

TERMINAL NUMBERING/LINKING DETAILS



TAG No.	SERVICE
JB4/212	Loading Point 1 AC Junction Box
JB4/213	Loading Point 2 AC Junction Box
JB4/214	Loading Point 3 AC Junction Box
JB4/215	Loading Point 4 AC Junction Box
JB4/216	Loading Point 5 AC Junction Box
JB4/217	Loading Point 6 AC Junction Box

CLIENT:
Inter Terminals
Immingham East Terminal

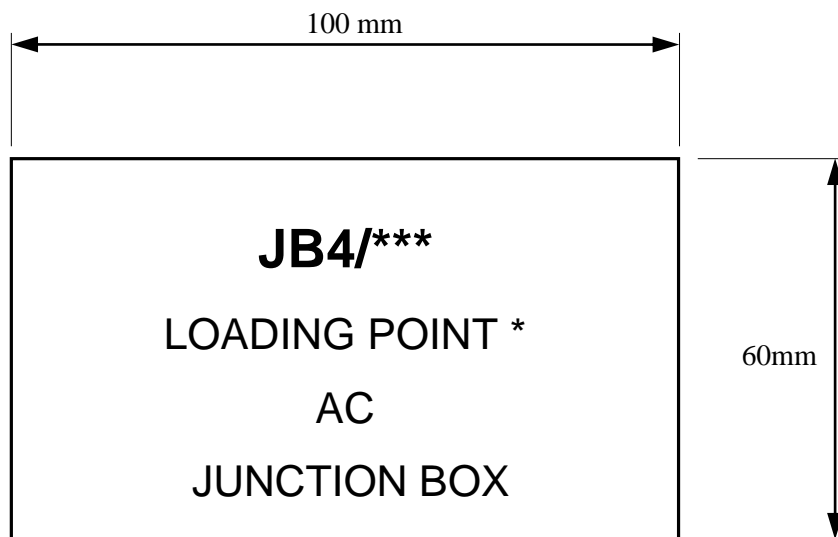
REV	DATE	BY	CHKD	APPD
A	10/10/16	PP	MM	MM
B	17/10/16	MM	PP	MM

CLIENT REF.

P & I REF.
16062SPC008
Page 3 of 4

LABEL DETAILS

- 1) Label to be manufactured from White/Black/White traffolyte.
- 2) Engraved text to be best fit.
- 3) Text to be centered.



CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	10/10/16	PP	MM	MM
B	17/10/16	MM	PP	MM

CLIENT REF.
P & I REF.
16062SPC008
Page 4 of 4

Documentation Requirement

<u>Item</u>	<u>Quantity</u>	<u>Description</u>
1.	n/a	APPROVAL DOCUMENTATION To be supplied before manufacture commences
2.	n/a	GENERAL ARRANGEMENT DRAWING Cross-sectioned to show all details necessary for repair and maintenance purposes.
3.	n/a	MATERIALS TEST CERTIFICATES a. Mechanical. n/a b. Chemical analysis.
4.	n/a	ITEMISED PARTS LIST Cross-referenced with G.A. drawing(s) and illustrating manufacturers references for all proprietary items such as bearings, oilseals, mechanical seals, etc.
5.	n/a	RECOMMEND SPARES QUOTATION a. Two years service. n/a b. Commissioning only.
6.	n/a	INSTALLATION, OPERATING AND MAINTENANCE MANUALS To include calibration instructions where applicable. n/a a. Paper Copy n/a b. Electronic copy (Preferably Adobe Acrobat)
7.	n/a	SOFTWARE a. Programming manual. n/a b. Operating manual.
8.	n/a	PRESSURE VESSELS Calculation sheets, spark test certificates (for lined vessels),hydraulic test certificates.
9.	n/a	ELECTRICAL a. Schematic and circuit diagrams. 1 b. Certificates of conformity (to include EMC Directive 89/336/EEC). 1 c. Hazardous area certification.
10.	n/a	INSTRUMENTATION a. Certificates of conformity (to include EMC Directive 89/336/EEC). n/a b. Calibration certificates. n/a c. Hazardous area certification.
11.	n/a	SPECIAL REQUIREMENTS

IMPORTANT NOTICE:

Vendors acceptance of this order is conditional on the provision of the Documentation.
Should the vendor not wish to supply the whole or part of the details herein requested, he shall state in writing any exceptions with the quotation or order acceptance.
P & I Design reserve the right to cancel any order where the documentation does not comply with P & I requirements. No item will be paid in full until documentation specified has been received.

###-FMB6.SPC

CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	10/10/16	PP	MM	MM
B	17/10/16	MM	PP	MM

CLIENT REF.
P & I REF.
16062SPC009
Page 1 of 3

ITEM: Electrical Component

GENERAL Tag Number See Sheet 2
Service Comms Junction Box
Area Classification Zone 1 IIB T4

UNIT Type Stainless Steel Enclosure (1 bottom gland plate)
Dimensions 260 x 260 x 150mm
Supply 24Vdc
Case Stainless Steel
Connections See OPTIONS
Mounting Surface
Enclosure Class IP66
Electrical Classification ATEX Ex II 2G Exeb IIC T6
Certificate Reference IBExU14ATEX1050

OPTIONS Enclosure to be fitted with the following:-

- Terminals
 - 1-off Vertical row of 8-off WDU2.5 EEx'e' terminals. Terminal identification & linking shown on sheet 2.
- Cable Entries : Enclosure to be drilled for the following entries:-
 - 4 x 20mm Bottom Entry

Note : All Holes to be Clearance & Plugged
- Labels
 - White/Black/White traffolyte label with Tag Number and Service Details – See Sheet 2
 - ATEX Certification Label.

MANUFACTURERS DATA Supplier R&M Electrical Group Ltd
Model Number Weidmuller TB MH

DOCUMENTATION See attached Documentation Specification

REVISION HISTORY	
Rev	Description
A	Issued for Tender
B	Issued for Purchase

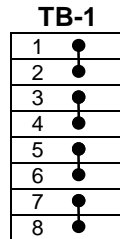
CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	10/10/16	PP	MM	MM
B	17/10/16	MM	PP	MM

CLIENT REF.

P & I REF.
16062SPC009
Page 2 of 3

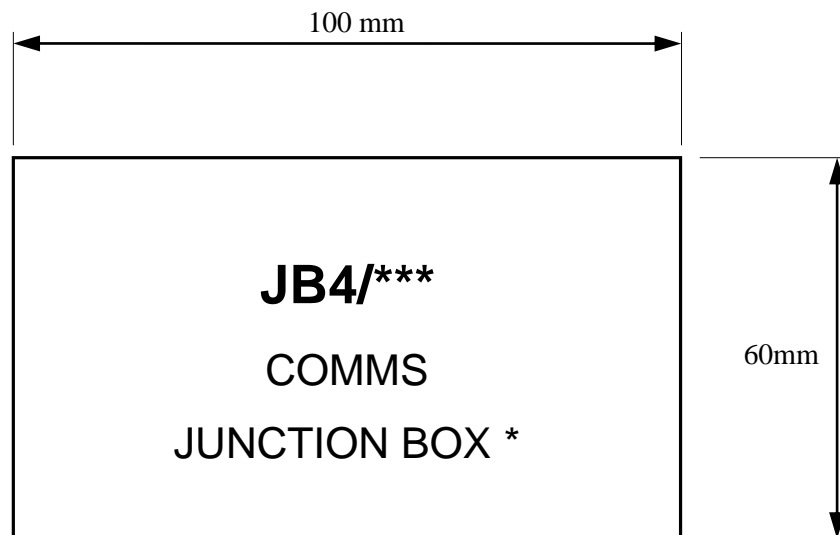
TERMINAL NUMBERING/LINKING DETAILS



TAG No.	SERVICE
JB4/218	Comms Junction Box 1
JB4/219	Comms Junction Box 2

LABEL DETAILS

- 1) Label to be manufactured from White/Black/White traffolyte.
- 2) Engraved text to be best fit.
- 3) Text to be centered.



CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	10/10/16	PP	MM	MM
B	17/10/16	MM	PP	MM

CLIENT REF.
P & I REF.
16062SPC009
Page 3 of 3

Documentation Requirement

<u>Item</u>	<u>Quantity</u>	<u>Description</u>
1.	n/a	APPROVAL DOCUMENTATION To be supplied before manufacture commences
2.	n/a	GENERAL ARRANGEMENT DRAWING Cross-sectioned to show all details necessary for repair and maintenance purposes.
3.	n/a	MATERIALS TEST CERTIFICATES a. Mechanical. n/a b. Chemical analysis.
4.	n/a	ITEMISED PARTS LIST Cross-referenced with G.A. drawing(s) and illustrating manufacturers references for all proprietary items such as bearings, oilseals, mechanical seals, etc.
5.	n/a	RECOMMEND SPARES QUOTATION a. Two years service. n/a b. Commissioning only.
6.	n/a	INSTALLATION, OPERATING AND MAINTENANCE MANUALS To include calibration instructions where applicable. n/a a. Paper Copy n/a b. Electronic copy (Preferably Adobe Acrobat)
7.	n/a	SOFTWARE a. Programming manual. n/a b. Operating manual.
8.	n/a	PRESSURE VESSELS Calculation sheets, spark test certificates (for lined vessels),hydraulic test certificates.
9.	n/a	ELECTRICAL a. Schematic and circuit diagrams. 1 b. Certificates of conformity (to include EMC Directive 89/336/EEC). 1 c. Hazardous area certification.
10.	n/a	INSTRUMENTATION a. Certificates of conformity (to include EMC Directive 89/336/EEC). n/a b. Calibration certificates. n/a c. Hazardous area certification.
11.	n/a	SPECIAL REQUIREMENTS

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P & I Design Ltd.

Instrument Specification

CLIENT:
Inter Terminals
Immingham East Terminal

REV **DATE** **BY** **CHKD** **APPD**
A 17/10/16 MM DBF MM

CLIENT REF.

P & I REF.
16062SPC010
SHT 1 OF 3

ITEM: Electrical
Component

GENERAL Tag Number See Sheet 2
Service 4 East Rail Loading – GOMC Batcher AC Power
Area Classification Zone 1 IIB T4

UNIT Type Safety Switch – 6 pole, 20A
Supply 240V ac
Case GRP
Connections 4 x M25
Mounting Surface
Enclosure Class IP66
Electrical Classification ATEX II 2 GD Ex ed IIC T6
Certificate Reference PTB99ATEX1161

OUTPUT Type

OPTIONS

MANUFACTURERS Supplier CEAG
DATA Model Number GHG262 2601 R0005

DOCUMENTATION See attached Documentation Specification

REVISION HISTORY	
Rev	Description
A	Issued for Purchase

P & I Design Ltd.

Instrument Specification

CLIENT:
Inter Terminals
Immingham East Terminal

REV	DATE	BY	CHKD	APPD
A	17/10/16	MM	DBF	MM

CLIENT REF.

P & I REF.
16062SPC010
SHT 2 OF 3

TAG No.	SERVICE	COMMENTS
n/a	Arm 1 (North Siding) / Arm 7 (South Siding)	
n/a	Arm 2 (North Siding) / Arm 8 (South Siding)	
n/a	Arm 3 (North Siding) / Arm 9 (South Siding)	
n/a	Arm 4 (North Siding) / Arm 10 (South Siding)	
n/a	Arm 5 (North Siding) / Arm 11 (South Siding)	
n/a	Arm 6 (North Siding) / Arm 12 (South Siding)	

CLIENT:
Inter Terminals
Immingham East Terminal

REV DATE BY CHKD APPD
A 17/10/16 MM DBF MM

CLIENT REF.
P & I REF.
16062SPC010
SHT 3 OF 3

Documentation Requirement

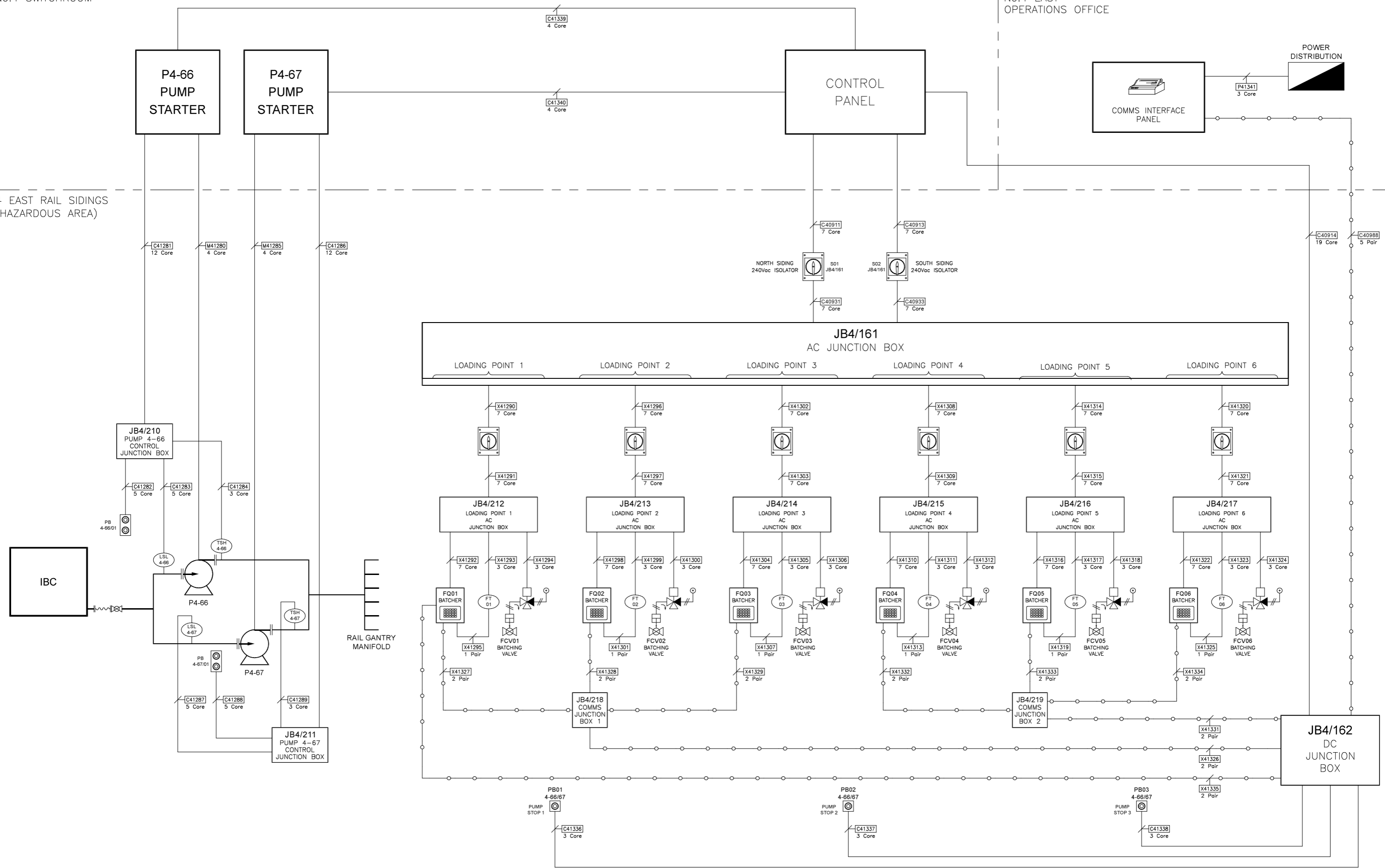
Item	Quantity	Description
1.	n/a	APPROVAL DOCUMENTATION To be supplied before manufacture commences
2.	n/a	GENERAL ARRANGEMENT DRAWING Cross-sectioned to show all details necessary for repair and maintenance purposes.
3.	n/a	MATERIALS TEST CERTIFICATES a. Mechanical. n/a b. Chemical analysis.
4.	n/a	ITEMISED PARTS LIST Cross-referenced with G.A. drawing(s) and illustrating manufacturers references for all proprietary items such as bearings, oilseals, mechanical seals, etc.
5.	n/a	RECOMMEND SPARES QUOTATION a. Two years service. n/a b. Commissioning only.
6.	n/a	INSTALLATION, OPERATING AND MAINTENANCE MANUALS To include calibration instructions where applicable. n/a a. Paper Copy n/a b. Electronic copy (Preferably Adobe Acrobat)
7.	n/a	SOFTWARE a. Programming manual. n/a b. Operating manual.
8.	n/a	PRESSURE VESSELS Calculation sheets, spark test certificates (for lined vessels),hydraulic test certificates.
9.	n/a	ELECTRICAL a. Schematic and circuit diagrams. 1 b. Certificates of conformity (to include EMC Directive 89/336/EEC). 1 c. Hazardous area certification.
10.	n/a	INSTRUMENTATION a. Certificates of conformity (to include EMC Directive 89/336/EEC). n/a b. Calibration certificates. n/a c. Hazardous area certification.
11.	n/a	SPECIAL REQUIREMENTS

IMPORTANT NOTICE:

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4 EAST RAIL SIDINGS (HAZARDOUS AREA)



IF NOT SIGNED THIS DOCUMENT IS UNCONTROLLED

REV	DATE	BY	DRN	CHK'D	APP'D	DESCRIPTION
A	30/08/16	P.P.	P.P.	D.R.P	D.R.P	M.M. M.M. DRAFT ISSUE
B	04/10/16	P.P.	P.P.	D.R.P	D.R.P	M.M. M.M. ISSUED FOR TENDER
C	12/10/16	P.P.	P.P.	D.R.P	D.R.P	M.M. M.M. ISSUED FOR CONSTRUCTION
D	25/10/16	P.P.	P.P.	D.R.P	D.R.P	M.M. M.M. CABLES 41335 & 41341 ADDED
E	04/01/17	P.P.	P.P.	D.R.P	D.R.P	M.M. M.M. AS BUILT

PLANT	INTER TERMINALS IMMINGHAM LTD - EAST TERMINAL
TITLE	4 EAST RAIL LOADING - GAS OIL MARKER SYSTEM DYE MARKER CABLE OVERVIEW
Immingham East Terminal Immingham Dock Immingham N.E. Lincolnshire DN40 2QW	Tel. 01642 617444 www.pidesign.co.uk
CLIENT DRG. No. IME-E-0276	P&I DRG No. 16062DWG001

SHEET 1 OF 1

INSTRUMENT/ELECTRICAL CABLE SCHEDULE

CABLE		CONDUCTORS		CABLE ROUTE				APPROX. LENGTH METRES	REMARKS
REFERENCE	TYPE	AREA mm ²	No.	FROM	GLAND TYPE	TO	GLAND TYPE		
M41280	J04	4	4 Core	P4-66 Pump Starter Panel	ATEX II 2 G EExed	P4-66 Pump Motor	ATEX II 2 G EExed	335	
C41281	J12	1.5	12 Core	P4-66 Pump Starter Panel	ATEX II 2 G EExed	JB4/210 P4-66 Control Junction Box	ATEX II 2 G EExed		
C41282	J05	1.5	5 Core	JB4/210 P4-66 Control Junction Box	ATEX II 2 G EExed	P4-66 Control Station	ATEX II 2 G EExed		
C41283	J05	1.5	5 Core	JB4/210 P4-66 Control Junction Box	ATEX II 2 G EExed	LSL4-66 Dry Run Switch	ATEX II 2 G EExed		
C41284	J03	1.5	3 Core	JB4/210 P4-66 Control Junction Box	ATEX II 2 G EExed	TSH4-66 Discharge Temperature Switch	ATEX II 2 G EExed		
M41285	J04	4	4 Core	P4-67 Pump Starter Panel	ATEX II 2 G EExed	P4-67 Pump Motor	ATEX II 2 G EExed	335	
C41286	J12	1.5	12 Core	P4-67 Pump Starter Panel	ATEX II 2 G EExed	JB4/210 P4-67 Control Junction Box	ATEX II 2 G EExed		
C41287	J05	1.5	5 Core	JB4/210 P4-67 Control Junction Box	ATEX II 2 G EExed	P4-67 Control Station	ATEX II 2 G EExed		
C41288	J05	1.5	5 Core	JB4/210 P4-67 Control Junction Box	ATEX II 2 G EExed	LSL4-67 Dry Run Switch	ATEX II 2 G EExed		
C41289	J03	1.5	3 Core	JB4/210 P4-67 Control Junction Box	ATEX II 2 G EExed	TSH4-67 Discharge Temperature Switch	ATEX II 2 G EExed		
X41290	J07	1.5	7 Core	Existing AC Junction Box	ATEX II 2 G EExed	Loading Point 1 Isolator	ATEX II 2 G EExed		
X41291	J07	1.5	7 Core	Loading Point 1 Isolator	ATEX II 2 G EExed	JB4/212 Loading Point 1 AC Junction Box	ATEX II 2 G EExed		
X41292	V07	0.75	7 Core	JB4/212 Loading Point 1 AC Junction Box	ATEX II 2 G EExed	FQ01 Loading Point 1 Batcher	ATEX II 2 G EExed		
X41293	J03	1.5	3 Core	JB4/212 Loading Point 1 AC Junction Box	ATEX II 2 G EExed	FT01 Loading Point 1 Flow Transmitter	ATEX II 2 G EExed		
X41294	J03	1.5	3 Core	JB4/212 Loading Point 1 AC Junction Box	ATEX II 2 G EExed	FCV01 Loading Point 1 Batching Valve Solenoid	ATEX II 2 G EExed		
X41295	E01	0.75	1 Pair	FQ01 Loading Point 1 Batcher	ATEX II 2 G EExed	FT01 Loading Point 1 Flow Transmitter	ATEX II 2 G EExed		
X41296	J07	1.5	7 Core	Existing AC Junction Box	ATEX II 2 G EExed	Loading Point 2 Isolator	ATEX II 2 G EExed		
X41297	J07	1.5	7 Core	Loading Point 2 Isolator	ATEX II 2 G EExed	JB4/213 Loading Point 2 AC Junction Box	ATEX II 2 G EExed		
X41298	V07	0.75	7 Core	JB4/213 Loading Point 2 AC Junction Box	ATEX II 2 G EExed	FQ02 Loading Point 2 Batcher	ATEX II 2 G EExed		
X41299	J03	1.5	3 Core	JB4/213 Loading Point 2 AC Junction Box	ATEX II 2 G EExed	FT02 Loading Point 2 Flow Transmitter	ATEX II 2 G EExed		
X41300	J03	1.5	3 Core	JB4/213 Loading Point 2 AC Junction Box	ATEX II 2 G EExed	FCV02 Loading Point 2 Batching Valve Solenoid	ATEX II 2 G EExed		
X41301	E01	0.75	1 Pair	FQ02 Loading Point 2 Batcher	ATEX II 2 G EExed	FT02 Loading Point 2 Flow Transmitter	ATEX II 2 G EExed		
X41302	J07	0.75	7 Core	Existing AC Junction Box	ATEX II 2 G EExed	Loading Point 3 Isolator	ATEX II 2 G EExed		
X41303	J07	1.5	7 Core	Loading Point 3 Isolator	ATEX II 2 G EExed	JB4/214 Loading Point 3 AC Junction Box	ATEX II 2 G EExed		
X41304	V07	1.5	7 Core	JB4/214 Loading Point 3 AC Junction Box	ATEX II 2 G EExed	FQ03 Loading Point 3 Batcher	ATEX II 2 G EExed		
X41305	J03	1.5	3 Core	JB4/214 Loading Point 3 AC Junction Box	ATEX II 2 G EExed	FT03 Loading Point 3 Flow Transmitter	ATEX II 2 G EExed		
X41306	J03	1.5	3 Core	JB4/214 Loading Point 3 AC Junction Box	ATEX II 2 G EExed	FCV03 Loading Point 3 Batching Valve Solenoid	ATEX II 2 G EExed		
X41307	E01	0.75	1 Pair	FQ03 Loading Point 3 Batcher	ATEX II 2 G EExed	FT03 Loading Point 3 Flow Transmitter	ATEX II 2 G EExed		
X41308	J07	0.75	7 Core	Existing AC Junction Box	ATEX II 2 G EExed	Loading Point 4 Isolator	ATEX II 2 G EExed		
X41309	J07	1.5	7 Core	Loading Point 4 Isolator	ATEX II 2 G EExed	JB4/215 Loading Point 4 AC Junction Box	ATEX II 2 G EExed		
X41310	V07	1.5	7 Core	JB4/215 Loading Point 4 AC Junction Box	ATEX II 2 G EExed	FQ04 Loading Point 4 Batcher	ATEX II 2 G EExed		
X41311	J03	1.5	3 Core	JB4/215 Loading Point 4 AC Junction Box	ATEX II 2 G EExed	FT04 Loading Point 4 Flow Transmitter	ATEX II 2 G EExed		
X41312	J03	1.5	3 Core	JB4/215 Loading Point 4 AC Junction Box	ATEX II 2 G EExed	FCV04 Loading Point 4 Batching Valve Solenoid	ATEX II 2 G EExed		
X41313	E01	0.75	1 Pair	FQ04 Loading Point 4 Batcher	ATEX II 2 G EExed	FT04 Loading Point 4 Flow Transmitter	ATEX II 2 G EExed		
X41314	J07	0.75	7 Core	Existing AC Junction Box	ATEX II 2 G EExed	Loading Point 5 Isolator	ATEX II 2 G EExed		
X41315	J07	1.5	7 Core	Loading Point 5 Isolator	ATEX II 2 G EExed	JB4/216 Loading Point 5 AC Junction Box	ATEX II 2 G EExed		
							TOTAL	670	

NOTES:
1) Refer to P&I Design Cable Specifications for details on Cable Type.

IF NOT SIGNED THIS DOCUMENT IS UNCONTROLLED								
REV	DATE	BY	DRN	CHK'D	APP'D	DESCRIPTION		
A	04/10/16	P.P.	P.P.	M.M.	MM	M.M.	MM	Issued for Tender
B	10/12/16	MM	MM	DRP	DRP	MM	MM	Issued for Construction
C	28/10/16	MM	MM	PP	PP	MM	PP	Cables Added for Ticket Printing
D	16/01/17	MM	MM	PP		MM		As Built

PLANT	Inter Terminals Immingham Ltd - East Terminal	
TITLE	Rail Loading Marker Dye : Cable Schedule	
SHEET 1 of 2		
CLIENT DRG No		
REF No. 16062SCH002		

- Denotes Cable Modified
- Denotes Cable Deleted
- Denotes Cable Added
- Future Cables



FIELD							JB4/210 - PUMP CONTROL JUNCTION BOX					No.4 SWITCHROOM : P4-66 PUMP STARTER													
FIELD INSTRUMENT	TERMINAL No.	CABLE DETAILS					TERMINAL No.	JUNCTION BOX DETAILS					TERMINAL No.	PANEL TERMINATION DETAILS					INST. TERMINAL No.	INST. LOOP DIAGRAM	REMARKS				
		CABLE No.	TYPE	CORE No.	FERRULE No.	LENGTH METRES		CABLE No.	TYPE	CORE No.	FERRULE No.	LENGTH METRES		CABLE No.	TYPE	CORE No.	FERRULE No.	LENGTH METRES							
P4-66 Local Control Station	Start Com	C41282	5 Core	1	41282/1	1	C41281	12 Core	1	41281/1	5	TB2									Start				
	Start N/O			2	41282/2	2			2	41281/2	6													Stop	
	Stop Com			3	41282/3	3			3	41281/3	7														Earth
	Stop N/C			4	41282/4	4																			
	Earth			5	41282/5	5		● 13		10	41281/10		14												
TSH/4-66 Temp. Switch	1	C41284	3 Core	1	41284/1	4																	Discharge Temperature		
	3			2	41284/2	5																		Earth	
	Earth			3	41284/3	● 14			11	41281/11	15														
LSL/4-66 Level Switch	4	C41283	5 Core	3	41283/3	5																	Suction Level Switch		
	3			4	41283/4	6			4	41281/4	8													230Vac	
	1			1	41283/1	7			5	41281/5	9													Neutral	
	2			2	41283/2	8			6	41281/6	10														Earth
	Earth			5	41283/5	● 15			12	41281/12	16														
						9		7	41281/7	11												Spare			
						10		8	41281/8	12												Spare			
						11		9	41281/9	13												Spare			
						12																			

IF NOT SIGNED THIS DOCUMENT IS UNCONTROLLED

NOTES:
 1) Future Level & Temperature switches to be linked out.

	Denotes Item Modified
	Denotes Item Deleted
	Denotes Item Added
	Future Use

REV	DATE	BY	DRN	CHECKED	APPROVED	DESCRIPTION
A	31/10/16	P.P.	P.P.	D.R.P	DRP	M.M. MM
B	16/01/17	MM	MM	PP	MM	As Built

PLANT	Immingham Storage Co. - East Terminal
TITLE	JB4/210 - Pump Controls J/B Connection Schedule
 	
CLIENT DRG No.	SHEET 1 OF 1
	REF No. 16062SCH003

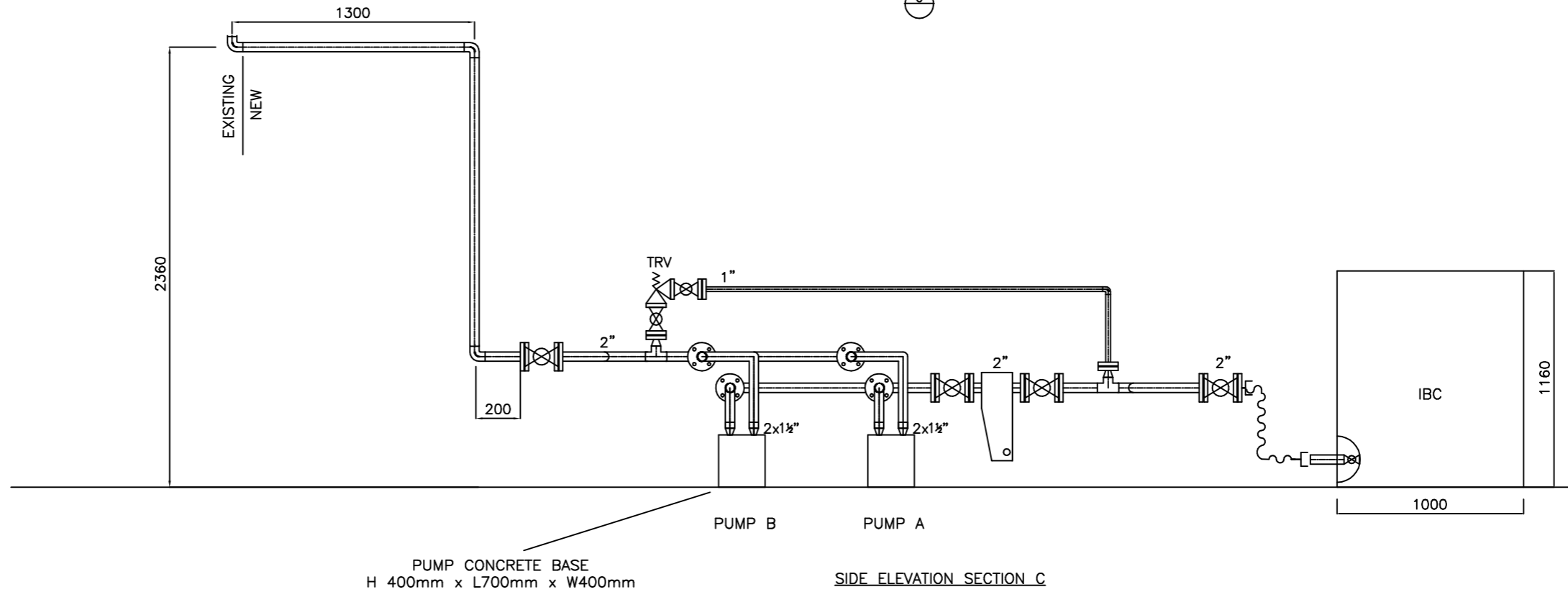
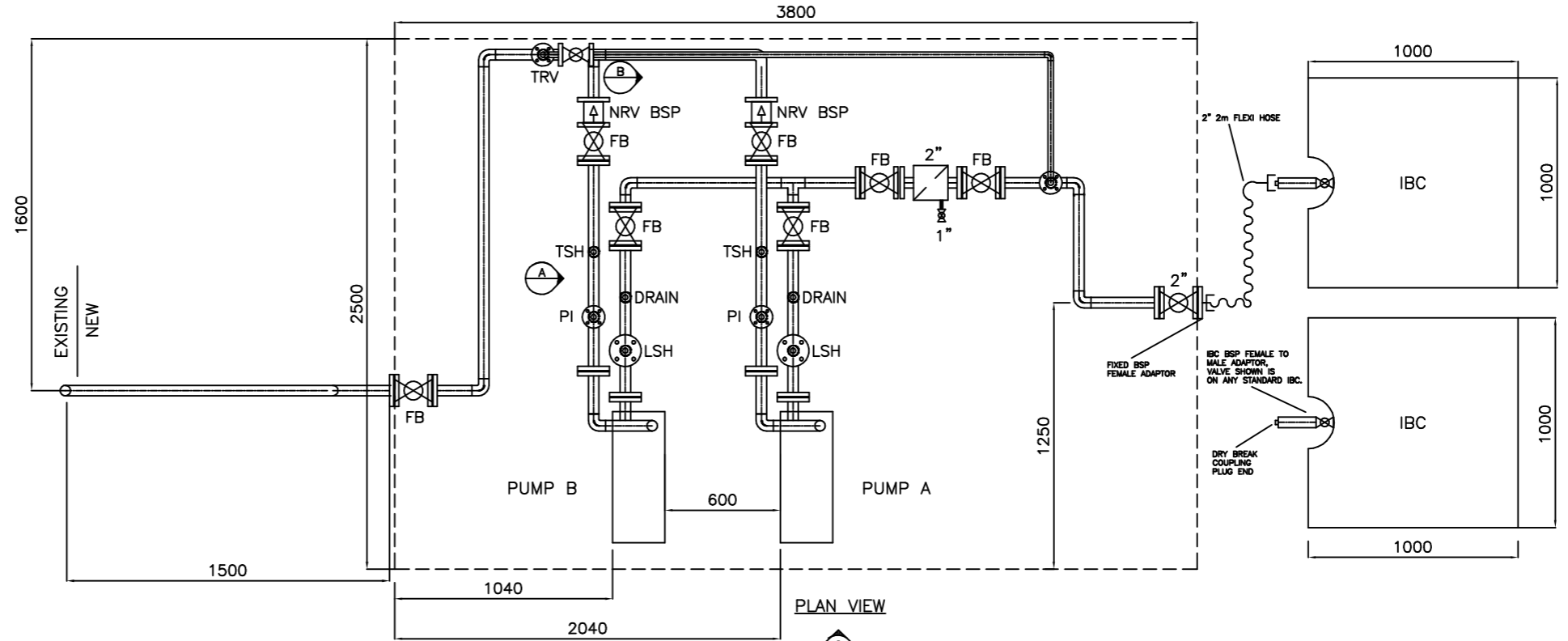
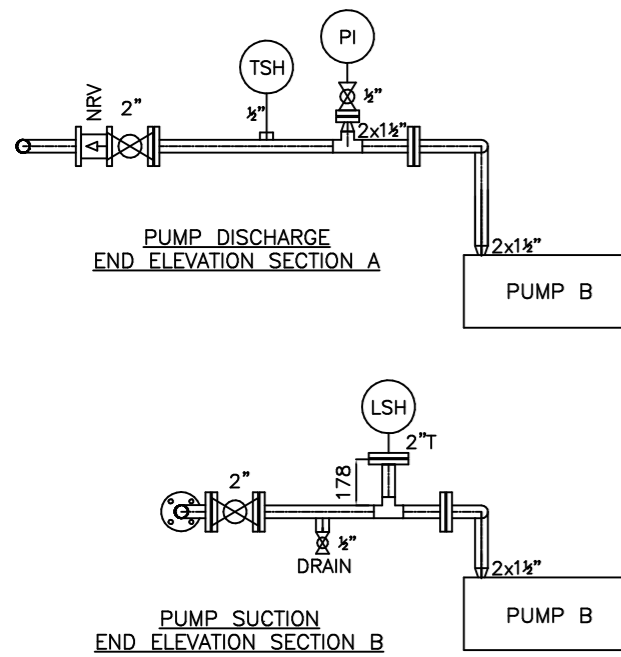
FIELD							JB4/211 - PUMP CONTROL JUNCTION BOX					No.4 SWITCHROOM : P4-67 PUMP STARTER													
FIELD INSTRUMENT	TERMINAL No.	CABLE DETAILS					TERMINAL No.	JUNCTION BOX DETAILS					TERMINAL No.	PANEL TERMINATION DETAILS					INST. TERMINAL No.	INST. LOOP DIAGRAM	REMARKS				
		CABLE No.	TYPE	CORE No.	FERRULE No.	LENGTH METRES		CABLE No.	TYPE	CORE No.	FERRULE No.	LENGTH METRES		CABLE No.	TYPE	CORE No.	FERRULE No.	LENGTH METRES							
P4-67 Local Control Station	Start Com	C41288	5 Core	1	41288/1	1	C41286	12 Core	1	41286/1	5	TB2									Start				
	Start N/O			2	41288/2	2		2	41286/2	6														Stop	
	Stop Com			3	41288/3	3		3	41286/3	7															Earth
	Stop N/C			4	41288/4	4																			
	Earth			5	41288/5	5		13		10	41286/10		14												
TSH/4-67 Temp. Switch	1	C41289	3 Core	1	41289/1	4																	Discharge Temperature		
	3			2	41289/2	5																		Earth	
	Earth			3	41289/3	14			11	41286/11	15														
LSL/4-67 Level Switch	4	C41287	5 Core	3	41287/3	5																	Suction Level Switch		
	3			4	41287/4	6			4	41286/4	8													230Vac	
	1			1	41287/1	7			5	41286/5	9													Neutral	
	2			2	41287/2	8			6	41286/6	10														Earth
	Earth			5	41287/5	15		12	41286/12	16															
						9		7	41286/7	11												Spare			
						10		8	41286/8	12												Spare			
						11		9	41286/9	13												Spare			
						12																			

IF NOT SIGNED THIS DOCUMENT IS UNCONTROLLED										PLANT		Immingham Storage Co. - East Terminal																																																					
NOTES:										TITLE		JB4/211 - Pump Controls J/B Connection Schedule																																																					
1) Future Level & Temperature switches to be linked out.										DESCRIPTION		Issued for Construction																																																					
<table border="1"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>BY</th> <th>DRN</th> <th>CHECKED</th> <th>APPROVED</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>31/10/16</td> <td>P.P.</td> <td>P.P.</td> <td>D.R.P</td> <td>DRP</td> <td>M.M.</td> <td>MM</td> <td>As Built</td> </tr> <tr> <td>B</td> <td>16/01/17</td> <td>MM</td> <td>MM</td> <td>PP</td> <td></td> <td>MM</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>										REV	DATE	BY	DRN	CHECKED	APPROVED	DESCRIPTION	A	31/10/16	P.P.	P.P.	D.R.P	DRP	M.M.	MM	As Built	B	16/01/17	MM	MM	PP		MM																														CLIENT DRG No.		REF No. 16062SCH004	
REV	DATE	BY	DRN	CHECKED	APPROVED	DESCRIPTION																																																											
A	31/10/16	P.P.	P.P.	D.R.P	DRP	M.M.	MM	As Built																																																									
B	16/01/17	MM	MM	PP		MM																																																											

- Denotes Item Modified
- Denotes Item Deleted
- Denotes Item Added
- Future Use

SHEET 1 OF 1

PLEASE ALSO REFER TO REF IMMEA52984/16-1



PUMP CONCRETE BASE
 H 400mm x L700mm x W400mm

IF NOT SIGNED THIS DOCUMENT IS UNCONTROLLED							PLANT	INTER TERMINALS IMMINGHAM LTD - EAST TERMINAL
REV	DATE	BY	DRN	CHK'D	APP'D	DESCRIPTION	TITLE	4 EAST RAIL LOADING - GAS OIL MARKER SYSTEM GENERAL ARRANGEMENT
A	19/09/16	P.J.P	D.A.Y	P.J.P	P.J.P	M.M.	M.M.	ORIGINAL ISSUE
B	21/09/16	P.J.P	D.A.Y	P.J.P	P.J.P	M.M.	M.M.	CLIENT COMMENTS ADDED
C	21/09/16	P.J.P	D.A.Y	P.J.P	P.J.P	M.M.	M.M.	VALVES ADDED TO TRV
D	03/10/16	P.J.P	D.A.Y	P.J.P	P.J.P	M.M.	M.M.	DIMENSIONS ADDED
E	06/12/16	P.J.P	D.A.Y	P.J.P	P.J.P	M.M.	M.M.	AS BUILT

inter terminals
 Inter Terminals Immingham Ltd
 Immingham East Terminal
 Immingham Dock Immingham
 N.E. Lincolnshire
 DN40 2QW

P & I Design Ltd
 Tel. 01642 617444
 www.pidesign.co.uk

SHEET 1 OF 1
 CLIENT DRG. No. P&I DRG No. 16062DWG003

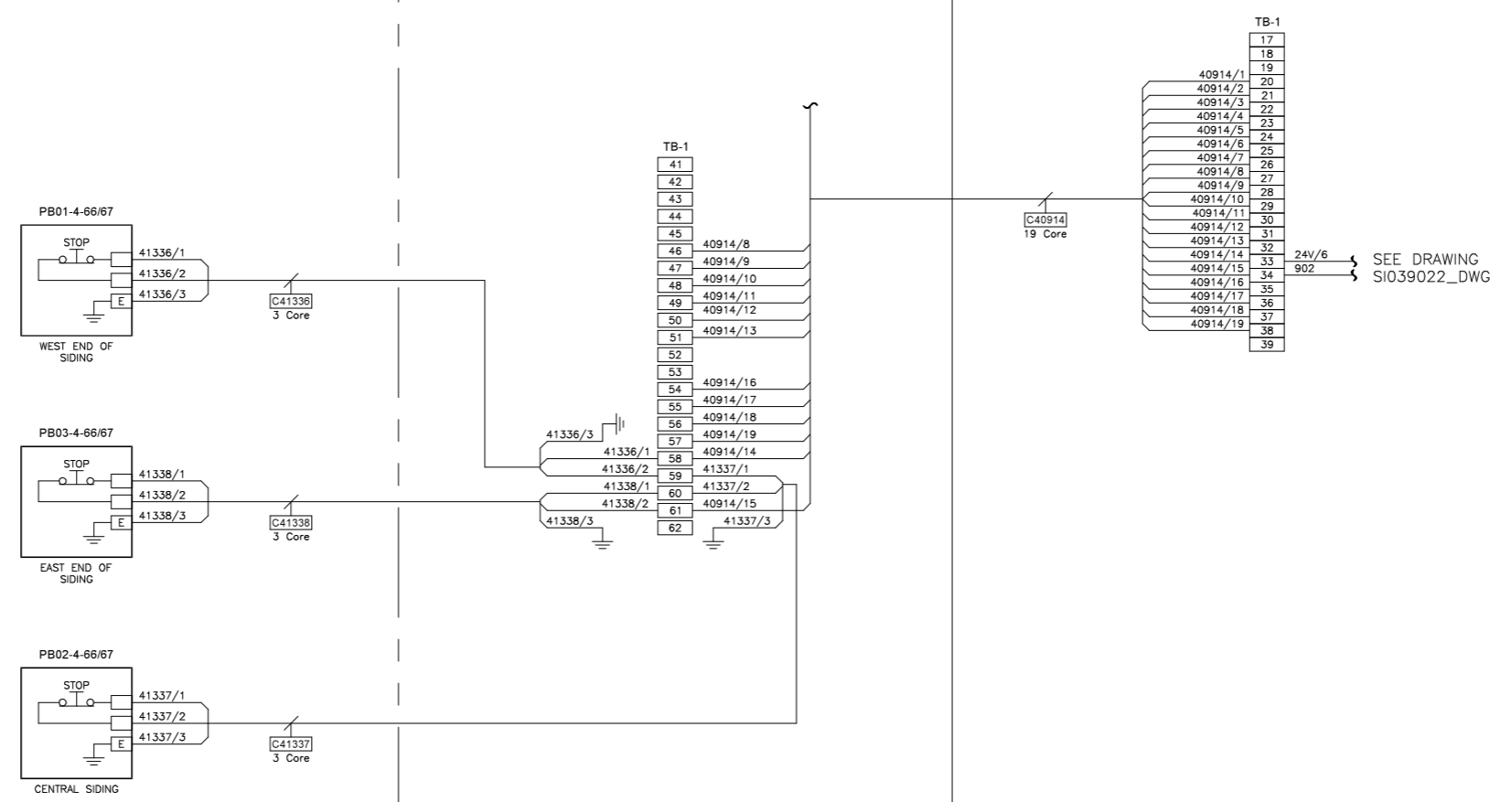
LOADING POINT BATCHER

HAZARDOUS AREA

JB4/161 - DC JUNCTION BOX

4 EAST SWITCHROOM PLC PANEL

4 EAST OPERATIONS OFFICE




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REV	DATE	BY	DRN	CHK'D	APP'D	DESCRIPTION
A	28/10/16	P.P.	P.P.	D.R.P	D.R.P	M.M. M.M. ISSUED FOR CONSTRUCTION
B	04/01/17	P.P.	P.P.	D.R.P	M.M.	AS BUILT

PLANT	INTER TERMINALS IMMINGHAM LTD - EAST TERMINAL
TITLE	4 EAST RAIL LOADING - GAS OIL MARKER SYSTEM DC JUNCTION BOX CONNECTION DETAILS
CLIENT	DRG. No.

inter terminals
Inter Terminals Immingham Ltd
Immingham East Terminal
Immingham Dock Immingham
N.E. Lincolnshire
DN40 2QW



P & I Design Ltd
Tel. 01642 617444
www.pidesign.co.uk

SHEET 1 OF 1
P&I DRG No. 16062DWG005

HAZARDOUS AREA

SAFE AREA

LOADING POINT 1

JB4/212
AC JUNCTION BOX

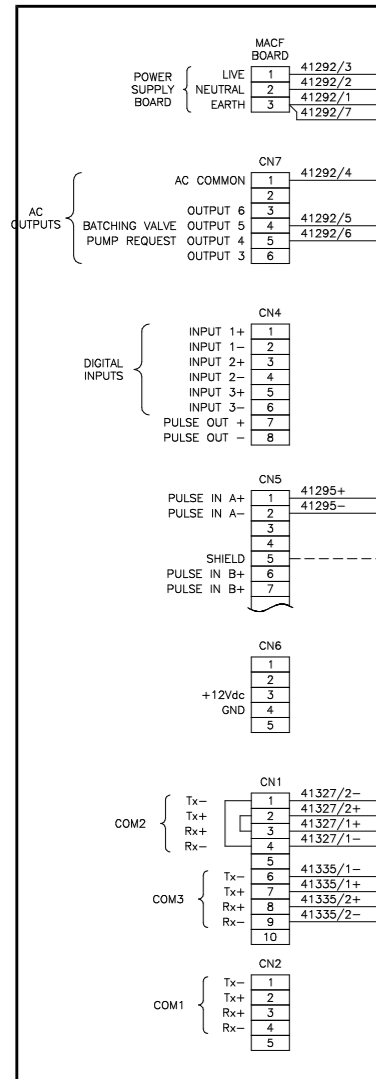
LOADING POINT 1 ISOLATOR

JB4/161
AC JUNCTION BOX

S01-JB4/161
230Vac ISOLATOR

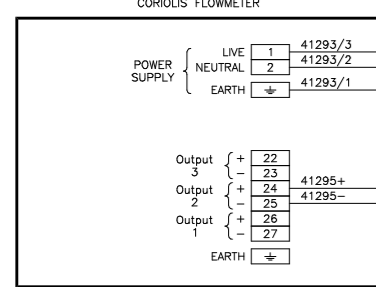
No.4 EAST SWITCHROOM
CONTROL PANEL

FQ01
MICROLOAD BATCHER

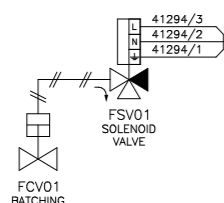


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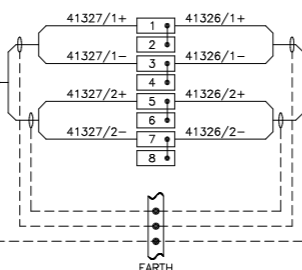
FT01
CORIOLIS FLOWMETER



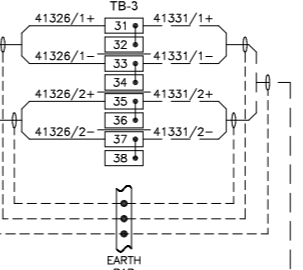
E+H PROLINE PROMASS F300



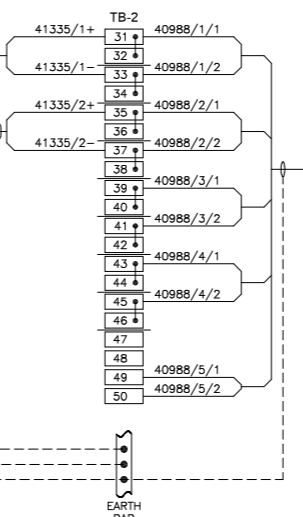
JB4/218
COMMS JUNCTION BOX 1



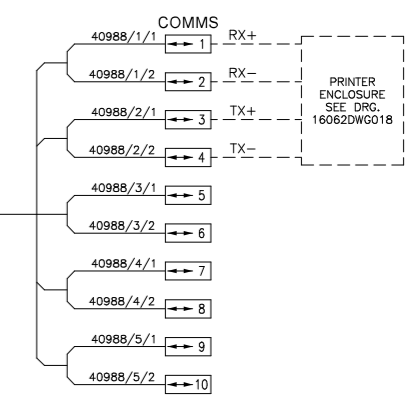
JB4/162
DC JUNCTION BOX



COMMS FROM
LOADING POINT
BATCHERS 4, 5 & 6
via JB4/219
COMMS JUNCTION
BOX 2



No.4 EAST OPERATIONS OFFICE



PRINTER
ENCLOSURE
SEE DRG.
16062DWG018

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REV	DATE	BY	DRN	CHK'D	APP'D	DESCRIPTION
A	28/10/16	P.P.	P.P.	D.R.P	D.R.P	M.M. M.M. ISSUED FOR CONSTRUCTION
B	04/01/17	P.P.	P.P.	D.R.P	M.M.	AS BUILT

PLANT	INTER TERMINALS IMMINGHAM LTD - EAST TERMINAL
TITLE	4 EAST RAIL LOADING - GAS OIL MARKER SYSTEM LOADING POINT 1 CONNECTION DETAILS
CLIENT	DRG. No.

inter terminals
Immingham East Terminal
Immingham Dock Immingham
N.E. Lincolnshire
DN40 2QW

P & I Design Ltd
Tel. 01642 617444
www.pidesign.co.uk

SHEET 1 OF 1
P&I DRG No. 16062DWG006

HAZARDOUS AREA

SAFE AREA

LOADING POINT 2

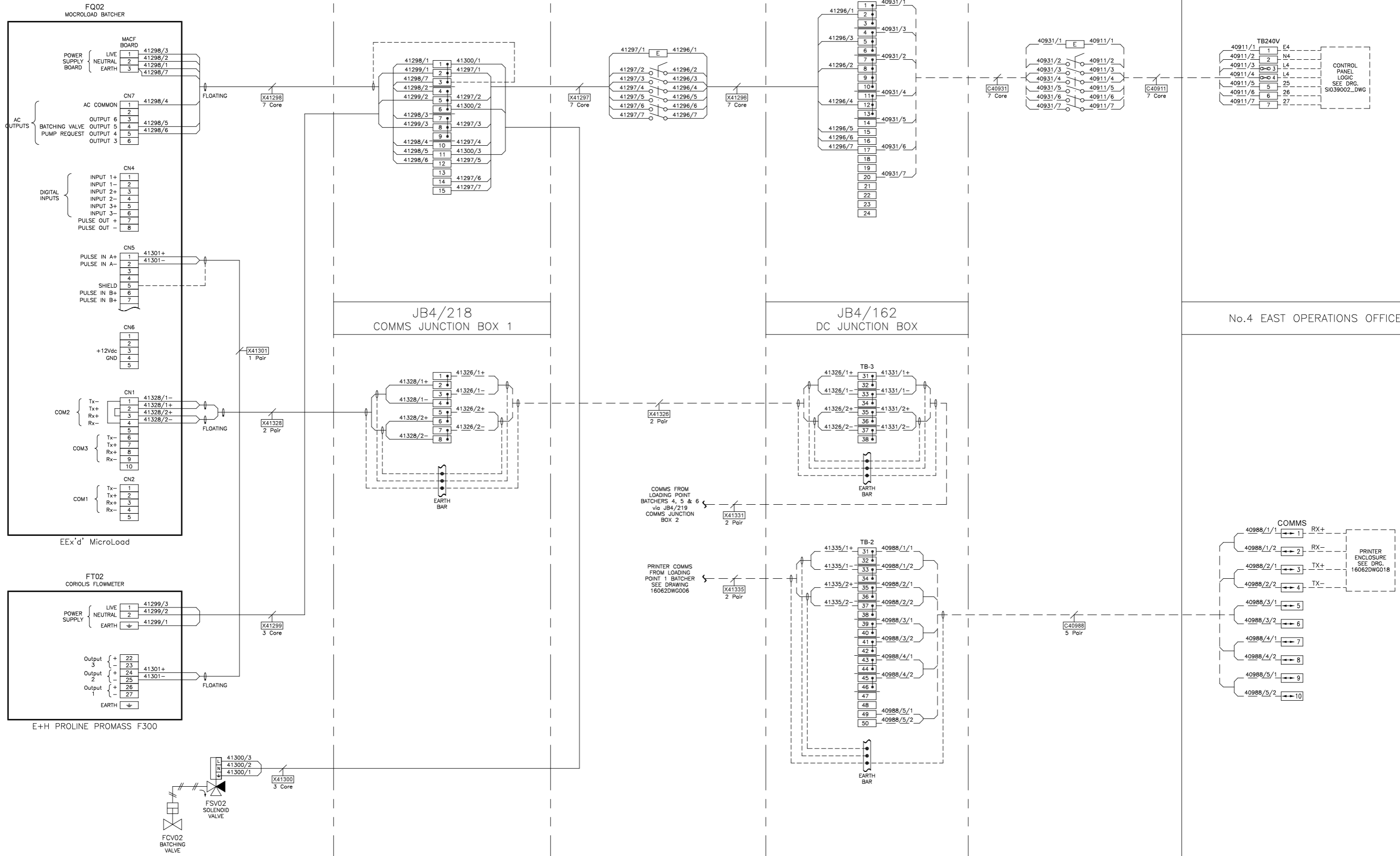
JB4/213
AC JUNCTION BOX

LOADING POINT 2 ISOLATOR

JB4/161
AC JUNCTION BOX

S01-JB4/161
230Vac ISOLATOR

No.4 EAST SWITCHROOM
CONTROL PANEL



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REV	DATE	BY	DRN	CHK'D	APP'D	DESCRIPTION
A	28/10/16	P.P.	P.P.	D.R.P	D.R.P	M.M. M.M. ISSUED FOR CONSTRUCTION
B	04/01/17	P.P.	P.P.	D.R.P	M.M.	AS BUILT

PLANT	INTER TERMINALS IMMINGHAM LTD - EAST TERMINAL
TITLE	4 EAST RAIL LOADING - GAS OIL MARKER SYSTEM LOADING POINT 2 CONNECTION DETAILS
Immingham East Terminal Immingham Dock Immingham N.E. Lincolnshire DN40 2QW	
Tel. 01642 617444 www.pidesign.co.uk	
SHEET 1 OF 1	
CLIENT DRG. No.	P&I DRG No. 16062DWG007

HAZARDOUS AREA

SAFE AREA

LOADING POINT 3

JB4/214
AC JUNCTION BOX

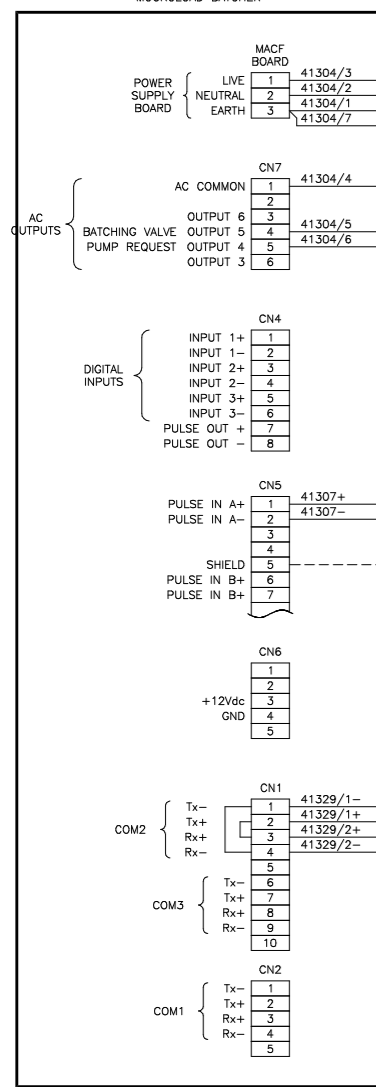
LOADING POINT 3 ISOLATOR

JB4/161
AC JUNCTION BOX

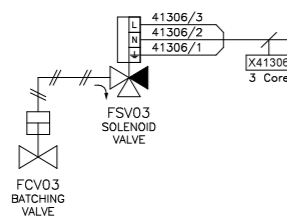
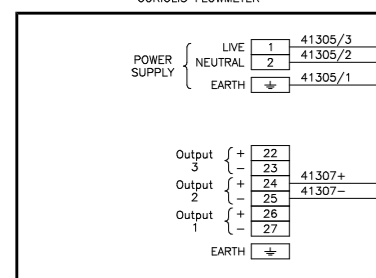
S01-JB4/161
230Vac ISOLATOR

No.4 EAST SWITCHROOM
CONTROL PANEL

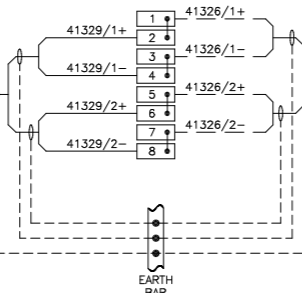
FQ03
MICROLOAD BATCHER



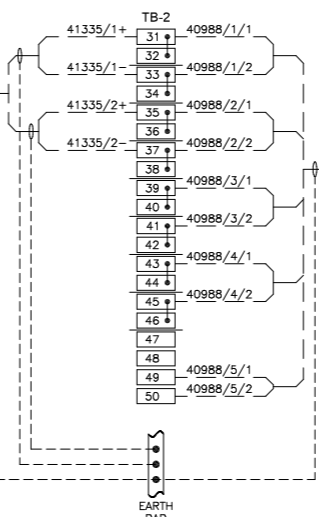
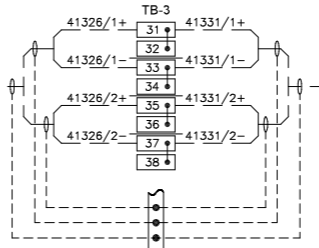
FT03
CORIOLIS FLOWMETER



JB4/218
COMMS JUNCTION BOX 1

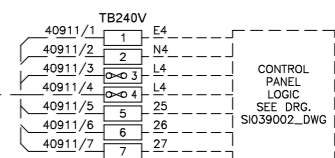
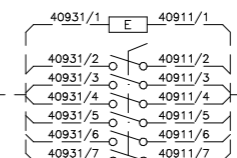


JB4/162
DC JUNCTION BOX

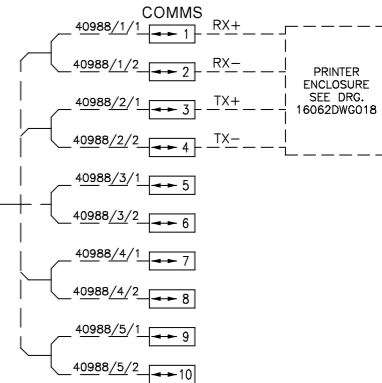


COMMS FROM
LOADING POINT
BATCHERS 4, 5 & 6
via JB4/219
COMMS JUNCTION
BOX 2

PRINTER COMMS
FROM LOADING
POINT 1 BATCHER
SEE DRAWING
16062DWG006



No.4 EAST OPERATIONS OFFICE



IF NOT SIGNED THIS DOCUMENT IS UNCONTROLLED							PLANT	INTER TERMINALS IMMINGHAM LTD - EAST TERMINAL	
REV	DATE	BY	DRN	CHK'D	APP'D	DESCRIPTION	TITLE	4 EAST RAIL LOADING - GAS OIL MARKER SYSTEM LOADING POINT 3 CONNECTION DETAILS	
A	28/10/16	P.P.	P.P.	D.R.P	D.R.P	M.M.	M.M.	ISSUED FOR CONSTRUCTION	
B	04/01/17	P.P.	P.P.	D.R.P	M.M.	AS BUILT			

inter terminals	P & I Design Ltd
Immingham East Terminal Immingham Dock Immingham N.E. Lincolnshire DN40 2QW	Tel. 01642 617444 www.pidesign.co.uk
CLIENT DRG. No.	P&I DRG No. 16062DWG008

HAZARDOUS AREA

SAFE AREA

LOADING POINT 4

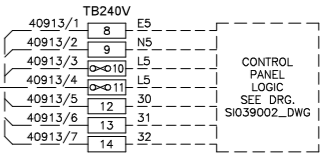
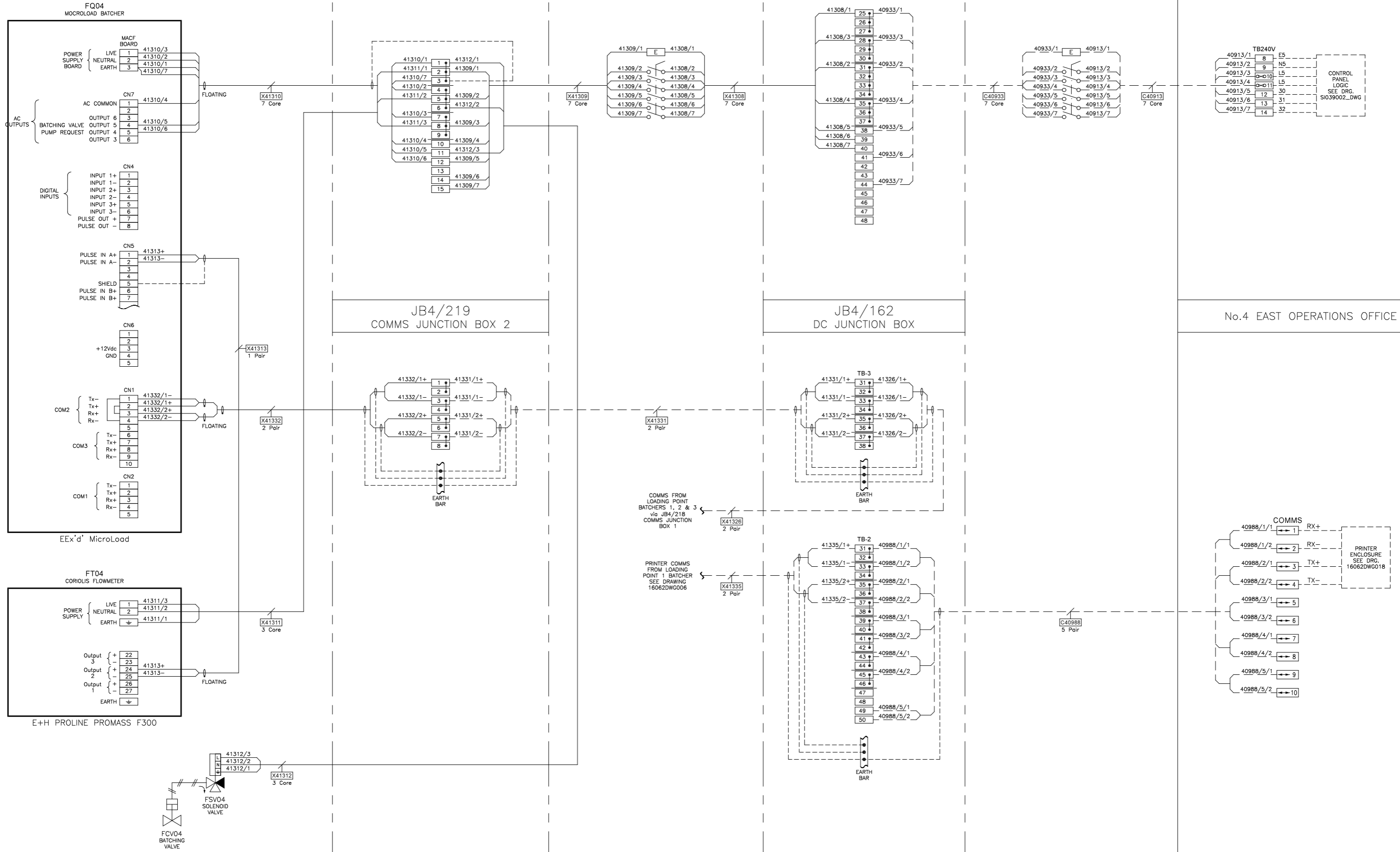
JB4/215
AC JUNCTION BOX

LOADING POINT 4 ISOLATOR

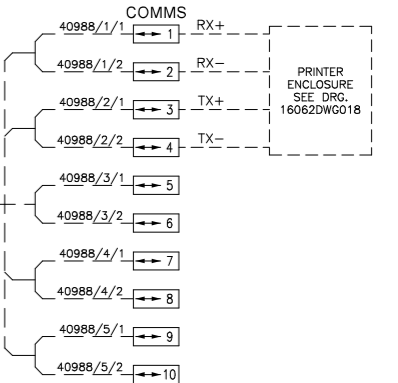
JB4/161
AC JUNCTION BOX

SO2-JB4/161
230Vac ISOLATOR

No.4 EAST SWITCHROOM
CONTROL PANEL



No.4 EAST OPERATIONS OFFICE



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REV	DATE	BY	DRN	CHK'D	APP'D	DESCRIPTION	TITLE	4 EAST RAIL LOADING - GAS OIL MARKER SYSTEM LOADING POINT 4 CONNECTION DETAILS		
A	28/10/16	P.P.	P.P.	D.R.P	D.R.P	M.M.	M.M.	ISSUED FOR CONSTRUCTION		
B	04/01/17	P.P.	P.P.	D.R.P	M.M.			AS BUILT		
							Immingham East Terminal Immingham Dock Immingham N.E. Lincolnshire DN40 2QW		Tel. 01642 617444 www.pidesign.co.uk	
							CLIENT DRG. No.		SHEET 1 OF 1 P&I DRG No. 16062DWG009	

HAZARDOUS AREA

SAFE AREA

LOADING POINT 5

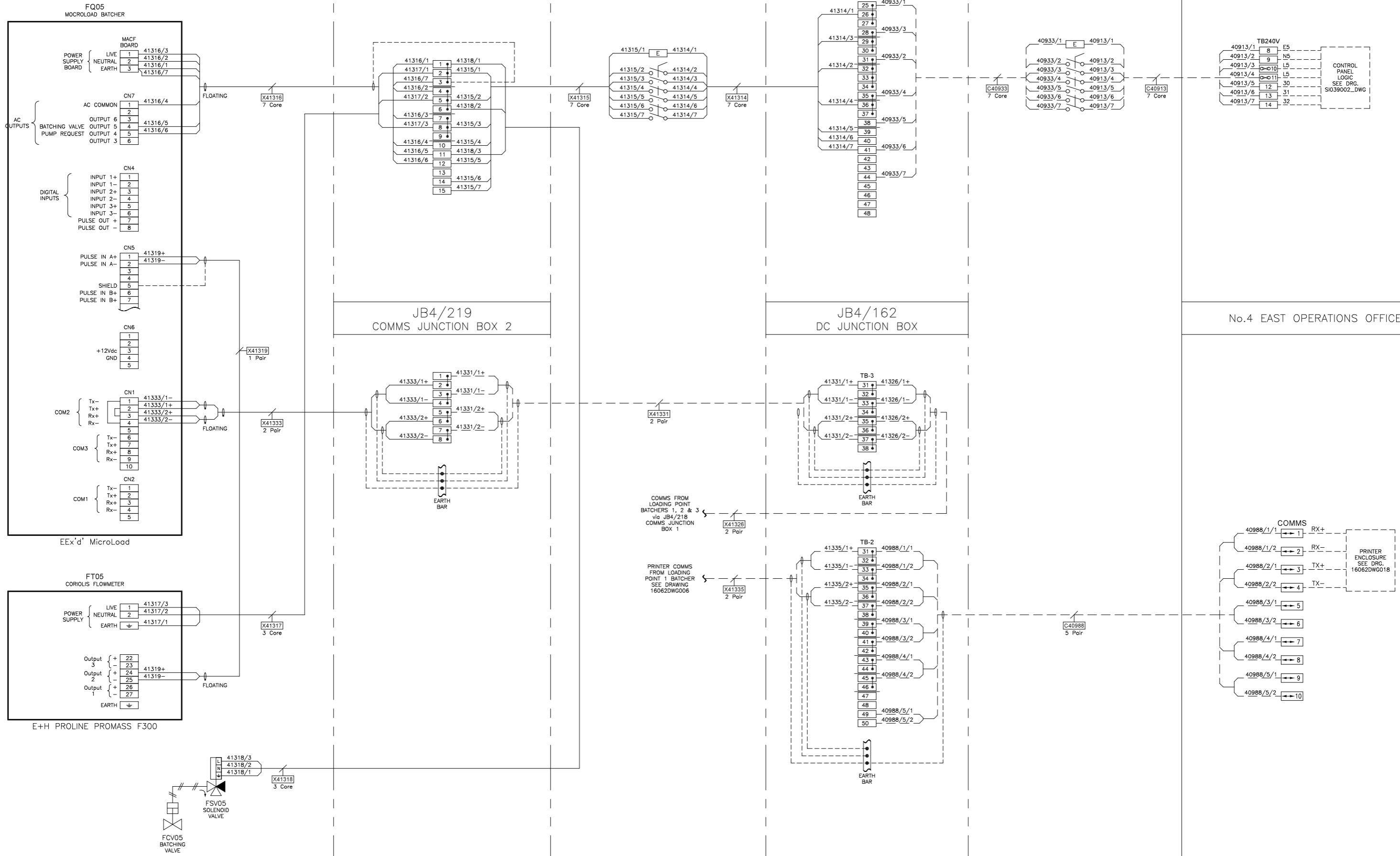
JB4/216
AC JUNCTION BOX

LOADING POINT 5 ISOLATOR

JB4/161
AC JUNCTION BOX

S02-JB4/161
230Vac ISOLATOR

No.4 EAST SWITCHROOM
CONTROL PANEL



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REV	DATE	BY	DRN	CHK'D	APP'D	DESCRIPTION
A	28/10/16	P.P.	P.P.	D.R.P	D.R.P	M.M. M.M. ISSUED FOR CONSTRUCTION
B	04/01/17	P.P.	P.P.	D.R.P	M.M.	AS BUILT

PLANT	INTER TERMINALS IMMINGHAM LTD - EAST TERMINAL
TITLE	4 EAST RAIL LOADING - GAS OIL MARKER SYSTEM LOADING POINT 5 CONNECTION DETAILS
CLIENT	DRG. No.
DRG. No.	P&I DRG No. 16062DWG010

inter terminals
 Immingham East Terminal
 Immingham Dock Immingham
 N.E. Lincolnshire
 DN40 2QW

P & I Design Ltd
 Tel. 01642 617444
 www.pidesign.co.uk

SHEET 1 OF 1

HAZARDOUS AREA

SAFE AREA

LOADING POINT 6

JB4/217
AC JUNCTION BOX

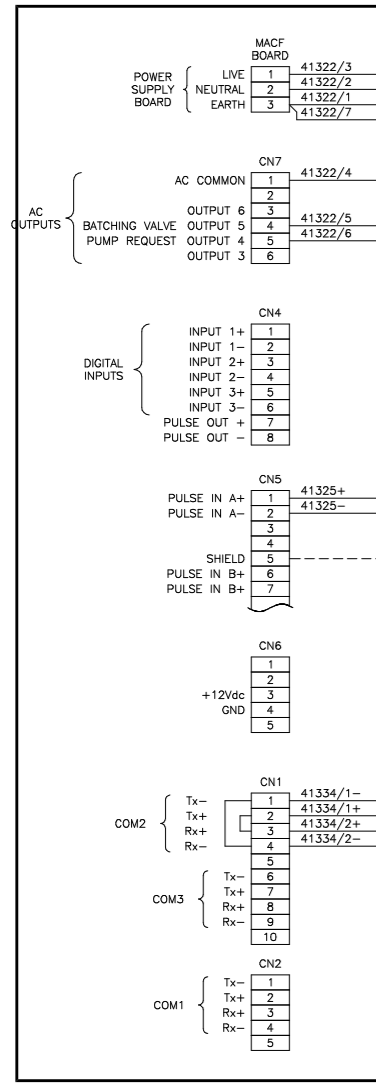
LOADING POINT 6 ISOLATOR

JB4/161
AC JUNCTION BOX

S02-JB4/161
230Vac ISOLATOR

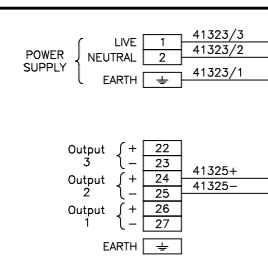
No.4 EAST SWITCHROOM
CONTROL PANEL

FQ06
MICROLOAD BATCHER

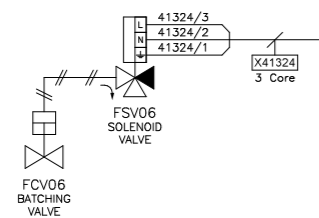


EEx'd' MicroLoad

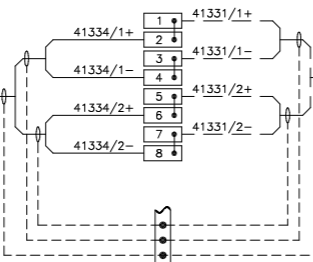
FT06
CORIOLIS FLOWMETER



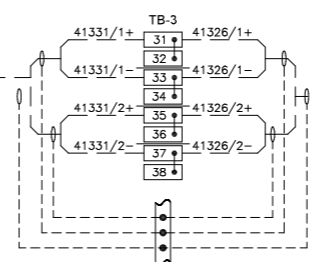
E+H PROLINE PROMASS F300



JB4/219
COMMS JUNCTION BOX 2



JB4/162
DC JUNCTION BOX



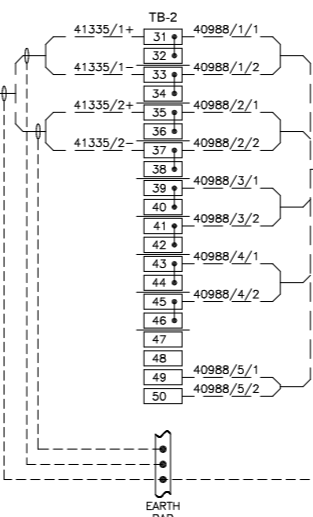
COMMS FROM
LOADING POINT
BATCHERS 1, 2 & 3
via JB4/218
COMMS JUNCTION
BOX 1

PRINTER COMMS
FROM LOADING
POINT 1 BATCHER
SEE DRAWING
16062DWG006

X41331
2 Pair

X41326
2 Pair

X41335
2 Pair



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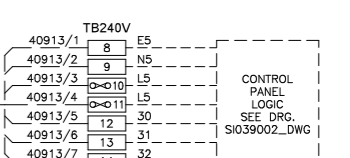
REV	DATE	BY	DRN	CHK'D	APP'D	DESCRIPTION
A	28/10/16	P.P.	P.P.	D.R.P	D.R.P	M.M. M.M. ISSUED FOR CONSTRUCTION
B	04/01/17	P.P.	P.P.	D.R.P	M.M.	AS BUILT

PLANT INTER TERMINALS IMMINGHAM LTD - EAST TERMINAL
TITLE 4 EAST RAIL LOADING - GAS OIL MARKER SYSTEM
LOADING POINT 6 CONNECTION DETAILS

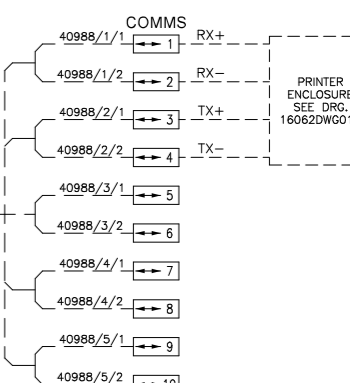
inter terminals
Immingham East Terminal
Immingham Dock Immingham
N.E. Lincolnshire
DN40 2QW

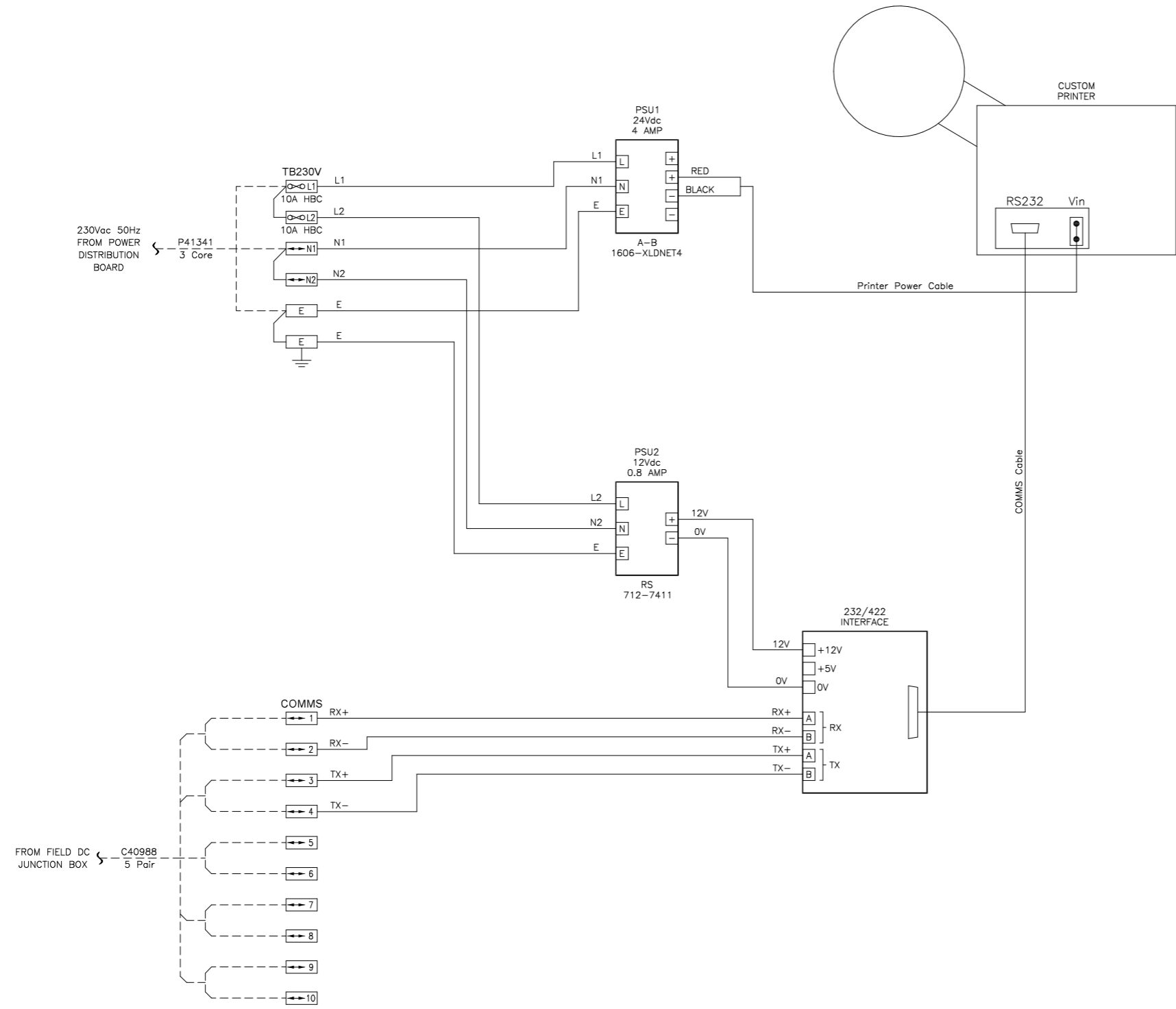
P & I Design Ltd
Tel. 01642 617444
www.pidesign.co.uk

SHEET 1 OF 1
P&I DRG No. 16062DWG011



No.4 EAST OPERATIONS OFFICE





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REV	DATE	BY	DRN	CHK'D	APP'D	DESCRIPTION
A	17/11/16	P.P.	P.P.	M.M.	M.M.	ISSUED FOR CONSTRUCTION

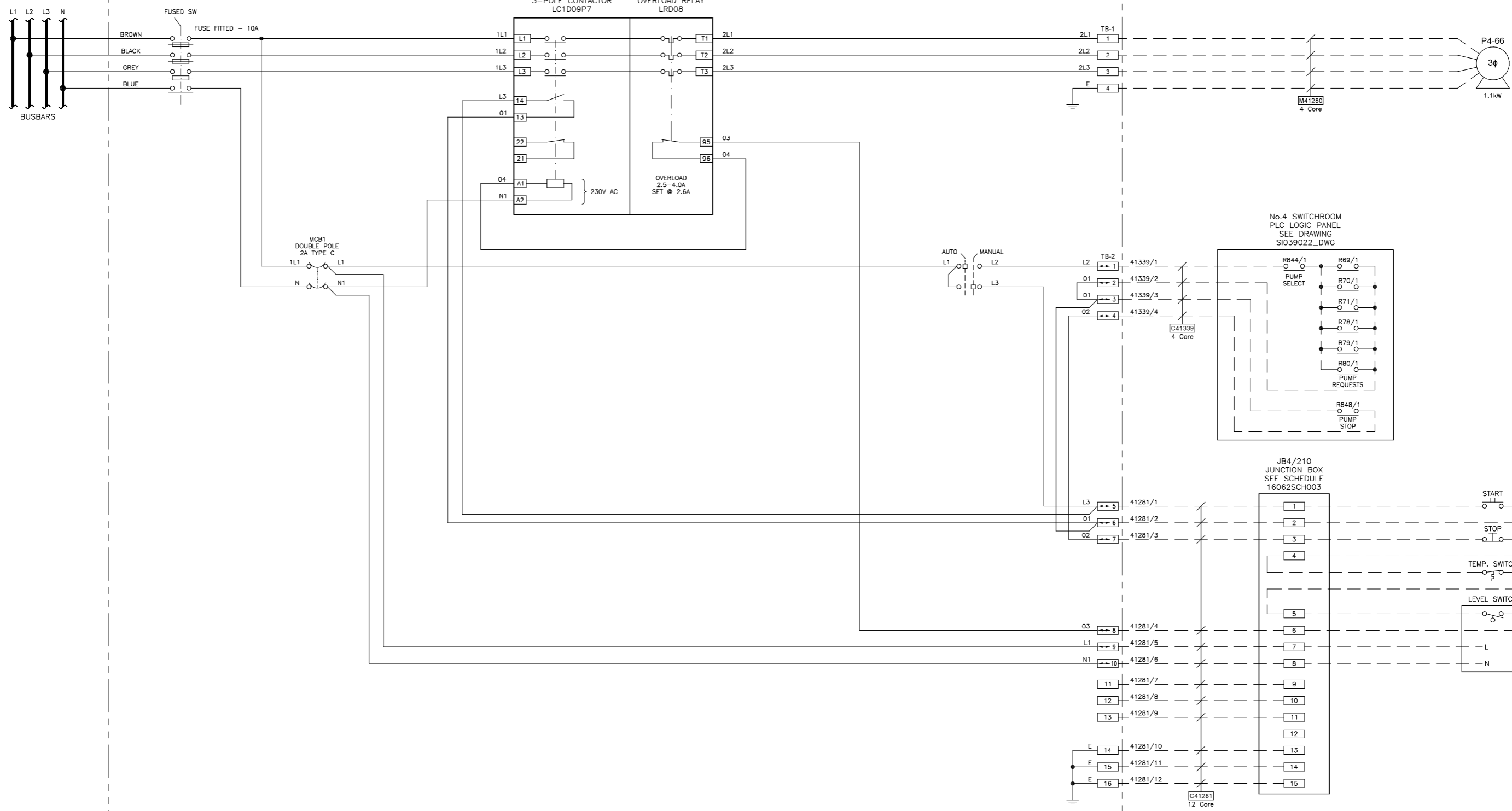
PLANT	INTER TERMINALS IMMINGHAM LTD - EAST TERMINAL
TITLE	4 EAST RAIL LOADING - GAS OIL MARKER SYSTEM PRINTER ENCLOSURE WIRING DETAILS
CLIENT	DRG. No.

inter terminals
Inter Terminals Immingham Ltd
Immingham East Terminal
Immingham Dock Immingham
N.E. Lincolnshire
DN40 2QW

P & I Design Ltd
Tel. 01642 617444
www.pidesign.co.uk

SHEET 1 OF 1
P&I DRG No. 16062DWG018

No.4 SWITCHROOM : COMPARTMENT AH2



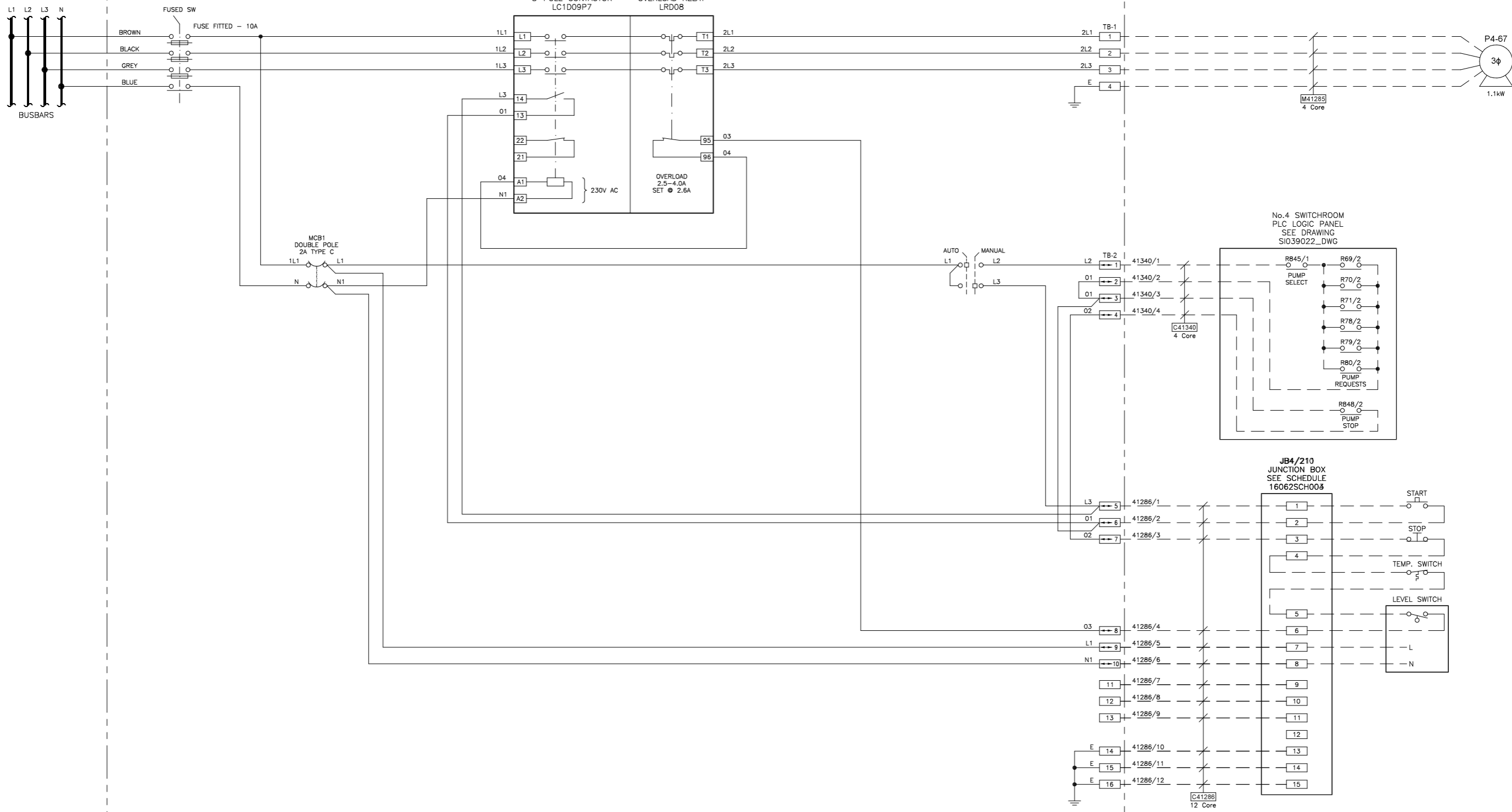
IF NOT SIGNED THIS DOCUMENT IS UNCONTROLLED								PLANT	INTER TERMINALS IMMINGHAM LTD - EAST TERMINAL
REV	DATE	BY	DRN	CHK'D	APP'D	DESCRIPTION		TITLE	4 EAST RAIL LOADING - GAS OIL MARKER SYSTEM P4-66 PUMP STARTER WIRING DETAILS
A	31/10/16	P.P.	P.P.	D.R.P	D.R.P	M.M.	M.M.	ISSUED FOR CONSTRUCTION	
B	24/01/17	P.P.	P.P.	M.M.	M.M.			AS BUILT	
								CLIENT	DRG. No.

inter terminals
 Inter Terminals Immingham Ltd
 Immingham East Terminal
 Immingham Dock Immingham
 N.E. Lincolnshire
 DN40 2QW

P & I Design Ltd
 Tel. 01642 617444
 www.pidesign.co.uk

SHEET 1 OF 1
 P&I DRG No. 16062DWG016

No.4 SWITCHROOM : COMPARTMENT AH3



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REV	DATE	BY	DRN	CHK'D	APP'D	DESCRIPTION		
A	31/10/16	P.P.	P.P.	D.R.P	D.R.P	M.M.	M.M.	ISSUED FOR CONSTRUCTION
B	24/01/17	P.P.	P.P.	M.M.	M.M.			AS BUILT

PLANT	INTER TERMINALS IMMINGHAM LTD - EAST TERMINAL
TITLE	4 EAST RAIL LOADING - GAS OIL MARKER SYSTEM P4-67 PUMP STARTER WIRING DETAILS
CLIENT	DRG. No.

inter terminals
Inter Terminals Immingham Ltd
Immingham East Terminal
Immingham Dock Immingham
N.E. Lincolnshire
DN40 2QW

P & I Design Ltd
Tel. 01642 617444
www.pidesign.co.uk

SHEET 1 OF 1
P&I DRG No. 16062DWG017

P & I Design Ltd

Process Instrumentation Consultancy & Design

2 Reed Street, Gladstone Industrial Estate,
Thornaby, TS17 7AF, United Kingdom.
Tel. +44 (0) 1642 617444 Fax. +44 (0) 1642 616447
Web Site: www.pidesign.co.uk

INTER TERMINALS

IMMINGHAM EAST TERMINAL

4 EAST RAIL LOADING

DYE MARKER MICROLOAD

OPERATING INSTRUCTIONS

Rev	Date	By	Checked	Approved	Description	Client Ref.
A	14.11.16	D. Pearson	M. Morgan	M. Morgan	Original Issue for Review	
B	19.01.17	D. Pearson	M. Morgan	M. Morgan	Loading Point instruction modified	Document No. 16062RPT004

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11.	ALARMS AND TRIPS	11



1 REVISION HISTORY

Rev	Description
A	Original Issue for Review
B	Loading point instruction modified

2 SCOPE

This reports details the operating procedures in the use of the Microload batchers used to control the loading of the dye marker used in the rail loading of diesel fuel to create Gas Oil

3. INSTALLATION

The rail loading gantry consists of two sidings, each having the facility to load six rail cars with diesel. Marker dye can also be loaded in the diesel for identification purposes. This marker dye is loaded separately to each rail car by the use of a batcher system consisting of the following:

Microload batcher (shared with the opposite loading point on the adjacent siding)

Block valve with solenoid controlled via the Microload.

Coriolis flowmeter (pulse output to the Microload)

Shared bill of lading printer.



4 HOME SCREEN



This example of the Microload is programmed to load marker dye to either Loading Point 1 on the North siding or Loading Point 7 on the South siding. The screen shown is the home screen and allows the Operator to commence loading operations. This screen allows the Operator to follow a series of prompts to allow the completion of the load. The first prompt requests the operation of the 'Set' key.



5 RAIL CAR NUMBER



The above screen will now appear. This allows the Operator to enter the rail car number. The number can be up to 20 characters and can be either numbers or upper case letters.

Numbers are accessed directly from the numerical key board. Letters are accessed via the operation of the '+/- key then the operation of the '2' key to scroll up the alphabet or '8' to scroll down the alphabet. Alternately operation of the '6' key will jump forward six characters, while operation of '4' key jump back 6 characters.

To move to the next character of the rail car number operate the '+/- key. To delete an incorrect entry operate the 'Clear' key. A second operation of the 'Clear' will clear all entries for the rail car number. Once the correct rail car number has been entered operation of the 'Enter' key will move on to the following screen.



6 LOADING POINT



The above screen will now appear. This allows the Operator to enter the Loading Point number which will appear on the bill of lading. The entry is restricted to two characters however there is no validation of the validity of the characters entered. An incorrect entry will result in an incorrect loading point number on the bill of lading.

Numbers are accessed directly from the numerical key board. Once the first number is entered the cursor will automatically move to right to allow for the second number to be entered if required. To delete an incorrect entry operate the 'Clear' key. A second operation of the 'Clear' will clear all entries for the Loading Point number. Once the correct Loading Point number has been entered operation of the 'Enter' key will move on to the following screen.

7. BATCH SIZE



This screen allows the Operator to enter the volume in litres of marker dye required up to a maximum of 20 litres. The volume required is entered using the numerical keys and the 'Clear' key to delete. Once the correct amount has been entered the batch can commence via the operation of the 'Start' key.



8. VALVE DELAY



Once the batch start has been operated the batcher will send the signal to start the pump followed by a 5 second delay before the opening of the valve. The above photograph is showing this count down in action.



9. BATCH RUNNING



Once the valve has opened and the dye marker has begun to flow the screen will look like the above. The top line displays the amount of product measured through the meter while the second row displays the amount remaining. The bottom line of text displays the flow rate in litres per minute on the left of the screen, while the right displays the batch size.



10. BATCH COMPLETE



Once the batch size is achieved both the pump and valve output are turned off and the bottom line of text will display 'Batch Complete'. The Operator then needs to press the 'Print' key to send the bill of lading details to the printer. The screen will then return to its home page waiting for the next batch details to be added.



11. ALARMS AND TRIPS



The Batcher has all user alarms and trips set to off. If the batch requires halting during the loading operation activation of the 'Stop' key will perform this task, as displayed above. Re-start can be achieved by operating the 'Start' key. Once stopped the batch can be terminated by operation of the 'Print' key.



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INTER TERMINALS

IMMINGHAM EAST TERMINAL

4 EAST RAIL LOADING

DYE MARKER MICROLOAD

METER ADJUSTMENT INSTRUCTION

Rev	Date	By	Checked	Approved	Description	Client Ref.
A	25.11.16	D. Pearson	M.Morgan	M.Morgan	Original Issue for Review	
B	20.01.17	D. Pearson	M.Morgan	M.Morgan	As Built	Document No. 16062RPT006

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1 SCOPE

This reports details the operating procedures in the adjustment of the meter calibration within the Microload batchers used to control the loading of the dye marker used in the rail loading of diesel fuel to create Gas Oil.

2. INSTALLATION

The rail loading gantry consists of two sidings, each having the facility to load six rail cars with diesel. Marker dye can also be loaded in the diesel for identification purposes. This marker dye is loaded separately to each rail car by the use of a batcher system consisting of the following:

Microload batcher (shared with the opposite loading point on the adjacent siding)

Block valve with solenoid controlled via the Microload.

Coriolis flowmeter (pulse output to the Microload)

Shared bill of lading printer.

3. HOME SCREEN



This example of the Microload is programmed to load marker dye to either Loading Point 1 on the North siding or Loading Point 7 on the South siding. The screen shown is the home screen.



4. METER ADJUSTMENT

If during meter proving it is found that there is a difference between the volume of the proved product and the displayed total at the Microload and this difference is great enough to require correcting then the Engineer requires to implement the following to allow for the correction:

Press the 'Enter' key

Use the up and down keys (1 and 8) until 'Program Mode' is highlighted.

Press the 'Enter' key

You will now be prompted to enter a password enter '0' followed by 'Enter'

Use the up and down keys (1 and 8) until 'Vol Accuracy Dir' is highlighted.

Press the 'Enter' key

Use the up and down keys (1 and 8) until 'Meter Factor' is highlighted.

Press the 'Enter' key

Use the up and down keys (1 and 8) until 'Meter Factor 1' is highlighted with the current meter factor (default will be 1)

Press the 'Enter' key this will enable the current factor to be changed via the key board to the new meter factor.

Press the 'Enter' key

The change is now complete. To return to the home page press the 'clear' key several times until you are returned to the home page.



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INTER TERMINALS IMMINGHAM LTD

EAST TERMINAL

INSTRUMENT & ELECTRICAL INSTALLATION

SCOPE OF WORK

4 EAST RAIL LOADING - GAS OIL MARKER DYE SYSTEM

Rev	Date	Description	Client Ref.
A	07.10.16	Issued for Tender	
B	28.10.16	Issued for Construction	
			Document No.
			16062INS001

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1 REVISION HISTORY

Revision	A	
Description	Issued for Tender	
By	M. Morgan	
Checked	D. Pearson	
Approved	M. Morgan	
Revision	B	
Description	Issued for Construction <ul style="list-style-type: none">• Ticket Printing amended<ul style="list-style-type: none">○ Cable 41335 added (FQ01 to DC JB)○ Cable 41341 added (Power supply to ticket printer panel)○ Ticket printing section 3.2.2 requirements further clarified○ Ticket printer panel added to free issue equipment	
By	M. Morgan	
Checked	P.Potter	
Approved	M. Morgan	



2 INSTRUCTIONS TO TENDERERS

This document details the scope of work to provide the instrument and electrical installation for a Gas Oil marker dye system at the 4 East rail siding. It is to be read in conjunction with specification SI003001_INS - Standard Specification for Instrument & Electrical Installations (available on request).

A marker dye batching system is to be installed at 4 East rail loading facility. It will comprise a duty/standby pump arrangement connected via a header to six double sided batching systems. This new facility does not interact with the existing product loading facilities however will share some common control panels and cabling.

The batching controls will be distributed along the North side of the rail loading gantry and all operator controls shall face North and be accessible from this side of the gantry. Unistrut framework or similar shall be constructed to mount the batchers, junction boxes and pump stop buttons as necessary, the format and location of which shall be agreed with the Inter Terminals engineer.



3 SCOPE OF WORK

The scope of work is as detailed in the following sections and as shown on the documentation listed below.

Drawings

16062DWG001D – Marker Dye Cable Overview

Schedules

16062SCH002C – Marker Dye Cable Schedule

3.1 Pumps

Duty and Standby pumps are to be installed.

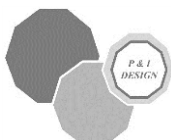
3.1.1 Pump Starters

Cabling to be installed as shown on drawings and schedules. Existing empty starter compartments AH2 & AH3 in No.4 switchroom are to be utilised for these drives. The contractor shall make allowance to furnish the compartments as 1.1kW DOL starters.



3.1.2 Duty/Standby Selection

A Duty / Standby selector switch is to be added to the existing PLC control panel in No.4 switchroom. The existing Polling PC / Batcher standalone switch can be re-used, with new labelling applied. Control cables will link the PLC panel and the pump starters as shown on the drawings and schedules



3.1.3 Remote Stop Buttons

3 remote pump stop buttons will be installed along the rail siding, accessible from the North side of the gantry and positioned equally as follows

- Pump stop 1 – between batcher points 1 & 2
- Pump stop 2 – between batcher points 3 & 4
- Pump stop 3 – between batcher points 5 & 6

The contractor shall allow for mounting of these buttons on unistrut as required to locate them in positions as instructed by the Inter Terminals engineer.

3.2 **Batching Systems**

3.2.1 Gantry Batching Systems

Six batching systems are to be installed as shown on the drawings and schedules. The batching controls will be distributed along the North side of the rail loading gantry and all operator controls shall face North and be accessible from this side of the gantry. Unistrut framework or similar shall be constructed to mount the batchers and junction boxes as necessary, the format and location of which shall be agreed with the Inter Terminals engineer.

New cabling shall be run along the gantry utilising existing containment as far as practical. New local containment will be required to the batching positions. The batching systems are to utilise existing cabling from the gantry multicore junction boxes and operator control panel back to the PLC control panel in No.4 switchroom.

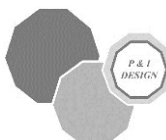
Pneumatically actuated valves will be installed in pipework by others. Remote mounted solenoid valves are to be mounted and pneumatic tubing installed.

3.2.2 Ticket Printing

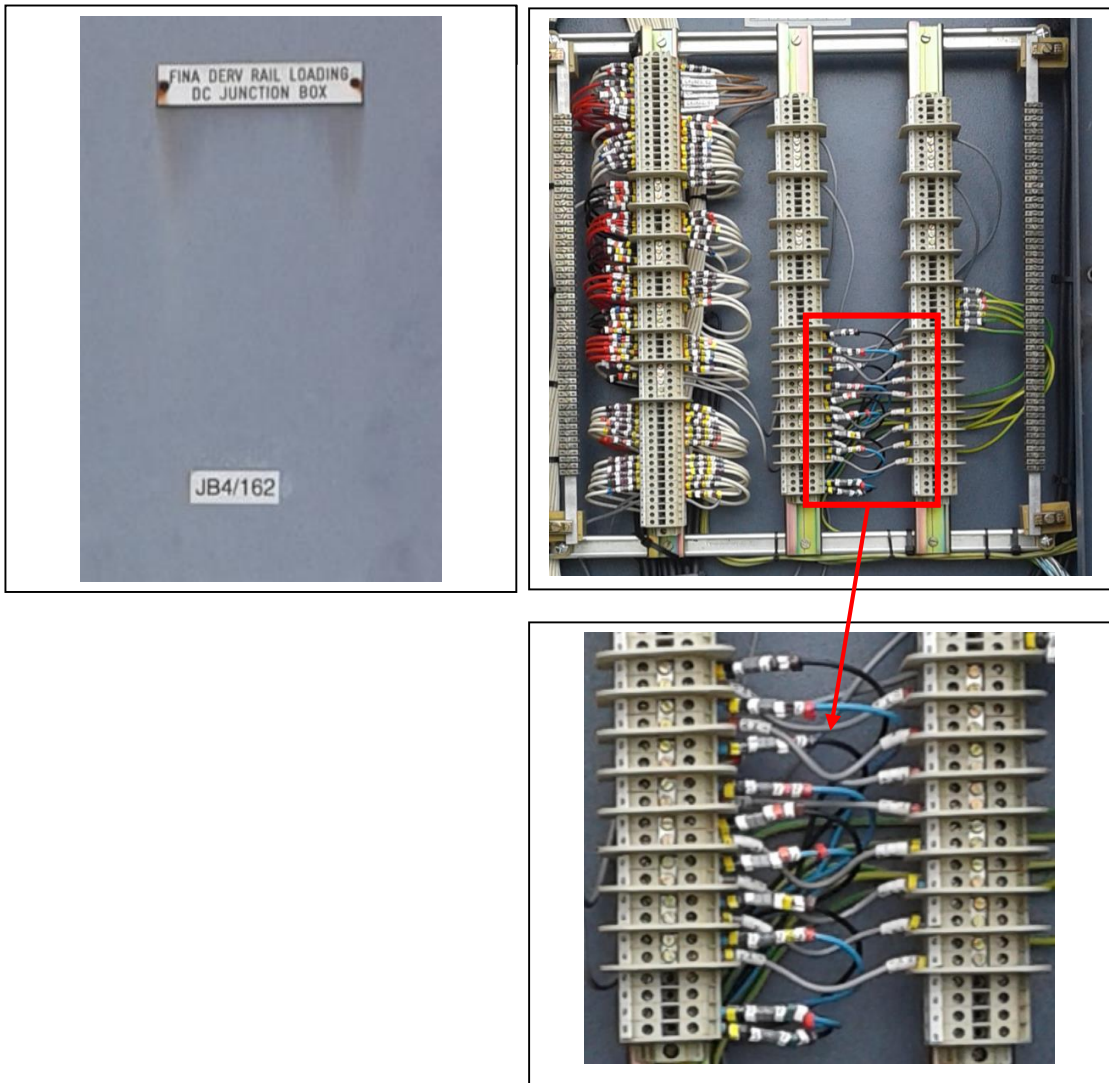
It is proposed to run two legs of communications comprising three batchers each. The communication cables will run from the existing DC junction box at the end of the gantry.

Existing cable 40988 is understood to enter the Inter Terminals Computer Services building and has been coiled up in the roof space following an office re-structuring. This cable is to be located and re-routed to the 4 East Operations Office and will be terminated in a new ticket printer panel.

A free issue ticket printer panel is to be mounted in the 4 East operations office. A 230Vac power supply will be required from a local distribution board.



In addition to the cabling and terminations shown on the drawings, link wires between TB2 & TB3 in DC JB 4/162 to be removed as shown below.

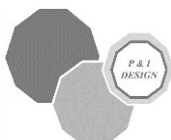


Remove link wires from TB2 to TB3 - terminals 32 to 46

3.3 Contractor Supplied Equipment

The contractor shall supply and install the following equipment. All equipment shall be suitably rated for the environment in which it is to be installed (site hazardous area drawing available on request). Where not fully specified, equipment shall conform with normal site standards for similar installations.

- 3 off pump remote stop buttons
- 2 off pump start/stop control stations



3.4 Free Issue Equipment

The contractor shall supply labour and materials to take delivery, offload and position the following free issue equipment. Equipment requiring a direct connection into the process lines will be mechanically completed by others.

<u>Qty</u>	<u>Description</u>
6	Microload batchers
6	Mass flowmeters
6	½” pneumatically actuated valves
6	Remote mount solenoid valves
2	Pump dry run probes
2	Pump discharge temperature probes
2	Pump control JB
6	Batcher AC JB
2	Batcher comms JB
6	Batcher power isolator
1	Ticket printer panel

4 TESTING & HANDOVER

The installation contractor will perform all necessary testing including CompEx inspections, cold test the modifications, listed drawings to be marked up as built and issued as handover package.

5 PROGRAMME

The following information is supplied for the guidance of the installation contractor and is provisional only, based upon the information available at the time of issue of the scope:

1. Site Visit – Immediately
2. Tender required by – 14/10/16
3. Earliest date on which order can be placed – 14/10/16
4. Free issue equipment available – TBA
5. Latest date for completion, including all testing - 18/11/16
6. Contract start date – 1st load of product to railcars – 1/12/2016



CLIENT: Inter Terminals Immingham Storage Co Ltd	PROJECT REF: 16062	DOC REF: 16062HDR001C
PROJECT: 4 East Rail Loading Marker Dye	LOCATION: East Terminal	DATE: 16.12.16
PLANT SECTION: No4 East	PLANT UNIT: Rail Loading	PAGE: 1 OF 1

This certificate covers the acceptance of the following works:-

Re-Commissioning of the 4 East rail loading control and trip system.

Logic panel powered up, internal socket, lights and power supplies tested. Lamp test function tested. A laptop running software application A326 V4.03 connected on line monitoring mode. Local gantry control panel lamps and pushbuttons tested.

Rail loading car high levels LS1, LS2, LS3, LS4, LS5, LS6, LS7, LS8, LS9, LS10, LS11 & LS12 tested to logic panel lamps, trip relay R42 and local horn.

LS6 replaced by SES. Hazardous area Mux4 in JB4/164 replaced by P&I.

Rail loading point valves XCV1, XCV2, XCV3, XCV4, XCV5, XCV6, XCV7, XCV8, XCV9, XCV10, XCV11 & XCV12, stroke tested from manual local OPEN/CLOSE hand switch and trip tested closed by activating Rail Loading ESD pushbuttons (X7) and rail car high levels (X12).

Solenoids XSV3, XSV6, XSV7, & XSV11 replaced by SES.

Rail loading ESD valve XCVESD, stroke tested from manual local OPEN/CLOSE hand switch and trip tested closed by activating Rail Loading ESD pushbuttons (X7) and rail car high levels (X12).

Hardwired trips from R44 (Level) and R84 (ESD) tested by linking out PLC inputs.

Bund R rail loading tank side ROSOV's XV60103, XV60203, XV60303, stroke tested from manual local OPEN/CLOSE hand switch and trip tested closed by activating tank isolation pushbuttons. Initially found powered down see P2-25.

P5-12 4 East rail gantry stop/start/run stations (X3) tested with multi-meter and link wires. ESD and High Level trip tested to compartment fault lamp

P2-25 4 East rail gantry stop/start/run stations (X3) tested with multi-meter and link wires. ESD and High Level trip tested to compartment stop terminals. Compartment control breaker 4F0 initially found tripped, tripped twice more before staying healthy, suspect inrush current issues.

See marked up SI760100_SCH_B - 4 East Rail Loading Trip Matrix, tests highlighted green completed.

In accordance with the following specifications and conditions of contract:-

16062QUO002A - 4 East Rail Loading Re-commissioning

Inter Terminals Immingham Ltd Purchase Order No. 16138

We duly handover the work specified subject to the following exceptions:-

To avoid spurious trips and activations the system has been left in a tripped state, all XCVs closed, the annunciator signals have been left linked and the local horn output knife-edge has been removed **Links replaced Horn and Local Operator Panel now operational**

P2-25 & P5-12 rail gantry components have been tested individually or as part of a simulated test. A full end to end test with running pump required. P2-25 4F0 to investigate. **Breaker now changed by SES**

4E ESD input to rail loading logic simulated, full end to end test by activation of site ESD required.

2E ESD input to tank side ROSV logic simulated, full end to end test by activation of site ESD required.

Water ingress in JB4/164, site to monitor / replace. **J/B changed by SES**

Approvals

P & I DESIGN LTD: D.Pearson

DATE: 16.12.16

CLIENT:

DATE:

CLIENT: Inter Terminals Immingham East	PROJECT REF: 16062	DOC REF: 16062HDR002B
PROJECT: 4 East Rail Loading Marker Dye	LOCATION: East Terminal	DATE: 16.12.16
PLANT SECTION: No4 East	PLANT UNIT: Rail Loading	PAGE: 1 OF 1

This certificate covers the acceptance of the following works:-

Commissioning of the 4 East rail loading marker dye control and trip system.

Operation of North/South Isolators checked.

Operation of Microloads FQ01 to 06 Isolators checked.

Flowmeters FT01 to 06 checked to associated Batcher via use of the simulation function within the meter.

Operation of Batchers FQ01 to 06 checked via the operation of a batch to their associated valve, associated pump logic and common printer.

Pumps P4-66 and P4-67 Logic checked with the MCC tails removed.

‘Wet’ commissioning

Site Operations dept. assisted P & I Design by flooding up of the system and using a temporary test connection to allow product to be checked into a bucket.

FT01 to 06 operation checked in to a bucket for a rough check of volume accuracy (meter proving by others).

Both pumps used for this operation.

On completion of batch results were checked on print out.

P4-67 Temperature switch was found to have a faulty calibration adjuster Note :This did not compromise the operation of the switch – New unit supplied for client to install and test, check calibration performed at P&I Design before delivery. Faulty unit has been received back at P&I Design.

In accordance with the following specifications and conditions of contract:-

16062QUO001 - 4 East Rail Loading Dye Marker

Inter Terminals Immingham Ltd Purchase Order No. 15889

We duly handover the work specified subject to the following exceptions:-**Approvals**

P & I DESIGN LTD: D.Pearson

DATE: 16.12.16

CLIENT:

DATE:



*P & I
DESIGN*



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