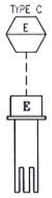
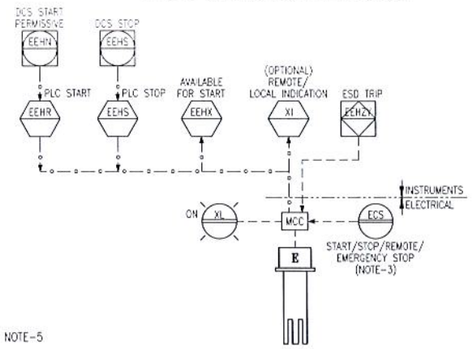
SHOWN ON P&ID

TYPE C



ENGINEERING DETAIL

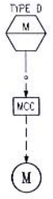
TYPE C–ELECTRIC HEATER (RTU/PLC)



NOTE–5

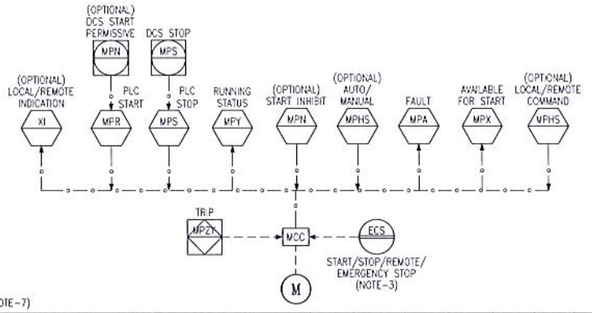
SHOWN ON P&ID

TYPE D



ENGINEERING DETAIL

ONE PUMP MOTOR PLC CONTROLLED (TYPE–D)

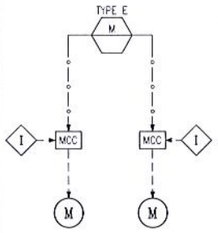


(NOTE–7)

Type D 1 Pump Motor (1 X 100%) PLC CONTROLLED		SUFFIX FOR SIGNALS			Type D.1	Type D.2	Type D.3	Type D.4
	ENS CODE	MOTOR A						
LOCAL/REMOTE CMND FROM UCP	MPHS	A			X		X	
RUNNING STATUS	MPY				X	X	X	X
FAULT	MPA				X	X	X	X
AVAILABLE	MPX				X	X	X	X
LOCAL REMOTE INDICATION ON UCP	XI				X		X	
AUTO/MANUAL FROM DCS	MPHS	B			X	X	X	X
DCS START PERMISSIVE	MPN				X	X	X	X
DCS STOP	MPS				X	X	X	X
PLC START	MPR				X	X	X	X
PLC STOP	MPS				X	X	X	X
LOCAL START/STOP/REMOTE [PART OF ELECTRICAL CONTROL STATION (ECS)] (OPTIONAL)					X		X	
EMERGENCY STOP [PART OF ELECTRICAL CONTROL STATION (ECS)] (MUST)					X	X	X	X
ESD TRIP	MPZY				X	X	X	X
LEAD / LAG BASED ON INTERLOCK							X	X
START INHIBIT (OPTIONAL)	MPN						X	X

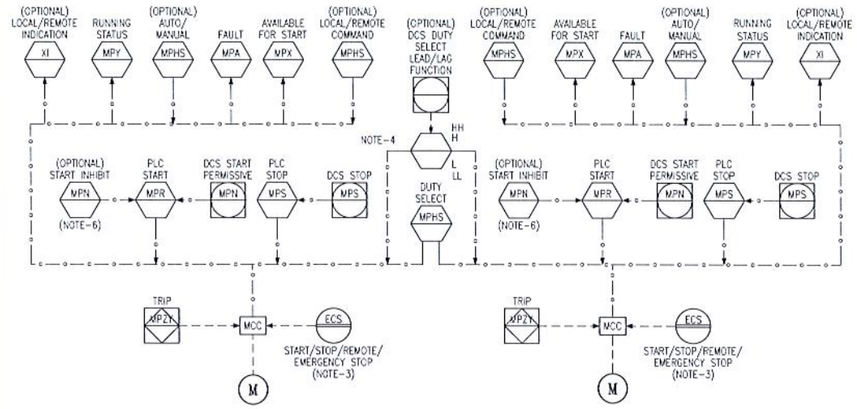
SHOWN ON P&ID

TYPE E



ENGINEERING DETAIL

TWO PUMP MOTORS PLC CONTROLLED (TYPE–E)

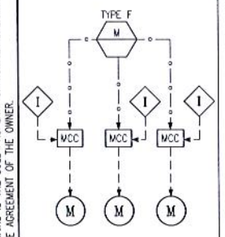


(NOTE–7)

Type E Duty Stand By Pumps (2 X 100%) PLC CONTROLLED		SUFFIX FOR SIGNALS		Type E.1	Type E.2	Type E.3	Type E.4	Type E.5
	ENS CODE	MOTOR A	MOTOR B					
LOCAL/REMOTE CMND FROM UCP	MPHS	A	B	X		X		X
RUNNING STATUS	MPY	A	B	X	X	X	X	X
FAULT	MPA	A	B	X	X	X	X	X
AVAILABLE	MPX	A	B	X	X	X	X	X
LOCAL REMOTE INDICATION ON UCP	XI	A	B	X		X		X
AUTO/MANUAL FROM DCS	MPHS	A	B	X	X	X	X	X
DCS START PERMISSIVE	MPN	A	B	X	X	X	X	X
DCS STOP	MPS	A	B	X	X	X	X	X
PLC START	MPR	A	B	X	X	X	X	X
PLC STOP	MPS	A	B	X	X	X	X	X
LOCAL START/STOP/REMOTE [PART OF ELECTRICAL CONTROL STATION (ECS)] (OPTIONAL)				X		X		X
EMERGENCY STOP [PART OF ELECTRICAL CONTROL STATION (ECS)] (MUST)				X	X	X	X	X
ESD TRIP	MPZY	A	B	X	X	X	X	X
DUTY /STANDBY SELECT FROM UCP	MPHS			X	X	X	X	X
LEAD / LAG BASED ON INTERLOCK (OPTIONAL)							X	X
START INHIBIT (OPTIONAL)	MPN	A	B			X	X	X

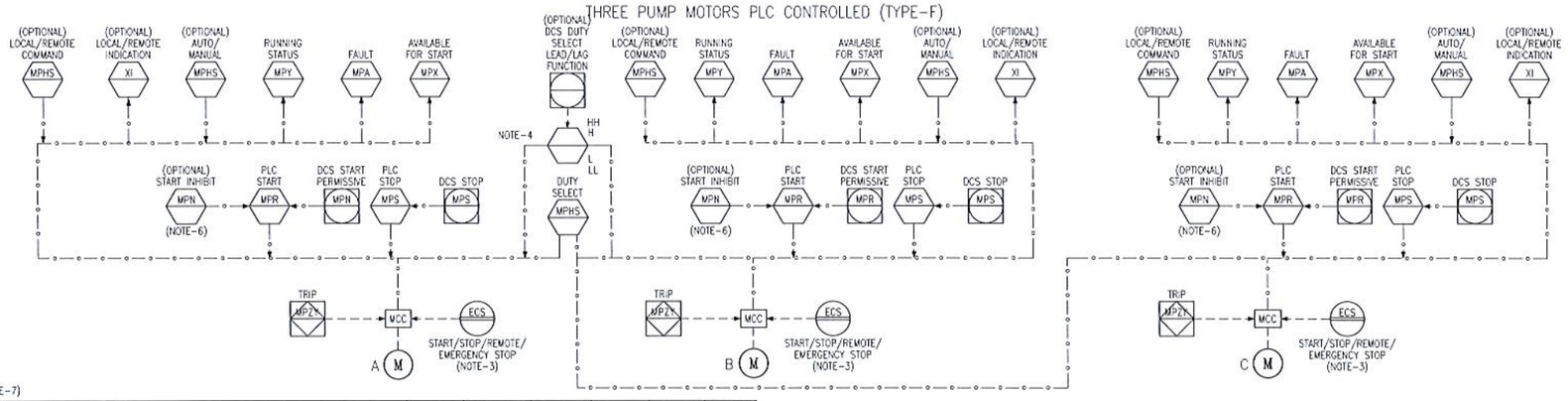
SHOWN ON P&ID

TYPE F



ENGINEERING DETAIL

THREE PUMP MOTORS PLC CONTROLLED (TYPE–F)



(NOTE–7)

Type F Duty Stand By Pumps (3 X 50%, 2 DUTY + 1 STANDBY) PLC CONTROLLED		SUFFIX FOR SIGNALS			Type F.1	Type F.2
	ENS CODE	MOTOR A	MOTOR B	MOTOR C		
LOCAL/REMOTE CMND FROM UCP	MPHS	A	B	C	X	
RUNNING STATUS	MPY	A	B	C	X	X
FAULT	MPA	A	B	C	X	X
AVAILABLE	MPX	A	B	C	X	X
LOCAL REMOTE INDICATION ON UCP	XI	A	B	C	X	
AUTO/MANUAL FROM DCS	MPHS	A	B	C	X	X
DCS START PERMISSIVE	MPN	A	B	C	X	X
DCS STOP	MPS	A	B	C	X	X
PLC START	MPR	A	B	C	X	X
PLC STOP	MPS	A	B	C	X	X
LOCAL START/STOP/REMOTE [PART OF ELECTRICAL CONTROL STATION (ECS)] (OPTIONAL)					X	
EMERGENCY STOP [PART OF ELECTRICAL CONTROL STATION (ECS)] (MUST)					X	X
ESD TRIP	MPZY	A	B	C	X	X
DUTY /STANDBY SELECT FROM UCP	MPHS				X	X
LEAD / LAG BASED ON INTERLOCK (OPTIONAL)						
START INHIBIT (OPTIONAL)	MPN	A	B	C	X	X

NOTES:

1. IF DUTY/STANDBY PUMP ARE ON VSD CONTROL SPEED INDICATION SHALL BE PROVIDED ON PLC.
2. ALL THE OPERATIONAL SIGNALS AND FEEDBACKS TO THE PLC SHALL BE REPEATED TO THE DCS VIA SERIAL COMMUNICATION.
3. ECS SHALL HAVE ONLY EMERGENCY STOP AS DEFAULT. SELECTIVE MOTORS/ HEATERS SHALL HAVE OPTIONS OF LOCAL START/STOP/REMOTE SELECTION BASED ON OPERATIONS.
4. LEAD/LAG & DUTY SELECT TO BE IMPLEMENTED IN DCS/PLC.
5. FOR OTHER HEATER SIGNALS REFER TO ENGINEERING NUMBERING SPECIFICATION 0000RP–C–GO–G000–DM–SPC–0001.
6. START INHIBIT SHALL BE IMPLEMENTED IN DCS/PLC.
7. THE SUB–TYPE PROVIDED FOR MOTOR CONTROL ARE INDICATIVE ONLY. THE SELECTION OF SIGNALS SHALL BE BASED ON PLANT OPERATIONS AS ELABORATED IN THE CONTROL NARRATIVE.
8. THE OPTIONAL SIGNALS SHALL BE SELECTED BASED ON CONTROL PHILOSOPHY, AS ELABORATED IN THE CONTROL NARRATIVE.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
C01	25.05.16	ISSUED FOR CONSTRUCTION	DX	VÜ	AB SQ
D01	18.02.16	ISSUED FOR USE (DD)	DX	SI/VU	AB SQ
H01	28.12.15	ISSUED FOR HAZOP (DD)	DX	SI/VU	AB SQ
G01	26.10.15	ISSUED FOR REVIEW (DD)	DX	SI/VU	TT SQ
B02	15.07.15	APPROVED FOR COMPLETION OF FEED	DX	SI/RS	TT SQ
B01	28.05.15	ISSUED FOR DESIGN	DX	SI/RS	TT SQ
A01	10.02.15	ISSUED FOR COMPANY REVIEW	DX	HM/RS	VM JF

EARLY POWER PLANT
RUMAILA OIL FIELD
CONTRACT NO. 100478

中国石油工程建设公司
CHINA PETROLEUM ENGINEERING & CONSTRUCTION CORP.

CH2MHILL

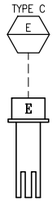
DRAWING TITLE:
PIPING AND INSTRUMENTATION DIAGRAM
LEGEND SHEET
MOTOR CONTROL CENTRES (RTU/PLC)

PROJECT NO.	100478CP	SCALE:	NONE	DWG SIZE:	A1
DRAWING NUMBER:				SHT. NO.:	REV.
100478CP–N–PG–PP01–PR–PID–0001–011				11/17	C01

CAD FILENAME100478CP-N-PG-PP01-PR-PID-0001-011-001.DWG

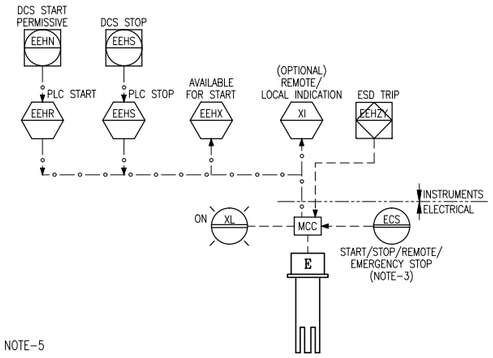
SHOWN ON P&ID

TYPE C



ENGINEERING DETAIL

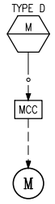
TYPE C–ELECTRIC HEATER (RTU/PLC)



NOTE–5

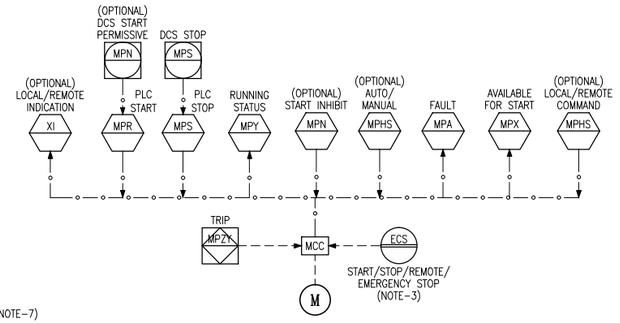
SHOWN ON P&ID

TYPE D



ENGINEERING DETAIL

ONE PUMP MOTOR PLC CONTROLLED (TYPE–D)

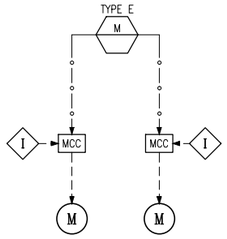


(NOTE–7)

Type D 1 Pump Motor (1 X 100%) PLC CONTROLLED	ENS CODE	SUFFIX FOR SIGNALS MOTOR A		Type D.1	Type D.2	Type D.3	Type D.4
LOCAL/REMOTE CMND FROM UCP	MPHS	A		X		X	
RUNNING STATUS	MPY			X	X	X	X
FAULT	MPA			X	X	X	X
AVAILABLE	MPX			X	X	X	X
LOCAL REMOTE INDICATION ON UCP	XI			X		X	
AUTO/MANUAL FROM DCS	MPHS	B		X	X	X	X
DCS START PERMISSIVE	MPN			X	X	X	X
DCS STOP	MPS			X	X	X	X
PLC START	MPR			X	X	X	X
PLC STOP	MPS			X	X	X	X
LOCAL START/STOP/REMOTE [PART OF ELECTRICAL CONTROL STATION (ECS)] (OPTIONAL)				X		X	
EMERGENCY STOP [PART OF ELECTRICAL CONTROL STATION (ECS)] (MUST)				X	X	X	X
ESD TRIP	MPZY			X	X	X	X
LEAD / LAG BASED ON INTERLOCK						X	X
START INHIBIT (OPTIONAL)	MPN					X	X

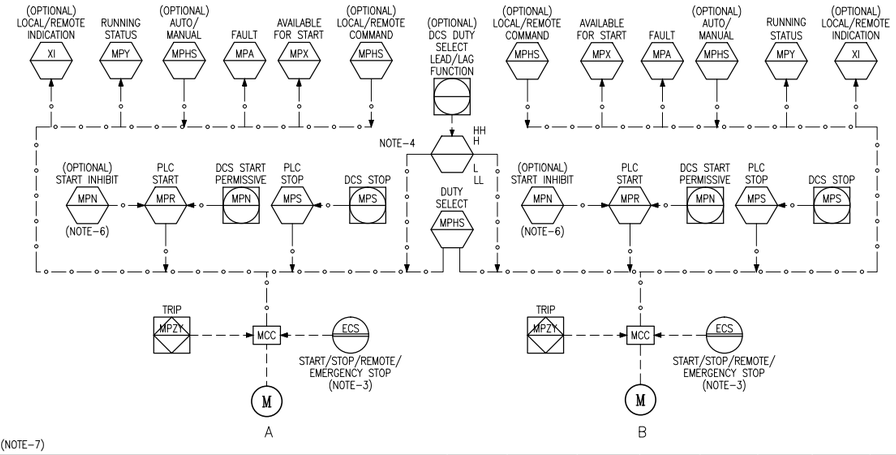
SHOWN ON P&ID

TYPE E



ENGINEERING DETAIL

TWO PUMP MOTORS PLC CONTROLLED (TYPE–E)



(NOTE–7)

Type E Duty Stand By Pumps (2 X 100%) PLC CONTROLLED	ENS CODE	SUFFIX FOR SIGNALS MOTOR A	MOTOR B	Type E.1	Type E.2	Type E.3	Type E.4	Type E.5
LOCAL/REMOTE CMND FROM UCP	MPHS	A	B	X		X		X
RUNNING STATUS	MPY	A	B	X	X	X	X	X
FAULT	MPA	A	B	X	X	X	X	X
AVAILABLE	MPX	A	B	X	X	X	X	X
LOCAL REMOTE INDICATION ON UCP	XI	A	B	X		X		X
AUTO/MANUAL FROM DCS	MPHS	A	B	X	X	X	X	X
DCS START PERMISSIVE	MPN	A	B	X	X	X	X	X
DCS STOP	MPS	A	B	X	X	X	X	X
PLC START	MPR	A	B	X	X	X	X	X
PLC STOP	MPS	A	B	X	X	X	X	X
LOCAL START/STOP/REMOTE [PART OF ELECTRICAL CONTROL STATION (ECS)] (OPTIONAL)				X		X		X
EMERGENCY STOP [PART OF ELECTRICAL CONTROL STATION (ECS)] (MUST)				X	X	X	X	X
ESD TRIP	MPZY	A	B	X	X	X	X	X
DUTY /STANDBY SELECT FROM UCP	MPHS			X	X	X	X	X
LEAD / LAG BASED ON INTERLOCK (OPTIONAL)							X	X
START INHIBIT (OPTIONAL)	MPN	A	B			X	X	X

NOTES:

1. IF DUTY/STANDBY PUMP ARE ON VSD CONTROL, SPEED INDICATION SHALL BE PROVIDED ON PLC.
2. ALL THE OPERATIONAL SIGNALS AND FEEDBACKS TO THE PLC SHALL BE REPEATED TO THE DCS VIA SERIAL COMMUNICATION.
3. ECS SHALL HAVE ONLY EMERGENCY STOP AS DEFAULT. SELECTIVE MOTORS/ HEATERS SHALL HAVE OPTIONS OF LOCAL START/STOP/REMOTE SELECTION BASED ON OPERATIONS.
4. LEAD/LAG & DUTY SELECT TO BE IMPLEMENTED IN DCS/PLC.
5. FOR OTHER HEATER SIGNALS REFER TO ENGINEERING NUMBERING SPECIFICATION 0000RP–C–GO–G000–DM–SPC–0001.
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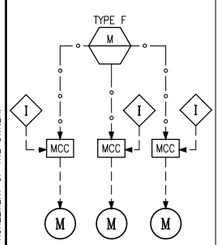
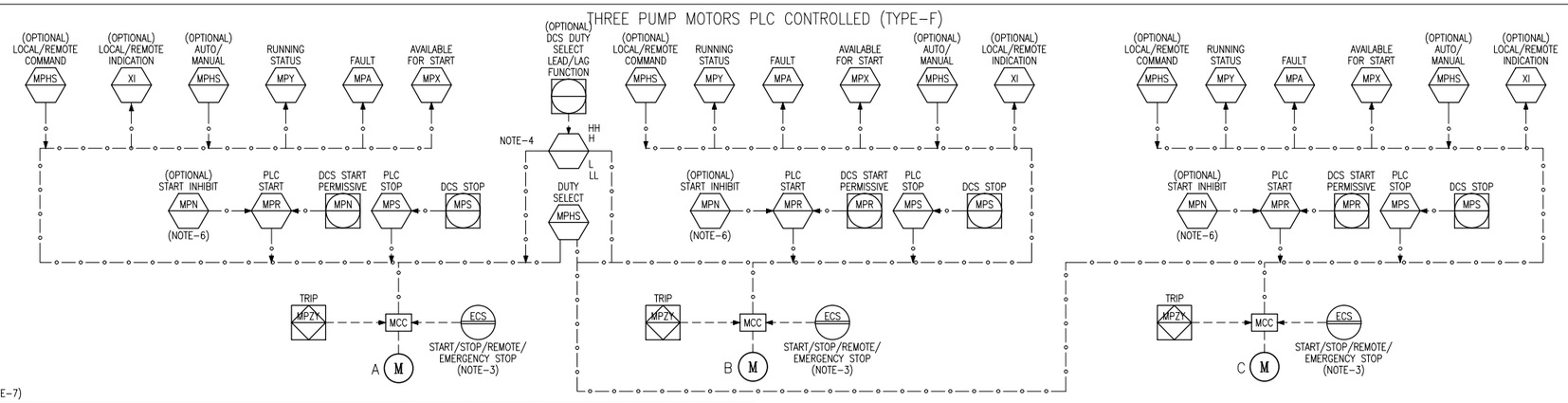
SHOWN ON P&ID

TYPE F



ENGINEERING DETAIL

THREE PUMP MOTORS PLC CONTROLLED (TYPE–F)



(NOTE–7)

Type F Duty Stand By Pumps (3 X 50%, 2 DUTY + 1 STANDBY) PLC CONTROLLED	ENS CODE	SUFFIX FOR SIGNALS MOTOR A	MOTOR B	MOTOR C	Type F.1	Type F.2
LOCAL/REMOTE CMND FROM UCP	MPHS	A	B	C	X	
RUNNING STATUS	MPY	A	B	C	X	X
FAULT	MPA	A	B	C	X	X
AVAILABLE	MPX	A	B	C	X	X
LOCAL REMOTE INDICATION ON UCP	XI	A	B	C	X	
AUTO/MANUAL FROM DCS	MPHS	A	B	C	X	X
DCS START PERMISSIVE	MPN	A	B	C	X	X
DCS STOP	MPS	A	B	C	X	X
PLC START	MPR	A	B	C	X	X
PLC STOP	MPS	A	B	C	X	X
LOCAL START/STOP/REMOTE [PART OF ELECTRICAL CONTROL STATION (ECS)] (OPTIONAL)					X	
EMERGENCY STOP [PART OF ELECTRICAL CONTROL STATION (ECS)] (MUST)					X	X
ESD TRIP	MPZY	A	B	C	X	X
DUTY /STANDBY SELECT FROM UCP	MPHS				X	X
LEAD / LAG BASED ON INTERLOCK (OPTIONAL)						
START INHIBIT (OPTIONAL)	MPN	A	B	C	X	X

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
C01	25.05.16	ISSUED FOR CONSTRUCTION	DX	VU	AB	SQ
D01	18.02.16	ISSUED FOR USE (DD)	DX	SI/VU	AB	SQ
H01	28.12.15	ISSUED FOR HAZOP (DD)	DX	SI/VU	AB	SQ
G01	26.10.15	ISSUED FOR REVIEW (DD)	DX	SI/VU	TT	SQ
B02	15.07.15	APPROVED FOR COMPLETION OF FEED	DX	SI/RS	TT	SQ
B01	28.05.15	ISSUED FOR DESIGN	DX	SI/RS	TT	SQ
A01	10.02.15	ISSUED FOR COMPANY REVIEW	DX	HM/RS	VM	JF

EARLY POWER PLANT
RUMAILA OIL FIELD
CONTRACT NO. 100478

中国石油工程建设公司
CHINA PETROLEUM ENGINEERING & CONSTRUCTION CORP.

CH2MHILL

DRAWING TITLE:
PIPING AND INSTRUMENTATION DIAGRAM
LEGEND SHEET
MOTOR CONTROL CENTRES (RTU/PLC)

PROJECT NO.	100478CP	SCALE:	NONE	DWG SIZE:	A1
DRAWING NUMBER:				SHT. NO.:	REV.
100478CP–N–PG–PP01–PR–PID–0001–011				11/17	C01

CAD FILENAME:100478CP–N–PG–PP01–PR–PID–0001–011–C01.DWG