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Equipments for Testing and Commissioning

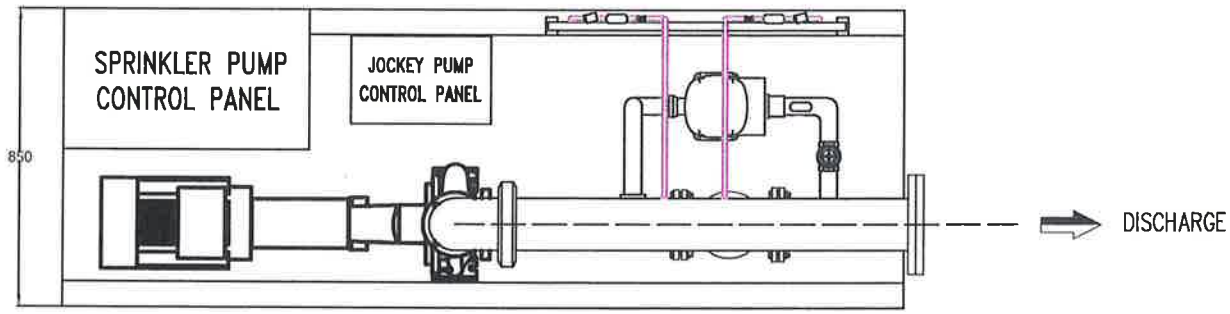
PROJECT : PUMPSET TESTING	Prepared by :	IVAN TAN	Approved by:
	Date : 5-9-2017		Signature (Project manager)
Services : FIRE PROTECTION SYSTEM	CAE ENGINEERING PTE LTD www.caegroup.com.sg		

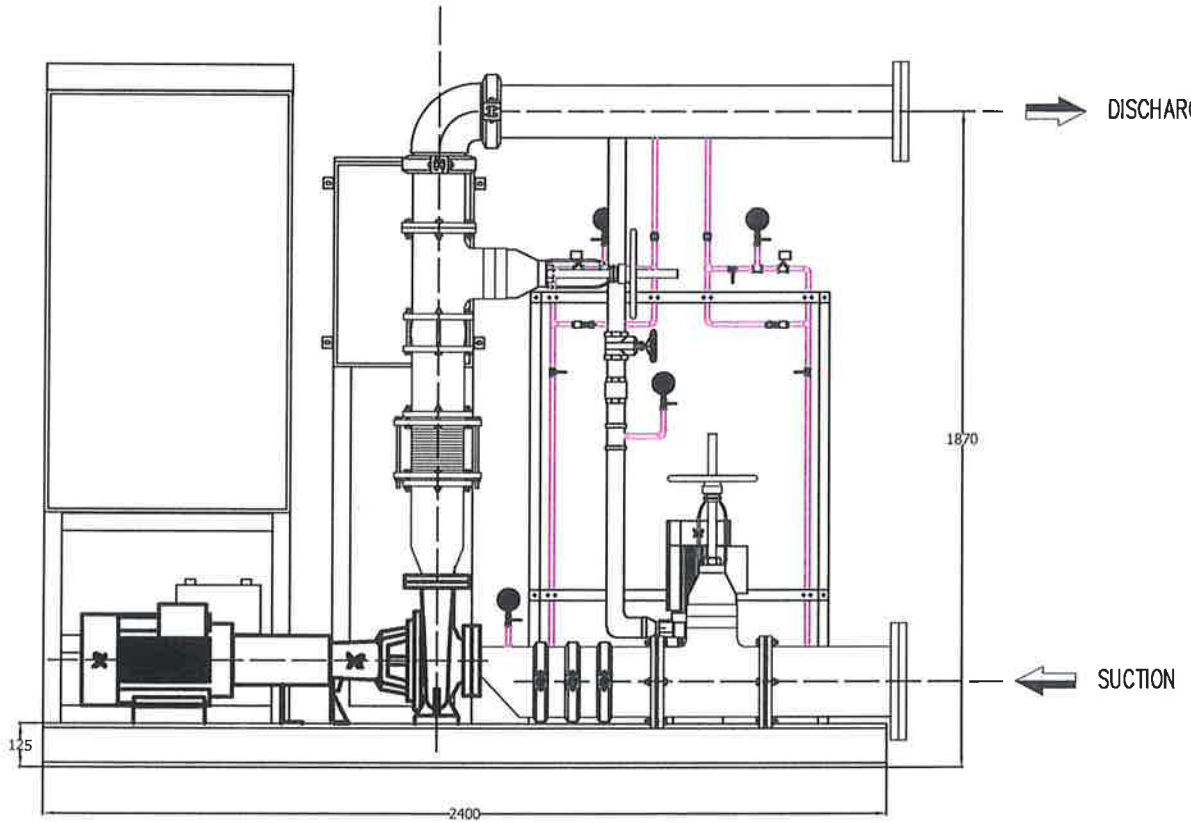
S/No.	Equipments	Usage	Qty	Calibration	Testing sequence	Remark
		FOR CHECKING ON THE CONTROLLER				
1	Multi Test Meter/test pen	To check IF ANY incoming /outgoingSUPPLY TO controller	1	N	**1**	
2		TO CONFIRM THAT THERE'S NO ELECT. SUPPLY			**2**	
3	screw driver / SPANNER	dis-connnect all sec. motor cable at panel	1	N	**3**	
4	Insulation Tester (Megger)	to megger AND RECORD :- U1 TO E, V1 TO E & W1 TO E	1	Y	**4**	
5	Multi Test Meter	to check on motor winding :- U1-V1, U1-W1, V1-W1.	1	Y	**5**	
6	screw driver / SPANNER	connnect all sec. motor cable at panel	1	N	**6**	
7		WAIT FOR ELECT. TURN ON			**7**	
8	Multi Test Meter	To check incoming/outgoing VOLTAGE TO the controller	1	Y	**8**	
9	Phase sequence meter	To check incoming/outgoing phase rotation on the controller	1	N	**9**	
10	Ampere Clamp meter	To check on the ampere (starting /running amp)	1	Y	**10**	
		FOR CHECKING ON THE PUMPSET				
1	Alignment Tools	To check on the aligment of the pumpset	1	N	**1**	
2	Tachometer	To check on the speed of the pumpsets (motor / pump)	1	Y	**2**	
3	Vibration Meter	To check on the Vibration of the pumpset	1	Y	**3**	
4	Infared Thermometer	To check the temp. of the pumpset	1	Y	**4**	

TESTING CHECK LIST

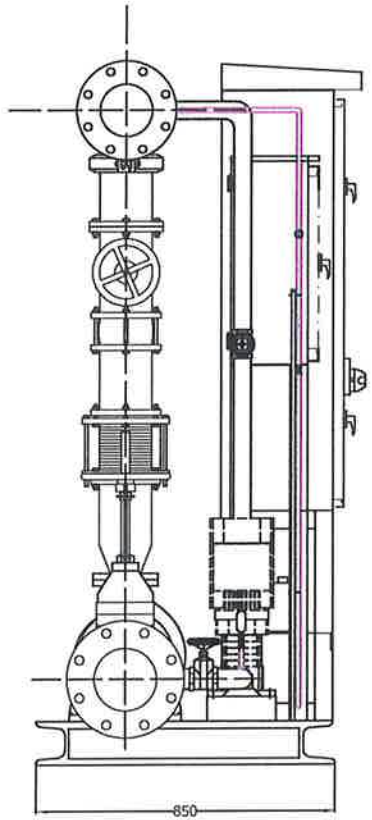
		PASS	FAIL	REMARK 1	REMARK 2	REMARK 3
1	CONNECTION	y				
2	ALIGMENT	y				
3	CABLE SIZE	y				
4	MEGGERING	y				
5	MOTOR OHM	y				
6	INC. VOLTAGE	y				
7	PHASE CHECK	y				
8	ROTATION CHECK	y				
9	TIMER CHECK	y				
10	INTERLOCK CHECK	y				
11	PRESSURE SET CHECK	y				
12	OVERLOAD CHECK	y				

TOP VIEW





FRONT VIEW



SIDE VIEW

PUMP MODEL	NK 65-200	CAPACITY	27 L/SEC	COUPLING TYPE					
PUMP MATERIAL	CAST IRON CASING, BRONZE IMP	TOTAL HEAD	50 M	APPROX. WT.					
MOTOR MODEL	30KW-2POLE	MOTOR FRAME		SPEED	2950 RPM				
REMARKS		SUPPLY	3PH/AC 415V			REV	DATE	DESCRIPTION	BY

2.1

Shaft Alignment Report

SKF

Report name: BOONLAY OFFICE

Machine ID: BOONLAY OFFICE
Operator: K H AUNG
Date: 30-8-2017
Previous Alignment: ---

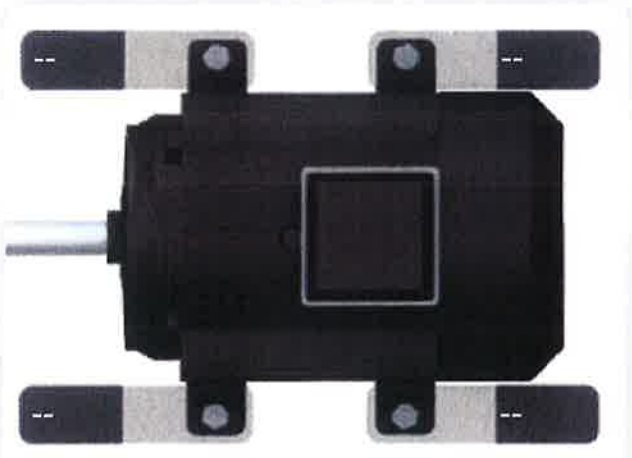
Instrument: TKSA-31
Serial No. MU-M: TKSA31-M-1622-0076
Serial No. MU-S: TKSA31-S-1623-0080
Measuring Unit Temperature: 38.1°C

Comments: NK 65_200; B98917263P115410001; MOTOLOGY 30KW; 17031141C

Soft Foot

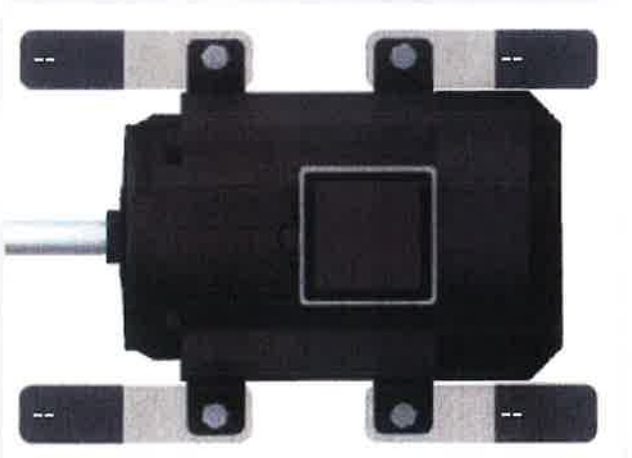
Soft Foot checked: No

As Found



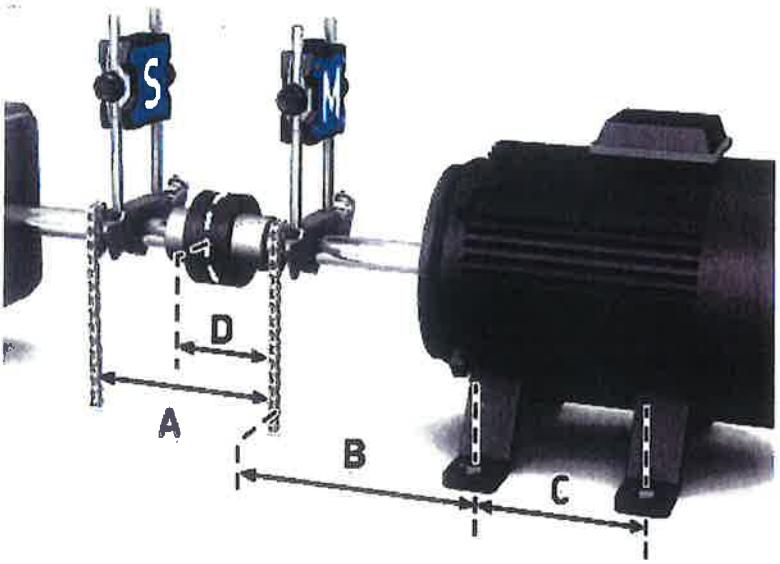
Soft Foot corrected: No

As Corrected



Dimensions

	mm/100mm	mm
Tolerances	0.20	0.20



A	D	B	C
130mm	90mm	125mm	280mm

Alignment Results

Horizontal: Top View



As Found		As Corrected	
0.07 mm/100mm	✓	-0.00 mm/100mm	✓
-0.44 mm	✗	-0.00 mm	✓

Vertical: Side View



As Found		As Corrected	
0.24 mm/100mm	≈	0.06 mm/100mm	✓
0.09 mm	✓	-0.07 mm	✓

Signature: Tan Chun.

Date: 30.08.2017

Backlash within tolerance: Yes

C A E ENGINEERING PTE LTD

NO 1 YISHUN STREET 23, #01-45 YS-ONE, SINGAPORE 768441

EMAIL : technical@caegroup.com.sg

DID : 6844 7518 FAX : 6756 1448

INSULATION RESISTANCE TEST REPORT

PROJECT : NK 65-200 DEMO SET

DRAWING No. :

DB No. :

SUPPLY SYSTEM : 415V/ 3PH/ TPN

LOCATION : BOON LAY #01-88

MEGGERING INSTRUMENT

COUNTRY OF ORIGIN : Hioki / Japan

MODEL : 345411

SERIAL NO. : 110916807

VOLT / M.OHM RATING : 500V / 500M.Ohm

CIRCUIT NO.	NO. OF POINT		INSULATION RESISTANCE [MEGAOHMS]										REMARKS
			L1 - E	L2 - E	L3 - E	N - E	L1 - N	L2 - N	L3 - N	L1 - L2	L1 - L3	L2 - L3	
INCOMING			700	700	700	-	700	700	700	-	-	-	
OUTGOING CIRCUIT	T1 - E	T2 - E	T3 - E	T4 - E	T5 - E	T6 - E	T1 - T2	T1 - T3	T2 - T3	T4 - T5	T4 - T6	T5 - T6	TYPE OF STARTER
WET-RISER PUMP	700	700	700	-	-	-	0.3 Ω	0.3 Ω	0.3 Ω	-	-	-	SOFT STARTER
(27L/SEC AT 50M)							(MOTOR FIELD WIRING)						
JOCKEY PUMP	500	500	500	-	-	-	0.8 Ω	0.8 Ω	0.8 Ω	-	-	-	DOL STARTER
							(MOTOR FIELD WIRING)						

EARTH TEST INSTRUMENT :

EARTH VALUE OF ELECTRODE SYSTEM IS EXISTING OHMS.

MODEL : SERIAL NO :

TESTED BY : KHANT HTET AUNG

WITNESS BY : Jati

SIGNATURE :

SIGNATURE :

TESTING DATE : 22/08/2017

REF NO. : 22/08/2017

3.2

ACCEPTANCE TEST CHECKLIST

DATE :	4-Sep-17	PROJECT:	PUMPSET TESTING
FLOW :	27L/SEC (1620L/MIN)		
PRESSURE	5BAR (51M) (72.5PSI)	CUSTOMER	CAE
RPM :	2950		

	PUMP MODEL / SERIAL NO.		CONTROLLER MODEL / SERIAL NO.	
PUMP 1	NK 65-200 / 898917263		CAE-AS2941-2013-SS30-FPC-VER-01	
PUMP 2				
JOCKEY 1	CMV 5-7 / A97908652		CAE-JOC-VER-01	
JOCKEY 2				
	JOCKEY CV	95 PSI	MAIN PUMP CV	80 PSI
	PRESSURE CUT IN		PRESSURE CUT OUT	
PUMP 1	65 PSI		MANUAL STOP	
PUMP 2				
JOCKEY 1	85PSI		95PSI	
JOCKEY 2				

1 VISUAL INSPECTION AND MECHANICAL ADJUSTMENT

FIRE PUMPSETS	PASS ☑	FAIL ☒
Verify conformity of component layout to DWG	Y	
Inspect mounting & identification of components are of the accepted brands & colour	Y	
Inspect mounting plate bolts tightness	Y	
Inspect incoming & outgoing cables are neatly arranged & tighten inside the panel	Y	
Verify that cable lugs match the terminals in the panel & ensure proper labels	Y	
Verify that all flexible wire have minimum bonding radius for incoming /outgoing	Y	
Inspect all lables are in place & securely fixed	Y	
Inspect door grounding and ground labels	Y	
Inspect indicating lights (LED) are installed & labelled correctly	Y	
Pump aligment	Y	
Meggaring and Motor winding - check	Y	
Incoming Voltage check and phase check	Y	
Control timer setting check	Y	
Interlock check	Y	
Pressure setting check	Y	
overload setting check	Y	

2 MEGGAR TEST

	PASS ☑	FAIL ☒
Disconnect all control fuses	Y	
Turn on all Isolator & Power Fuses	Y	
Test Voltage 500V AC for 1 sec. Set Passing Mohm	Y	
Incoming L1 TO GROUND	Y	
Incoming L2 TO GROUND	Y	
Incoming L3 TO GROUND	Y	
Incoming L1 TO L2	Y	
Incoming L1 TO L3	Y	
Incoming L2 TO L3	Y	

3 POWER SECTION TEST FOR JOCKEY PUMP 1

	PASS ☑	FAIL ☒
VERIFICATION OF MOTOR STARTER: DOL (Direct-On-Line)		
Manually 'ON' the pump at control panel. Run pump for a period of at least 5mins at full speed; measure incoming voltage	Y	
L1-L2	Y	
L2-L3	Y	
L1-L3	Y	
Press Pump 1 "START " pushbutton ,	Y	
verify MC "on" - MC ?	Y	
Check Volts & Ammeter for pump	Y	
Check 'LED' light indication on panel	Y	
Initiate stop with "STOP" pushbutton, verify MC "OFF"	Y	

4 POWER SECTION TEST FOR JOCKEY PUMP 2

	PASS ☑	FAIL ☒
VERIFICATION OF MOTOR STARTER: DOL (Direct-On-Line)		
Manually 'ON' the pump at control panel. Run pump for a period of at least 5mins at full speed; measure incoming voltage		
L1-L2		
L2-L3		
L1-L3		
Press Pump 1 "START " pushbutton ,		
verify MC "on" - MC ?		
Check Volts & Ammeter for pump		
Check 'LED' light indication on panel		
Initiate stop with "STOP" pushbutton, verify MC "OFF"		

5 MEGGAR TEST

	PASS ☑	FAIL ☒
Disconnect all control fuses	Y	
Turn on all Isolator & Power Fuses	Y	
Test Voltage 500V AC for 1 sec. Set Passing Mohm	Y	
Incoming L1 TO GROUND	Y	
Incoming L2 TO GROUND	Y	
Incoming L3 TO GROUND	Y	
Incoming L1 TO L2	Y	
Incoming L1 TO L3	Y	
Incoming L2 TO L3	Y	

6 POWER SECTION TEST FOR MAIN PUMP 1

	PASS ☑	FAIL ☒
VERIFICATION OF MOTOR STARTER: SOFT STARTER		
Power 'ON' the pump at control panel. measure incoming voltage	Y	
L1-L2	Y	
L2-L3	Y	
L1-L3	Y	
Press Pump 1 "START " pushbutton ,	Y	
verify Starting relay / Starter " activated "	Y	
Initiate stop with "STOP" pushbutton, verify Starting relay / Starter "OFF"	Y	

7 POWER SECTION TEST FOR MAIN PUMP 2

	PASS ☑	FAIL ☒
VERIFICATION OF MOTOR STARTER: SOFT STARTER		
Power 'ON' the pump at control panel. measure incoming voltage		
L1-L2		
L2-L3		
L1-L3		
Press Pump 1 "START " pushbutton ,		
verify Starting relay / Starter " activated "		
Initiate stop with "STOP" pushbutton, verify Starting relay / Starter "OFF"		

8 POWER SECTION TEST FOR DIESEL DRIVEN MAIN PUMP 2

	PASS ☑	FAIL ☒
VERIFICATION		
Power 'ON' the pump at control panel. measure incoming voltage		
L1-N		
Press "START 1 " pushbutton ,		
SOLENOID STARTER 1 AT ENGINE CRANK START		
RUN FEEDBACK FROM ENGINE RECEIVED		
Initiate stop with "STOP" pushbutton, verify ENGINE STOP		
Press "START 2 " pushbutton , - Please clerify		
SOLENOID STARTER 2 AT ENGINE CRANK START		
RUN FEEDBACK FROM ENGINE RECEIVED		
Initiate stop with "STOP" pushbutton, verify ENGINE STOP		
To conduct operation for diesel main pump during complete 'POWER FAILURE'.		
To test all 'CONTROL MONITORING' system for pump / equipment		
Manual crank on solenoid one starter, "Engine Run"		
Manual crank on solenoid two starter, "Engine Run"		
Disable diesel to Engine, crank starter, unable to run		
Batt charging voltage / amp check		
cooling loop valve and system check		

TESTED BY _____

WITNESS BY _____

C A E ENGINEERING PTE LTD

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PANEL FUNCTION TEST FOR ELECTRIC FIRE & JOCKEY PUMP CONTROLLERS

Customer: CAE @ BUON LAY	Project Name: TEST BAY Serial Number: CAE-AS2941-2013-SS-50-FPC-VER-01 Voltage: 415V Manufacture Date:

Item	Description	Operational Status / Comment
1	Power Available—MAIN PUMP JOCKEY PUMP 1 ~~JOCKEY PUMP 2~~	(Yes/No) (Yes/No) ~~(Yes/No)~~
2	ACTIVE PHASE FOR EACH PUMP	(Yes/No)
3	PANEL LIGHT FUNCTION	(Yes/No)
4	AMP METER FUNCTION	(Yes/No)
5	VOLTMETER FUNCTION	(Yes/No)
6	ALARM FUNCTION	(Yes/No)
7	ALARM SILENCE FUNCTION	(Yes/No)
8	JOCKEY PUMP 1 Contact Function ~~JOCKEY PUMP 2 Contact Function~~	(Yes/No) ~~(Yes/No)~~
9	BATTERY BOOST ACTIVE	(Yes/No)
10	SET JOCKEY PUMP 1 OVERLOAD	(Yes/No)
11	~~SET JOCKEY PUMP 2 OVERLOAD~~	~~(Yes/No)~~
12	PANEL WIRED AND CONNECTED (by electrician)	(Yes/No)
13	MOTOR FUNCTION AUTO START	(Yes/No)
14	PRESSURE SWITCH FUNCTION AUTO START	(Yes/No)
15	JOCKEY PUMP 1 AUTO START	(Yes/No)
16	~~JOCKEY PUMP 2 AUTO START~~	~~(Yes/No)~~

General Comments: _____

All the above tests carried out by: SAM CHAN.

Witnessed by: Sati Date: 22/08/17

Authorized by: Ivan Date: 22/08/2017

FIGURE F6 PANEL FUNCTION TEST FOR ELECTRIC FIRE AND JOCKEY PUMP CONTROLLERS

© Standards Australia

ELECTRIC PUMP SET - During 15 min test, check the following :

Every 5 minutes

Flow rate: O

Controller Serial Number: 1708001

Pump Model : NK 65-200

Motor Model : ME-180LB-2

Panel Model : CAE - AS 2941

Date : 8th Aug 2017

Pump Serial Number : B98917263

Motor Serial : 17031141C

Panel Serial Number : 1708001

Duration (min)	ACTUAL START TIME : Actual time :(Hour:Min)	Voltage (V) L1/L2/L3	Current (A) L1/L2/L3	Power (KW)	Stffing Box Temperature (°C)	Bearing Temperature (°C)		Speed (r/min)	Check Vibration (mm/s)
						Motor End	Pump End		
5	15:36	419/421/421	25.6/24.4/27.6	10.38	37.8	51.2	35.6	2990	1.1
10	15:46	419/421/421	24.8/23.8/26.9	10.34	39.6	57.4	36.8	2992	0.8
15	16:01	419/420/420	24.8/23.8/26.9	10.3	40.4	57.6	36.8	2991	0.9

Tested By : SAM CHUAN.

Job Title : OPERATION MANAGER

Signed :

Approved By: IVAN

Job Title : GM

Signed :

4.3

Job No : Testing Pump Serial No : Nk65-200/8985117263 Drive Serial No : 17031141C 5:11:34 PM 06-Nov-17

Controller Serial No : 1708001 Test By (1) : (2) Samy (3) Yan (4) Sri

Accessories included in test :

40

Open

Close

Log

Print

Magnetic

Reset

Discharge Vs

Magnetic | Ultra

Power Vs

Magnetic | Ultra

	Flow (Magnetic) (L/MIN)	Flow (Ultrasonic) (L/MIN)	SUCTION PRESSURE (M)	DISCHARGE PRESSURE (M)	WATER TEMP (DEGREE C)	SPEED (RPM)
Point 1	0	5	0.15	60.25	31	0
Point 2	992	0	0.15	57.43	31	0
Point 3	1629	0	0.15	49.54	31	0
Point 4	2052	0	0.15	42.61	31	0
Point 5	2405	0	0.15	34.45	31	0

	L1 Voltage (V)	L2 Voltage (V)	L3 Voltage (V)	L1 Current (A)	L2 Current (A)	L3 Current (A)	Power (KW)	Frequency (Hz)
Point 1	424	425	425	25.5	24.7	27.3	10.52	49.99
Point 2	424	425	425	31.6	31.4	33.7	17.01	50.00
Point 3	424	426	425	36.7	36.8	39.0	21.53	50.01
Point 4	424	425	425	39.7	40.0	42.0	24.00	49.99
Point 5	424	425	425	41.9	42.3	44.3	25.77	49.99

5.1

C A E ENGINEERING PTE LTD

PUMP PERFORMANCE FINAL NATA REPORT - ELECTRIC

CLIENT : TEST
ADDRESS 26 boonlay way, #01-88
singapore 609970
CLIENT CONTACT :

TEST PREMISES cae - boonlay test bay
ADDRESS 26 boonlay way, #01-88
singapore 609970

JOB NO: TEST
DATE : 06-Nov-17
PROJECT : MODULAR PUMPSET TEST

DUTY POINT: FLOW(l/s): 27.0 HEAD(m): 51.0

PUMP TYPE/SIZE : NK 65-200 C/W 30KW TEFC 2POLE
PUMP SERIAL N°: 898917263

**** PUMP TESTING CARRIED OUT IN ACCORDANCE WITH AS2417 EXCLUDING CAVITATION AND AS2941 ****

PT.	FLOW (l/s)	GAUGE READINGS DISCH. (m)	GAUGE READINGS SUCT. (m)	VELOCITY HEAD DIFF. (m)	HEAD CORR. (m)	TOTAL HEAD (m)	POWER MEASUREMENT METER CONST: 1.0 Power (kW) METER	Power (kW)	Current (A)	MOTOR EFF. (%)	PUMP POWER INPUT (kW)	PUMP POWER OUTPUT (kW)	PUMP EFF. (%)	PUMP SPEED (RPM)
1	0.00	60.25	0.15	0.00		60.1	10.52	10.5	27.30	89.7%	9.4	0.0	0.0%	2950
2	16.53	57.43	0.15	0.03		57.3	17.01	17.0	33.70	90.5%	15.4	9.3	60.3%	2950
3	27.15	49.54	0.15	0.08		49.5	21.53	21.5	39.00	91.2%	19.6	13.2	67.1%	2950
4	34.20	42.61	0.15	0.13		42.6	24.00	24.0	42.00	91.4%	21.9	14.3	65.1%	2950
5	40.08	34.45	0.15	0.18		34.5	25.77	25.8	44.30	91.5%	23.6	13.5	57.5%	2950
6														
7														
8														
9														
10														
11														

MOTOR

Make :	MOTORLOGY	kw :	30.0
Type/Frame :	180LB-2	amps :	53
Serial No. :	17031141C	Speed :	2950
Voltage :	415	Phase :	3
Motor efficiency		Cert.N°	

% Load	100%	75%	50%
Efficiency	91.8%	91.3%	89.6%

CONTROL PANEL

Make :	CAE
Type No. :	30KW SS FPC VER-01
Voltage :	AC 415 V
Serial No. :	
Starter. :	SOFT STARTER
Option 1. :	DATA LOG
Option 2. :	
Option 3. :	

MEASURING INSTRUMENTATION

HEAD	Disch.Sensor:	KROHNE OPTIBAR P1010	Cert.N°
	Suct. sensor:	KROHNE OPTIBAR P1010	Cert.N°
FLOW:	Magnetic Flow meter		Cert.N°
	KROHNE OPTIFLUX 1000 C/W IFC 050		Serial N°
			Doc.N°
POWER:	SIEMENS SENTRON PAC3200		Cert.N°
SPEED:	CEM AT-6 TACHOMETER		Cert.N°

TEST BY : Sam.

SIGNATURE :

Flow= Flow Constant x √Manometer Diff.

Suction Pipe Ø : 200

Discharge Pipe Ø : 150

Velocity Head ($x10^5$) : 11.157

Velocity Head Diff. (m)= Flow^2x Velocity Head Diffx10^-5

Full Load (A) 44.30

Impeller Ø : 198 mm

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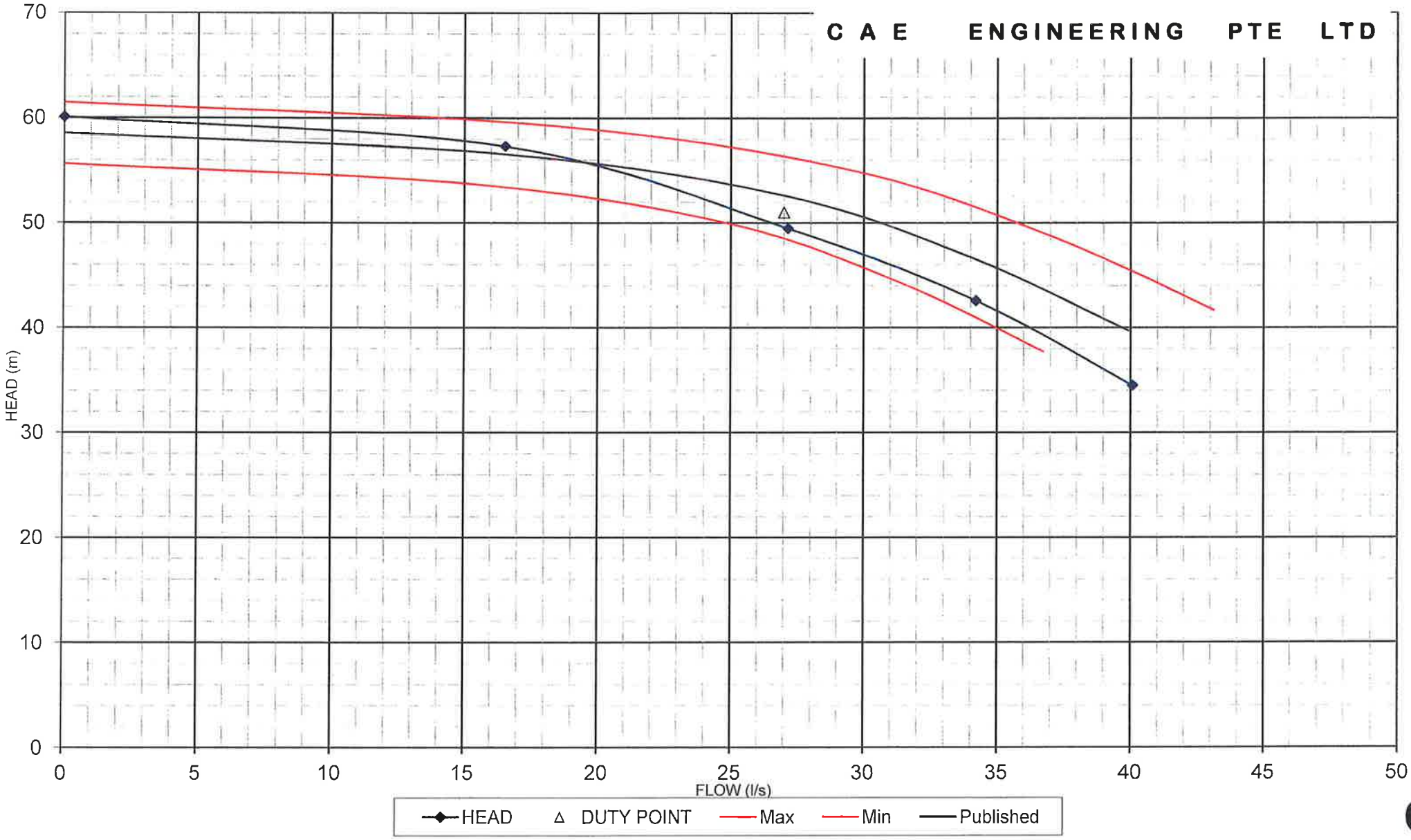
Authorized by: IVAN

Signature

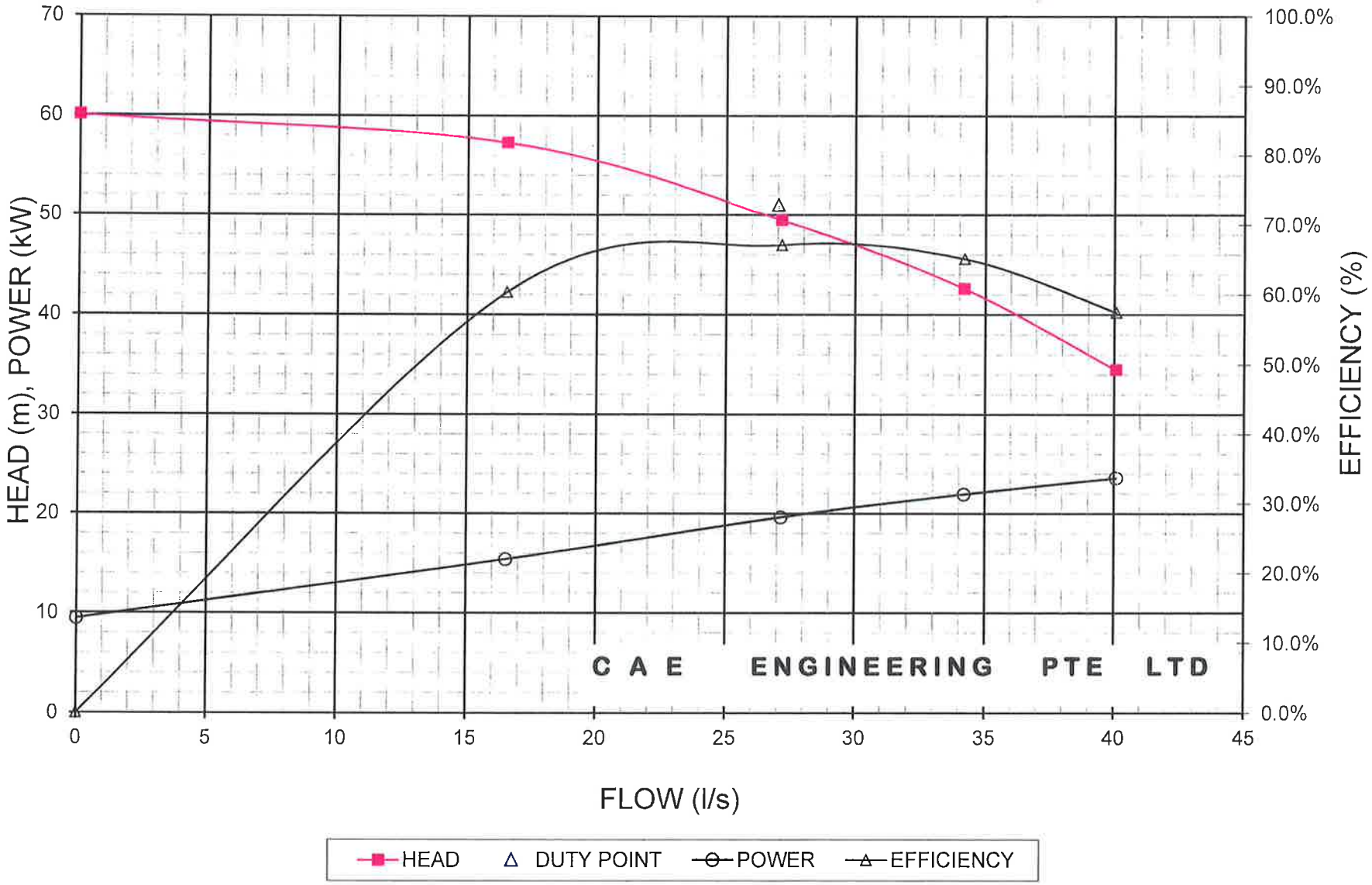
Checked by: Ivan

Signature

PUMP CURVE - Tolerance Curve



PUMP CURVE -POWER & EFFICIENCY CURVE



5.4

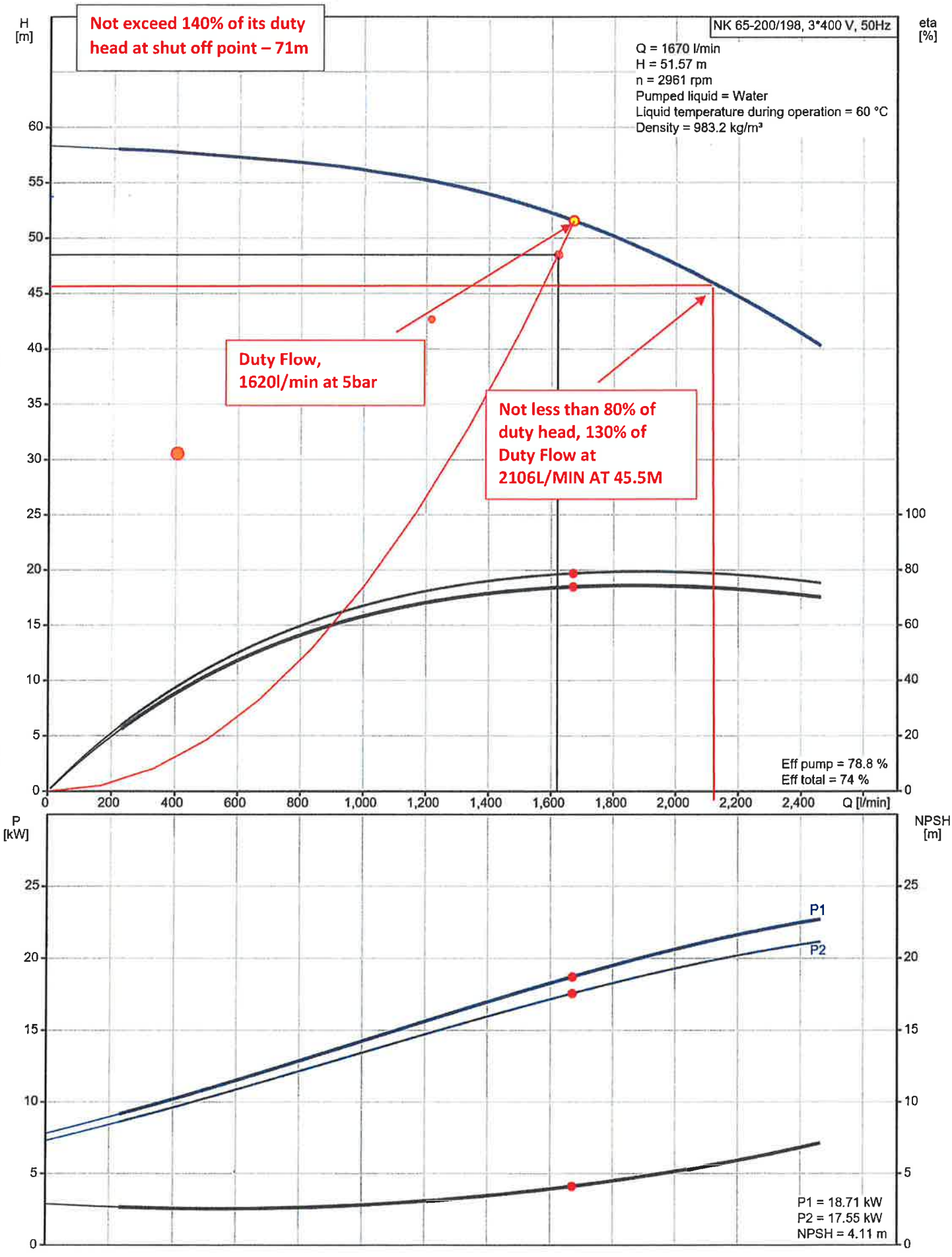
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Created by:
Phone:

Date: 9/4/2017

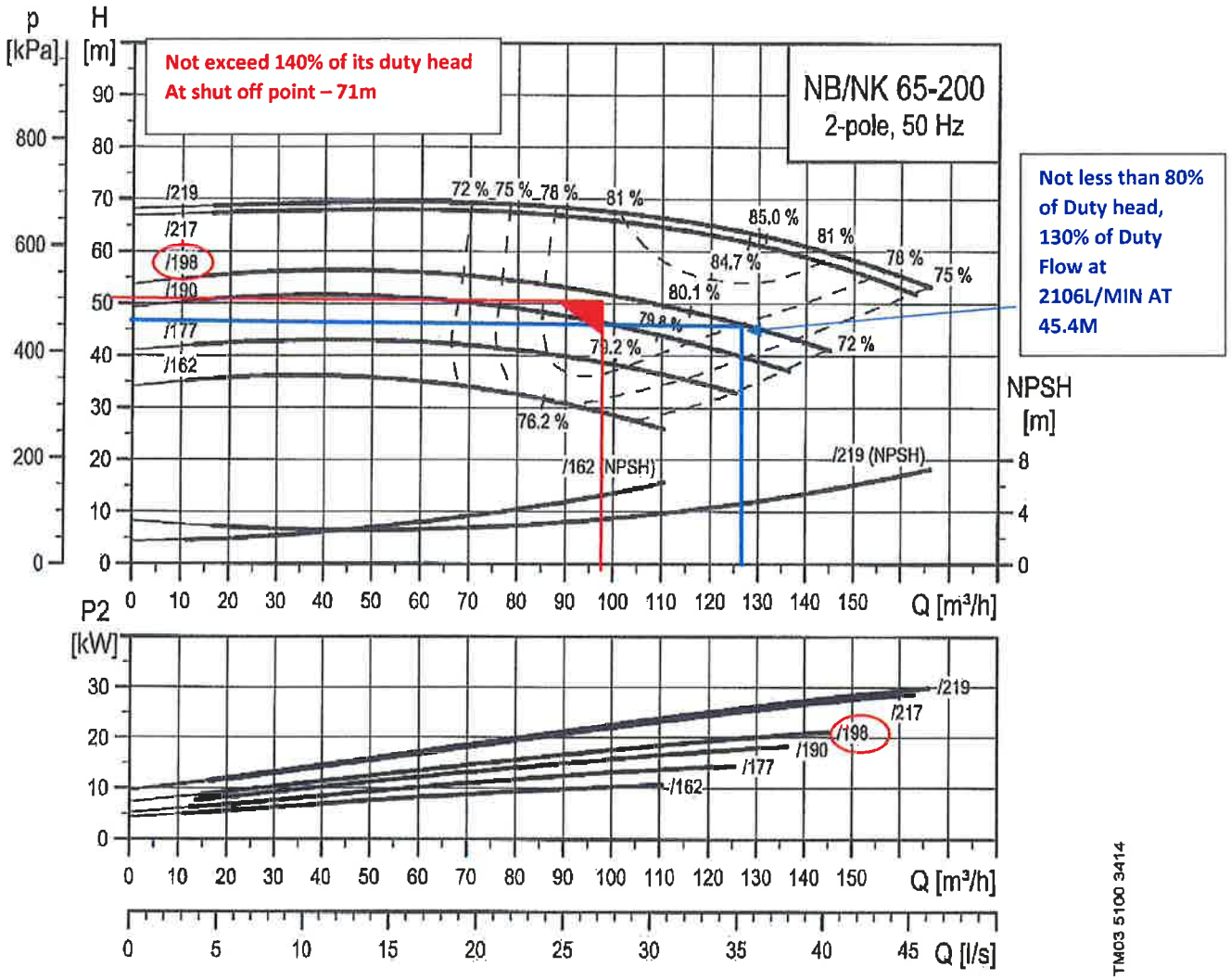
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97829240 NK 65-200/198 50 Hz



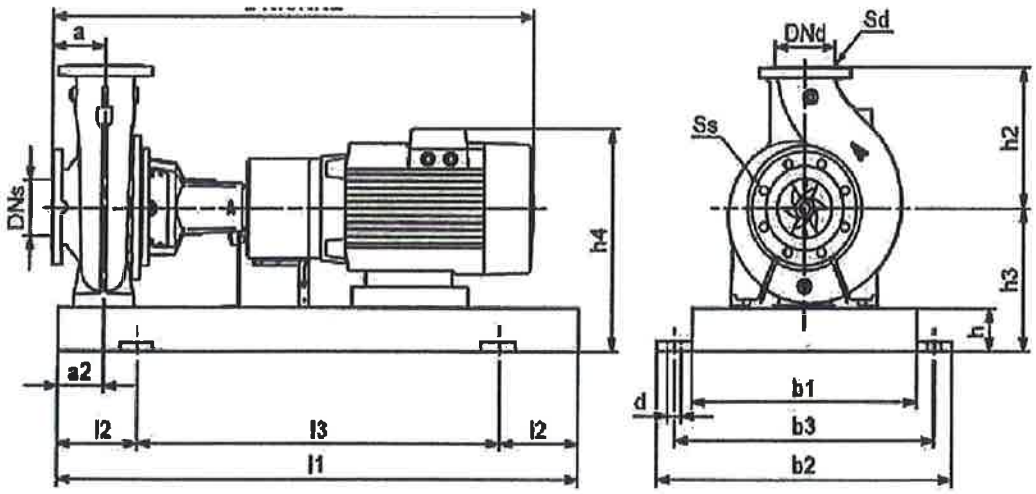
NK65-200

WR 27L/SEC AT 5BAR



10

L
NK/NKE

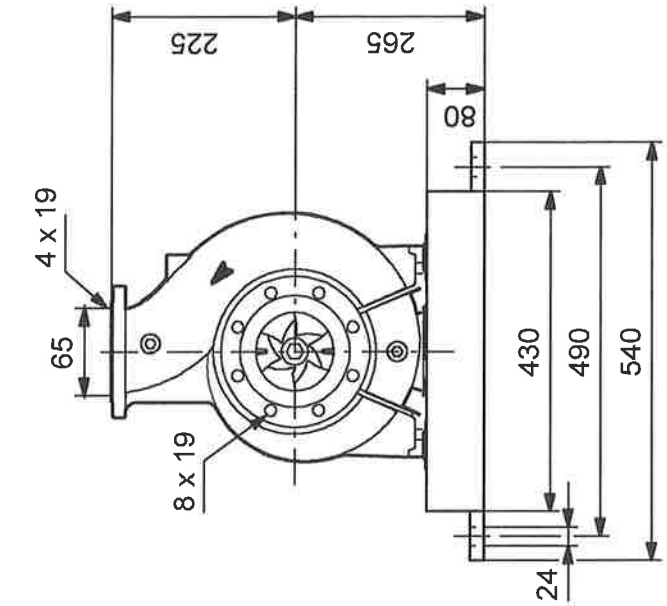


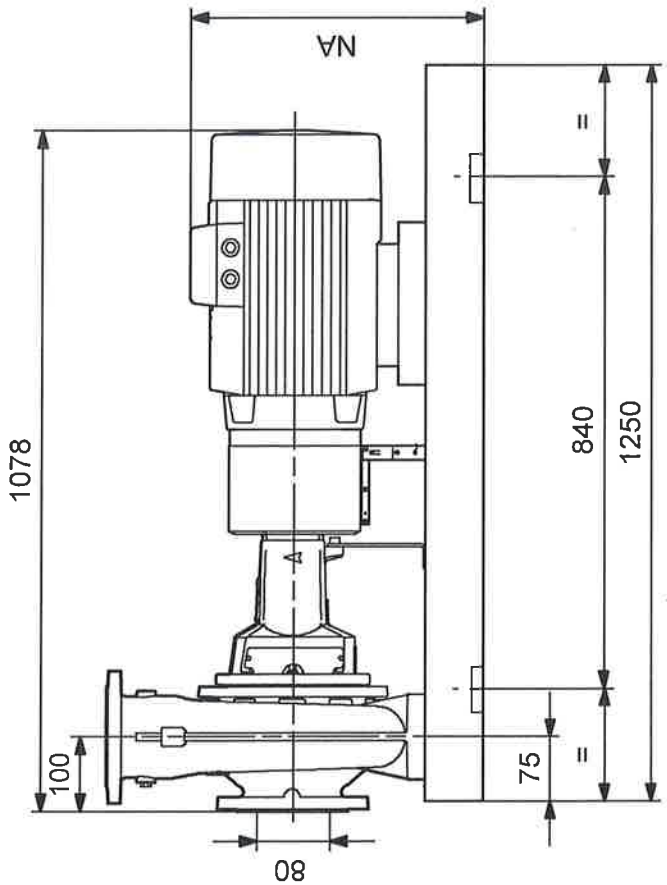
GRUNDFOS NK 65-200

Description	Value
Product No :	NK 65-200/198 A1-A-E-GQQE
Technical :	
Speed for pump data :	2950 rpm
Actual calculated flow :	1623 l/min
Resulting head of the pump :	51 m
Actual impeller diameter :	198mm
Shaft seal :	GQQE
Shaft diameter :	24mm
Pump version :	A1
Materials :	
Pump housing :	Cast iron EN-GJL-250 ASTM A48-40 B
Impeller :	BRONZE EN-GJL-200 ASTM A48-30 B
Materials code :	A
Rubber :	EPDM
Code for rubber :	E
Installation :	
Maximum ambient temperature :	60 °C
Maximum operating pressure :	16 bar
Flange standard :	EN 1092-2
Pump inlet :	DN 80
Pump outlet :	DN 65
Pressure stage :	PN 16
Coupling type :	Standard
Wear ring(s) :	neckring(s)
Liquid :	
Pump liquid :	Water
Liquid temperature range:	-25 .. 90°C
Liqui temp :	20°C
Density :	998.2 kg/m³
Electrical data :	
Motor type :	180LB

IE Efficiency class :	IE 1
Number of poles :	2
Rated power - P2 :	30KW
Mains frequency :	50Hz
Rated voltage :	3X380-415 D/660-390Y V
Rated current :	54/31.1 A
Starting current :	800%
Cos phi-power factor :	0.9
Rated speed :	2950 rpm
IE efficiency :	IE 1 90.7%
Motor efficiency at full load :	90.70%
Motor efficiency at 3/4 load :	91.30%
Motor efficiency at 1/2 load :	89.60%
Enclosure cla (IEC 34-5) :	55
Insulation class (IEC 85) :	F
Motor protec :	PTC
Motor No :	
Lubricant type :	GREASE
Others :	
Label :	Grundfos Blueflux
Net weight :	275 kg
Gross weight :	384 kg
Shipping volume :	1.11 m3

NK 65-200/198 50 Hz





Note! All units are in [mm] unless others are stated.
Disclaimer: This simplified dimensional drawing does not show all details.

ELECTRICAL POWER REQUIREMENT SCHEDULE

	Name	Date
Prepared by:	THI THI	24.8.2017
Approved by:		
Signature (Project manager)		

TEST-PUMP

Revision : 0

**NOTE THAT THIS REQUIREMENT SCHEDULE IS FOR REFERENCE ONLY, REALS VALUES MAY VARY DEPENDING ON THE TYPE OF PUMP, MOTOR, CONDITIONS AND INSTALLATION.

CAE ENGINEERING PTE LTD
www.caegroup.com.sg

Services : FIRE PROTECTION SYSTEM

S/No.	Equipment Tag	Equipment	Location	Qty	Rated Power (KW)	Starting Current (A)	Full-Load Current (A)	Voltage Level/Phase (V)	Motor Starter Type (*see notes*)	Remark
WET-RISER PUMP 1 (27LPS AT 50M)										
1	WR-01	Electric WET-RISER Pump		1	30	***205.2***	54	415V/3Φ	SOFT STARTER	
	WR CONTROLLER	WET-RISER PUMP CONTROLLER		1	AC415V 100A TPN 4WIRE + CPC 50HZ					
	PLS ENSURE THAT THE INCOMING BREAKER IS ABLE TO WITH STAND **205.2A (147.4KVA)** FOR 5 TO 10 SEC.									
JOCKEY PUMP (60L/MIN AT 58M)										
2	JOC	Electric JOCKEY pump		1	1.58	***28***	3.5	415V/3Φ	DOL STARTER	
	JOC CONTROLLER	WET-RISER JOCKEY PUMP CONTROLLER		1	AC415V 20A TPN 4WIRE + CPC 50HZ					
	PLS ENSURE THAT THE GEN SET IS ABLE TO WITH STAND **28A (20KVA)** FOR 3 TO 10SEC.									

FIRE PUMP CONTROLLERS

BUILT TO AS2941-2013 (5TH EDITION)

Model : FPC VER-01



Standard Features

- IP55 ENCLOSURE
- INCOMING,OUTGOING AVAILABLE INDICATION
- PHASE REVERSAL /LOSS ALARM
- PUMP ON DEMAND, RUN, OVERCURRENT, FAILED TO START INDICATION
- AC AMPERE DISPLAY
- BATTERY CHARGER DC VOLTAGE, AMPERE DISPLAY
- START AND STOP PUSHBUTTONS
- LAMP TEST PUSHBUTTON
- REMOTE START PROVISION
- INTERLOCK AND LOCK OUT PROVISION
- BUZZER WITH MUTE PUSHBUTTON
- VOLTAGE FREE CONTACT FOR REMOTE MONITORING

Options

- OP1 - Anti-condensation heater & thermostat
- OP2 - Data log, pressure & event recording
- OP3 - Modus with RS485 connection





7.2

ELECTRIC FIRE PUMP CONTROLLER

[30KW SOFT STARTER TYPE]

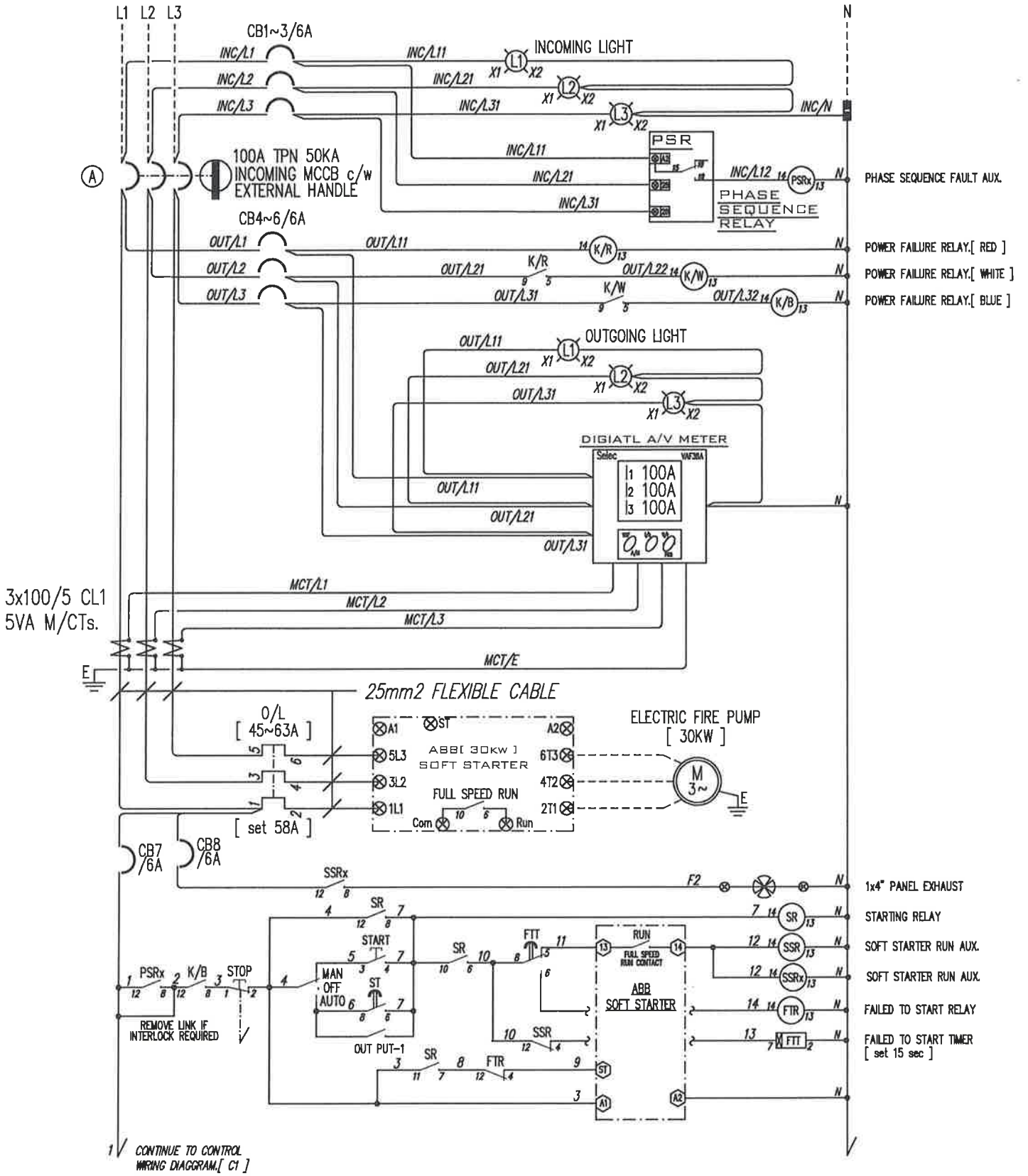
POWER CIRCUIT/ CONTROL WIRING DIAGRAM & PANEL LAYOUT

MODEL NO. :- CAE-AS2941:2013-SS-30-FPC VER-01	DATE : 22-06-2017	DRAWN BY :- THI THI	CHECK BY :- MR IVAN TAN
	REVISION : VER-01		
	DWG NO. : 30KW S/S FPC VER-01		SHEET 1 OF 6

7.2

INCOMING SUPPLY
AC 415V/ 230V 100AT
3 PHASE-4W+E 50HZ

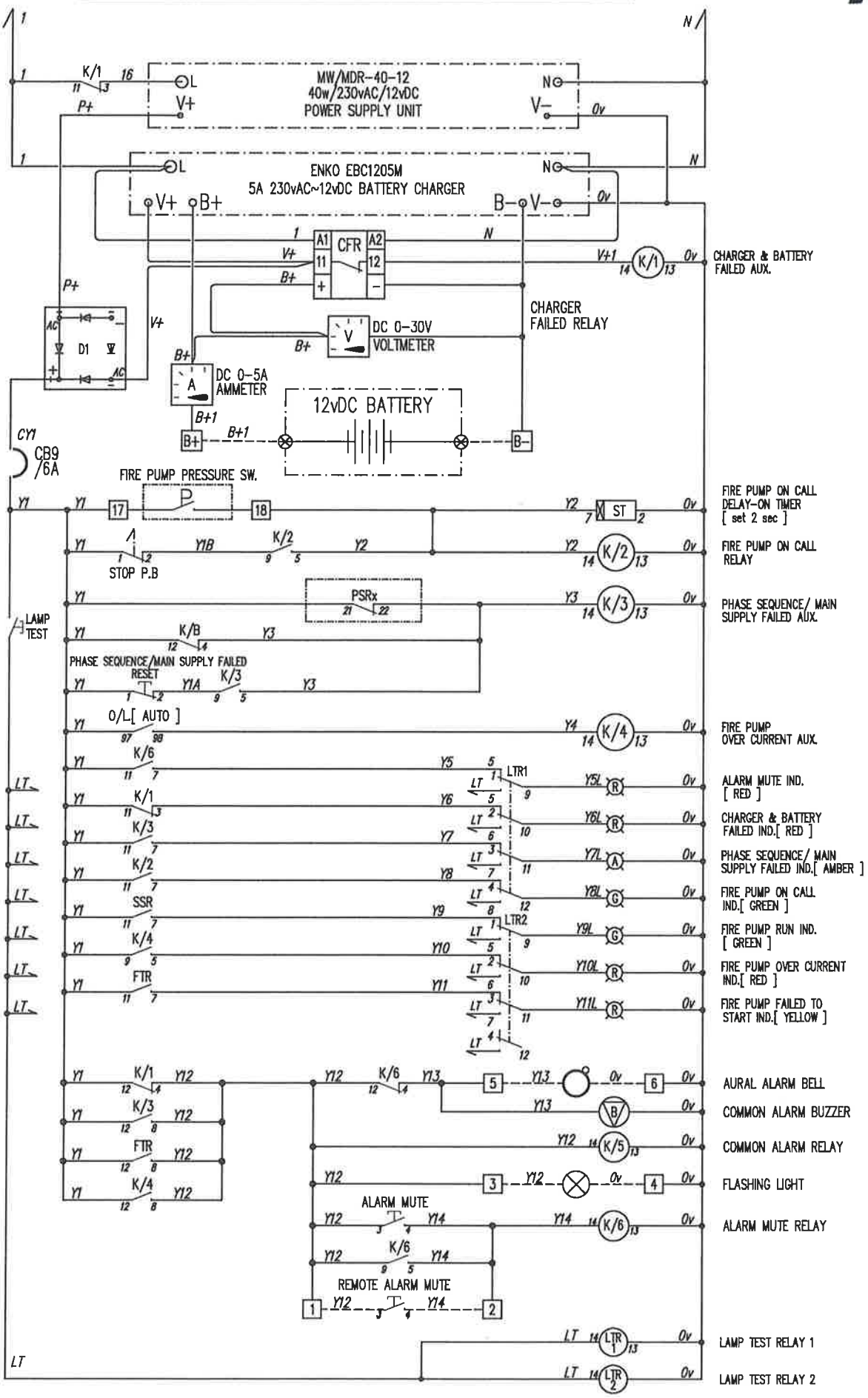
INCOMING SECTION
POWER CIRCUIT/ CONTROL WIRING DIAGRAM



MODEL NO. :-	DATE : 22-06-2017	DRAWN BY :-	CHECK BY :-
CAE-AS2941:2013-SS-30-FPC VER-01	REVISION : VER-01	THI THI	MR IVAN TAN
	DWG NO. : 30KW S/S FPC VER-01		SHEET 2 OF 6

12vDC CONTROL WIRING DIAGRAM

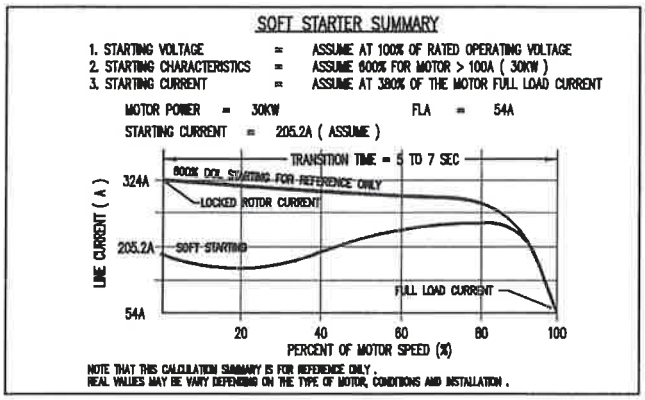
7.2



MODEL NO. :- CAE-AS2941:2013-SS-30-FPC VER-01	DATE : 22-06-2017	DRAWN BY :- THI THI	CHECK BY :- MR IVAN TAN
	REVISION : VER-01		
	DWG NO. : 30KW S/S FPC VER-01		SHEET 3 OF 6

STARTER STARTING SUMMARY & STATUS WIRING DIAGRAM

INCOMING POWER SUPPLY REQUIREMENT OF
AC 415V/230V 100A TPN 4WIRE+E 50HZ
TO ENSURE THAT ARE ABLE TO WITHSTAND THE STARTING
CURRENT OF 205.2A (147.4kVA) FOR 5 TO 15 sec.



STARTER CONTROL PANEL SYSTEM DESIGN

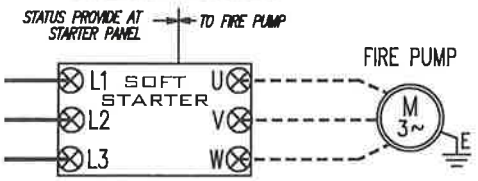
MANUAL OPERATION.[FIRE PUMP]

Select respectic AUTO/OFF/MAN selector to ' MAN '. Press START/GREEN push button to start, & press STOP/RED to stops.

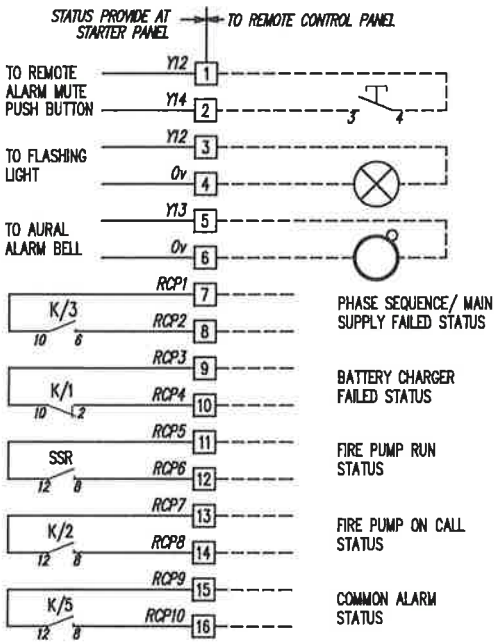
AUTO OPERATION.[FIRE PUMP]

Select respectic AUTO/OFF/MAN selector to ' AUTO '. FIRE PUMP automatic start when water PRESSURE sudden drops below pressure setting, PUMP once start, must be stopped MANUALLY using the ' STOP/RED ' push button at the Pump Starter Control Panel to stops. [After water PRESSURE back to pressure setting].

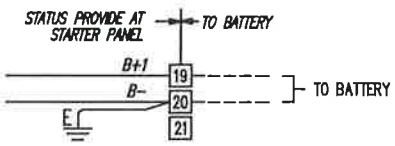
FIELD WIRING TO MOTOR



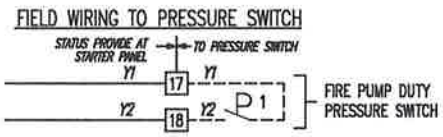
FIELD WIRING TO REMOTE CONTROL PANEL



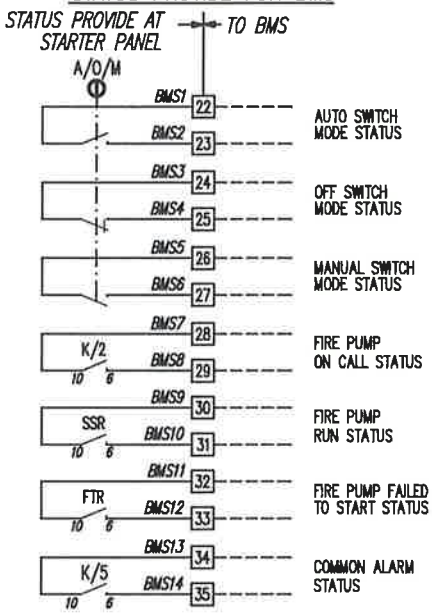
FIELD WIRING TO BATTERY



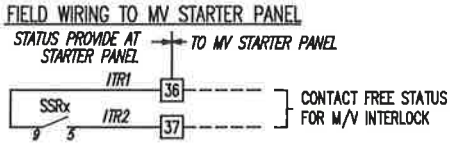
FIELD WIRING TO PRESSURE SWITCH



STATUS PROVIDE FOR BMS



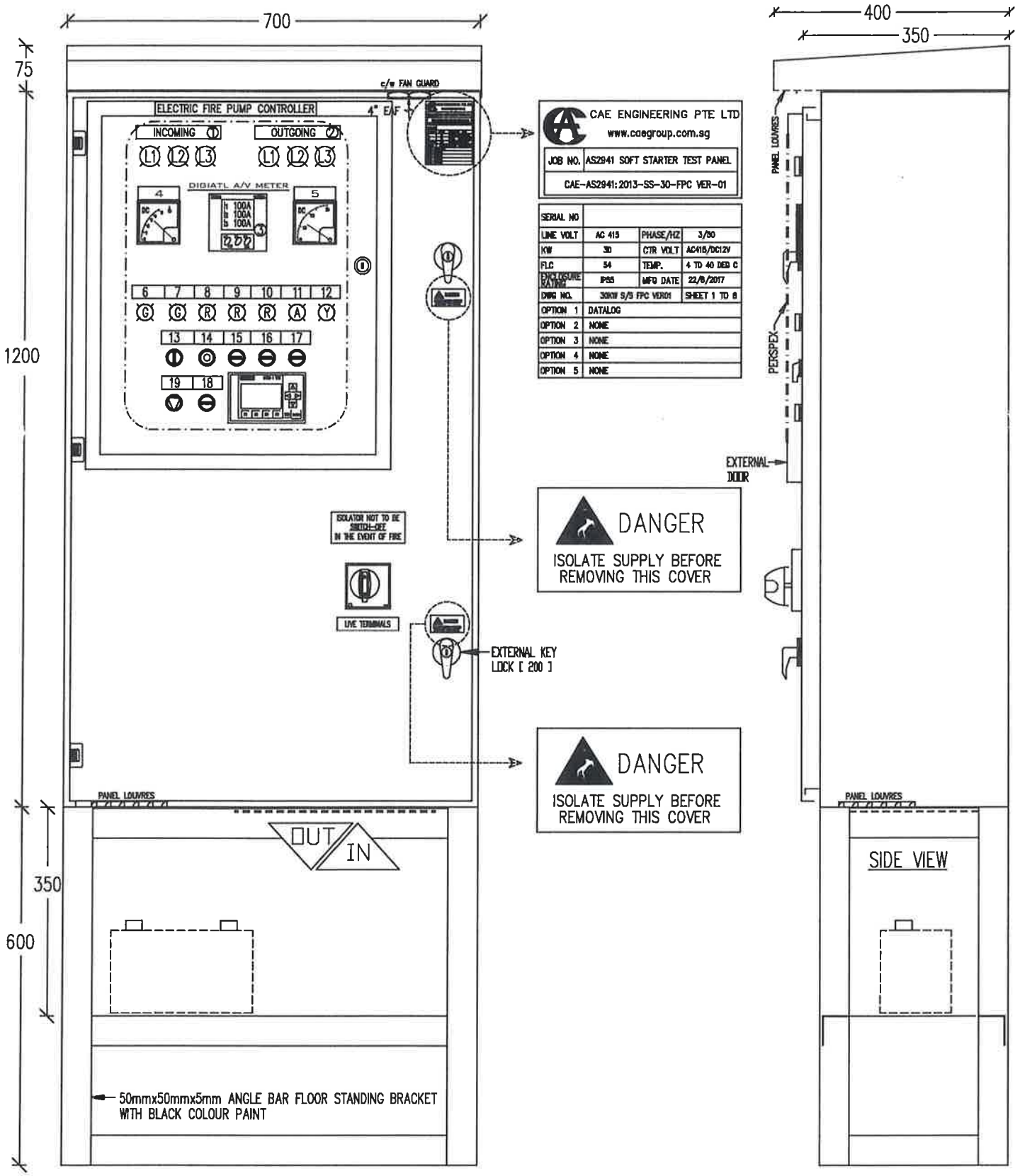
FIELD WIRING TO MV STARTER PANEL



MODEL NO. :-	DATE : 22-06-2017	DRAWN BY :-	CHECK BY :-
CAE-AS2941:2013-SS-30-FPC VER-01	REVISION : VER-01	THI THI	MR IVAN TAN
	DWG NO. : 30KW S/S FPC VER-01		SHEET 4 OF 6

ELECTRIC FIRE PUMP CONTROLLER PANEL LAYOUT

7.2



DIMENSION : 1875mmH.[c/w flooor standing bracket]X700mmWx400mmD.
[NTS / DIMENSION AS SHOWN]
OUTDOOR TYPE/WALL MOUNTED / MAKE TO IP55.

MODEL NO. :-	DATE : 22-06-2017	DRAWN BY :-	CHECK BY :-
CAE-AS2941:2013-SS-30-FPC VER-01	REVISION : VER-01	THI THI	MR IVAN TAN
	DWG NO. : 30KW S/S FPC VER-01		SHEET 5 OF 6

MATERIAL LIST

MATERIAL LIST			
MARK	DESCRIPTION	BRAND / MAKE	PART NO.
A.	MAIN INCOMING MCCB	ABB/ ITALY	160AF/100AT 3POLE 50KA.[XT2S160
1.	INCOMING SUPPLY AVAILABLE IND.[R/W/B]	IZUMI/JAPAN	YW SERIES 230v/6v AC LED LAMP
2.	DIGITAL DISPLAY POWER METER	SELEC/ INDIA	VAF36A
3.	DC AMMETER	MH/ SINGAPORE	0~5/10A
4.	DC VOLTMETER	MH/ SINGAPORE	0~50V
5.	FIRE PUMP ON-CALL IND.[RED]	IZUMI/JAPAN	YW series c/w 24v LED LAMP
6.	FIRE PUMP RUN IND.[RED]	IZUMI/JAPAN	YW series c/w 24v LED LAMP
7.	FIRE PUMP OVER CURRENT IND.[RED]	IZUMI/JAPAN	YW series c/w 24v LED LAMP
8.	FIRE PUMP FAILED TO START IND.[RED]	IZUMI/JAPAN	YW series c/w 24v LED LAMP
9.	CHARGER & BATTERY FAILED IND.[RED]	IZUMI/JAPAN	YW series c/w 24v LED LAMP
10.	MAIN SUPPLY FAILURE IND.[RED]	IZUMI/JAPAN	YW series c/w 24v LED LAMP
11.	ALARM MUTE IND.[RED]	IZUMI/JAPAN	YW series c/w 24v LED LAMP
12.	FIRE PUMP MANUAL/OFF/AUTO SELECTOR SWITCH	IZUMI/JAPAN	YW1S-3E20P
13.	FIRE PUMP MANUAL START PUSH BUTTON.[GREEN]	IZUMI/ JAPAN	YW-M1E10G
14.	FIRE PUMP MANUAL STOP PUSH BUTTON.[RED]	IZUMI/ JAPAN	YW-M1E01R
15.	LAMP-TEST PUSH BUTTON.[GREEN]	IZUMI/ JAPAN	YW-M1E10G
16.	ALARM BELL MUTE PUSH BUTTON.[BLACK]	IZUMI/ JAPAN	YW-M1E10B
17.	PHASE SEQUENCE/MAIN SUPPLY FAILED/OVERCURRENT TRIP RESET P/B.	IZUMI/ JAPAN	YW-M1E01R.[BLACK]
18.	COMMON ALARM BUZZER	KOINO/ KOREA	KH-4025 [12~24vDC]
CB1~9	CONTROL BREAKER	ABB/ CHINA	6A 1POLE 6KA TYPE B
PSR	PHASE SEQUENCE RELAY	SELEC/ INDIA	600PSR-CE
BATTERY CHARGER	5A 230vAC~12vDC	ENKO/ TURKIYE	EBC1205M
PSU	POWER SUPPLY UNIT.[40W/250vAC/12vDC]	MW/ TAIWAN	MW/MDR-40-12
CFR	DC VOLTAGE TRIP RELAY	SELEC/ INDIA	M200-TVU
K/R, K/W, K/B	POWER FAILURE RELAY	IZUMI/ JAPAN	RU2S-C, AC230v with Light
SR, FTR, SSR	CONTROL RELAY 250vAC	IZUMI/ JAPAN	RU4S-C, AC230v with Light
K/1 TO K/6	CONTROL RELAY 12vDC	OMRON/ JAPAN	MY4N, DC12v with Light
STT, FTT	STARTING/ FAILED TO START DELAY ON TIMER	IZUMI/ JAPAN	GT-5P, AC230v, 0~30sec
M/CTs.[60/5A]	METERING CURRENT TRANSFORMER	HOBUT/ SINGAPORE	Moulded case C.T.Series 13 >135H8
O/L	OVERLOAD LOAD RELAY	ABB/ CHINA	TA75DU63M + Mounting Kit DB80
S/S.[22~30KW]	SOFT STARTER [FOR FIRE PUMP]	ABB/ CHINA	PSR60-600-70

NOTE :

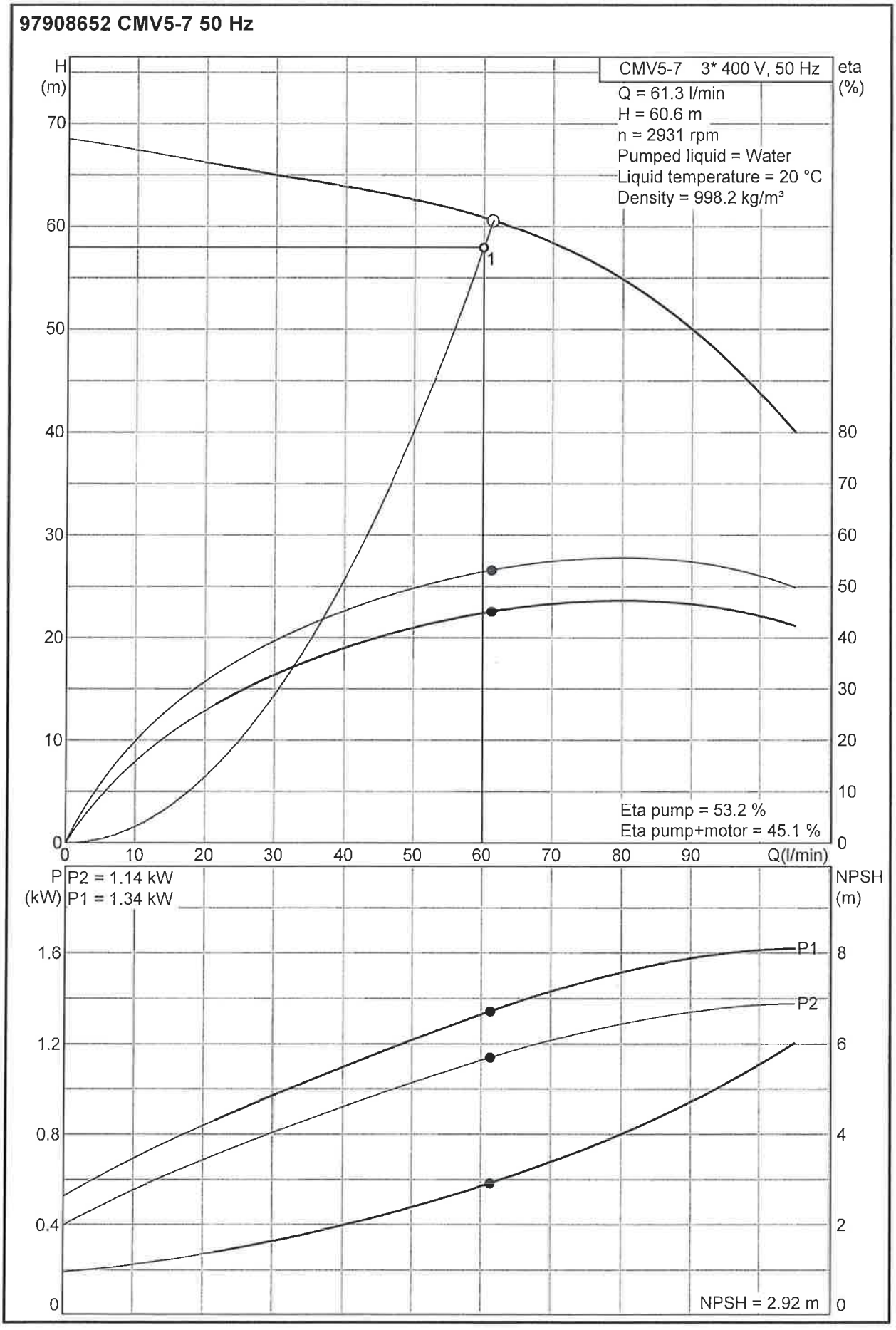
1. THICKNESS OF SWITCHBOARD :
   DOOR, FRAME & BASE PLATE : 1.5mm
2. COLOUR OF SWITCHBOARD :RED RAL3001
   RED, ROUGH FINISHING OVEN BAKED POWDER COATING
3. WEIGHT : TBA
4. CABLE SIZE FOR CONTROL TO BE FOLLOW :-

4.1 1.5mm2 (7/0.53) PVC RED & BLACK FOR INTENRAL AC230v CONTROL

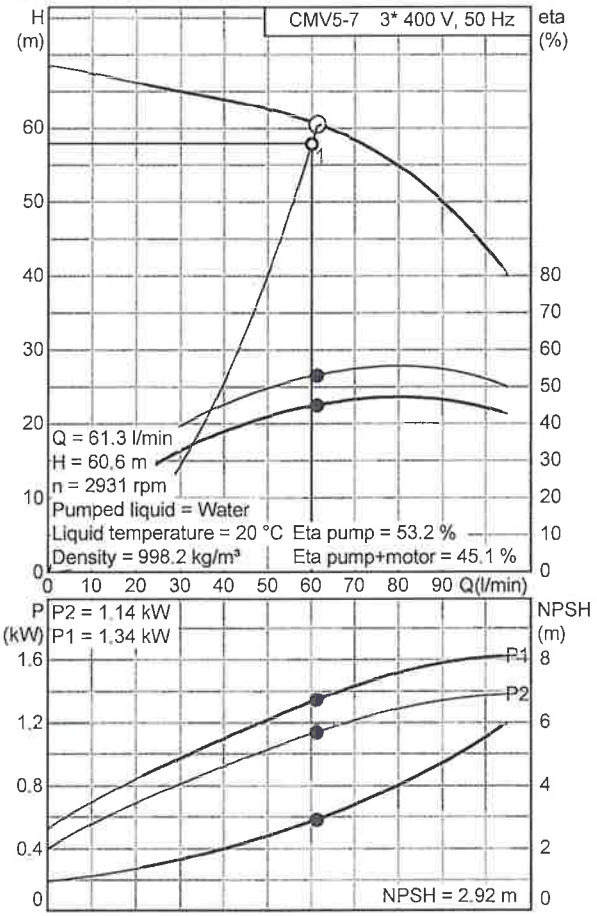
4.2 1.5mm2 (7/0.53) PVC YELLOW FOR 12vDC CONTROL

JOCKEY 60LPM AT 58M

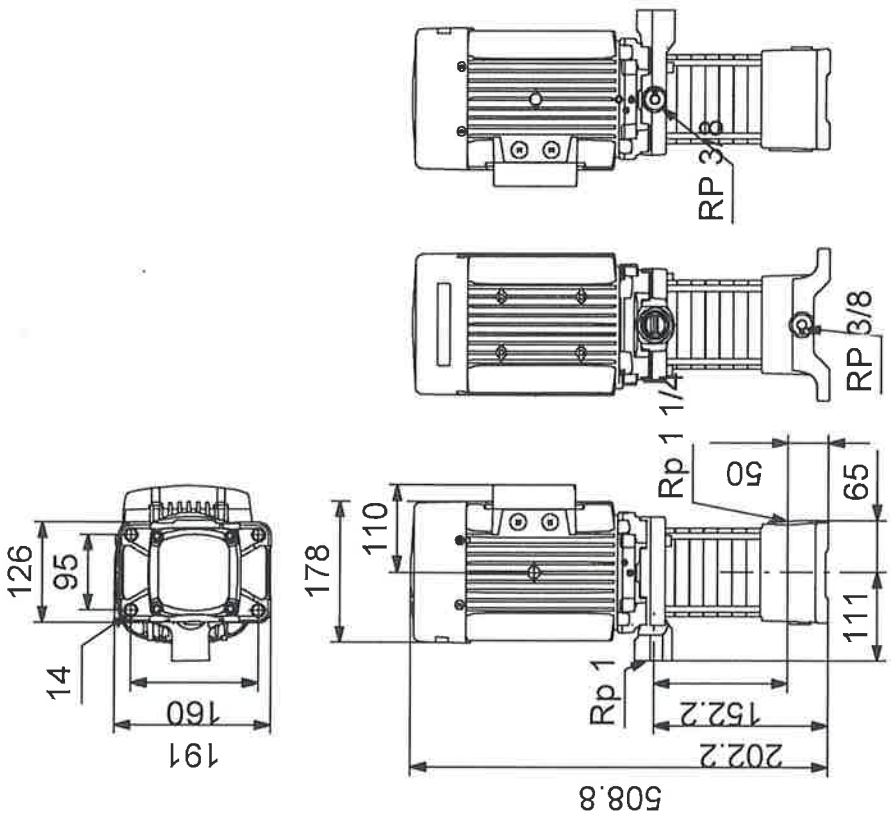
97908652 CMV5-7 50 Hz



Description	Value
	CMV5-7 A-R-A-E-AVBE
Product No:	97908652
	5710626199600
Technical:	
Speed for pump data:	2900 rpm
Actual calculated flow:	61.34 l/min
Resulting head of the pump:	60.6 m
Impellers:	7
Shaft seal:	AVBE
Approvals on nameplate:	CE
Pump version:	A
Model:	A
Materials:	
Pump housing:	Cast iron
	EN-JL1030
	AISI 30 B
Impeller:	Stainless steel
	DIN W.-Nr. 1.4301
	AISI 304
Material code:	A
Rubber:	EPDM
Code for rubber:	E
Installation:	
Maximum ambient temperature:	55 °C
Maximum operating pressure:	10 bar
Max pressure at stated temp:	10 bar / 40 °C
Flange standard:	WHITWORTH THREAD RP
Connect code:	R
Pump inlet:	Rp 1 1/4
Pump outlet:	Rp 1
Liquid:	
Pumped liquid:	Water
Minimum liquid temperature:	-20 °C
Liquid temp:	20 °C
Density:	998.2 kg/m³
Electrical data:	
IE Efficiency class:	IE2
Rated power - P2:	1.58 kW
Mains frequency:	50 Hz
Rated voltage:	3 x 220-240D/380-415Y V
Service factor:	1
Rated current:	5,55-5,38/3,25-3 A
Rated speed:	2880-2910 rpm
IE efficiency:	IE2 81,3 %
Motor efficiency at full load:	81,3 %
Enclosure class (IEC 34-5):	55
Insulation class (IEC 85):	F
Motor protec:	NO
Others:	
Net weight:	26.9 kg
Gross weight:	29.4 kg

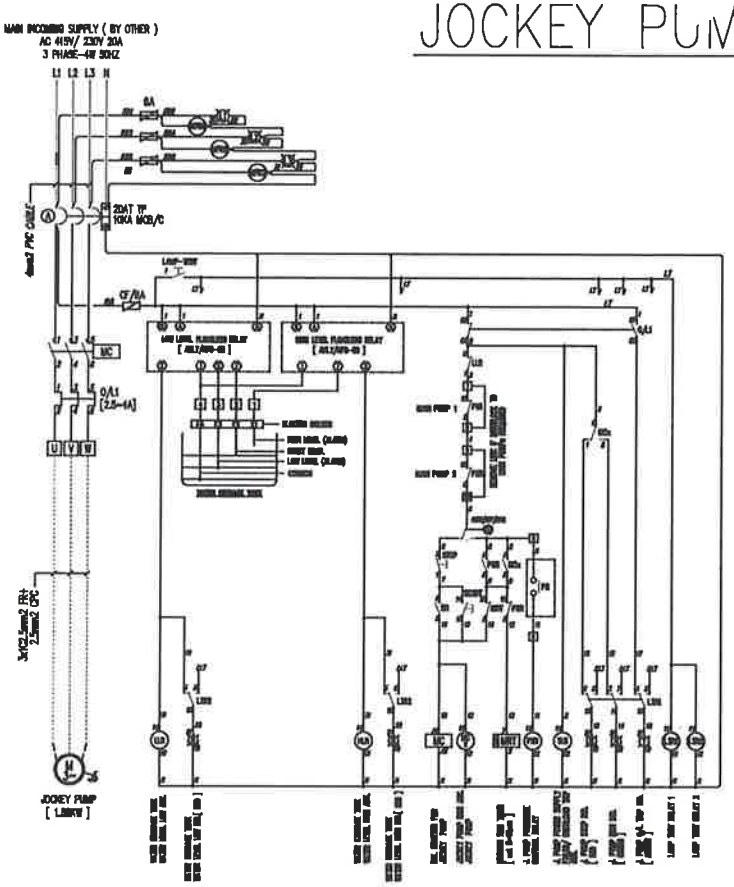


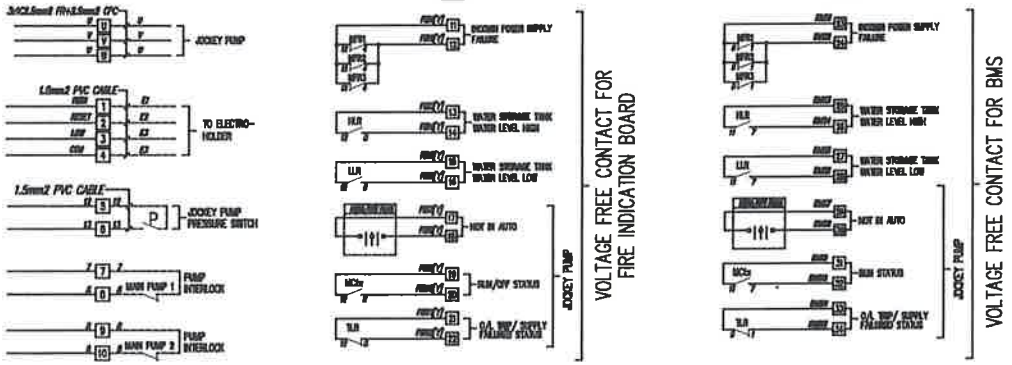
97908652 CMV5-7 50 Hz

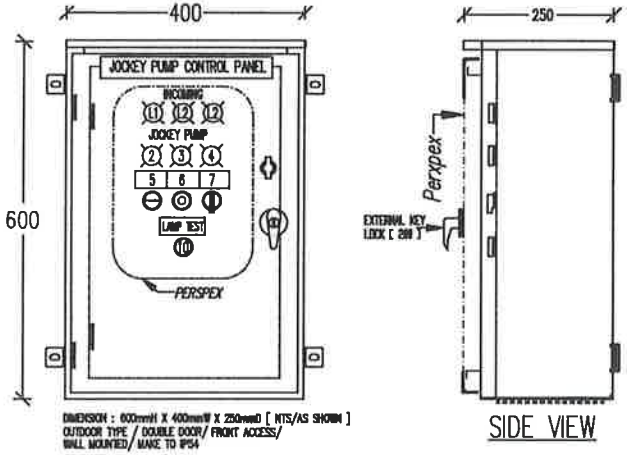


Note! All units are in [mm] unless others are stated.
Disclaimer: This simplified dimensional drawing does not show all details.

JOCKEY PUMP STARTER CONTROL PANEL







MARK	DESCRIPTION	BRAND / MAKE	PART NO.
A	MAIN INCOMING MCB	ABB/ ITALY	20AT 3POLE 10KA TYPE C
1	INCOMING/ OUTGOING SUPPLY AVAILABLE IND.[L1, L2, L3]	SCHNEIDER/ CHINA	XA2-EV SERIES 230vAC LED
2	JOCKEY PUMP RUN IND.[GREEN]	SCHNEIDER/ CHINA	XA2-EV SERIES 230vAC LED
3	JOCKEY PUMP STOP IND.[RED]	SCHNEIDER/ CHINA	XA2-EV SERIES 230vAC LED
4	JOCKEY PUMP TRIP IND.[YELLOW]	SCHNEIDER/ CHINA	XA2-EV SERIES 230vAC LED
5	START PUSHBUTTON[GREEN]	IDEC/ JAPAN	YW8B-M1E10
6	STOP PUSHBUTTON[RED]	IDEC/ JAPAN	YW8B-M1E01
7	MANUAL/OFF/AUTO SELECTOR SWITCH	SCHNEIDER/ CHINA	ZA2EE SERIES 3POLE
8	JOCKEY WATER STORAGE TANK WATER LEVEL HIGH IND.[RED]	SCHNEIDER/ CHINA	XA2-EV SERIES 230vAC LED
9	JOCKEY WATER STORAGE TANK WATER LEVEL LOW IND.[RED]	SCHNEIDER/ CHINA	XA2-EV SERIES 230vAC LED
10	LAMP TEST PUSHBUTTON[GREEN]	IDEC/ JAPAN	YW8B-M1E10
MFR1~3	MAIN FAILURE RELAY	IDEC/ JAPAN	RU2S-C, AC230v with Light
LLR, HLR	CONTROL RELAY	IDEC/ JAPAN	RU4S-C, AC230v with Light
TLR1, LTR1&2	CONTROL RELAY	IDEC/ JAPAN	RU4S-C, AC230v with Light
MC1~n	CONTROL RELAY	IDEC/ JAPAN	RU4S-C, AC230v with Light
MRT	DELAY ON TIMER	ANLY/ TAIWAN	AH3-1, 0~30s, 230vAC
LEVEL RELAY	HIGH/ LOW LEVEL MONITORING RELAY	ANLY/ TAIWAN	AFS-6R, 230vAC
F1	CONTROL FUSES	Zhrdq/ CHINA	RT18-32X, 10x38, 500~690v
MC1	CONTACTOR [FOR JOCKEY PUMP]	ABB/ CHINA	AX09-30-10
O/L1	THERMAL OVERLOAD RELAY [FOR JOCKEY PUMP]	ABB/ JAPAN	T25DU-4.0A

SYMBOL	DESCRIPTION	MAKE	MODEL
	CIRCUIT BREAKER	ABB/ CHINA	3POLE 10KA TYPE C
	INCOMING/OUTGOING LIGHT	SCHNEIDER / CHINA	XA2-EV SERIES 230vAC LED
	PUSH BUTTON	IDEC/ JAPAN	YW SERIES
	SELECTOR SWITCH	SCHNEIDER/ CHINA	ZA2EE SERIES
	CONTACTOR	ABB/ CHINA	AX SERIESA
	OVERLOAD RELAY	ABB / CHINA	O/L [2.5~4A]
	CONTROL RELAY	IZUMI/ JAPAN	RU SERIES, AC230v
	DELAY ON TIMER	ANLY/TAIWAN	AH3-1, AC230v
	CONTROL FUSE	Zhrdq/ CHINA	RT18C-32X, 500~690v

AMENDMENT

REV.	DATE	DESCRIPTION
0A	28/03/2017	

FIRE CONTRACTOR :

SWITCHBOARD MANUFACTURER :

CAE ENGINEERING PTE LTD

PROJECT :

JOCKEY PANEL PROJECT

DRAWING TITLE :

JOCKEY PUMP CONTROLLER FOR 1 X 1.5KW DOL STARTER JOCKEY PUMP

DESIGNED BY :	TONY TAN
DRAWN BY :	TAI TAI
CHECKED BY :	MIKE TAN
DWG. NO. :	PPP-JCO-03-01
DATE :	28/03/2017

9.1

SHUT OFF PRESSURE = 85 PSI		
	CUT IN	CUT OUT
WET-RISER PUMP 1	65 PSI	NA
WET-RISER PUMP 1 LOW PRESSURE	65 PSI	

SHUT OFF PRESSURE = 95 PSI		
	CUT IN	CUT OUT
JOCKEY PUMP	85 PSI	95 PSI

SERIAL NO	1708001
LINE VOLT	AC 415 V
KW	30KW
FLC	54A
ENCLOSURE RATING	IP55
PHASE / HZ	3 / 50
CTR VOLT	AC415V / DC12V
TEMP.	4 TO 40 DEG C
MFG DATE	6/22/2017
DWG NO.	30KW S/S FPC VER01 -C1 TO C6

OPTIONS 1	DATA LOG
OPTIONS 2	NONE
OPTIONS 3	NONE
OPTIONS 4	NONE
OPTIONS 5	NONE

PUMP MODEL	GRUNDFOS, NK 65-200
PUMP TYPE	END SUCTION PUMP
SERIAL NO	B98917263
RATED KW	17.9KW
MAX. KW	22KW
RPM	2950 RPM
DUTY FLOW	27LPS AT 50M
130% FLOW	35.1LPS
MAX. PRESSURE	55M
IMP DIA.	198mm

MODEL NO.	CAE-JOC-VER-01
LINE VOLT	AC 415 V
KW	1.58 KW
FLC	3.5 A
ENCLOSURE RATING	IP54
PHASE / HZ	3 / 50
TEMP.	4 TO 40 DEG C
MFG DATE	6/22/2017
DWG NO.	FPP-JOC-VER-01

OPTIONS 1	DATA LOG
OPTIONS 2	NONE
OPTIONS 3	NONE
OPTIONS 4	NONE
OPTIONS 5	NONE

PUMP MODEL	CMV 5-7
PUMP TYPE	VERTICAL MULTISTAGE
SERIAL NO	A97908652
RATED KW	1.34KW
MAX. KW	1.58KW
RPM	2900 RPM
DUTY FLOW	60L/MIN AT 58M
130% FLOW	78L/MIN
MAX. PRESSURE	10 BAR
IMP DIA.	7 mm

								DATALOG TABLE		
DATE	TIME	I1	I2	I3	I4	I5	I6	I7	I8	B003.Ax
9/6/2017	16:04:50	1	1	0	0	0	0	0	0	16
9/6/2017	16:06:18	1	1	0	0	0	0	0	0	56
9/6/2017	16:10:19	1	1	0	0	0	0	0	0	53
9/6/2017	16:11:20	1	1	0	0	0	0	0	0	84
9/6/2017	16:12:20	1	1	0	0	0	0	0	0	85
9/6/2017	16:13:20	1	1	0	0	0	0	0	0	84
9/6/2017	16:14:21	1	1	0	0	0	0	0	0	84
9/6/2017	16:15:22	1	1	0	0	0	0	0	0	97
9/6/2017	16:16:23	1	1	0	0	0	0	0	0	97
9/6/2017	16:17:23	1	1	0	0	0	0	0	0	96
9/6/2017	16:18:23	1	1	0	0	0	0	0	0	96
9/6/2017	16:19:24	1	1	0	0	0	0	0	0	96
9/6/2017	16:20:24	1	1	0	0	0	0	0	0	95
9/6/2017	16:21:24	1	1	0	0	0	0	0	0	96
9/6/2017	16:22:25	1	1	0	0	0	0	0	0	94
9/6/2017	16:23:26	1	1	0	0	0	0	0	0	96
9/6/2017	16:24:27	1	1	0	0	0	0	0	0	95
9/6/2017	16:25:27	1	1	0	0	0	0	0	0	95

I1	1 IS RUN	0 IS STOP
I2	1 IS NOT IN AUTO	0 IS AUTO
I3	1 IS OVERCURRENT	0 IS NORMAL
I4	1 IS PHASE FAULT	0 IS NORMAL
I5	SPARE	SPARE
I6	SPARE	SPARE
I7	TRANSDUCER (INPUT)	-
I8	SPARE	SPARE
B003.Ax	PRESSURE READING IN PSI	-